

Environmental Impact Assessment Report

Taurbeg Wind Farm Extension of Operational Life

Chapter 12 – Noise and Vibration





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Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



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12. NOISE AND VIBRATION

12.1 Introduction

12.1.1 Background & Objectives

This chapter of the EIAR describes the assessment undertaken of the potential noise and vibration impacts associated with the Proposed Project (Proposed Lifetime Extension for the existing Taurbeg Wind Farm and Proposed Offsetting Measures). The Proposed Lifetime Extension consists of the continued operation of the existing Taurbeg Wind Farm (permitted under Cork CC Pl. Ref N/2002/3608) for a further period of 10 years from the date of expiry (2026) of the current planning permission. The Proposed Offsetting lands are located in Knockatee and Coom, Co. Kerry, approximately 12 km west from the Taurbeg Wind Farm site. A full description of the Proposed Project is provided in Chapter 4: Description of Proposed Project.

There are no modifications proposed for the continued operation of the existing Taurbeg Wind Farm that will affect the existing noise and vibration emissions from the Proposed Lifetime Extension. As all elements of the Taurbeg wind farm are existing, there is no construction phase associated with Proposed Lifetime Extension. A noise assessment has been conducted for the deforestation works at the Proposed Offsetting lands required for the mitigation of potential effects of the continued operation of the existing Taurbeg Wind Farm.

Nearby existing operational wind turbines are located at Knockacummer and Glentane 1 & 2 wind farms (collective known as Glentane / Glentanemacelligot Wind Farm) and these developments have been included in the cumulative wind turbine noise assessment.

The current *Wind Energy Development Guidelines for Planning Authorities*, published by the Department of the Environment, Heritage and Local Government in 2006, defines a noise sensitive location (NSL) as any occupied dwelling house, hostel, health building or place of worship and may include areas of particular scenic quality or special recreational amenity importance. In this assessment, all of the NSLs are residential dwellings, some of which are denoted as derelict. In the EIAR, all residential dwellings are referred to as Sensitive Receptors. Therefore, any reference to NSLs or Sensitive Receptors in Chapter 12 are referring to the same receptors.

To inform this assessment, existing noise levels have been measured at a set of locations, representative of the nearest NSLs in the vicinity of the site, to assess the potential impacts associated with the Proposed Lifetime Extension. Background noise levels have been derived for these locations based on guidance in the Institute of Acoustics (IOA) document *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (2013) (IOA GPG).

12.1.2 Statement of Authority

This chapter of the EIAR has been prepared by the following staff of AWN Consulting Ltd.

Dermot Blunnie (Associate (Acoustics)) holds a BEng (Hons) in Sound Engineering, MSc in Applied Acoustics and has completed the Institute of Acoustics (IOA) Diploma in Acoustics and Noise Control. He has been working in the field of acoustics since 2008 and is a member of the Institute of Engineers Ireland (MIEI) and the Institute of Acoustics (MIOA). He has extensive knowledge and experience in relation to commissioning noise monitoring and impact assessment of wind farms as well as a detailed knowledge of acoustic standards and proprietary noise modelling software packages. He has commissioned noise surveys and completed noise impact assessments for numerous wind farm projects within Ireland.

Miguel Cartuyvels (Acoustic Consultant) holds a BEng (Hons) in Industrial Engineering and is a member (TechIOA) of the Institute of Acoustics. Miguel has worked in the field of acoustics since 2021, where he has contributed to numerous projects related to environmental surveying, noise modelling, and impact assessment for various sectors, including wind energy, industrial, commercial, and residential.

This chapter of the EIAR has been reviewed by Mike Simms (Principal Acoustic Consultant) holds a BE and MEngSc in Mechanical Engineering and is a member of the Institute of Acoustics (MIOA) and of the Institution of Engineering and Technology (MIET). Mike has worked in the field of acoustics for over 20 years. He has extensive experience in all aspects of environmental surveying, noise modelling and impact assessment for various sectors including, wind energy, industrial, commercial and residential.

12.2

Fundamentals of Acoustics

A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. To take account of the vast range of pressure levels that can be detected by the ear, it is convenient to measure sound in terms of a logarithmic ratio of sound pressures. These values are expressed as Sound Pressure Levels (SPL) in decibels (dB).

The human audible range of sounds expressed in terms of Sound Pressure Levels (SPL) is 0 dB (for the threshold of hearing) to 120 dB (for the threshold of pain). In general, a subjective impression of doubling of loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10 dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3 dB.

The frequency of sound is the rate at which a sound wave oscillates is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250Hz. In order to rank the SPL of various noise sources, the measured level has to be adjusted to give comparatively more weight to the frequencies that are readily detected by the human ear. The 'A-weighting' system defined in the international standard, BS ISO 226:2003 Acoustics. Normal Equal-loudness Level Contours has been found to provide the best correlations with human response to perceived loudness. SPLs measured using 'A-weighting' are expressed in terms of dB(A).

An indication of the level of some common sounds on the dB(A) scale is presented in Figure 12-1.

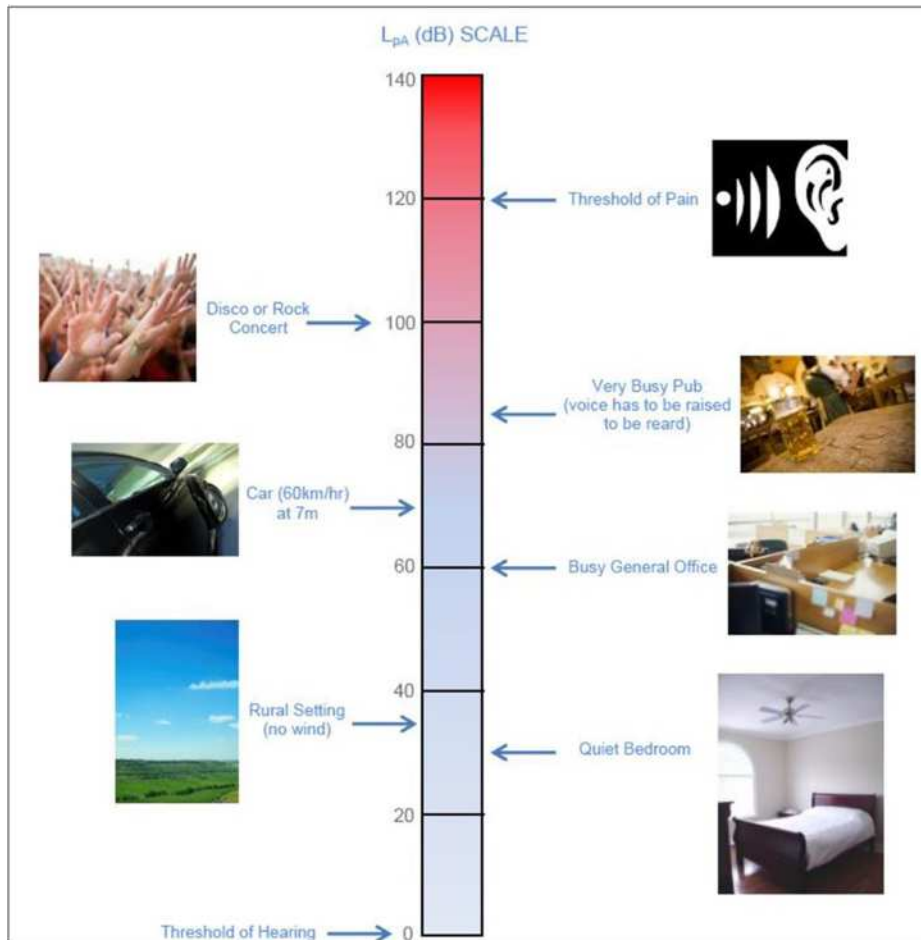


Figure 12-1 dB(A) Scale & Indicative Noise Levels – (EPA NG4 – 2016))

For a glossary of terms used in this chapter please refer to Appendix 12-1.

12.3 Assessment Methodology

The assessment of impacts has been undertaken with reference to the most appropriate guidance documents relating to noise and vibration for the extended operational and standard decommissioning phases of the Proposed Lifetime Extension, which are set out within the relevant sections of this chapter.

In addition to the specific guidance documents discussed in this section, the Environmental Impact Assessment (EIA) guidelines and legislative context presented in Chapter 1 (Introduction) have been considered and consulted for the purposes of preparing this EIAR chapter.

The methodology adopted for this noise and vibration impact assessment for the Proposed Project is summarised as follows:

- Characterise the receiving environment through noise surveys at various NSLs where required.
- Undertake predictive calculations to assess the potential impacts associated with the extended operational and decommission phases of the Proposed Lifetime Extension and the Proposed Offsetting Measures.
- Evaluate the potential noise and vibration impacts and effects.
- Specify mitigation measures and monitoring requirements, where necessary, control and reduce the identified potential outward impacts relating to noise and vibration from the Proposed Project; and

- Describe the significance of the residual noise and vibration effects associated with the Proposed Project.

12.3.1 EPA Description of Effects

The significance of effects of the Proposed Project shall be described in accordance with the EPA guidance document ‘*Guidelines on the information to be contained in Environmental Impact Assessment Reports (ELAR)*’, (EPA,2022). Details of the methodology for describing the significance of the effects are provided in Chapter 1 – Introduction.

The effects associated with the Proposed Lifetime Extension and are described with respect to the EPA guidance in the relevant sections of this chapter.

12.3.2 Guidance Documents and Assessment Criteria

The following sections review the best practice and applicable guidance that is commonly adopted in relation to developments such as the one under consideration here.

12.3.2.1 Extended Operational Phase Noise

12.3.2.1.1 Underground Cables

It is not considered that any significant operational noise or vibration effects are likely in relation to the underground electrical and communications cabling within the site connecting the wind turbines and the met mast to the on-site 38kV substation. The underground cabling will not generate any noise during the operational phase. Therefore, an assessment of noise and vibration from underground cables for the continued operation has been scoped out of this assessment.

12.3.2.1.2 Onsite Substation

The existing onsite 38kV substation will continue operation as part of the Proposed Lifetime Extension. The nearest NSL or Sensitive Receptor to the onsite substation is located at approximately 1.2 km. At this distance there is no likelihood of any significant effects from noise or vibration. Therefore, an assessment of noise and vibration from the continued operation of the onsite substation has been scoped out of this assessment.

12.3.2.1.3 Wind Turbine Noise

There are no conditions of the planning permission for the Taurbeg Wind Farm (Cork Co. Co. Planning Reference No. N/2002/3608) relating to environmental noise.

It is noted that if the Proposed Project is granted permission for continued operation, the wind farm would continue as currently operating and there would be no change to the existing noise environment from the operation of the Taurbeg Wind Farm.

The approach adopted for this assessment is to assess operational noise from the wind farm, in so far as is practicable, as if it were a new wind turbine development. The noise assessment methodology summarised in the following sections has been based on guidance in relation to acceptable levels of noise from wind farms as contained in the document Wind Energy Development Guidelines for Planning Authorities published by the Department of the Environment, Heritage, and Local Government (DEHLG) in 2006 (2006 WEDGs). These guidelines are in turn based on detailed recommendations set out in the Department of Trade & Industry (UK) Energy Technology Support Unit (ETSU) publication “*The Assessment and Rating of Noise from Wind Farms*” (1996). The ETSU document has been used to supplement the guidance contained within the “*Wind Energy Development*

Guidelines” publication where necessary. Reference is also made to noise limits in planning conditions for other nearby operational wind turbine developments.

The Assessment and Rating of Noise from Wind Farms – ETSU-R-97

The core of the noise guidance contained within the Wind Energy Development Guidelines guidance document is based on the 1996 ETSU publication *The Assessment and Rating of Noise from Wind Farms (ETSU-R-97)*.

ETSU-R-97 calls for the control of wind turbine noise by the application of noise limits at the nearest noise sensitive properties. ETSU-R-97 considers that absolute noise limits applied at all wind speeds are not suited to wind turbine developments and recommends that noise limits should be set relative to the existing background noise levels at noise sensitive locations. A critical aspect of the noise assessment of wind energy proposals relates to the identification of baseline noise levels through on-site noise surveys.

ETSU-R-97 states on page 58, “*absolute noise limits and margins above background should relate to the cumulative effect of all wind turbines in the area which contribute to the noise received at the properties in question*”. Therefore, the noise contribution from all wind turbine developments in the area shall be considered in the assessment.

The ETSU-R-97 guidance allows for a higher level of turbine noise operation at properties that have an involvement in the development, both as a higher fixed level of 45 dB L_{A90} and/or a higher level above the prevailing background noise level.

Institute of Acoustics Good Practice Guide

The guidance contained within the institute of Acoustics (IOA) document *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (2013) (IOA GPG) and Supplementary Guidance Notes are considered to represent best practice and have been adopted for this assessment. The IOA GPG states, that at a minimum continuous baseline noise monitoring should be carried out at the nearest noise sensitive locations for typically a two-week period and should capture a representative sample of wind speeds in the area (i.e. cut in speeds to wind speed of rated sound power of the proposed turbine). Background noise measurements (i.e. L_{A90,10min}) should be related to wind speed measurements that are collated at the site of the wind turbine development. Regression analysis is then conducted on the data sets to derive background noise levels at various wind speeds to establish the appropriate day and night-time noise criterion curves.

Noise emissions associated with the wind turbine presented in this Chapter have predicted in accordance with ISO 9613: *Acoustics – Attenuation of sound outdoors, Part 2: General method of calculation* (2004). This is a noise prediction standard that considers noise attenuation offered, amongst others, by distance, ground absorption, directivity and atmospheric absorption. Noise predictions and contours are typically prepared for various wind speeds, and the predicted levels are compared against the relevant noise criterion curve to demonstrate compliance with the appropriate noise criteria.

Where noise predictions indicate that reductions in noise emissions are required in order to satisfy any adopted criteria, consideration can be given to detailed downwind analysis and operating turbines in low noise mode, which is an option on the wind turbine units.

For guidance on the methodology for the background noise survey and operation impact assessment for wind turbine noise, the IOA GPG has been adopted.

The IOA GPG states that cumulative noise exceedances should be avoided and where existing or permitted development is at the noise limit, any new turbine noise sources should be designed to be 10 dB below the limit value. Reference will be made to this guidance when considering potential cumulative impacts from any other existing permitted or proposed wind farms in the surrounding

environment. In the first instance, to determine if they need to be included in the wind turbine noise assessment or if they can be scoped out of the cumulative assessment. noise levels within 10 dB of any existing wind farms at the same receptor location, then a cumulative noise impact assessment is necessary.

Section 5.1 of the IOA GPG provide criteria to determine whether a cumulative turbine noise assessment is necessary:

”5.1.4 During scoping of a new wind farm development consideration should be given to cumulative noise impacts from any other wind farms in the locality. If the proposed wind farm produces

5.1.5 Equally, in such cases where noise from the proposed wind farm is predicted to be 10 dB greater than that from the existing wind farm (but compliant with ETSU-R-97 in its own right), then a cumulative noise impact assessment would not be necessary.”

An appraisal of the study area for the cumulative turbine noise impact assessment is presented in Section 10.3.5 and 10.3.6.

Wind Energy Development Guidelines

Section 5.6 of the *Wind Energy Development Guidelines* published by the Department of the Environment, Heritage and Local Government (2006) addresses noise and outlines the appropriate noise criteria in relation to wind farm developments.

The following extracts from this document are considered:

“An appropriate balance must be achieved between power generation and noise impact.”

While this comment is noted it is stated that the Guidelines give no specific advice in relation to what constitutes an ‘appropriate balance’. In the absence of this, guidance will be taken from alternative and appropriate publications.

Wind Energy Development Guidelines (2006) also state that:

“In the case of wind energy development, a noise sensitive location includes any occupied house, hostel, health building or place of worship and may include areas of particular scenic quality or special recreational importance. Noise limits should apply only to those areas frequently used for relaxation of activities for which a quiet environment is highly desirable. Noise limits should be applied to external locations and should reflect the variation in both turbine source noise and background noise with wind speed.”

As shown the calculations presented in Section 10.4.2 of this chapter, the various requirements identified in the extract above have been incorporated in the assessment.

“In general, a lower fixed limit of 45 dB(A) or a maximum increase of 5 dB(A) above background noise at nearby noise sensitive locations is considered appropriate to provide protection to wind energy development neighbours.”

This represents the commonly adopted daytime noise criterion curve in relation to wind farm developments. However, an important caveat should be noted as detailed in the following extract.

“However, in very quiet areas, the use of a margin of 5 dB(A) above background noise at nearby noise sensitive properties is not necessary to offer a reasonable degree of protection and may unduly restrict wind energy developments which should be recognised as having wider national and global benefits. Instead, in low noise environments where background

noise is less than 30 dB(A), it is recommended that the daytime level of the $L_{A90, 10min}$ of the wind energy development be limited to an absolute level within the range of 35 – 40 dB(A)."

In relation to night-time periods the following guidance is given:

"A fixed limit of 43 dB(A) will protect sleep inside properties during the night."

This limit is defined in terms of the $L_{A90,10min}$ parameter. This represents the commonly adopted night-time lower limit noise criterion curve in relation to wind farm developments.

In summary, the Wind Energy Development Guidelines outlines the following guidance to identify appropriate wind turbine noise criteria curves at noise sensitive locations:

- an appropriate absolute limit level for quiet daytime environments with background noise levels of less than 30 dB $L_{A90,10min}$;
- 45 dB $L_{A90,10min}$ for daytime environments with background noise levels of greater than 30 dB $L_{A90,10min}$ or a maximum increase of 5 dB above background noise (whichever is higher), and;
- 43 dB $L_{A90,10min}$ for night-time periods.

While the caveat of an increase of 5 dB(A) above background for night-time operation is not explicit within 2006 WEDGs, it is based on the methodology in ETSU and commonly applied in wind turbine noise assessments, it is utilised in numerous examples of planning conditions issued by local authorities and An Bord Pleanála (ABP). An increase of 5 dB(A) above background for night-time operation has been imposed through planning conditions at nearby wind farm developments (Knockacummer and Glentane / Glentanemacelligot Wind Farms).

This set of criteria has been chosen as it is in line with the intent of the relevant Irish guidance. The proposed operational noise criteria for wind turbine noise at noise sensitive locations are presented in Section 10.4.2.

Review of Planning Conditions for Other Operational Noise on Existing Wind Energy Developments in the Study Area

There are no planning conditions controlling noise for the existing Taurbeg Wind Farm. To determine appropriate noise limits in accordance with proposed criteria for wind turbine operations, it is important to consider any existing planning controls for turbine noise on other wind farm developments within the study area.

Best practice for setting wind turbine noise limits is that any turbine limits should relate to the cumulative turbine noise level from all turbines at Noise Sensitive Locations (NSLs). It is not uncommon for older wind farm developments in Ireland to have conditioned noise limits that conflict with, or do not align with, those of neighbouring wind farm developments.

When setting appropriate turbine noise limits in accordance with the criteria following the applicable guidance (2006 WEDGs), it is important to bear in mind that where an existing wind turbine development is the dominant source of turbine noise at a given NSL, this must be considered in the context of the planning condition for noise under which that particular development operates.

In practical terms, the proposed turbine noise limits for the Proposed Lifetime Extension should apply to the nearest NSLs where it can be reasonably determined that the noise contribution from the operation of the Proposed Lifetime Extension is the dominant wind turbine source or has a significant contribution to the cumulative turbine noise level at a given NSL.

The planning permission for the Glentane Phase 1 Wind Farm development (Planning Reference 06/4077) places a limit on noise levels at a lower threshold of 43 dB $L_{A90,10min}$ with an allowance for +5

dB above background noise through Condition no. 17 of the grant of planning. It is understood that a similar noise condition applies to Glentane Phase 2. It is also noted that this condition relates to all periods, day and night. Condition 17 states:

“Noise levels emanating from the proposed development following commissioning when measured externally shall not exceed the greater of 43dB (A) L_{90} or 5dB above background levels.

If noise contains a discrete continuous note (whine, hiss, hum etc.), or if there are distinct impulses in the noise (bangs, clicks, clatters or thumps), or if the noise is irregular enough in character to attract attention, a penalty of +5 dB shall be applied to the measured noise level and this increased level shall be used in assessing compliance with the specified levels.”

While the planning condition noise limits for Glentane Phase 1 is not strictly in line with best practice, they are not dissimilar of those applied in grants of permission issued by ABP for similar developments. A fixed lower threshold of 43 dB L_{A90} is applied to daytime. Given the precedents for this condition and the fact that the Proposed Lifetime Extension shares common NSLs, it is reasonable to apply the same 43 dB L_{A90} as a lower threshold for cumulative turbine noise during daytime periods, where background noise levels are less than 30 dB L_{A90} (refer to Section 10.3.2.2.3 for discussion of the turbine noise criteria). Having NSLs in the study area with two different cumulative turbine noise limits may lead to complications in demonstrating planning compliance and enforcement. In our professional opinion it would be appropriate to maintain the same conditions, adopting a daytime lower threshold of 43 dB L_{A90} for the Proposed Lifetime Extension as a cumulative turbine noise limit, to align to the conditioned turbine noise limits to others in the area to avoid practical difficulties in terms of demonstrating compliance. Ultimately, the turbine noise emission from the Proposed Lifetime Extension will remain unchanged.

Condition 14 of the ABP grant of planning permission for the Knockacummer Wind Farm relates to noise and states the following requirement:

(a) Noise levels measured externally during the operation of the development at the nearest noise sensitive location shall not exceed 5 dBA above ambient noise levels.

(b) Prior to the commissioning of the plant, the developers shall arrange for the monitoring of noise levels within one year of the commissioning of the development. The nature and extent of the monitoring programme, and noise sensitive locations to be monitored, shall be agreed with the planning authority. Mitigation measures shall be submitted to the planning authority for written agreement in the event of noise levels exceeding the permitted levels and having an adverse impact on nearby noise sensitive properties.

Condition 14 from Knockacummer Wind Farm is not typical of planning conditions for noise from wind turbine development and does not align with best practice guidance for wind turbine noise. The limit values are not clearly defined, and there is no lower threshold limit stipulated. However, it is understood that the intent is to apply an allowance in the turbine noise limit of 5 dB above background noise levels at all periods, day and night.

The proposed operation turbine noise limits for the Lifetime Extension are presented in Section 12.4.2.

Future Potential Guidance Change

In December 2019, the Draft Revised Wind Energy Development Guidelines (2019 Draft) were published for consultation and at the time of writing, the final guidelines have yet to be published. It is important to note that during the public consultation on the 2019 Draft, several concerns relating to the proposed approach of the 2019 Draft have been expressed by various parties. Specific concerns expressed by a group of acoustic professionals working in the field are most relevant. The group was made up of acousticians who act for wind farm developers, Councils, Government bodies and

residents' groups (all of whom are members of the Institute of Acoustics, IOA). The group contained several of the authors / contributors to ETSU-R-97, the IOA Good Practice Guide (IOA GPG) and the IOA Amplitude Modulation Working Group, which are all referenced extensively in the draft guidelines. A statement from the group can be reviewed at:

<https://www.ioa.org.uk/wind-energy-development-guidelines-wedg-consultation-irish-department-housing-planning-community-and>

A copy of the group's consultation response can be viewed at:

<https://tneigroup-com.stackstaging.com/wp-content/uploads/2022/05/WEDG-consultation-joint-response-R0.pdf>

The following statement is of note from the response:

“a number of acousticians working in the field have raised serious concerns over the significant amount of technical errors, ambiguities and inconsistencies in the content of the draft WEDG and these were highlighted during the consultation process by a group of acousticians”

The following statements was submitted by the Minister for Housing, Local Government and Heritage during a Dail Eireann Debates on 13 June 2023¹

“My Department is currently undertaking a focused review of the 2006 Wind Energy Development Guidelines. The review is addressing a number of key aspects including noise, setback distance, shadow flicker, community obligation, community dividend and grid connections.

Guidance on the noise aspect, which is highly technical in nature, is currently being finalised by my Department in conjunction with the Department of the Environment, Climate and Communications (DECC), which has primary responsibility for environmental noise matters. Both Departments are engaging on proposals regarding the measurement and assessment of noise from wind turbines to ensure they are robust and fit for purpose having regard to, inter alia, the revised 2030 target to generate up to 80% of our electricity from renewable sources.

In this connection, DECC has recently appointed an acoustic expert, who has commenced work to inform any amendments to the noise aspect of the Guidelines. My Department in conjunction with DECC will make any further changes to the draft Guidelines which are deemed necessary or appropriate in the wake of this work, with a view to bringing the review of the Guidelines to a conclusion. My Department will be in a better position to provide an update on the expected publication date of the revised Guidelines once this process has concluded.

It should be noted that Action EL/23/4 of the Climate Action Plan 2023 Annex of Actions contains a commitment to having new draft Guidelines prepared by the end of Q4 2023, with revised Guidelines to be published in 2024.

When finalised, the revised Guidelines will be issued under section 28 of the Planning and Development Act 2000, as amended. Planning authorities and, where applicable, An Bord Pleanála, must have regard to guidelines issued under section 28 in the performance of their functions generally under the Planning Acts. In the meantime, the current 2006 Wind Energy Development Guidelines remain in force.”

¹ <https://www.oireachtas.ie/en/debates/question/2023-06-13/780/>

At the time of writing, no new draft Guidelines have been published and there is no confirmed timeframe for their publication. The assessment of wind turbine noise presented in this EIAR is based on the guidance outlined in the 2006 WEDGs and has been supplemented with best practice guidance from ESTU-R-97 and the IOA GPG. If updated Wind Energy Guidelines are published during the application process for the Proposed Lifetime Extension it is anticipated that any relevant changes affecting the noise will be addressed through an appropriate planning condition, or where a supplementary assessment is necessary, through provision of additional information.

World Health Organisation (WHO) Noise Guidelines for the European Region

The World Health Organisation (WHO) *Environmental Noise Guidelines for the European Region* (2018) provide guidance on protecting human health from exposure to environmental noise. They set health-based recommendations based on average environmental noise exposure of several sources of environmental noise, including wind turbine noise. Recommendations are rated as either ‘strong’ or ‘conditional’. A strong recommendation, “*can be adopted as policy in most situations*” whereas a conditional recommendation, “*requires a policy-making process with substantial debate and involvement of various stakeholders. There is less certainty of its efficacy owing to lower quality of evidence of a net benefit, opposing values and preferences of individuals and populations affected or the high resource implications of the recommendation, meaning there may be circumstances or settings in which it will not apply*”.

The objective of the WHO Environmental Noise Guidelines for the European Region that was published in October 2018 is to provide recommendations for protecting human health from exposure to environmental noise from transportation, wind farm and leisure sources of noise. The guidelines present recommendations for each noise source type in terms of L_{den} and L_{night} levels above which there is potential for adverse health risks.

In relation to wind turbine noise, the WHO Guideline Development Group (GDG) state the following:

*“For average noise exposure, the GDG **conditionally** recommends reducing noise levels produced by wind turbines below 45 dB L_{den} , as wind turbine noise above this level is associated with adverse health effects.*

No recommendation is made for average night noise exposure L_{night} of wind turbines. The quality of evidence of night-time exposure to wind turbine noise is too low to allow a recommendation.

*To reduce health effects, the GDG **conditionally** recommends that policymakers implement suitable measures to reduce noise exposure from wind turbines in the population exposed to levels above the guideline values for average noise exposure. No evidence is available, however, to facilitate the recommendation of one particular type of intervention over another.”*

The quality of evidence used for the WHO research is stated as being ‘Low’, the recommendations are therefore conditional.

There is potential increased uncertainty due to the parameter used by the WHO for assessment of exposure (i.e. L_{den}), which it is acknowledged may be a poor characterisation of wind turbine noise and may limit the ability to observe associations between wind turbine noise and health outcomes, as stated below.

“Even though correlations between noise indicators tend to be high (especially between L_{Aeq} -like indicators) and conversions between indicators do not normally influence the correlations between the noise indicator and a particular health effect, important assumptions remain when exposure to wind turbine noise in L_{den} is converted from original sound pressure level values. The conversion requires, as variable, the statistical distribution of annual wind speed at a particular height, which depends on the type of wind turbine and meteorological conditions at

a particular geographical location. Such input variables may not be directly applicable for use in other sites. They are sometimes used without specific validation for a particular area, however, because of practical limitations or lack of data and resources. This can lead to increased uncertainty in the assessment of the relationship between wind turbine noise exposure and health outcomes. Based on all these factors, it may be concluded that the acoustical description of wind turbine noise by means of L_{den} or L_{night} may be a poor characterization of wind turbine noise and may limit the ability to observe associations between wind turbine noise and health outcomes

Further work is required to assess fully the benefits and harms of exposure to environmental noise from wind turbines and to clarify whether the potential benefits associated with reducing exposure to environmental noise for individuals living in the vicinity of wind turbines outweigh the impact on the development of renewable energy policies in the WHO European Region.”

Based upon the review set out above, it is concluded that the conditional WHO recommended average noise exposure level (i.e. 45 dB L_{den}) should not currently be applied as target noise criteria for an existing or proposed wind turbine development in Ireland.

12.3.2.1.4 *Low Frequency Noise and Infrasound*

Low Frequency Noise is noise that is dominated by frequency components less than approximately 200Hz whereas Infrasound is typically described as sound at frequencies below 20Hz. In relation to Infrasound, the following extract from the EPA document *Guidance Note for Noise Assessment of Wind Turbine Operations at EPA Licensed Sites* (NG3) (EPA, 2011) is noted here:

“There is similarly no significant infrasound from wind turbines. Infrasound is high level sound at frequencies below 20 Hz. This was a prominent feature of passive yaw “downwind” turbines where the blades were positioned downwind of the tower which resulted in a characteristic “thump” as each blade passed through the wake caused by the turbine tower. With modern active yaw turbines (i.e. the blades are upwind of the tower and the turbine is turned to face into the wind by a wind direction sensor on the nacelle activating a yaw motor) this is no longer a significant feature.”

The UK Institute of Acoustics Bulletin in March 2009 included a statement of agreement between acoustic consultants regularly employed on behalf of wind farm developers, and conversely acoustic consultants regularly employed on behalf of community groups campaigning against wind farm developments (IAO JS2009). The intent of the article was to promote consistent assessment practices, and to assist in restricting wind farm noise disputes to legitimate matters of concern. The article notes the following with respect to infrasound:

“Infrasound is the term generally used to describe sound at frequencies below 20 Hz. At separation distances from wind turbines which are typical of residential locations the levels of infrasound from wind turbines are well below the human perception level. Infrasound from wind turbines is often at levels below that of the noise generated by wind around buildings and other obstacles.

Sounds at frequencies from about 20 Hz to 200 Hz are conventionally referred to as low-frequency sounds. A report for the DTI in 2006 by Hayes McKenzie concluded that neither infrasound nor low frequency noise was a significant factor at the separation distances at which people lived. This was confirmed by a peer review by a number of consultants working in this field. We concur with this view.”

The article concludes that:

“from examination of reports of the studies referred to above, and other reports widely available on internet sites, we conclude that there is no robust evidence that low frequency

noise (including ‘infrasound’) or ground-borne vibration from wind farms, generally has adverse effects on wind farm neighbours”.

A report released in January 2013 by the South Australian Environment Protection Authority namely, *Infrasound levels near windfarms and in other environments* (EPA, 2013)² found that the level of infrasound from wind turbines is insignificant and no different to any other source of noise, and that the worst contributors to household infrasound are air-conditioners, traffic and noise generated by people.

The EPA’s study concluded that the level of infrasound at houses near wind turbines was no greater than in other urban and rural environments, and stated that:

“The contribution of wind turbines to the measured infrasound levels is insignificant in comparison with the background level of infrasound in the environment.”

In conclusion, low frequency noise and infrasound associated with wind turbines is expected to be below perceptibility thresholds and are not likely to result in any significant effects at NSLs. There are no criteria proposed to assess low frequency noise or infrasound as part of the EIAR.

12.3.2.1.5 *Amplitude Modulation*

In the context of this assessment, amplitude modulation (AM) is defined in the IOA Noise Working Group (Wind Turbine Noise) Amplitude Modulation Working Group (AMWG) document A Method for Rating Amplitude Modulation in Wind Turbine Noise (IOA, 2016) as:

“Periodic fluctuations in the level of audible noise from a wind turbine (or wind turbines), the frequency of the fluctuations being related to the blade passing frequency (BPF) of the turbine rotor(s).”

It is now generally accepted that there are two mechanisms which can cause amplitude modulation:

- ‘Normal’ AM, and;
- ‘Other’ AM (sometimes referred to ‘Excessive’ AM).

In both cases, the result is a regular fluctuation in amplitude at the Blade Passing Frequency (BPF) of the wind turbine blades (the rate at which the blades of the turbine pass a fixed point). For a three-bladed turbine rotating at 20 rpm, this equates to a modulation frequency of 1 Hz.

‘Normal’ AM An observer at ground level close to a wind turbine will experience ‘blade swish’ because of the directional characteristics of the noise radiated from the trailing edge of the blades as it rotates towards and then away from the observer.

This effect is reduced for an observer on or close to the turbine axis, and therefore would not generally be expected to be significant at typical separation distances, at least on relatively level sites.

The RenewableUK AM project (RenewableUK, 2013) has coined the term ‘normal’ AM (NAM) for this inherent characteristic of wind turbine noise, which has long been recognised and was discussed in ETSU-R-97 in 1996.

‘Other’ AM In some cases AM is observed at large distances from a wind turbine (or turbines). The sound is generally heard as a periodic ‘thumping’ or ‘whoomphing’ at relatively low frequencies.

² EPA South Australia, 2013, *Wind farms* https://www.epa.sa.gov.au/files/477912_infrasound.pdf

On sites where it has been reported, occurrences appear to be occasional, although they can persist for several hours under some conditions, dependent on atmospheric factors, including wind speed and direction.

It was proposed in the RenewableUK 2013 study that the fundamental cause of this type of AM is transient stall conditions occurring as the blades rotate, giving rise to the periodic thumping at the blade passing frequency.

Transient stall represents a fundamentally different mechanism from blade swish and can be heard at relatively large distances, primarily downwind of the rotor blade.

The RenewableUK AM project report adopted the term ‘Other AM’ (OAM) for this characteristic. The terms ‘enhanced’ or ‘excess’ AM (EAM) have been used by others, although such definitions do not distinguish between the source mechanisms and presuppose a ‘normal’ level of AM, presumably relating back to blade swish as described in ETSU-R-97.

Frequency of Occurrence of AM

Research by Salford University commissioned by the Department of Environment Food and Rural Affairs (DEFRA), the Department of Business, Enterprise and Regulatory Reform (BERR) and the Department of Communities and Local Government (CLG) investigated the issue of AM associated with wind turbine noise at existing sites. The results were reviewed and published in the report ‘Research into Aerodynamic Modulation of Wind Turbine Noise’ (2007). The conclusions of this report were that aerodynamic modulation was only considered to be an issue at four, and a possible issue at a further eight, of 133 sites in the UK that were operational at the time of the study and considered within the review. At the four sites where AM was confirmed as an issue, it was considered that conditions associated with AM might occur between about 7 and 15% of the time. It also emerged that for three out of the four sites the complaints have subsided, in one case due to the introduction of a turbine control system.

It is not possible to predict an occurrence of AM at the planning stage. While OAM can occur it is noted that the research has shown that it is a rare event associated with a limited number of wind farms.

RenewableUK Research Document states the following in relation to matter:

- | | |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Page 68 Module F | <i>“even on those limited sites where it has been reported, its frequency of occurrence appears to be at best infrequent and intermittent.”</i> |
| Page 6 Module F | <i>“It has also been the experience of the project team that, even at those wind farm sites where AM has been reported or identified to be an issue, its occurrence may be relatively infrequent. Thus, the capture of time periods when subjectively significant AM occurs may involve elapsed periods of several weeks or even months.”</i> |
| Page 61 Module F | <i>“There is nothing at the planning stage that can presently be used to indicate a positive likelihood of OAM occurring at any given proposed wind farm site, based either on the site’s general characteristics or on the known characteristics of the wind turbines to be installed.”</i> |

Concluding Comments on Amplitude Modulation

It is critical to this discussion to recognise that amplitude modulation (AM) is an inherent characteristic of wind turbine noise. A distinction must be made between ‘Normal’ AM, which is a regular fluctuation

in noise levels, and ‘Other’ or ‘Excessive’ AM, which can be more pronounced and potentially disruptive. Normal AM is typically expected and accounted for in noise assessments, whereas Excessive AM should it occur may require additional mitigation measures due to its potential impact on nearby residents.

Research and Guidance in the field of wind turbine noise AM is ongoing with publications being issued by the Institute of Acoustics (IOA) Noise working Group (Wind Turbine Noise) Amplitude Modulation Working Group (AMWG) namely, *A Method for Rating Amplitude Modulation in Wind Turbine Noise* (August 2016) (The Reference Method). The document proposes an objective method for measuring and rating AM. The AMWG does not propose what level of AM is likely to result in adverse community response or propose any limits for AM. The purpose of the group is simply to use existing research to develop a Reference Methodology for the measurement and rating of amplitude modulation.

A 2016 report commissioned by the UK government *Wind turbine AM review: Phase 2 report. 3514482A Issue 3. Department for Business, Energy & Industrial Strategy* completed by WSP Parsons Brinckerhoff recommended the use of a penalty scheme as a potential planning condition for AM to cover periods of complaints due to unacceptable AM. The report included the following caveat “*Any condition developed using the elements proposed in this study should be subject to a period of testing and review. The period should cover a number of sites where the condition has been implemented and would be typically in the order of 2-5 years from planning approval being granted.*”

To date there is no clear industry consensus on how AM should be regulated or managed through the planning stage. In the context of a site seeking permission to continue operation, reference is made to the mitigation measures in respect of AM described in section 12.6.1.1.1.

12.3.2.1.6 *Human Health Effects from Wind Turbine Noise*

There is currently no credible evidence to link wind turbine noise exposure in the environment to adverse health impacts. For further details of potential health impacts effects associated with the Proposed Project, refer to Chapter 5 (Population and Human Health) of this ELAR.

12.3.2.2 **Operational Phase Vibration**

Any vibration generated from the operation of a wind turbine unit will decrease significantly over distance. A recent report from Germany published by the State Office for the Environment, Measurement and Nature Conservation of the Federal State of Baden-Württemberg in 2016, “Low Frequency Noise Incl. Infrasound from Wind Turbines and Other Sources” conducted vibration measurements study for an operational Nordex N117 – 2.4 MW wind turbine. The report concluded that at distances of less than 300 m from the turbine vibration levels had dropped so far that they could no longer be differentiated from the background vibration levels. The shortest distance from any turbine to a wind turbine is 734 m.

There are no reported cases of perceptible vibration from the operation of the Taurbeg Wind Farm at any NSL. Therefore, vibration criteria are not specified for the operational phase of the project.

12.3.2.3 **Decommissioning Phase**

There is no construction associated with the Proposed Lifetime Extension, however, if permitted the Taurbeg Wind Farm would be decommissioned in 2036. The appropriate criteria for the decommissioning phases of the existing Taurbeg Wind Farm are provided here.

The above-ground turbine components will be removed; however, the turbine bases and hardstanding will be left in-situ and covering with topsoil. Electrical cabling connecting the site infrastructure to the

on-site substation will be removed, while the ducting itself will remain in-situ. The substation will remain as a permanent part of the grid network.

It is proposed that the site roadways be left in situ, as appropriate, so as to facilitate on-going access to local landowners. If it were to be confirmed that the roads were not required in the future for any other useful purpose, they could be covered over with local topsoil and left to reseed, however, that is not envisaged at this time.

Refer to Chapter 4 of this EIAR (Description of Proposed Project) for full details of proposed decommissioning.

12.3.2.3.1 Noise Criteria

There is no published statutory Irish guidance relating to the maximum permissible noise levels that may be generated during the construction or decommissioning phase of a project. Local authorities normally control construction activities by imposing limits on the hours of works and may consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction and decommissioning noise levels for a development of this scale may be found in the *British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise*.

The approach adopted here calls for the designation of a NSL into a specific category (A, B or C) based on existing ambient noise levels in the area. This then sets a threshold noise value that, if exceeded (construction or decommissioning noise only) at the façade of residential, noise sensitive locations, indicates a potential significant noise impact is associated with the decommissioning activities.

Table 12-1 sets out the values which, when exceeded, potentially signify a significant effect at the facades of residential receptors as recommended by BS 5228 – 1.

Table 12-1 Example Threshold of Potential Significant Effect at Noise Sensitive Locations

Assessment category and threshold value period (T)	Threshold values, $L_{Aeq,T}$ dB		
	Category A ^{Note A}	Category B ^{Note B}	Category C ^{Note C}
Night-time (23:00 to 07:00hrs)	45	50	55
Evenings and weekends ^{Note D}	55	60	65
Daytime (07:00 – 19:00hrs)	65	70	75

Note A Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

Note B Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.

Note C Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.

Note D 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

For the appropriate period (e.g. daytime) the ambient noise level is determined and rounded to the nearest 5 dB. In this instance, with the rural nature of the site, properties near the development have daytime ambient noise levels that typically range from 40 to 50 dB $L_{Aeq,1hr}$. Therefore, as a precautionary approach, all properties will be afforded a Category A designation.

If the specific noise level due to decommissioning exceeds the appropriate category value (e.g. 65 dB $L_{Aeq,T}$ during daytime periods) then a significant effect is deemed to have occurred.

12.3.2.3.2

Additional Vehicular Activity on Public Roads - Noise

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. Given that decommissioning traffic from the Taurbeg Wind Farm will make use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated increase in traffic noise levels that will arise because of vehicular movements associated with the decommissioning of the Taurbeg Wind Farm. To assist with the interpretation of the noise associated with additional vehicular traffic on public roads, Table 12-2, adapted from United Kingdom Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) Sustainability & Environment Appraisal LA 111 Noise and Vibration Revision 2 (UKHA 2020), offers guidance as to the likely impact in the short-term associated with any change in traffic noise level.

Table 12-2 Classification of magnitude of traffic noise changes in the short-term (Source DMRB, 2020)

Change in Sound Level (dB(A))	Subjective Reaction	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effect
Less than 1 dB	Inaudible	No Change	Imperceptible
1.0 – 2.9	Barely Perceptible	Minor	Slight/Moderate
3.0 – 4.9	Perceptible	Moderate	Significant
≥5	Up to a doubling of loudness	Major	Very Significant

The guidance outlined in Table 12-2 will be used to assess the predicted increases in traffic levels on public roads associated with the decommissioning of the Taurbeg Wind Farm. Where an impact is identified due to the change in traffic noise level, reference will be made to the overall predicted noise level from decommissioning traffic in the context of the decommissioning noise criteria outlined in Section 12.3.2.3.1.

12.3.2.3.3

Consideration of Duration When Assessing Effect

Section 3.19 of LA 111, DMRB states that construction noise and construction traffic noise shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- 10 or more days or nights in any 15 consecutive days or nights; or,
- A total number of days exceeding 40 in any 6 consecutive months.

12.3.2.3.4

Decommissioning Phase - Vibration

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. With respect to the decommissioning of the Taurbeg Wind Farm, the range of relevant criteria used for building protection is expressed in terms of Peak Particle Velocity (PPV) in mm/s.

Guidance relevant to acceptable vibration within buildings is contained in the following documents:

- BS 7385 – Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration (1993); and
- BS 5228 – Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (2009+A1:2014).

BS 7385 states that there should typically be no cosmetic damage if transient vibration does not exceed 15 mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above.

BS 5228-2 recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak particle velocity of 15 mm/s for transient vibration at frequencies below 15 Hz and 20 mm/s at frequencies above than 15 Hz. Below these vibration magnitudes minor damage is unlikely, although where there is existing damage, these limits may be reduced by up to 50%. In addition, where continuous vibration is generated, the limits discussed above may need to be reduced by 50%.

The Transport Infrastructure Ireland (TII) *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes* (TII, 2014) also contains information on the permissible construction vibration levels during the construction phase as shown in Table 12-3.

Table 12-3 Allowable Transient Vibration at Properties

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

12.3.2.4 Proposed Offsetting Measures

The Proposed Offsetting Measures will be achieved by permanent removal of approximately 105.5Ha of plantation forestry to create new viable hen harrier habitat. It is also proposed to restore approximately 17.7 ha of farmland habitat for the benefit of hen harrier. Restoration measures include planting and restoring of hedgerow, implementation of a rotational grazing scheme, planting of linear wildlife crop, predator fencing and cease on fertiliser application. Further detail regarding the Proposed Offsetting Measures can be found in Appendix 7-7. The proposed deforestation works will be of short-term duration and will involve permanent removal of trees which has potential to generate noise to the environment. Refer to Chapter 4 (Description of Proposed Project) for full details of Proposed Offsetting Measures.

There is no published statutory Irish guidance relating to the maximum permissible noise levels that may be generated by the proposed works. In the absence of specific noise limits, appropriate criteria relating to permissible construction and decommissioning noise levels outlined Section 12.3.2.3 are proposed.

12.3.3 Study Area

The study area for the noise and vibration impact assessment was defined by the area where there is potential for noise and vibration impacts and effects at NSLs associated with the Proposed Lifetime Extension during the decommissioning, and operational phases.

12.3.3.1 Operational Phase Noise

For the operational phase, the study area should cover, at a minimum, the area predicted to exceed 35 dB L_{A90} from all existing, permitted, and proposed wind turbines. Due to the potential for cumulative effects with other existing wind farm developments, the study area for the Proposed Lifetime Extension covers at a minimum the area predicted to exceed 30 dB L_{A90} at the maximum predicted noise

emission level for the Taurbeg Turbines isolation. Refer to Appendix 12-5 which displays the relevant noise contours maps which identify this area.

12.3.3.2 Short Term Activities

12.3.3.2.1 Decommissioning Phase

During the decommissioning phase, noise could occur at any location within the redline boundary and along public roads where there are increases in traffic associated with the Proposed Lifetime Extension.

NSLs in proximity to specific demolition activities and those situated along public road with the potential for additional traffic flows associated with the decommissioning have the most potential to experience noise and vibration from the Taurbeg Wind Farm. The study area is based on the nearest NSLs to the working areas, these distances are confirmed in the relevant sections and representative of the closest identified NSL or at defined set back distances from the proposed works.

12.3.3.2.2 Proposed Offsetting Measures

NSLs in proximity to deforestation activities have the most potential to experience noise impacts and effects. The study area is based on the nearest NSLs to the working areas, or at defined set back distances from the proposed works.

12.3.4 Background Noise Assessment

As the Taurbeg Wind Farm is operational, and there are other operational wind farms in the areas it was necessary to adapt the background noise survey methodology, within the framework and principles of the IOA GPG.

As mentioned in section 2.2.2 of the GPG: “Any contribution to background noise levels of noise from an existing wind farm must be excluded when assigning background noise and setting noise limits for a new development.” There are a number of ways of achieving this, as described in section 5.2 of GPG:

- 5.2.2 *Where a new wind farm is proposed and a receptor is also within the area acoustically affected by an already operational wind farm, then noise from the existing wind farm must not be allowed to influence the background noise measurements for the proposed development.*
- 5.2.3 *In the presence of an existing wind farm, suitable background noise levels can be derived by one of the following methods:*
 - 1. *switching off the existing wind farm during the background noise level survey (with associated significant cost implications);*
 - 2. *accounting for the contribution of the existing wind farm in the measurement data e.g. directional filtering (only including background data when it is not influenced by the existing turbines e.g. upwind of the receptor, but mindful of other extraneous noise sources e.g. motorways) or subtracting a prediction of noise from the existing wind farm from the measured noise levels;*
 - 3. *utilising an agreed proxy location removed from the area acoustically affected by the existing wind farm/s; or*
 - 4. *utilising background noise level data as presented within the Environmental Statement/s for the original wind farm/s (the suitability of the background noise level data should be established).*

Option 1 will have commercial implications and a negative impact on renewable energy production, on that basis it is the least preferred option. In this instance, a combination of option 2 (directional filtering

and subtracting a prediction of the noise from existing wind turbines), and option 3 (selecting locations where that will provide noise measurements at positions upwind of operational turbines, i.e. where the influence of operational turbines is least) was chosen. Further details are presented in the following sections and in Appendix 12-3.

All measurement data collected during the background noise surveys has been carried out in accordance with the IOA GPG and accompanying *Supplementary Guidance Note 1: Data Collection* (2014) discussed in the following Section.

It is important to note that background noise levels should be derived such that there is no noise contribution from the existing wind turbines. In contrast, the terms ‘baseline noise level’ or the ‘existing noise levels’ environment, incorporate current noise contributions from the operation of the existing turbines.

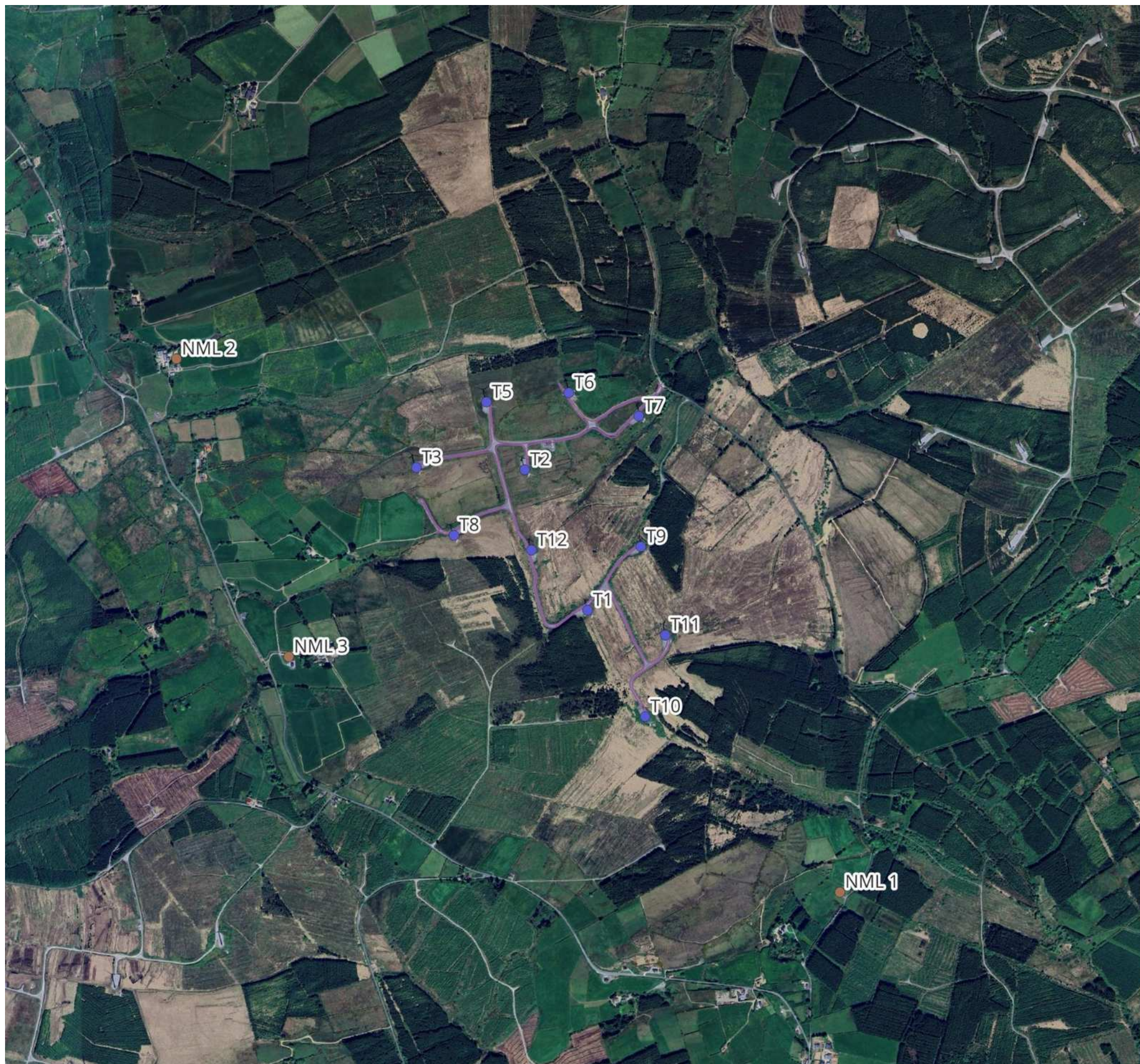
12.3.4.1 Choice of Measurement Locations

A computer-based 3D model of the wind farm was prepared using the coordinates of the operational turbines’ coordinates using the selected software DGMR iNoise (See Appendix 12-4 for more detail on wind turbine noise calculations). The model was used to prepare a set of noise contours based on the sound power levels of the operational turbines, at rated power wind speed, i.e. the wind speed at which the turbines reach their rated power and the highest sound power levels. The selected noise monitoring locations are considered robust to capture the typical representative background noise levels at NSLs surrounding the proposed development. Appendix 12-3 presents full details of the background noise survey and selection of locations.

On review of the noise contour, three locations were selected for noise monitoring. The principles for the selection are that the noise environment must be typical of the noise environment at other nearby locations. Coordinates for the noise monitoring locations are detailed in Table 12-4 and Figure 12-2 .

Table 12-4 Noise Measurement Location Coordinates

Location	Coordinates – Irish Transverse Mercator (ITM)	
	Easting	Northing
NML 1	523,693	610,287
NML 2	521,032	612,392
NML 3	521,477	611,213



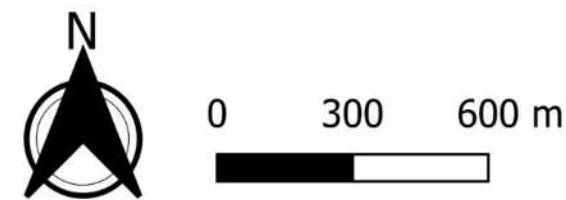
Project: Taurbeg Wind Farm
Extension of Operational Life

Description: Noise Monitoring
Location Selection

- Taurbeg Turbines
- Internal Roads
- NML Selection

Google Satellite

Figure 12-2



Trinity Consultants  

The Tecpro Building, Clonsilla Business and Technology Park,
Dublin 17
T: +353 1 847 4220 | F: +353 1 847 4257

Significant noise sources in this area were noted to be farming activity, intermittent local traffic movements, activity in and around the residences and wind generated noise from local foliage. Depending on wind speed and direction during visits, noise from existing wind turbines was audible to varying degrees.

There were no perceptible sources of vibration noted at any of the survey locations.

Appendix 12-3 presents full details of the background noise survey methodology instrumentation and results, including the location-specific wind direction filtering applied at each location to derive the background noise levels. Additional information is included in Appendix 12-2 (Copies of Calibration Certificates)

Section 12.4.1 of this chapter presents the results of the background noise survey and Section 12.4.2 presents the derived noise criteria for the operational wind farm.

12.3.4.1.1 **Wind Speed Measurements**

Wind speed measurements were obtained from a Zephir ZX300 Lidar unit installed and operated by MKO. A copy of the Lidar installation report is included in Appendix 12-7 (Copy of Lidar Installation Report).

12.3.4.2 **Analysis of Background Noise Data**

As well as the location-specific filtering, the data sets have been filtered to remove issues such as the dawn chorus and the influence of other atypical noise sources. An example of atypical sources would be short, isolated periods of raised noise levels attributable to local sources, agricultural activity, boiler flues, operation of gardening equipment etc. In addition, sample periods affected by rainfall or when rainfall resulted in prolonged periods of atypical noise levels have also been screened from the data sets. The assessment methods outlined above are in line with the guidance contained in the IOA GPG.

The results presented Appendix 12-3 and summarised in the following sections refer to the noise data collated during ‘quiet periods’ of the day and night as defined in the IOA GPG. These periods are defined as follows:

- Daytime Amenity hours are:
 - all evenings from 18:00 to 23:00hrs;
 - Saturday afternoons from 13:00 to 18:00hrs, and;
 - all day Sunday from 07:00 to 18:00hrs.
- Night-time hours are 23:00 to 07:00hrs.

12.3.4.2.1 **Consideration of Wind Shear**

Wind shear is defined as the change of wind speed with height above ground. Any reference to wind speed in this chapter should be understood to be at standardised 10 m height. The standardised equations used to determine the wind speed at standardised 10 m above ground are presented in Appendix 12-3. Any reference to wind speed in this chapter should be understood to be at standardised 10 m height unless otherwise stated.

12.3.5 **Turbine Noise Calculations**

A series of computer-based prediction models have been prepared to quantify the noise level associated with the operation of the Taurbeg Wind Farm. This section discusses the methodology for the noise modelling process.

12.3.5.1 Noise Modelling Software

Proprietary noise calculation software was used for the purposes of this impact assessment. The selected software, DGM iNoise Enterprise, calculates noise levels in accordance with ISO 9613: *Acoustics – Attenuation of sound outdoors, Part 2: General method of calculation*, (ISO, 2024).

iNoise is a proprietary noise calculation package for computing noise levels and propagation of noise sources. iNoise calculates noise levels in different ways depending on the selected prediction standard. In general, however, the resultant noise level is calculated considering a range of factors affecting the propagation of sound, including:

- the magnitude of the noise source in terms of A weighted sound power levels (L_{WA});
- the distance between the source and receiver;
- the presence of obstacles such as screens or barriers in the propagation path;
- the presence of reflecting surfaces;
- the hardness of the ground between the source and receiver;
- Attenuation due to atmospheric absorption; and
- Meteorological effects such as wind gradient, temperature gradient and humidity (these have significant impact at distances greater than approximately 400 m).

12.3.5.2 Input Data and Assumptions

The calculation settings, input data and any assumptions made in the assessment are described in the following sections. Additional information relating to the noise model inputs and calculation settings is provided in Appendix 12-4.

12.3.5.2.1 Turbine Details

Table 12-5 details the co-ordinates of the 11 No. existing turbines at Taurbeg Wind Farm.

Table 12-5 Taurbeg Wind Farm Turbine Co-ordinates

Turbine	ITM X	ITM Y
T01	522,663	611,397
T02	522,412	611,957
T03	521,979	611,966
T05	522,259	612,226
T06	522,588	612,264
T07	522,868	612,172
T08	522,129	611,694
T09	522,876	611,649
T10	522,892	610,971
T11	522,972	611,296
T12	522,439	611,635

The installed turbines at the Taurbeg wind farm are Bonus (now Siemens) 2.3MW models with a hub height of 67 m and a rotor diameter of 82.4 m.

The installed turbines at the existing Taurbeg Wind Farm are no longer in production, and there is a degree of uncertainty on the sound power noise emission data of these turbines. To assess the turbine noise for the Proposed Lifetime Extension, reference has been made to published data for the Siemens SWT-2.3-82 VS turbines in the AWN database and a review of various test reports for similar turbine types to those installed at Taurbeg Wind Farm.

The published data from Siemens for the SWT-2.3-82 VS^{3/4} confirms a maximum turbine sound power noise level of 104.5 dBA at ≥ 8 m/s. Review of other documents show similar noise emission levels for the SWT-2.3-82 VS and similar Siemens turbine models, however a test report⁵ was sourced that indicated that a similar turbines had maximum turbine sound power noise level of up to 108.2 dBA at 10 m/s . This higher range is considered unlikely but the data from the various sources does indicate a range of potential noise emissions from the installed turbines. A review of the downwind measured noise data from the AWN survey with the Taurbeg Wind Farm in operation indicate that it is it most likely that the noise emissions associated with the operation of the Taurbeg turbines are at the lower end of the range identified. It is important to note that the testing methodology to determine the sound power emission from a turbines per IEC 61400-11 *Wind turbines - Part 11: Acoustic noise measurement techniques* is very different form background survey methodology employed for this assessment detailed in Section 12.3.4.

The approach adopted for this assessment is to consider two operational scenarios to consider the range of potential sound power noise emissions that have been identified for the installed turbines at the Taurbeg Wind Farm:

- The first assuming the ‘Higher Range of Noise Emissions’ as presented in Table 12-6 below, and
- The second assuming the ‘Lower Range of Noise Emissions’ as presented in Table 12-7 below.

This approach provides a robust assessment of the likely impacts and effects, with the ‘Higher Noise Emissions’ scenario representing a worst-case situation.

Table 12-6 Sound Power Level Spectra for Higher Range of Noise Emissions for a hub height of 67 m

Wind Speed (m/s)	Octave Band Centre Frequency (Hz)								dB L _{WA}
	63	125	250	500	1000	2000	4000	8000	
6	82.9	90.5	93.2	96.7	95.2	93.8	90.9	83.8	101.8
7	86.2	93.7	95.0	97.4	96.0	96.0	93.8	86.3	103.4
8	88.2	95.4	95.5	97.4	97.3	98.5	96.9	89.4	104.9
9	91.0	97.8	97.7	98.9	100.1	100.6	97.6	88.8	106.9
10	92.2	99.1	98.9	100.1	101.3	101.9	98.9	90.0	108.2

³ Acoustic Emissions, SWT-2.3-82 VS Document ID: E R WP-EN431-10-0000-0160-00 PE / 2009.03.31

⁴ Acoustic Emissions, SWT-2.3-82 VS Document ID: E R WP-EN431-10-0000-0162-00 PE / 2009.03.31

⁵ Measurement of Noise Emission from an AN BONUS 2.3MW/82, BONUS 2.3 MW Wind Turbine situated at Blåhøj, Denmark 2002.12.10

Table 12-7 Sound Power Level Spectra for Lower Range of Noise Emissions for a hub height of 67 m

Wind Speed (m/s)	Octave Band Centre Frequency (Hz)								dB L _{WA}
	63	125	250	500	1000	2000	4000	8000	
4	62.9	74.7	83.5	84.6	84.1	82.0	79.8	73.6	90.3
5	70.0	81.8	90.6	91.7	91.2	89.1	86.9	80.7	97.4
6	75.0	86.8	95.6	96.7	96.2	94.1	91.9	85.7	102.4
7	77.5	87.5	96.2	98.3	98.6	96.0	94.1	88.3	104.2
≥8	77.8	87.8	96.5	98.6	98.9	96.3	94.4	88.6	104.5

The turbine sound power levels in Table 12-6 and Table 12-7 are presented in terms of the L_{Aeq} parameter. As explained further in Section 10.4.2, the wind turbine noise criteria are expressed in terms of an L_{A90} criterion. Best practice guidance in the IOA GPG states that “ L_{A90} levels should be determined from calculated L_{Aeq} levels by subtraction of 2 dB”. A 2 dB reduction has therefore been applied in the noise model calculation. All predicted noise levels in this chapter are presented in terms of L_{A90} parameter, i.e., this reduction of 2 dB is applied in the noise prediction calculations.

The IOA GPG states that in noise propagation calculations an allowance for uncertainty of the noise emissions must be considered. In the absence of any stated uncertainty in the manufacturers data, a +2 dB uncertainty for the Lower Noise Emissions scenario while as allowance for uncertainty of +1 dB has been added in the noise predictions calculation for the High Noise Emissions scenario as that was specifically stated in the associated documentation.

Finally, best practice specifies that should any tonal component be present, a penalty shall be added to the predicted noise levels. The level of this penalty is described in ETSU-R-97 and is related to the level by which any tonal components exceed audibility. For the purposes of this assessment a tonal penalty has not been included in the predicted turbine noise levels. In relation to tonal noise from the operation of the wind turbines, refer to mitigation measures in Section 12.6.1.1.2.

Appendix 10-4 presents full details of the turbine specifications and the sound power emission for both the Higher and Lower Range across various wind speeds that have been used in this assessment. The following wind turbine developments have been included in the cumulative turbine noise assessment.

- Knockacummer; and
- Glentane / Glentanemacelligot Wind Farm (Glentane Phase 1 & Phase 2).

12.3.5.3 Consideration of Wind Direction and Noise Propagation

When considering noise impacts of wind turbines, the effects of propagation in different wind directions should be considered. The day-to-day operations of the optimised development will not result in a worst-case condition of all noise locations being downwind of all turbines at the same time i.e. omnidirectional predictions. Therefore, to address this issue, a review of expected noise levels downwind of the turbines has been prepared for various wind directions in accordance with the IOA GPG Guidance.

For any given wind direction, a property can be assigned one of the following classifications in relation to turbine noise propagation:

- Downwind (i.e. $0^\circ \pm 80^\circ$);
- Crosswind (i.e. $90^\circ \pm 10^\circ$ and $270^\circ \pm 10^\circ$), and;
- Upwind (i.e. $180^\circ \pm 80^\circ$).

Table 12-8 presents the directivity attenuation factor that has been applied to turbines when considering noise propagation in downwind conditions (full downwind is represented by 0° and full upwind is 180°).

Table 12-8 Turbine Directivity Attenuation with Consideration of Wind Direction

Wind Direction Sector	Degrees (°)	Attenuation (dB)
Downwind	280 – 360 & 0 - 80	0
Crosswind	260 – 280 & 80 - 100	2
Upwind	230 - 250	5
	220	5.5
	210	6
	200	6.5
	190	7
	180	7.5

12.3.5.4 Assessment of Turbine Noise Levels

The predicted turbine noise level from the Proposed Lifetime Extension will be compared against the derived turbine noise limits and any exceedances of the limits will be identified and assessed. Where necessary, appropriate mitigation measures will be detailed.

12.3.6 Decommissioning Noise Calculations

A variety of items of plant will be used for decommissioning. There will be vehicular movements to and from the site that will make use of existing roads. There is the potential for generation of noise from these activities.

Due to the nature of decommissioning activities, it is difficult to calculate the actual magnitude of emissions to the local environment in the absence of details on the specific plant items and methods to be employed. The standard best practice approach is to predict typical noise levels at the NSLs using guidance set out in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.

The methodology adopted for the assessment of decommissioning noise is to analyse the various elements of the decommissioning phase in isolation. For each element, the typical construction noise

sources are assessed along with typical sound pressure levels and spectra from BS 5228-1 at various distances from these works.

12.4

Receiving Environment

This stage of the assessment was to determine typical background noise levels at representative NSLs surrounding the development site. The background noise survey was conducted through installing unattended sound level meters at three locations in the surrounding area.

12.4.1

Background Noise Levels

Appendix 12-3 presents the results of the background noise surveys as analysed in accordance with the methodology in Section 12.3.3.

Table 12-9 presents the various derived $L_{A90,10min}$ noise levels for each of the monitoring locations for daytime quiet periods and night-time periods. These levels have been derived using analysis carried out on the data sets in line with guidance contained the IOA *GPG* and its SGN No. 2 *Data Collection*.

Values in parenthesis are used where, for higher wind speeds during day and night-time periods, the measurements obtained during the survey did not have sufficient data points at these wind speeds. In accordance with IOA *GPG* Supplementary Guidance Note 2: *Data Processing & Derivation of ETSU-R-97 Background Curves*, paragraph 2.9.1: “Where background noise data has not been collected for higher wind speeds it may be appropriate to cap the background noise curve (and therefore the associated noise limit)”.

Table 12-9 Derived Background Noise Levels of $L_{A90,10min}$ for Various Wind Speeds

Location	Period	Derived $L_{A90,10min}$ Levels (dB) at various Standardised 10m Height Wind Speed (m/s)							
		3	4	5	6	7	8	9	10
NML 1	Day	22.6	25.3	28.0	30.8	33.6	36.4	39.1	41.7
	Night	19.9	22.7	25.9	29.4	32.8	36.0	38.7	40.7
NML 2	Day	26.5	28.3	30.2	32.1	34.0	35.9	37.8	39.6
	Night	26.0	27.2	28.6	30.4	32.8	36.0	40.1	(40.1)
NML 3	Day	31.1	33.8	34.8	35.2	37.5	40.1	42.3	44.3
	Night	30.5	33.4	34.5	34.6	36.5	38.8	(38.8)	(38.8)

12.4.2

Wind Turbine Noise Criteria

With respect to the relevant guidance documents outlined in Section 10.3.2.2 the following noise criteria curves have been identified for the Proposed Lifetime Extension. The criteria curves have been derived following a detailed review of the background noise data conducted at the nearest noise sensitive locations.

It is proposed to adopt a lower daytime threshold of 40 dB $L_{A90,10min}$ for low noise environments where the background noise is less than 30 dB(A). This follows a review of the prevailing background noise levels and is considered appropriate in light of the following:

- The EPA document ‘Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)’ proposes a daytime noise criterion of 45 dB L_{Aeq} in ‘areas of low background noise’. Turbine noise limits are detailed in terms of the L_{A90} parameter while the NG4 daytime limit is detailed in terms of the L_{Aeq} . The accepted difference between the L_{Aeq} and L_{A90} for wind turbine noise assessments is 2 dB, i.e., 45 dB L_{Aeq} equates to 43 L_{A90} . This approach accounts for the 3 dB difference when comparing the NG4 limits and the 2006 WEDGs limits. The proposed lower threshold daytime criterion for wind turbine noise here is 3 dB more stringent than the equivalent daytime noise limit for areas of low background noise outlined in NG4.
- Glentane Phase 1 is conditioned with a lower threshold of 43 dB L_{A90} .
- A lower threshold of 40 or 43 dB is commonly adopted in planning conditions for similar wind energy developments that have been granted planning permission by ABP and local planning authorities in recent years for example Derrinlough Wind Farm (ABP Ref: 306706-20) Derryadd Wind Farm (ABP Ref: PL14.303592⁶), Coole Wind Farm (ABP Ref: PL25M.300686) Cloncreen Wind Farm (ABP Ref: PA0047), Meenbog Wind Farm (ABP Ref: PL05E.300460), Borrisbeg Wind Farm (ABP-318704-23) and Ballivor Wind Farm (ABP-316212-23).

As previously discussed in Section 12.3.2.4, the nearby Glentane / Glentanemacelligot Wind Farm a fixed lower threshold of 43 dB L_{A90} is applied to daytime periods through its planning condition. Given the precedence of this condition and the fact that the Proposed Lifetime Extension shares common Sensitive Receptors, it is reasonable to apply a 43 dB as a lower threshold for cumulative turbine noise during daytime periods where background noise levels are less than 30 dB L_{A90} . Having Sensitive Receptors in the study area with two different cumulative turbine noise limits may lead to complications in demonstrating planning compliance and enforcement. In our professional opinion and from a technical perspective, it would be more appropriate to adopt a daytime lower threshold of 43 dB for the Proposed Lifetime Extension. Ultimately, the turbine noise emission from the Proposed Lifetime Extension will remain unchanged.

Based on the guidance listed above, the proposed operational limits in $L_{A90,10min}$ for the Proposed Lifetime Extension are:

- 43 dB $L_{A90,10min}$ for quiet daytime environments of less than 30 dB $L_{A90,10min}$;
- 45 dB $L_{A90,10min}$ for daytime environments greater than 30 dB $L_{A90,10min}$ or a maximum increase of 5 dB above background noise (whichever is higher), and;
- 43 dB $L_{A90,10min}$ or a maximum increase of 5 dB above background noise (whichever is higher) for night-time periods.

A noise criteria envelope, based on the lowest turbine noise limits derived across NML1, NML2, and NML3 at the various wind speeds has been derived for daytime and night-time and used as assessment criteria at all other non-surveyed Sensitive Receptors as a conservative approach to the assessment.

Table 12-10 outlines the derived noise criteria curves which are based on the background noise levels derived and presented in Table 12-9. With reference to Table 12-10, the sound power level of the turbine reaches is understood to reach a maximum level at 10 m/s. It is sufficient therefore to consider wind speed up to 10 m/s for this assessment, in line with the best with practice guidance.

Table 12-10 Noise Criteria Curves

Location	Period	Turbine Noise Limits (dB, $L_{A90, 10 \text{ min}}$) at Various Standardised 10 m Height Wind Speed (m/s)							
		3	4	5	6	7	8	9	10
NML 1	Day	43.0	43.0	43.0	45.0	45.0	45.0	45.0	46.1
	Night	43.0	43.0	43.0	43.0	43.0	43.0	43.7	45.7
NML 2	Day	43.0	43.0	45.0	45.0	45.0	45.0	45.0	45.0
	Night	43.0	43.0	43.0	43.0	43.0	43.0	45.1	45.1
NML 3	Day	45.0	45.0	45.0	45.0	45.0	45.1	47.3	49.3
	Night	43.0	43.0	43.0	43.0	43.0	43.8	43.8	43.8

12.5 Likely Significant Effects and Associated Mitigation Measures

12.5.1 Do-Nothing Scenario

If the Proposed Project were not to proceed, the existing wind farm will be decommissioned when the current permission expires. As part of the decommissioning stage, the existing turbines would be dismantled, and the site reinstated to its original condition; please see Section 4.7 in Chapter 4 of this EIAR for further details regarding decommissioning. Potential noise and vibration impacts associated with the decommissioning phase are presented in Section 12.5.3 below. In the do-nothing scenario, there will be potential short-term, moderate negative noise impacts on nearby sensitive receptors during the decommissioning phase. However, once the existing turbines are decommissioned, there will be no further potential for noise effects.

12.5.2 Operational Phase Potential Impacts

12.5.2.1 Turbine Noise Assessment

The cumulative turbine noise levels have been calculated for a set of 70 no. Sensitive Receptors identified within the study area. Many of the Sensitive Receptors are situated closer to turbines from other developments than to Taurbeg Wind Farm turbines. In many instances the dominant turbine noise at the Sensitive Receptor is from other developments.

Using the assessment methodology described in Section 12.3.5 the predicted turbine noise levels have been calculated at all Sensitive Receptors within the study area of the Proposed Lifetime Extension for the two noise emission scenarios under consideration. A worst-case omni-directional turbine noise prediction assessment has been carried out using the ISO 9613-2 calculation standard and best practice guidance for turbine noise prediction contained in the IOA GPG. These calculations are based on 'worst-case' conditions favourable to noise propagation, i.e., downwind propagation from source to receiver and/or downward refraction under temperature inversions.

The results of the noise prediction models have been compared against the turbine noise limits that have been assigned to each of the Sensitive Receptors as described in Section 12.4.2, which have been

derived in accordance with the criteria set out in Section 12.3.2.1.3. The results are presented here for the higher and lower range of potential noise emissions derived for the existing Taurbeg wind turbines. Results for the full set of receptors are presented in Appendix 12-6. A series of noise contour maps showing the predicted omni-directional turbine noise levels for both potential operating scenarios at the Proposed Lifetime Extension are presented in Appendix 12-5.

12.5.2.1.1 *Assessment with Higher Noise Emissions Assumed for Taurbeg Turbines*

Assuming the worst case higher turbine noise emissions scenario for the installed turbines at Taurbeg wind farm (see Table 12-6), potential exceedances of the assessment criteria are noted at 6 no. locations: H006, H011, H022, H023, H032 and H053. At all other Sensitive Receptors the predicted omni-directional cumulative turbine noise levels are below the turbine noise criteria proposed for the Proposed Lifetime Extension.

An investigation into these potential exceedances confirms that the predicted turbine noise is dominated by other existing wind farms and there is no significant contribution to turbine noise from the operation of the Taurbeg turbines associated with the Proposed Lifetime Extension.

The predicted turbine noise contribution from the Proposed Lifetime Extension at Sensitive Receptors H006, H022, H023, and H053 is more than 10 dB below the noise level of other existing turbines. Therefore, according to the guidance in Section 12.3.2.1.3 no cumulative assessment is necessary, as there is no significant contribution to turbine noise at these receptors from the operation of the existing Taurbeg turbines. At the remaining two Sensitive Receptors, H011 and H032 the dominant source of turbine noise at these locations is associated with other existing wind farms, each is discussed in turn below.

The nearest Taurbeg turbine to H032 is T10 at approximately 1.9 km. The cumulative turbine noise levels at H032 are dominated by turbine noise from the Glentane / Glentanemacelligot Wind Farm. The contribution to the cumulative turbine noise at H032 from the operation of the Taurbeg turbines associated with the Proposed Lifetime Extension approximately 8 dB below the noise level of other existing turbines; this is not significant, as the magnitude of the potential predicted cumulative increase due to the Taurbeg turbines is imperceptible. Moreover, the magnitude of potential exceedances predicted in the omni-directional assessment are ≤ 0.5 dB which is negligible in the context of this assessment.

The nearest Taurbeg turbine to H011 is T16 at approximately 1.2 km. The cumulative turbine noise levels at H011 are dominated by turbine noise from the Knockacummer Wind Farm. The contribution to the cumulative turbine noise at H011 from the operation of the Taurbeg turbines associated with the Proposed Lifetime Extension approximately 7 dB below the noise level of other existing turbines, again this is not significant, as the magnitude of the potential predicted cumulative increase due to the Taurbeg turbines is less than 1 dB and imperceptible. This assessment assumes the higher range of the potential noise emissions associated with the existing Taurbeg turbines and it is re-iterated that the predicted noise levels also include an allowance for uncertainty which is greater than the exceedances noted in the predicted turbine noise levels.

For the higher noise emission scenario, Table 12-11 presents the predicted noise levels for each of 2 no. Sensitive Receptors where potential exceedance of the criteria has been identified in the omni-directional turbine noise predictions, along with the applicable criteria and the magnitude of the potential exceedance. As noted in Section 12.4.2, a noise criteria envelope, based on the lowest turbine noise limits derived across NML1, NML2, and NML3 at the various wind speeds has been derived for daytime and night-time and used as assessment criteria at all other non-surveyed Sensitive Receptors as a conservative approach to the assessment.

It is important to note that these two Sensitive Receptors H011 and H032 are in proximity to the Knockacummer and Glentane / Glentanemacelligot turbines, and the turbine noise from these other developments is the greater contributor to the total wind turbine noise level at these Sensitive

Receptors. These other developments are subject to separate planning conditions. The turbine noise assessment criteria adopted for this assessment and the methodology are conservative and derived in accordance with best practice guidance to assess the impacts and effects of the Proposed Lifetime Extension only. Any potential exceedance identified should not be taken as evidence or indication of non-compliance of other operational sites with their planning conditions.

Table 12-11 Predicted Noise Levels with Potential Cumulative Exceedances (higher noise emission scenario)

House Ref	Parameter	Predicted Noise Level dB L _{A90} at Standardised Wind Speed at 10m				
		6	7	8	9	10
H011	Predicted	42.4	43.4	43.9	44.2	44.4
	Daytime Criterion	45	45	45	45	45
	Daytime Excess	–	–	–	–	–
	Night-time Criterion	43	43	43	43.7	43.8
	Night-time Excess	–	0.4	0.9	0.5	0.6
H032	Predicted	42.0	43.0	43.5	43.7	43.9
	Daytime Criterion	45	45	45	45	45
	Daytime Excess	–	–	–	–	–
	Night-time Criterion	43	43	43	43.7	43.8
	Night-time Excess	–	–	0.5	–	0.1

Table 12-11 confirms that there are no predicted exceedances of the assessment criteria during daytime and the potential exceeded during night time periods are between 0.1 and 0.9 dB.

The next stage in the assessment is to consider the effects of wind direction. As presented in Section 12.3.5.3 above, the effect of the directionality of noise emissions from wind turbines means that in certain wind directions, noise levels are less than the values presented in Table 12-11, as a given noise-sensitive location cannot be downwind of all turbines at the same time.

Directional noise prediction models have been developed to identify the number and magnitude of exceedances of the noise criteria at the various Sensitive Receptors. Table 12-12 and Table 12-13 reviews the predicted noise levels against the noise criteria curves for the proposed Lifetime Extension at the various wind directions.

Table 12-12 Review of Predicted Exceedances in Various Wind Direction Sectors – H011

House Ref	Parameter	Predicted exceedance in Noise Level dB L _{A90} at Standardised Wind Speed at 10m A.G.L.				
		6	7	8	9	10
H011	Omni-directional	42.4	43.4	43.9	44.2	44.4
	North (N)	38.3	39.3	39.8	40.1	40.3
	Northeast	41.0	42.0	42.5	42.8	43.0

House Ref	Parameter	Predicted exceedance in Noise Level dB L _{A90} at Standardised Wind Speed at 10m _{A.G.L.}				
		6	7	8	9	10
	East	42.0	43.0	43.5	43.8	44.0
	Southeast	42.4	43.4	43.9	44.2	44.4
	South	41.9	42.9	43.4	43.7	43.9
	Southwest	39.8	40.8	41.3	41.6	41.8
	West	37.6	38.6	39.1	39.4	39.6
	Northwest	36.3	37.3	37.8	38.1	38.3
	Daytime Criterion	45	45	45	45	45
	Daytime Excess Accounting for Wind Direction	-	-	-	-	-
	Night-time Criterion	43	43	43	43.7	43.8
	Night-time Excess Accounting for Wind Direction	-	0.4 (SE)	0.5 (E) 0.9 (SE) 0.4 (S)	0.1 (E) 0.6 (SE)	0.2 (E) 0.6 (SE) 0.1 (S)

The assessment of directional cumulative noise prediction for H011 in Table 12-13 confirms that the predicted turbine noise levels are below the assessment noise criteria noise which the exception of a potential exceedance of between 0.1 to 0.9 dB in a limited number of wind speed and direction sectors. It is reiterated that the contribution to the cumulative turbine noise at H011 from the operation of the Taurbeg turbines associated with the Proposed Lifetime Extension is not significant, as the magnitude of the potential predicted cumulative increase due to the Taurbeg turbines would be imperceptible. When considering changes to the predicted turbine noise levels it is important to highlight that, for sounds of the same nature, a change of 3 dB is considered the minimum difference detectable to the average human ear; changes of +/-1 dB are therefore insignificant in the context of this review.

Table 12-13 Review of Predicted Exceedances in Various Wind Direction Sectors - H032

House Ref	Parameter	Predicted exceedance in Noise Level dB L _{A90} at Standardised Wind Speed at 10m _{A.G.L.}				
		6	7	8	9	10
H032	Omni-directional	42.0	43.0	43.5	43.7	43.9
	North (N)	40.6	41.6	42.1	42.3	42.5
	Northeast (NE)	39.3	40.3	40.8	41.0	41.2
	East	37.6	38.6	39.1	39.3	39.5
	Southeast	37.7	38.7	39.2	39.4	39.6

House Ref	Parameter	Predicted exceedance in Noise Level dB L _{A90} at Standardised Wind Speed at 10m A.G.L.				
		6	7	8	9	10
	South	39.3	40.3	40.8	41.0	41.2
	Southwest	40.5	41.5	42.0	42.2	42.4
	West	41.5	42.5	43.0	43.2	43.4
	Northwest	41.4	42.4	42.9	43.1	43.3
	Daytime Criterion	45	45	45	45	45
	Daytime Excess Accounting for Wind Direction	-	-	-	-	-
	Night-time Criterion	43	43	43	43.7	43.8
	Night-time Excess Accounting for Wind Direction	-	-	-	-	-

The assessment of directional cumulative noise prediction for H032 in Table 12-13 confirms that the predicted turbine noise levels are below the assessment noise criteria in all wind speeds and wind direction sectors.

Summary of Assessment with Higher Noise Emissions Assumed for Taurbeg Turbines

Assuming the worst case, i.e. with the Taurbeg turbines having the higher noise emissions in the potential range, the cumulative assessment has identified potential cumulative exceedances at one Sensitive Receptor H011. At this Sensitive Receptors, the predicted noise levels are dominated by turbine noise from the Knockacummer Wind Farm, and the cumulative contribution from the Taurbeg turbines is not significant. The differences in the predicted cumulative noise turbine noise levels with the Taurbeg turbines associated with the Proposed Lifetime Extension is negligible, and imperceptible to the human ear. In the context of this review, it is noted that if the Proposed Lifetime Extension is permitted, there will be no change to the existing noise environment.

The turbine noise assessment criteria adopted for this assessment and the methodology are conservative and derived in accordance with best practice guidance to assess the impacts and effects of the Proposed Lifetime Extension only. Any potential exceedance identified should not be taken as evidence or indication of non-compliance of other operational sites with their relevant planning conditions.

The noise prediction calculations have been made using the ISO 9613:2024-2 standard and relate to conditions favourable to noise propagation (typically downwind propagation from source to receiver and/or downward refraction under temperature inversions) and an uncertainty factor has been applied to turbine emissions.

The next stage in this assessment is to consider the potential impacts and effects of the Proposed Project for the assumed scenario with the sound power emissions for the existing turbines at Taurbeg Wind Farm associated with the Proposed Lifetime Extension are at the lower range of the potential sound power emissions identified for the installed turbines. This review is presented in Section 12.5.2.1.2.

12.5.2.1.2 Assessment with Lower Noise Emissions Assumed for the Existing Taurbeg Turbines

Assuming the scenario for the lower turbine noise emissions for the installed turbines at Taurbeg Wind Farm (see Table 12-7), potential exceedances of the noise criteria are noted at the same 6 no. Sensitive Receptors: H006, H011, H022, H023, H032 and H053. As the noise contribution from the Taurbeg turbines is lower in the scenario a similar conclusion can be reached for this assessment.

The predicted turbine noise contribution from the Proposed Lifetime Extension at Sensitive Receptors H006, H022, H023, and H053 is more than 10 dB below the noise level of other existing turbines. Therefore, according to the guidance in Section 12.3.2.1.3 no cumulative assessment is necessary, as there is no significant contribution to turbine noise at these receptors from the operation of the existing Taurbeg turbines.

With the lower turbine noise emissions for the installed turbines at Taurbeg Wind Farm the predicted turbine noise contribution from the Proposed Lifetime Extension at H011 is more than 10 dB below the noise level of other existing turbines. No cumulative assessment is necessary, as there is no significant contribution to turbine noise at H011 from the operation of the existing Taurbeg turbines.

At Sensitive Receptor H032 the directional assessment presented in Section 12.5.2.1.1 confirmed that the predicted turbine noise levels are below the assessment noise criteria in all wind speeds and wind direction sectors. The same conclusion can be reached in this scenario where the contribution to the cumulative turbine noise levels from the is significantly lower.

Assuming the installed Taurbeg turbine operating with the lower noise emissions in the range identified, the contribution from the Taurbeg turbine is significantly lower at all locations. The cumulative turbine noise levels are dominated by noise from turbines at other developments, and any contribution from the Taurbeg turbines associated with the Proposed Lifetime Extension is not significant as any changes in the cumulative will be negligible and imperceptible to the human ear. In the context of this review, it is noted that if the Proposed Lifetime Extension were permitted, there would be no change to the existing noise environment.

12.5.2.1.3 *Description of Effects*

Taurbeg Wind Farm was commissioned in 2006 and has been in operation for 19 years, is it not considered that a significant effect on the noise environment is associated with the continuation of its operation. The assessment, presented in Section 12.5.2.1.1 and 12.5.2.1.2, has found that turbine noise from the operation of the Proposed Lifetime Extension will be within best practice turbine noise criteria at all locations with no likely significant cumulative impacts or effects predicted. With respect to the EPA criteria for description of effects, the potential worst-case cumulative effects at the nearest Sensitive Receptor associated with the Proposed Lifetime Extension are described below.

Quality	Significance	Duration
Neutral	Imperceptible	Medium-term

12.5.3 **Proposed Offsetting Measures Potential Impacts**

Noise prediction calculations for the Proposed Offsetting Measures have been conducted using the methodology outlined in Section 12.3.2.3.

Proposed Offsetting Measures will be conducted during standard daytime working hours (i.e., weekdays 07:00–19:00 and Saturdays 07:00–13:00). However, to optimise favourable weather conditions, address critical periods in the schedule (e.g., specific equipment usage), or accommodate the transportation, occasional work outside of these hours may be necessary. Any such out-of-hours operations will be communicated in advance to the Local Authority.

Table 12-14 outlines the likely noise levels associated with deforestation activity at the Proposed Offsetting lands at varying set back distances from the works. The calculations are based on typical sound pressure noise levels derived from BS 5228-1:2009 for the proposed activities and assume an operating time of 50% for each plant item, equivalent to 6 hours within a 12-hour assessment period.

Table 12-14 Typical Noise Levels – Deforestation

Item (BS 5228-1 Ref.)	Plant Noise Level at 10m Distance (dB $L_{Aeq,T}$) ⁷	Highest Predicted Plant Noise Level (dB $L_{Aeq,T}$)				
		50m Distance	75m Distance	100m Distance	200m Distance	60m Distance
Wheeled loader (C2.8) x 2	68	49	44	41	33	29
Tracked excavator (C2.2) x 2	77	58	53	50	42	38
Petrol-driven chainsaw (D2.14)	86	64	59	56	48	44
Total Construction Noise		65	60	57	49	45

These predicted levels of noise associated with deforestation activities are within the construction noise criterion outlined in Table 12-1, where the works occur at distances of greater than 50 m for the nearest sensitive receptor it is concluded that there will be no significant noise impact associated with these activities and no specific mitigation measures are required.

In the unlikely event that the works occur at distance closer than 50 m from the nearest sensitive receptor, the calculations indicate that the noise threshold outlined in Table 12-1 may be exceeded. However, for a significant effect to occur, the duration of the of any such exceedance would need to be greater than the durations listed in Section 12.3.2.3.3 according to the guidance outlined in Section 12.3.2.3. Due to the nature of the Proposed Offsetting Measures as described in Chapter 4 (Description of Proposed Project), a significant effect is not expected to occur at any Sensitive Receptor as the activity is not likely to occur with 50 m from a sensitive receptor, and specific mitigation measures are therefore not required.

A chipping machine is proposed to chip the timber following a drying-out period. The chipping machine will be located at a sufficient setback distance from any Sensitive Receptor to ensure that the potential noise impacts are minimised and remain below the threshold for significant noise impacts.

12.5.4 Decommissioning Phase Potential Impacts

Decommissioning noise prediction calculations have been conducted using the assessment methodology outlined in Section 12.3.2.1. Noise levels are predicted at the nearest Sensitive Receptor to each element of the works and compared against the criteria in Section 12.3.2.3.1. Several indicative sources that would be expected on a site of this nature have been identified and noise predictions of their potential impacts prepared to the nearest Sensitive Receptor. This represents a conservative approach to the assessment; decommissioning noise levels will be lower at properties located further from the works. The source noise levels referred to in this section are indicative of the type of plant items and activities associated with the decommissioning of the Taurbeg Wind Farm.

⁷

All plant noise levels are derived from BS 5228: Part 1

In general, the distances between the decommissioning activities associated with the Taurbeg Wind Farm and the nearest Sensitive Receptors (minimum of 731m) are such that there will be no significant noise and vibration impacts at Sensitive Receptors. The following sections present an assessment of the main stages of the decommissioning phase that have the potential for associated noise and vibration impacts, all other stages and elements are considered unlikely to have any significant noise and vibration impacts.

Decommissioning activities will be carried out during normal daytime working hours (i.e., weekdays 0700 – 1900 hrs and Saturdays 0700 – 1300 hrs). However, to ensure that optimal use is made of good weather period or at critical periods within the programme (e.g., crane use) or to accommodate removal of large turbine component along public routes it could be necessary on occasion to work outside of these hours. Any such out of hours working will be notified in advance to the Local Authority.

Noise from decommissioning of the turbines are calculated to the closest noise sensitive receptors, with the nearest Sensitive Receptor being H010 at approximately 731 m from T08.

Table 12-15 details the noise levels associated with decommissioning noise sources assessed in this instance along with typical sound pressure levels from BS 5228 – 1: 2009. Calculations have assumed an on-time of 66% for each item of plant i.e. 8 hours over a 12-hour assessment period.

Table 12-15 Typical decommissioning Noise Levels – Turbines

Item (BS 5228 Ref.)	Activity/Notes	Plant Noise level at 10m Distance (dB L _{Aeq,T}) ⁸	Predicted Noise Level (dB L _{Aeq,T}) at distance (m) 731 m – nearest Sensitive Receptor to turbine location
HGV Movement (C.2.30)	Transporting fill and other materials	79	34
Tracked Excavator (C.4.64)	Moving soil and rubble	77	32
General Works (Various)	All general activities plus deliveries/removals of materials and plant	84	39
Dumper Truck (C.4.4)	Backfilling Turbine Foundations	76	31
Mobile Telescopic Crane (C.4.39)	Turbine dismantling	77	32
Dewatering Pumps (D.7.70)	If required	80	-
Predicted Combined Decommissioning Noise Level		-	43

The assessment to H010 is sufficient to assess the noise impacts and effects of all decomposition activities. Due to the additional distances from the works, the predicted noise level will be further attenuated.

⁸ All plant noise levels are derived from BS5228: Part 1

The predicted noise level of 43 dB $L_{Aeq,T}$ to the nearest Sensitive Receptor is well within the construction noise criterion outlined in Table 12-1, therefore it is concluded that there will be no significant noise impact associated with decommissioning activities, and no specific mitigation measures are required.

12.5.4.1 Decommissioning Traffic Noise

This section reviews the potential noise impacts associated with traffic on the local road network. The information presented in Chapter 15 (Material Assets) has been used to inform the assessment.

12.5.4.1.1 *Proposed Lifetime Extension*

It is not expected that there will be any significant increase in traffic noise along public roads directly associated with the decommissioning phase of the Proposed Lifetime Extension that would result in a significant negative effect at residential receptors. This is concluded on the basis that it is estimated that 157 truckloads will travel to and from site over a period of 3 - 6 months. Assuming all of these journeys occurred over a period of 10 consecutive days which as per the guidance in 12.3.2.3.3 must be exceeded to constitute a significant effect, the total noise level associated with decommissioning traffic on public roads during this period would be of the order of 50 dB $L_{Aeq,T}$ which is well below the is well within the construction noise criterion outlined in Table 12-1.

12.5.4.1.2 *Proposed Offsetting Lands*

It is not expected that there will be any significant increase in traffic noise along public roads directly associated with the Proposed Offsetting Lands that would result in a significant negative effect at residential receptors. This is concluded on the basis that it is estimated that there will be approximately 20 days when 5 HGV loads or 10 HGV movements will be generated to and from the Proposed Offsetting lands. This a relative small number of trips and the total noise level associated with the HGV movements on public roads during this period would be less than 40 dB $L_{Aeq,T}$ which is well below the is well within the construction noise criterion outlined in Table 12-1.

12.5.4.1 Vibration

Due to the distance of the proposed works from Sensitive Receptors, vibration effects are not likely at any Sensitive Receptor.

12.5.4.2 Description of Effects

The likely predicted noise and vibration impacts are below the limits and/or thresholds identified. With respect to the EPA's criteria for description of effects, the likely potential associated effects at the nearest Sensitive Receptors associated with the decommissioning phase of the Proposed Lifetime Extension and the Proposed Offsetting Lands are as described below:

Quality	Significance	Duration
Negative	Not Significant	Short-term

12.6 Mitigation Measures

The assessment of potential effects has demonstrated that the Proposed Project is expected to comply with the identified criteria for the operational and decommissioning phases and the Proposed Offsetting Measures, therefore no specific mitigation measures are required.

12.6.1 Extended Operational Phase

12.6.1.1 Wind Turbines

An assessment of the operational wind turbine noise levels has been undertaken in accordance with best practice guidelines and procedures as outlined in Section 10.3. The findings of the assessment, presented in Section 12.5.2.1 has confirmed that no significant cumulative impacts or effects are predicted from the operational noise turbine levels associated with the Proposed Lifetime Extension. Therefore, no specific mitigation measures are required.

If the Proposed Project is granted permission to continue operating, a commissioning noise survey can be carried out as detailed in Section 12.6.1.1.2. In the unlikely event of any exceedances of the conditioned turbine noise limits being identified as a result of the Proposed Lifetime Extension, these exceedances will be mitigated through curtailment of turbine(s) in the relevant wind speed and wind directions. The curtailment strategy will be developed for the installed turbines to achieve the relevant noise criteria at all Sensitive Receptors.

The installed turbine can be programmed to run in reduced modes of operation (or low noise modes) to achieve the attenuation required in the specific wind conditions (i.e. wind speed and direction). Operating the turbines in reduced noise modes is referred to as curtailment, which typically results in a corresponding reduction in energy generation capacity for the turbine(s). For any turbine curtailment strategy that is developed, consideration must be given to the practical benefits. This is particularly the case with cumulative turbine noise, where two or more wind farm developments contribute to the overall turbine noise level. In these instances, curtailment of the non-dominant turbines may only achieve an imperceptible and unmeasurable change in the total wind turbine noise level at a given receptor. Such curtailment may unnecessarily reduce the electrical power generating capacity of a wind farm, for an imperceptible change to the overall turbine noise levels.

12.6.1.1.1 Amplitude Modulation

In the event that a complaint which indicates potential excessive amplitude modulation (AM) associated with the Proposed Lifetime Extension, the operator will employ a qualified acoustic consultant to assess the level of AM in accordance with the methods outlined in the Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) *Amplitude Modulation Working Group Final Report: A Method for Rating Amplitude Modulation in Wind Turbine Noise* (9 August 2016) or subsequent revisions.

The measurement method outlined in the IOA AMWG document, known as the ‘Reference Method’, will provide a robust and reliable indicator of AM and yield important information on the frequency and duration of occurrence, which can be used to evaluate different operational conditions including method to mitigate any excessive AM. These mitigation measures, if required, will consist of the implementation of operational controls for the relevant turbine type, which will include turbine curtailment under specific operational conditions.

In the absence of widely accepted and robust planning conditions to control amplitude modulation (AM) from wind turbines, the commitments outlined in this EIAR are considered best practice. The proposed approach will ensure that any negative impacts arising from AM associated with the operation of the proposed development will be effectively addressed by the operator.

12.6.1.1.2 Monitoring

As discussed above, commissioning noise surveys will be undertaken to ensure compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of a wind farm being commissioned – in this instance, continuing its operation. If an exceedance of the noise criteria is identified as part of the commissioning assessment, the guidance outlined in the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken. The commissioning survey will include a review for the presence of audible tones associated with the operation of the wind turbine farm in accordance with Annex C of ISO 1996-2:2017 *Acoustics – Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels*.

For example, implementation of noise reduced operational modes resulting in curtailment of turbine operation can be implemented for specific turbines in specific wind conditions to ensure turbine noise levels are within the relevant noise criterion curves/planning conditions limits. Such curtailment can be applied using the wind farm SCADA system without undue effect on the wind turbine performance. Following implementation of these measures, noise surveys can be repeated to confirm compliance with the noise criteria.

12.6.2 Proposed Offsetting Measures

The contract documents will specify that the Contractor undertaking the works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.

12.6.3 Decommissioning Phase

The contract documents will specify that the Contractor undertaking the decommissioning works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration.

The following best practice mitigation measures from these documents will be implemented as required for the duration of the decommissioning phase:

- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Establishing channels of communication between the contractor/developer, Local Authority and residents;
- Monitoring typical levels of noise and vibration during critical periods and at sensitive locations;
- Selection of plant with low inherent potential for generation of noise and/ or vibration where practical;
- Placing of noise generating / vibratory plant as far away from sensitive properties as practical within the site constraints, and;
- The hours of construction activity will be limited to avoid unsociable hours where possible. Works operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Friday and Saturday between 7:00hrs and 13:00hrs.

12.7 Description of Residual Effects

12.7.1 Extended Operational Phase

12.7.1.1 Wind Turbine Noise

With respect to the EPA criteria for description of effects, the potential worst-case effects at the nearest sensitive receptor associated with the Proposed Lifetime Extension are described below. In the context of this review, it is noted that if the Proposed Project is permitted there will be no change to the existing noise environment.

Quality	Significance	Duration
Neutral	Imperceptible	Medium-term

12.7.1.2 Vibration

There are no expected sources of vibration associated with the Proposed Lifetime Extension. In relation to of vibration the associated effect is summarised as follows:

Quality	Significance	Duration
Neutral	Imperceptible	Medium-term

12.7.2 Proposed Offsetting Measures

During the Offsetting Measures, there will be some negative effects on nearby sensitive receptors due to noise emissions from site traffic and other on-site activities associated with deforestation works. The noise and impacts associated with the proposed activities are expected to within the criteria in Section 12.3.2.4.

With respect to the EPA criteria for description of effects, the anticipated associated effects at the nearest sensitive receptors associated with the decommissioning phase are described below.

Quality	Significance	Duration
Negative	Not Significant	Short-term

12.7.3 Decommissioning Phase

During the decommissioning phase of the Taurbeg Wind Farm there will be some effect on nearby sensitive receptors due to noise emissions from site traffic and other on-site activities. The noise and vibration impacts associated with any decommissioning of the site within the criteria in Section 12.3.2.3.

With respect to the EPA criteria for description of effects, the anticipated associated effects at the nearest sensitive receptors associated with the decommissioning phase are described below.

Quality	Significance	Duration
Negative	Not Significant	Short-term

12.8 Cumulative Effects

12.8.1 Wind Turbine Noise

Existing permitted and proposed wind farm developments with the potential for cumulative impacts have been considered as part of the turbine noise impact assessment. A review of existing, proposed and permitted wind turbine developments in the wider study area has been undertaken in accordance with the guidance contained in the IOA GPG. A full cumulative turbine noise assessment has been undertaken in accordance with the IOA GPG, considering the Proposed Lifetime Extension, Knockacummer Glentane / Glentanemacelligot Wind Farms.

12.8.2 Proposed Offsetting Measures

It is not anticipated that there will be any other activities that would give rise to significant cumulative effects during the Proposed Offsetting Measures. For construction activities occurring near Sensitive Receptors, considering the distance to any other projects and the noise emissions associated with these activities, cumulative noise effects are unlikely. As stated in Section 12.6.2, the Contractor undertaking the works will adopt best practice noise abatement measures contained in British Standard BS 5228-1.

12.8.3 Decommissioning

It is not anticipated that there will be any other activities that would give rise to significant cumulative effects during the decommissioning phase. The predicted noise emissions for the proposed development are not of enough magnitude to cause an increase in cumulative decommissioning noise levels exceeding the threshold for significant impacts at any Sensitive Receptor.

The predicted noise levels from decommissioning activity would need to be in excess of 55 dB $L_{Aeq,T}$ at an NSL in order for a potential cumulative construction noise increase to exceed the noise thresholds. The assessment in Section 12.5.4 confirms that the predicted noise levels from activities at any NSL are ≤ 55 dB $L_{Aeq,T}$ and therefore the potential for any cumulative noise effect from all of the proposed activities occurring simultaneously or with construction/decommissioning activities from other developments is unlikely and not significant.

Chapter 13 Landscape and Visual

Taurbeg Wind Farm
Extension of Operational
Life





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Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



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13. LANDSCAPE AND VISUAL

13.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) addresses the potential landscape and visual impacts of the continued operation of the existing Taurbeg Wind Farm. It covers the assessment methodology, a description of the existing Taurbeg Wind Farm and the existing landscape based on relevant guidance. It includes a description of the landscape policy of County Cork with specific reference to wind energy and the 20km LVIA Study Area (as defined in Section 13.2.1 below) in which Taurbeg Wind Farm is located.

The landscape of the area is described in terms of its existing character, which includes a description of landscape value and the landscape's sensitivity to change. The Landscape and Visual Impact Assessment (LVIA) of the existing Taurbeg Wind Farm uses visibility mapping and photos from representative viewpoints. The potential impacts in both landscape and visual terms are then assessed, including cumulative impacts.

It is important to re-iterate that Taurbeg Wind Farm is an existing wind farm and has been operational for approximately 19 years to date, with the current planning permission set to expire in 2026. This EIAR is being prepared in support of a planning application to extend the operational lifespan of the wind farm beyond 2026, by a further 10 years.

The key components of the existing Taurbeg Wind Farm with potential to give rise to landscape and visual effects are the 11 No. wind turbines currently visible within the landscape. The assessments in this LVIA are predominantly informed by on-site appraisals which determined the reality of landscape conditions and existing turbine visibility of the wind farms, as it is experienced on the ground.

A full description of the Proposed Project is outlined in Chapter 4 of this EIAR.

13.1.1 Statement of Authority

MKO has developed extensive expertise and experience over the last 15 years in the LVIA of large-scale infrastructure developments for Environmental Impact Assessment Reports (EIAR). The MKO Landscape and Visual team have produced LVIA across a diverse range of project types, including: renewable energy and grid infrastructure; residential developments; transport infrastructure; extraction infrastructure; and a range of other projects requiring EIAR.

This LVIA was written by Jack Workman and reviewed by Michael Watson. Keelan Crawford provided technical support for the production of the LVIA including fieldwork and GIS with oversight from Jack and Michael.

Jack Workman MSc., TMLI. is the Landscape & Visual Project Director at MKO and is chartered as a Technician Member of the British Landscape Institute. Jack is an environmental scientist and an LVIA specialist with an academic background in the field of Environmental Science and Geography. Jack's primary role at MKO is scoping and writing LVIA for EIARs with over 5 years' experience managing all aspects of LVIA for a broad range of commercial infrastructure developments. Jack holds a BSc. in Psychology, and an MSc. in Coastal and Marine Environments (Physical Processes, Policy & Practice). Jack is an active participant in the National Landscape Forum, presenting in 2023 and 2024 on the topic of LVIA, he also regularly delivers guest lectures for students on the topic of LVIA at top third level institutions in Ireland including University of Galway, Trinity College Dublin, University College Dublin and University College Cork. Jack holds a membership with the Chartered Institute of Water and Environmental Management and is also a member of the Landscape Research Group.

Michael Watson is the Environmental Director at MKO, overseeing a team of highly skilled environmental professionals working on EIAR for a wide range and scale of projects, in particular large-scale infrastructure, housing, commercial and renewable energy development. His key strengths include project strategy, expert knowledge of the EIA Directive, and in-depth knowledge of the various disciplines contributing to EIAR and the Habitats Directive, including LVIA. Michael has been the Head of the Environment Team at MKO for over nine years. He is a key member of the MKO senior management team responsible for developing the business, mentoring team members, fostering a positive culture and promoting continuous employee professional development. Michael holds an MA in Environmental Management from NUI Maynooth, is a Member of IEMA, a Chartered Environmentalist (CEnv) and a Professional Geologist (PGeo).

Keelan Crawford is a LVIA Specialist with MKO. Keelan holds a BA (Hons) in Geography & Economics and Masters in Applied Coastal and Marine Management. Keelan's key strengths and areas of expertise are in GIS mapping and LVIA. His primary role at MKO is conducting LVIA's and writing the Landscape and Visual Chapter of EIA reports.

13.1.1.1 Essential Aspects of the Existing Taurbeg Wind Farm from an LVIA Perspective

The Guidelines for Landscape and Visual Impact Assessment 3rd Edition (hereafter, GLVIA3) (Landscape Institute & Institute of Environmental Management and Assessment [LI & IEMA], 2013) states that:

*“...it is important to make sure that the project description provides all the information needed to identify its effects on particular aspects of the environment. For LVIA it is important to understand, from the project description, **the essential aspects** of the scheme that will potentially give rise to its effects on the landscape and visual amenity”.*

The tall, vertical nature of the turbines make them the most prominent elements of any proposed wind energy development from a landscape and visual perspective; hence the turbines have the most potential to give rise to significant landscape and visual effects. Therefore, the 11 No. turbines are deemed to be the ‘essential aspect’ of the existing Taurbeg Wind Farm giving rise to potential effects on the landscape and visual amenity and are the primary focus of the LVIA conducted in this Chapter.

13.1.1.2 Landscape and Visual Assessment of an Existing Wind Farm

The existing Taurbeg Wind Farm is a fully constructed existing wind farm that is currently operational and currently visible in the existing landscape. The impact assessments in this Chapter are predominantly informed by the current landscape and visual effects of the existing Taurbeg Wind Farm as it is experienced on the ground. In this regard, the LVIA is primarily reliant on visibility appraisals conducted during site visits and photographic imagery captured from within the surrounding landscape.

As is evident by all photos and visualisations in this Chapter, the Proposed Lifetime Extension amounts to little or no change to the existing views of the 11 No. turbines. As detailed in the methodology (see Section 13.2) the term ‘Magnitude of Change’ is a key factor used to determine impacts. In the context of this assessment, where the turbines already exist in the landscape, the magnitude of the **continued** impact of the turbines is considered, instead. To facilitate the impact assessments and effectively determine the continued landscape and visual impacts of the existing Taurbeg Wind Farm in the landscape, the magnitude of change was determined by considering the change that would occur against a ‘do-nothing scenario’ in which the turbines would be removed and therefore no longer be visible in the landscape.

For a proposal of new development in the landscape, the traditional LVIA utilises tools of a predominantly theoretical nature, including Zone of Theoretical Visibility (ZTV) mapping and photomontage visualisations. The LVIA in this Chapter conducted for the Proposed Lifetime

Extension, utilised these same traditional tools, as they still have relevance to the assessment process by providing context and illustrating the points being explained by text. Although the existing turbines are already in place, at a minimum, the ZTV mapping (explained in Section 13.2.3), identifies areas of the landscape for which the existing turbines are not visible at all, and in addition, identifies areas where potential visibility may theoretically occur. This allows relevant stakeholders and interested parties (e.g. the LVIA professional conducting this Chapter, the planning authority) to focus on and visit the relevant areas where potential visibility may theoretically occur. ZTV mapping was therefore used to inform visibility appraisals from key sensitive receptors and identify key viewpoint locations to use in the assessment of visual effects.

For this LVIA, verified photomontages are **not required**, as the turbines already exist and therefore do not need to be modelled within landscape views. Instead, the impact assessments in this Chapter are predominantly informed by on-site appraisals and photographic imagery captured on the ground. Several representative viewpoints were selected to assess impacts from prominent receptors where open visibility is evident, and which have potential for cumulative landscape and visual effects to occur. In the case of the existing Taurbeg Wind Farm, persons visiting the Site or the surrounding landscape can see the turbines from all locations with visibility around the Site. Therefore, the assessment is not reliant on the selected viewpoints to the same extent that it would be in a traditional LVIA for a project with proposed (i.e. non-existent) turbines.

13.2 Methodology

This section broadly outlines the methodology and guidance used to undertake the LVIA of the Proposed Lifetime Extension. There are five main sections to this assessment:

- Landscape Baseline;
- Visual Baseline;
- Cumulative Baseline;
- Likely and Significant Landscape and Visual Effects, presenting the assessment of landscape and visual effects including the assessment of effects from representative viewpoints, and cumulative effects.

13.2.1 Guidelines

While the legislation and general guidance on Environmental Impact Assessment (EIA) is set out in Chapter 1 of this EIAR, only the guidance specifically pertaining to landscape and visual impact are outlined below.

In 2002, Ireland signed and ratified the European Landscape Convention (ELC), which introduced a pan-European concept centring on the quality of landscape protection, management, and planning. In 2015, the Department of Arts, Heritage and the Gaeltacht accordingly published a National Landscape Strategy for Ireland, aiming to ensure compliance with the ELC and containing six main objectives, which included developing a 'National Landscape Character Assessment' as well as 'Landscape Policies'.

In 2000, the Department of the Environment and Local Government (DoELG, formerly Department of Environment and Local Government) published the 'Landscape and Landscape Assessment: Consultation Draft of Guidelines for Planning Authorities' (hereafter, DoELG 2000 Guidance), which recommended that all Local Authorities adopt a standardised approach to landscape assessment for incorporation into Development Plans and consideration as part of the planning process. However, at the time of writing this report, the DoELG 2000 Guidance remains in draft form.

Therefore, the LVIA in this report is primarily based on the following guidance, published in the UK:

- GLVIA3 (LI & IEMA, 2013), and

- ‘Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Assessment Third Edition (GLVIA3): Landscape Institute Technical Guidance Note 2024-01’ (hereafter, LI TGN 24-01) (LI, 2024).

In addition, ten general guidance documents also informed the framework preparation of this LVIA, as follows (arranged from most recent):

- ‘Guidelines on the Information to be Contained in Environmental Impact Assessment Reports’ (Environmental Protection Agency of Ireland [EPA], 2022);
- ‘Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments’ (Nature Scot, 2021; includes methodology published in 2012);
- ‘Draft Revised Wind Energy Development Guidelines’ (Draft Revised WEDGs) (Department of Housing, Local Government and Heritage [DoHPLG], 2019);
- ‘Visual Representation of Development Proposals’ (Landscape Institute Technical Guidance Note 06/19, 2019) (hereafter, LI TGN 06/19);
- ‘Siting and Designing Wind Farms in the Landscape, Version 3a’ (Scottish Natural Heritage [SNH], 2017) (hereafter, SNH Guidance v.3a);
- ‘Visual Representation of Wind Farms, Version 2.2’ (SNH, 2017) (hereafter, SNH Guidance v.2.2);
- ‘Spatial Planning for Onshore Wind Turbines: Natural Heritage Considerations’ (SNH, 2015);
- ‘Visual Representation of Wind Farms, Version 2’ (SNH, 2014) (hereafter, SNH Guidance v.2)
- ‘Wind Energy Development Guidelines for Planning Authorities’ (WEDGs) (DoEHLG, 2006);
- ‘Visual Assessment of Wind Farms: Best Practice’ (SNH, 2002).

13.2.2 Scope and Definition of the Landscape and Visual Impact (LVIA) Study Area

For the purposes of this Chapter, where ‘the Site’ is referred to, this relates to the primary study area for the Proposed Lifetime Extension, as delineated by the EIAR Site Boundary in green. The Site is shown in mapping figures shown in Section 13.4 – *Landscape Baseline*.

The GLVIA3 (LI & IEMA, 2013) guidance refers to the identification of the area of landscape that is to be covered while assessing landscape and visual effects. The guidelines state:

“The study areas should include the Site itself and the full extent of the wider landscape around it which the Proposed Development may influence in a significant manner.”

Landscape and visual baseline mapping and viewpoint selection are based on the two wider study areas referred to in this LVIA as the ‘LVIA Study Area’ with a 20km radius, and ‘Landscape Character Assessment (LCA) Study Area’ with a 15km radius; these are explained in subsections below. The geographical parameters of this LVIA were determined by desktop study, survey work undertaken and the professional judgement of the assessment team, as well as experience from other relevant projects and policy guidance or standards, including:

- GLVIA3 (LI & IEMA, 2013) and clarifications in LI TGN 24-01 (LI, 2024);
- *Appendix 3* of the WEDGs (DoEHLG, 2006);
- Draft Revised WEDGs (DoHPLG, 2019).

13.2.2.1 LVIA Study Area for Effects on Landscape and Visual Receptors: 20km Radius

An area of 20km surrounding the Site was selected to conduct assessment of landscape and visual receptors. The distance at which a ZTV is set from a proposed wind farm development usually defines the parameters of the LVIA Study Area, therefore, the radius of 20km was selected for landscape and visual effects, as is suggested by guidance (WEDGs, DoEHLG, 2006, p.94; Draft Revised WEDGs, DoHPLG, 2019, p.152):

‘For blade tips in excess of 100m, a Zone of Theoretical Visibility radius of 20km would be adequate’.

13.2.2.2 LCA Study Area for Effects on Designated Landscape Character Areas (LCAs): 15km Radius

Through extensive experience conducting LVIA for previous wind energy development projects, the MKO assessment team has determined that no significant effects on landscape character are likely to arise beyond a distance of 15km from the existing turbines. The turbines of a wind farm are unlikely to significantly impact the key characteristics of county-level designated LCAs beyond a distance of 15km, even for the most sensitive designated LCAs. Therefore, a study area of 15km, hereafter referred to as the ‘**LCA Study Area**’, is deemed appropriate for assessing the effects on landscape character in relation to designated LCAs.

13.2.2.3 Topics Scoped Out of Assessment

On the basis of desk studies and survey work undertaken, the professional judgement of the assessment team, experience from other relevant projects and policy guidance or standards, the following topic areas have been scoped out of the assessment:

- Effects on landscape and visual receptors that have minimal or no theoretical visibility (as predicted by ZTV mapping) and are therefore unlikely to be subject to ‘Significant’ effects;
- Effects on designated landscape receptors beyond a 20km radius (LVIA Study Area) from the existing turbines, from where it is judged that potential ‘Significant’ effects on key characteristics and/or special qualities, or views are judged unlikely to occur;
- Effects on landscape character and designated LCAs beyond a 15km radius (LCA Study Area) from the existing turbines, where it is judged that potential ‘Significant’ effects on landscape character are unlikely to occur;
- Effects on visual receptors beyond a 20km radius (LVIA Study Area) from the existing turbines, where it is judged that potential ‘Significant’ effects are unlikely to occur;
- Cumulative landscape and visual effects beyond a 20km radius (LVIA Study Area) from the existing turbines, where it is judged that potential ‘Significant’ cumulative effects are unlikely to occur.

The tall, vertical nature of the existing turbines makes them the essential aspect of the Proposed Lifetime Extension from a landscape and visual perspective. The landscape and visual impact of other existing ancillary elements of the Proposed Lifetime Extension including roads and the substation are also addressed within this Chapter, however, the existing turbines are of primary focus in this LVIA.

13.2.3 Zone of Theoretical Visibility Mapping

Zone of Theoretical Visibility (ZTV) mapping is an important step in the LVIA process. For reasons outlined below, the ZTV is a useful mapping tool for LVIA, even when assessing the impact of turbines which are already built and visible within the landscape.

The MKO landscape and visual team have extensive experience ground-truthing areas showing no theoretical visibility of turbines on half-blade ZTV maps. In this regard, ZTV mapping is a useful tool to indicate where there is no visibility of turbines of a wind farm development (proposed or existing). The ZTV is therefore a useful tool for scoping out receptors from assessment that do not have theoretical visibility of turbines. In the context of the assessments reported in this Chapter, where the existing turbines already exist within the landscape, the ZTV ensures on-site visibility appraisals and identification of sensitive receptors can be focused to areas where the existing turbines are most likely to be visible. The results of site investigations reported later in this Chapter also consider the difference in visibility between what exists on the ground compared with what is shown on the ZTV map.

The ZTV represents the area over which a development can theoretically be seen and is based on a Digital Terrain Model (DTM), overlain on a map base. The DTM is a three-dimensional computerised visual representation of the topography, in the form of a digital model. The associated ZTV map, constructed based on the details of the DTM, indicates the following:

- Broad areas where visibility of a wind energy development is most likely to occur;
- How many of the existing turbines of the wind energy development are theoretically visible in those areas (using coloured bands for different numbers of turbines); and
- The extent and pattern of visibility.

The production of the ZTV map is one of the first steps of LVIA, as it (i) determines the boundaries of the LVIA Study Area in which impacts will be considered in more detail, and (ii) informs the identification of sensitive vantage points (SNH Guidance v.2.2, 2017).

13.2.3.1 ZTV Methodology

The ZTV maps presented in the EIAR show a calculated area of visibility of the existing turbines using the 'half-blade' height of the wind turbines as points of reference; this area is referred to as the Half-Blade ZTV, or ZTV. The WEDGs (DoEHLG, 2006 p.94) and Draft Revised WEDGs (DoPHLG, 2019 p.152) note that:

'It is recommended that the Zone of Theoretical Visibility should assess the degree of visibility based on the numbers of turbines visible to half the blade length in addition to hub height'.

Furthermore, as well as per the guidance, a Half-Blade ZTV is considered more appropriate and useful than a 'full-blade' ZTV for analysing visibility of the existing turbines and scoping receptors in and out for assessment, particularly when using a DTM representing a bare earth scenario. The decision to use a Half-Blade ZTV is based upon the guidance as well as the professional judgement and the extensive experience of the assessment team in ground-truthing ZTVs against the reality of turbine visibility within landscapes where turbines already exist.

The area presented in the ZTV maps in this LVIA has a radius of 20km from the outer-most existing turbines.

The Draft Revised WEDGs (DoPHLG, 2019, p.159) require that:

'...in areas where landscapes of national or international renown are located within 25 km of a proposed wind energy development, the Zone of Theoretical Visibility should be extended as far (and in the direction of) that landscape'.

A mapping investigation determined that no landscapes of national or international renown are located between 20 to 25km from the existing turbines, thus the extension of the ZTV beyond 20km from the outer-most existing turbine is not warranted in the case of this LVIA. As explained above in Section 13.2.2 - *Scope and Definition of LVIA Study Area*, 20km was deemed a sufficient and appropriate study area for the existing Taurbeg Wind Farm and any assessment of landscape and visual effects, as is determined in the WEDGs (DoEHLG, 2006, p.94) and Draft Revised WEDGs (DoHPLG, 2019, p.152):

‘For blade tips in excess of 100m, a Zone of Theoretical Visibility radius of 20km would be adequate.’

It should be emphasised that the ZTV maps assume a worst-case or ‘bare ground’ scenario, i.e. no land cover. The ZTV represents the theoretical visibility of the existing turbines in the absence of all natural and manmade features from the landscape, including vegetation, houses, and other buildings. In reality, such features restrict or limit visibility of the wind turbines, due to the visual screening effects of vegetation; for example, forestry and road-side hedgerows and trees, and buildings, particularly within towns and villages.

On each ZTV map, separate colour bands are used to indicate the number of turbines potentially visible to half-blade height, i.e. only half of one blade may be visible over the topography, as opposed to seeing a full turbine. The legend on each map shows the number of visible turbines for each corresponding colour, as follows:

- Orange: 1-3 turbines theoretically visible;
- Green: 4-7 turbines theoretically visible;
- Yellow: 8-10 turbines theoretically visible;
- Navy: 11 turbines theoretically visible.

13.2.3.2 Limitations of ZTV Mapping

The SNH Guidance v.2.2 (2017) acknowledges the following limitations inherent to the use of theoretical visibility mapping:

- The ZTV presents a ‘bare ground’ scenario, i.e. visibility of the existing turbines in a landscape without screening structures or vegetation, such as trees, hedgerows, buildings and small-scale landform or ground surface features;
- The ZTV does not take into account the effects of weather or atmospheric conditions, and therefore can be said to represent a ‘worst-case’ scenario, that is, one in which the wind turbines could potentially be seen given the combination of no intervening obstructions and favourable weather conditions;
- A ZTV is only as accurate as the data on which it is based. Accordingly, is not viable to test the accuracy of a ZTV in the field, although some verification does occur during the assessment of viewpoints;
- In order to handle relatively large areas of terrain, the DTM data are based on information that does not allow detail to be distinguished below a certain level of resolution. There are also differences in the way that the software package ‘interpolates’ between heights in the calculations made; and finally,
- While the ZTV indicates areas from which a wind farm may be visible, it cannot show how the existing Taurbeg Wind Farm will actually look, nor can it indicate the nature or magnitude of visual impacts. For example, the visibility of turbines naturally decreases with the distance from which they are viewed, yet this is not accounted for in the ZTV. Figure 13-1 below provides an illustration of the differences in view relative to the distance of the viewer from the turbine:

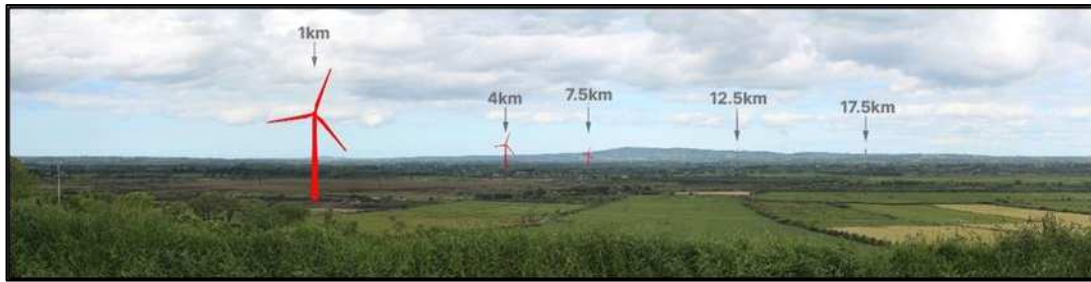


Figure 13-1 Effect of Distance on the Visibility of Wind Turbines (illustrative purposes only)

13.2.4 Photographic Visualisation

The assessment of potential impacts in this LVIA uses photographic and wireline visualisations (not Type 4 verified photomontages**, as the turbines are already existent within the landscape views), whereby the potential effects arising as a result of the Proposed Lifetime Extension are assessed from viewpoint locations representative of prominent and sensitive landscape and visual receptors located within the LVIA Study Area. These visualisations are included in Volume 2 of this EIAR – *Photographic Visualisation Booklet*.

The photographic visualisations are produced by stitching together high-quality photographs from each viewpoint. The visualisations are **not** 'photomontages'. Photomontages are produced by modelling and rendering infrastructure into the photographic imagery. As the existing Taurbeg Wind Farm is existing in the landscape, there is no need to model or render any developments into the panoramic photos, hence photomontages are not required in this instance, instead only the photos are required. Although the visualisations are not photomontages, they are presented in the layout and format required as per benchmark best practice guidance for LVIA and photomontages of wind energy developments; SNH Guidance v.2.2 (2017).

**** Note on Photomontages:** Type 4 verified photomontages are not required for this LVIA; therefore, no verified photomontages are included in the Volume 2 Photographic Visualisation Booklet. No rendering of turbines is required into the photographic imagery as the turbines already exist within the views. In addition, there are only existing turbines visible within the presented views. No other permitted or proposed turbines are visible within any of the presented views and therefore, no rendering is required for assessment of cumulative visual effects.

Presentation of Wireline Views

A 'wireline' is a visualisation comprising a model of turbines accurately scaled and positioned within a digital elevation model (topography) as seen from a viewpoint. Wirelines do not include background photographic imagery. Wireline views of the existing Taurbeg Wind Farm are included in the *Volume 2 Photographic Visualisation Booklet* following the photographic imagery. As per guidance, wirelines are presented within both a 90-degree and a 53.5-degree field of view, on A1 banner sheets. The wireline views show the existing Taurbeg Wind Farm and all other existing wind farms within the view. Labels are added to the wireline views to identify the different turbines of the existing wind farms.

The SNH Guidance v.2.2 (2017) suggests that all turbine blades should be presented in the same orientation when presented within a wireline view with one blade completely vertical. The rationale for this method proposes that the singular vertical blade will show the greatest turbine tip height for all turbines.

Using the above method, the orientation of the turbine blades does not match what is presented in the corresponding photo. Conversely, guidance in the WEDGS (DoEHLG, 2006, p. 97) and Draft Revised WEDGs (DoHPLG, 2019) state the following in relation to wirelines (referring to 'wireframes' – equivalent to wirelines):

*‘Related to the above, the photomontage should be accompanied by a wire frame computer generated perspective view of the landscape, or shaded-relief model, illustrating all theoretically visible turbines. These wire frame diagrams may also be used to indicate turbines that are not visible in whole or in part due to screening, simply to prove that point. **Wire frames and photomontages should be at the same scale and presented in unison so that direct comparison/correlation can be made.***

This LVIA is cognisant of guidance from all three sources: the WEDGs (DoEHLG, 2006), Draft Revised WEDGs (DoHPLG, 2019) and SNH v.2.2 (2017). Of these, it is considered that the guidance in the WEDGs and Draft Revised WEDGs is the preferred option. Thus, wireline views showing the turbines in irregular orientation with each other, but in unison with the corresponding photo is deemed an optimal method of presentation for the following reasons:

- The view enables direct correlation and comparison with the photo;
- If all turbines were to be oriented the same way, this would be an unnatural and unrealistic representation, hence there is no scenario in reality where this would occur;
- Although the single vertical blade shows the greatest tip height, it does not necessarily show the greatest visual exposure of turbines in the landscape, as there could potentially be two blades (instead of one) seen above a feature of the landform when using a non-regular orientation;

For these reasons outlined above, the turbines in the wireline views within the *Photographic Visualisation Booklet* are presented in unison with the orientation of the turbines in the photos, in line with the WEDGs and Draft Revised WEDGs guidance.

13.2.4.2 Viewpoint Identification

The viewpoints (i.e. photo locations) were selected following guidance contained in the WEDGs (DoEHLG, 2006) and Draft Revised WEDGs (DoHPLG, 2019), GLVIA3 and SNH Guidance v.2.2 (2017). The selection of viewpoints is designed to give a representative range of views of the existing Taurbeg Wind Farm.

‘Viewpoints’ are locations at which photographic imagery was captured for the Volume 2 – *Photographic Visualisation Booklet*. 6 No. viewpoints were chosen for assessment following visibility appraisals and capture of imagery from key visual receptors during a site visit. Section 13.5 – Visual Baseline included a mapping exercise to identify the following sensitive visual receptors in the LVIA Study Area:

- Designated Scenic Routes and Scenic Views;
- Settlements;
- Recreational Routes and Tourist Destinations:
 - Waymarked Walking Routes;
 - Cycle Routes;
 - Scenic Drives;
 - Tourist Routes;
- Viewing Points (e.g. marked on OSi Maps)
- Prominent Transport Routes.

6 No. Viewpoints were selected from locations representing key visual receptors with relatively open views towards the existing Taurbeg Wind Farm. In addition, viewpoints were selected in close proximity to the existing turbines, where turbines are most visible, and hence visual effects may be greatest.

Viewpoints were chosen having regard to the SNH Guidance v.2.2 (2017) which advises that a range of views should be shown at a range of distances and aspects, as well as at varying elevations and showing

both where the development will be completely visible as well as partially visible. Consideration was also given to ensure that viewpoints captured other wind farms in order to assess cumulative visual effects.

13.2.4.3 Limitations of Photographic Visualisation

Photographic visualisations are subject to a range of limitations, as stated in SNH Guidance v.2 (2014):

- Visualisations provide a tool for assessment that can be compared with an ‘actual’ view in the field; they should never be considered as a substitute to visiting a viewpoint in the field;
- Neither photographs nor visualisations can replicate a view as seen in reality by the human eye;
- Visualisations are only as accurate as the data used to construct them;
- Visualisations can only represent the view from a single location at a particular time and in particular weather conditions;
- Static visualisations cannot convey the effect of turbine blade movement.

Although the scale, siting and geometry of visualisations are based on technical data, the other qualities of the image are open to judgement. The guidance also notes that interpretation of visualisations must be taken into account as well as additional information including variable lighting, the movement of turbine blades, seasonal differences and the movement of the viewer through the landscape. However, accepting these limitations, the SNH Guidance v.2 (2014) and v.2.2 (2017) state that photomontages are useful tools in the visual impact assessment of wind turbines, as for this case where the turbines are already existing in the landscape, visualisations are used.

13.2.4.4 Presentation of Visualisations in the Volume 2 Photographic Visualisation Booklet

The viewpoints presented in the accompanying Volume 2 Photographic Visualisation Booklet show several panoramic views from each viewpoint location. The photographic visualisation and wireline views are panoramas presented on banner sheets of paper of size ‘A1’. More specifically, the horizontal field of view presented in the visualisations are spread across 84.1cm, the equivalent of the maximum horizontal field of an A1 sheet of paper. In line with best practice guidance for the production of photomontages for wind energy development (SNH Guidance v.2.2, 2017; LI TGN 06/19, 2019) the A1 banners present the existing Taurbeg Wind enlarged to fit within a 53.5° horizontal field of view.

The viewpoint images contained in the Volume 2 Photographic Visualisation Booklet are devised to be viewed at arm’s length. The viewpoints are presented in the Volume 2 Booklet as stated below:

- **Overview Sheet** – Viewpoint details include location description, grid reference distance from nearest turbine and technical data in relation to photography. Three maps at various scales show the viewpoint location. A 120-degree existing view image (‘Key Image’). Existing turbines visible in the landscape may appear within the image and the horizontal extent of the 90-degree and 53.5-degree image to be presented in subsequent images is also framed.
- **Proposed View and Matching Wireline at 90°** - 90-degree panorama view, a photographic visualisation a matching wireline image of the same view which includes any existing turbines visible in the landscape, including the existing Taurbeg turbines. If turbines are already existing in the landscape, these are visible on the photograph and are rendered in the wireline.
- **Proposed View at 53.5°**– Showing a photographic visualisation of the existing turbines and any existing turbines in a 53.5-degree horizontal field of view.
- **Proposed Wireline at 53.5°** - Showing a wireline image of the existing turbines and any existing turbines in a 53.5-degree horizontal field of view. The existing turbines

and any other existing wind farms are individually coloured and labelled for ease of identification.

13.2.5 Identification of Landscape and Visual Receptors

Section 13.4 Landscape Baseline of this LVIA reviews the policies and objectives of various planning policy documents relating to landscape, planning and the locational siting of wind farms, as they relate to the Site. The Landscape Baseline states baseline information about the receiving landscape of the Site and its wider setting.

Section 13.5 Visual Baseline of this LVIA identifies key sensitive visual receptors in the LVIA Study Area where visibility of the existing Taurbeg Wind Farm occurs and reports upon the nature of this visibility from visual receptors. The visual baseline is informed by ZTV mapping and visibility appraisals conducted during site visits. Receptors with no visibility of the existing Taurbeg Wind Farm are scoped out from assessment in the baselines section of the Chapter.

The effects on key sensitive landscape and visual receptors identified in the baseline investigation are assessed in Section 13.7– *Likely or Significant and Visual Effects using* the methodology reported below. The assessment of effects is primarily informed by site visits, ZTV mapping and the analysis of the 6 No. visualisations from representative viewpoints.

13.2.6 Assessing Landscape Effects

In line with the GLVIA3 (LI & IEMA, 2013), the potential impacts on landscape receptors and visual receptors are assessed separately. This section details the methods used to determine the likely significant landscape effects of the existing Taurbeg Wind Farm on landscape receptors.

The methodology for assessing landscape effects uses qualitative methods in order to arrive at an overall impact assessment, based on the DoELG 2000 Guidance as well as the GLVIA3 (LI & IEMA, 2013) and WEDGs (DoEHLG, 2006) and Draft Revised WEDGs (DoHPLG, 2019).

Here, ‘landscape effects’ are described as changes which affect the landscape as a resource. This includes how the Proposed Lifetime Extension will affect the physical elements that make up the landscape, as well as its aesthetic and perceptual aspects and its landscape character. Landscape effects also relate to changes in the structure of the landscape. Under the GLVIA3 (LI & IEMA, 2013), the assessment of likely ‘Significant’ effects on landscape receptors includes a judgement on both the ‘Sensitivity’ of the receptor as well as the ‘Magnitude of Change’.

13.2.6.1 Landscape Sensitivity: Value & Susceptibility to Change

Landscape ‘Sensitivity’ is described in the GLVIA3 (LI & IEMA, 2013) as a combination of the landscape’s ‘Susceptibility to Change’ as well as the ‘Value’ attached to the landscape.

Landscape susceptibility to change is described as the ability of the landscape receptor (either the overall character, quality of the landscape or a particular landscape feature) to accommodate the existing turbines without undue consequences for the maintenance of the baseline (existing) landscape and/or the aims of landscape planning policies and strategies. Table 13-1 below presents differing assessment criteria for susceptibility to change.

Table 13-1 Assessment Criteria for Landscape Susceptibility to Change

Susceptibility of Landscape Receptor to Change	Description and Example Criteria
------------------------------------------------	----------------------------------

‘High’	Landscape receptors where the overall character of the landscape receptor or the nature of the individual landscape receptor causes it to have a high susceptibility to change considering its inherent characteristics and where the landscape receptor has a low ability to accommodate the proposed change without undue consequences for the maintenance of its landscape character, and/or its quality or condition, and/or its particular aesthetic and perceptual aspects, and where such change is not in compliance with planning policies/strategies.
‘Medium’	Landscape receptors where the overall character of the landscape receptor or the nature of the individual landscape receptor causes it to have a medium susceptibility to change considering its inherent characteristics and where the landscape receptor has a moderate ability to accommodate the proposed change without undue consequences for the maintenance of its landscape character, and/or its quality or condition, and/or its particular aesthetic and perceptual aspects, with consideration given to planning policies/strategies.
‘Low’	Landscape receptors where the overall character of the landscape receptor or the nature of the individual landscape receptor causes it to have a low susceptibility to change considering its inherent characteristics and where the landscape receptor has a Strong ability to accommodate the proposed change without undue consequences for the maintenance of its landscape character, and/or its quality or condition, and/or its particular aesthetic and perceptual aspects, and where such change may be in compliance with planning policies/strategies.

Landscape ‘Value’ is a combination of values which are assessed in Section 13.4 - *Landscape Baseline*, combining any formal landscape designations, and, where there are no designations, judgements based on individual elements of the landscape receptor, for example particular landscape features, notable aesthetic, perceptual or experiential qualities, and combination of these contributors.

Notably, the GLVIA3 (LI & IEMA, 2013, p.89) states that:

‘...there should not be over-reliance on designations as the sole indicator of value’.

Accordingly, the assessments of landscape value undertaken in the LVIA included consideration of various elements that contribute to landscape value of specific receptors, using best practice standards and professional judgement. Where this occurred, landscape value was judged based on clearly stated criteria.

Table 13-2 below presents differing assessment criteria for landscape value.

Table 13-2 Assessment Criteria for Landscape Value

Value Attached to Landscape Elements	Description and Example Criteria
‘High’	Landscape receptors forming part of designations (e.g. areas of amenity, scenic routes/views) in the development plan, or at a national or international level, or landscape receptors not designated but where the receptor is judged to be of equivalent value using clearly stated criteria including wildness, naturalness,

Value Attached to Landscape Elements	Description and Example Criteria
	very strong cultural heritage or natural heritage associations and/or very high recreational value.
‘Medium’	Landscape receptors where value is not formally designated but are of value as good examples of high quality, intact landscapes or landscape features and are deemed to be of relatively high scenic quality. Landscapes or landscape receptors that contain some rare elements, include areas or features which are wild or have a sense of naturalness, have strong cultural associations or which have recreational value.
‘Low’	Landscapes that are not formally designated and considered as modified. Areas which do not have particularly scenic qualities, do not include rare elements or landscape features and do not have strongly evident cultural or heritage associations.

Section 13.4 - *Landscape Baseline*, describes and determines the landscape value of the Site and its wider landscape setting in order to establish the capacity of the immediate landscape in which the existing turbines will be built, as is prescribed by best practice guidance (GLVIA3, 2013, p.80):

‘...as part of the baseline description the value of the potentially affected landscape should be established’.

Comprehension of landscape value and its susceptibility to change enables determination of the sensitivity of the landscape at a micro-level, as well as the Site itself and the wider landscape setting.

In combining the assessment of the landscape value of a landscape receptor with the susceptibility to change of that receptor, it is noted here that a judgement of ‘High’ landscape value does not necessarily imply that this receptor has a ‘High’ susceptibility to change, and it is emphasised that this relationship can be complex. The combination of these two judgements, which determines the overall landscape ‘Sensitivity’, is undertaken using professional judgement with the rationale for judgements clearly explained in the description of the assessment of effects or in the baseline study. On this basis, landscape receptors have been assigned one of the four following ‘Sensitivity’ ratings:

- ‘Very High’;
- ‘High’;
- ‘Medium’;
- ‘Low’.

No table is provided for the description of these different classifications of landscape sensitivity as the relationship between susceptibility to change and landscape value is inherently complex and not suitable to concise definitions. It is noted that sensitivity classifications are generally guided by local and national planning policy, particularly for designated Landscape Character Areas (LCAs) and county policy in relation to these, as well as county wind energy policy, where available. However, it is noted that in cases where local variations in landscape receptors merit a smaller-scale-focused assessment that may differ from the policy, this was undertaken using professional judgement and is clearly explained in this Chapter.

13.2.6.2 Sensitivity of Landscape Character Areas (LCAs)

The ‘Sensitivity’ of designated LCAs is comprehensively assessed in Section 13.7.2.1.2. Ireland does not currently have a standardised nationwide Landscape Character Assessment. As such, the LCAs scoped

in for assessment in this LVIA are located in different counties and each county uses a different method, scale, hierarchy and naming convention to represent the sensitivity of its individual LCAs.

For the purposes of this LVIA, and to provide consistency across the assessment of LCAs (Section 13.7.2.1.2) a rating of ‘Sensitivity’ was assigned to each LCA within the following classification scale:

- > ‘Very High’;
- > ‘High’;
- > ‘Medium’;
- > ‘Low’.

The sensitivity classification assigned to each LCA considers key characteristic and sensitivity descriptions (and where applicable, the sensitivity ratings) in the respective county development plans, as well as any relevant wind energy capacity designations and policy. A rationale for the sensitivity classification of each LCA is provided in the assessment tables included in Section 13.7.2.1.2. LCAs at the ‘Very High’ end of the scale would include very sensitive landscapes of national importance, whilst LCAs at the ‘Low’ end of the scale might be locally important landscapes but are those which do not comprise receptors or characteristics of unique or national value.

13.2.6.3 Magnitude of Change in the Landscape

Taurbeg Wind Farm is an existing wind farm which is built, operational and currently visible in the existing landscape. As is evident by the visualisations, the existing Taurbeg Wind Farm amounts to little or no change to the existing views of the existing landscape. The term ‘Magnitude of Change’ is used in the impact assessment tables included in this EIAR. The context of this assessment where the turbines already exist in the landscape, the magnitude of the continued impact of the turbines is considered. In order to facilitate the impact assessments and effectively determine the continued impact of the existing Taurbeg turbines, the magnitude of change was determined by considering the change that would occur in a ‘do-nothing scenario’ where the turbines would be removed, thereby no longer existing in the landscape.

The magnitude of change, both within a given LCA or for a specific landscape receptor, is defined by a combination of the visual presence—that is, the size and scale—of the change, the extent of the area to be affected and the duration and reversibility of the effect.

It should be emphasised that all LVIA guidance documents generally agree that wind farm developments themselves are considered ‘reversible’. As part of the impact assessment process, the magnitude of change for each LCA and landscape receptor was assessed using the definitions outlined in Table 13-3 below.

Table 13-3 Assessment Criteria for Magnitude of Landscape Change

Magnitude of Change	Description
‘Substantial’	Where a landscape will experience the loss of key landscape features or the introduction of uncharacteristic additions over a large area. The changes to the landscape are prominent and large in scale. The level of change has an effect on the overall landscape character. The effects are likely long term and may be irreversible.
‘Moderate’	A more limited loss of or change to landscape features over a medium extent which will result in some change to landscape features and aesthetics. Could include the addition of some new uncharacteristic features or elements that would lead to the potential for change in landscape character in a localised area or part of a landscape character area. Would include

Magnitude of Change	Description
	moderate effects on the overall landscape character that do not affect key characteristics. The effects could be long- to medium-term and/or partially reversible.
‘Slight’	The loss of or change to landscape features of limited extent, or changes to landscape character in smaller areas. Changes would not affect key characteristics. The addition of any new features or elements to the landscape would only result in low-level changes to the overall aesthetics of the landscapes. Changes to the landscape are more evident at a local level and not over a wide geographical area. The effects could potentially be medium- to short-term and/or reversible.
‘Negligible’	A change affecting smaller areas of landscape character including the loss of some landscape elements or the addition of features or elements which are either of low value or hardly noticeable. The effects could be short-term and/or reversible.

13.2.6.4 Landscape Effects Assessment Matrix

The overall ‘Significance’ of landscape effects is determined by combining the landscape receptor ‘Sensitivity’ and the ‘Magnitude of Change’ classifications, according to the Landscape Effects Assessment Matrix shown below in Table 13-4.

In the below matrix, landscape receptor sensitivity is shown in the first, left-hand column and magnitude of landscape change is shown in the first row at the top. This matrix is used as an indicative tool to assist in determining the significance of landscape effects. In different circumstances, differing levels of mitigating factors may ultimately result in a different determination of the final rating of significance. The ‘Significance’ of a landscape effect is based on a balance between the ‘Sensitivity’ of the receptor and the ‘Magnitude of Change’ of the effect.

Table 13-4 Landscape Effects Assessment Matrix

	Substantial	Moderate	Slight	Negligible
Very High	Major	Major/Moderate	Moderate	Moderate/Minor
High	Major/Moderate	Moderate	Moderate/Minor	Minor
Medium	Moderate	Moderate/Minor	Minor	Minor/Negligible
Low	Moderate/Minor	Minor	Minor/Negligible	Negligible

The final ‘Significance’ rating of the landscape effect is then arrived at using a combination of the matrix and the EPA (2022) classification definitions, shown in Table 13-5 below.

The determination of significance uses a seven-point scale, ranging from ‘Major’ to ‘Negligible’. This seven-point scale is then translated to the EPA (2022) impact assessment classifications of ‘Significance’, as outlined in the table.

Table 13-5 Impact Assessment Significance Classification from EPA (2022) for Landscape Effects

Matrix Classification Significance	EPA Significance Classification	EPA (2022) Definition of Significance
Major	Profound	An effect which obliterates sensitive characteristics.
Major/Moderate	Very Significant	An effect, which by its character, magnitude, duration or intensity alters most of a sensitive aspect of the environment.
Moderate	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Moderate/Minor	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.
Minor	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Minor/Negligible	Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Negligible	Imperceptible	An effect capable of measurement but without significant consequences.

13.2.7 Assessing Visual Effects

‘Visual effects’ relate to the changes in views and visual amenity of the surroundings of individuals or groups of people, brought about by the development of the proposed lifetime extension. These may result from changes in content and character of views as a result in changes to the landscape. The assessment of visual effects is based on the views shown in the photographic visualisations and the potential visibility indicated by ZTV mapping, as well as the actual visibility on the ground.

It should be noted that, in assessing visual effects, there are two types of effects:

- **Visual obstruction:** Occurs when there is an impact on a view which blocks the view;
- **Visual intrusion:** Occurs when there is an impact on a view, but which does not block the view.

Due to the nature of the development and the appearance of wind turbines, ‘visual intrusion’ occurs more frequently than ‘visual obstruction’. Therefore, the ‘Significance’ of the effect on visual receptors is a combination of the ‘Sensitivity’ of the receptor as well as the ‘Magnitude of Change’ of the effect.

Mitigating factors are then taken into consideration to arrive at a ‘Residual’ visual effect. Residual visual effects are graded upon the same ‘impact assessment classification of significance’ scale used for landscape effects, as defined by the EPA (2022), which is included below in Table 13-9.

13.2.7.1 Visual Receptor Sensitivity

The ‘Sensitivity’ of a visual receptor depends on the occupation or activity of the people involved, as well as the extent to which the attention is focused on views and visual amenity, according to the

GLVIA3 (LI & IEMA, 2013). Visual receptor sensitivity is assessed as being ‘Very High’, ‘High’, ‘Medium’, or ‘Low’, based on the definition of descriptions and examples set out in Table 13-6 below.

Table 13-6 Assessment Criteria for Visual Receptor Sensitivity

Sensitivity of Visual Receptor(s)	Description
‘Very High’	Included in this category are viewers primarily focused on views from this particular location, such as visitors to popular destinations identified for their outstanding views, and residents in close proximity who have primary views of a scenic quality in the direction of the proposed turbines.
‘High’	Includes viewers at designated views or landscapes, such as residents in close proximity to the viewpoint who have primary views in the direction of the existing turbines that may not necessarily be of a particularly scenic quality, viewers at well-known heritage or popular tourist or recreational areas and viewers along scenic or tourist routes.
‘Medium’	Includes viewers who may have some susceptibility to a change in view, such as residents in medium proximity but who do not have views focused in the direction of the existing turbines or whose views are not of a particularly scenic quality, those from views which are not designated but may have local recreational uses or those travelling along routes or at views which are considered moderately scenic.
‘Low’	Includes viewers engaged in activities where the focus is not on the landscape or view. This includes those travelling along a busy route, viewers at work or engaged in sport not related to views or the experience of the landscape.

As described earlier in Section 13.2.4 - *Photographic Visualisations* are specific locations which are representative of key visual receptors. The viewpoint assessment tables in Section 13.7.2.2.2 consider all receptors represented in the determination of the visual receptor sensitivity rating for each viewpoint. This determination takes a balanced approach considering the types, sensitivities, and quantities of visual receptors represented. The sensitivity rating given to each viewpoint in Section 13.7.2.2.2 considers both the susceptibility of the visual receptors represented as well as the value attached to the available views at that location.

13.2.7.2 Magnitude of Visual Change

The turbines at the Site already exist in the landscape. Therefore, determining the ‘Magnitude of Change’ between an ‘Existing’ View and ‘Proposed View’ amounts to no change in scenic amenity and would not effectively describe the current visual impact using standard best practice LVIA methodology (‘Receptor Sensitivity’ × ‘Magnitude of Change’). In order to facilitate the visual impact assessments included in this Chapter and effectively determine the visual impact of the proposed turbines, the magnitude of change was determined by considering the change that would occur in a ‘do-nothing scenario’ where the turbines would not be visible in the landscape. A comprehensive description of the visual impact assessment of each photographic visualisation is detailed in Section 13.7.2.2.2 - *Viewpoint Assessment Tables*.

The magnitude of change in terms of the visual change resulting at each viewpoint is determined by assessing a combination of scale of the change, the extent of the area to be affected and the duration and reversibility of the effect, determined by reviewing the photomontage and wireframe images for

each viewpoint. The ‘Magnitude of Change’ is determined in accordance with the definitions and descriptions included below in Table 13-7.

Table 13-7 Assessment Criteria for Magnitude of Visual Change

Magnitude of Change	Description
‘Substantial’	Substantial change, where the proposal would result in large scale, prominent or very prominent change, leading to substantial obstruction of an existing view or complete change in character and composition of the baseline through removal of key elements or the addition of uncharacteristic elements which may or may not be visually discordant. This includes viewpoints where the existing turbines are fully or almost fully visible over a wide extent, at close proximity to the viewer. This change could be long-term or of a long duration.
‘Moderate’	The change in the view may involve partial obstruction of existing view or partial change in character and composition of the baseline through the introduction of new elements or removal of existing elements. Likely to occur at locations where the existing turbines are partially visible over a moderate or medium extent, and which are not in close proximity to the proposed development. Change may be readily noticeable but not substantially different in scale and/or character from the surroundings and wider setting.
‘Slight’	The proposal would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered but will remain similar to the baseline existing situation.
‘Negligible’	Any change would only be barely distinguishable from the status quo ‘do-nothing scenario’ in the surroundings. The composition and character of the view would be substantially unaltered, approximating to little or no change.

13.2.7.3 Visual Effects Assessment Matrix

The final ‘Significance’ rating of visual effects is determined by combining the visual receptor ‘Sensitivity’ and the ‘Magnitude of Change’ classifications, according to the Visual Effects Assessment Matrix shown below in Table 13-8.

In the matrix, visual receptor sensitivity is shown in the first, left-hand column and magnitude of the visual change is shown in the first row at the top of the table. This matrix is used as an indicative tool to assist in determining the significance of visual effects. In different circumstances, differing levels of mitigating factors may ultimately result in a different determination of the final rating of significance. The ‘Significance’ of a visual effect is based on a balance between the ‘Sensitivity’ of the receptor and the ‘Magnitude of Change’ of the effect.

Table 13-8 Visual Effects Assessment Matrix

	Substantial	Moderate	Slight	Negligible
Very High	Major	Major/Moderate	Moderate	Moderate/Minor
High	Major/Moderate	Moderate	Moderate/Minor	Minor
Medium	Moderate	Moderate/Minor	Minor	Minor/Negligible

	Substantial	Moderate	Slight	Negligible
Low	Moderate/Minor	Minor	Minor/Negligible	Negligible

The significance of the visual effect is arrived at using a combination of the above matrix and what is known as the ‘Visual Effect Significance Graph’ from the EPA (2022) (shown in Figure 13-2, see next section).

The determination of significance uses a seven-point scale, ranging from ‘Major’ to ‘Negligible’. This seven-point scale is then translated to the EPA (2022) impact assessment classifications of ‘Significance’, as outlined in Table 13-9 below.

Table 13-9 Impact Assessment Significance Classification from EPA (2022) for Visual Effects

Matrix Classification Significance	EPA Significance Classification	EPA (2022) Definition of Significance
Major	Profound	An effect which obliterates sensitive characteristics.
Major/Moderate	Very Significant	An effect, which by its character, magnitude, duration or intensity alters most of a sensitive aspect of the environment.
Moderate	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Moderate/Minor	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.
Minor	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Minor/Negligible	Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Negligible	Imperceptible	An effect capable of measurement but without significant consequences.

13.2.8 Determination of Residual Landscape and Visual Effects

After determining the ‘Significance’ of landscape and visual effects using the above assessment matrices (and significance graph in the case of visual effects), mitigating factors are then taken into consideration to arrive at the final ‘Residual’ effect rating, translated to the EPA classification scheme. In some cases, mitigating factors merit a reduction in classification.

The matrices and tables above are excellent tools to aid professional judgement in the determination of the significance of an effect. They are useful in that they provide a transparent, objective structure to the process of balancing ‘Sensitivity’ and ‘Magnitude of Change’.

Particularly for determining residual visual effects, the formulaic process created by the use of the above matrices (Table 13-6 and Table 13-7) does provide an indicative initial assessment, which can be seen clearly in the viewpoint assessment tables in Section 13.7.2.2.2.

However, over-reliance on the formulaic process, which is heavily influenced by the definitions of ‘Sensitivity’ and ‘Magnitude of Change’ contained in the matrices can lead to a failure of properly accounting for the full range of circumstances and factors at play in the determination of the final significance rating of a visual effect (see *sub-section 3.35* in ‘*Step 3: Judging the Overall Significance of the Effects*’ of the GLVIA3, LI & IEMA, 2013, p.41).

In actuality, a wide range of factors, mitigating or otherwise, can factor into the final determination, and it is not possible to capture the complexity involved in balancing all considerations within the necessarily limited definitions contained in the matrices. This then naturally results in circumstances whereby the process of the determination of significance using the formulaic method involved with the matrix shown above in Table 13-8 can result in misrepresentations of the overall significance of visual effects. It is only by applying professional judgement and composing narrative descriptions of the effect, that such complexity can be integrated into the final determination of significance.

Therefore, the formulaic methods based upon the matrices presented above are combined with professional judgement in the determination of significance. This is shown by the ‘Visual Effects Significance Graph’ below in Figure 13-2 Visual Effects Significance Graph (adapted from EPA, 2022) which illustrates how the professional judgement of the competent expert is used to properly determine the significance of an effect taking all considerations into account.

Accordingly, in this LVIA, focus is placed upon the narrative description of effects (see *sub-section 3.36* of the GLVIA3, LI & IEMA, 2013, p.41) given the naturally subjective nature of the significance determination process, particularly in relation to visual effects, ensuring that the rationale for the overall judgement is clear (see *sub-sections 3.28* and *3.29* in ‘*Step 2: Combining the Judgments*’, GLVIA3, 2013, p.40). The comprehensive assessment of viewpoints included in Section 13.7.2.2.2 aims to provide a transparent and robust determination of residual visual effects utilising the graph in Figure 13-2 below in combination with a clear and logical narrative.

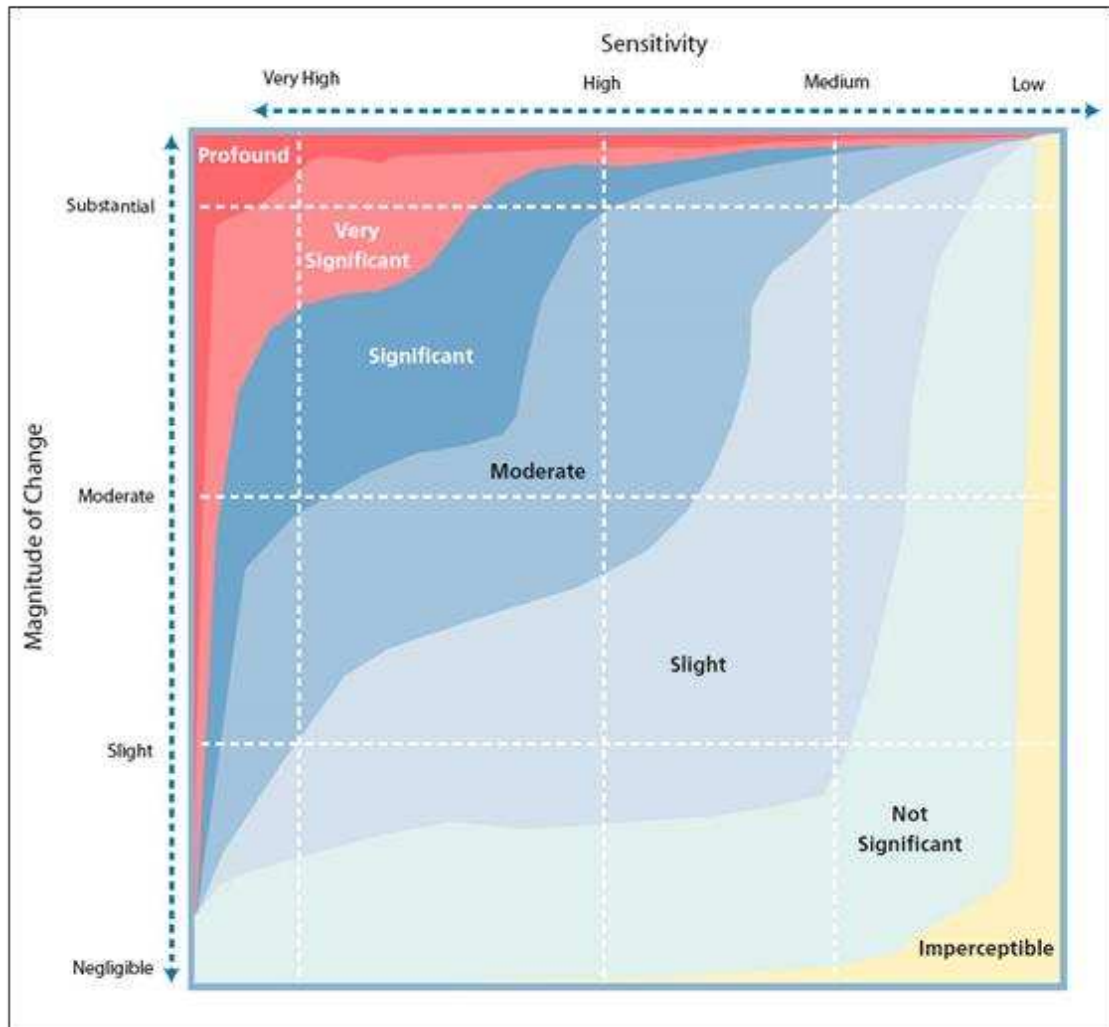


Figure 13-2 Visual Effects Significance Graph (adapted from EPA, 2022)

13.2.9 Assessing Cumulative Landscape and Visual Effects

Cumulative Landscape Effects. The Nature Scot online publication ‘*Assessing the Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments*’ (2021) identifies two principal areas of cumulative landscape effects, on the physical fabric of the landscape and on the landscape character, which state:

- **Physical Fabric:** Cumulative effects on the physical fabric of the landscape arise when two or more developments affect landscape components such as woodland, dykes, rural roads or hedgerows. Although this may not significantly affect the landscape character, the cumulative effect on these components may be significant – for example, where the last remnants of former shelterbelts are completely removed by two or more developments’.
- **Landscape Character:** Cumulative effects on landscape character arise when two or more developments introduce new features into the landscape. In this way, they can change the landscape character to such an extent that they create a different landscape character type, in a similar way to large scale afforestation. That change need not be adverse; some derelict or degraded landscapes may be enhanced as a result of such a change in landscape character’.

Potential changes to the physical fabric outlined above are predominantly restricted to the Site and the LCAs in which the Site is located. Therefore, the landscape receptors are to be assessed for cumulative

landscape effects on the physical fabric of the landscape arising from the existing turbines and all other components of the existing Taurbeg Wind Farm.

Cumulative effects on the landscape character were assessed in the identified LCAs with theoretical visibility of the existing turbines, with particular emphasis on the LCA in which the existing turbines will be located.

Cumulative landscape effects are included in Section 13.7: Likely Significant Landscape and Visual Effects.

Cumulative Visual Effects. For this assessment, Nature Scot (2021) defines cumulative effects as ‘*additional changes caused by a proposed development in conjunction with other similar developments*’. Whilst this assessment considers other types of developments beside wind farms, the focus is always on assessing the greatest potential for ‘Significant’ cumulative visual effects. In this regard, the greatest cumulative effects with the Proposed Lifetime Extension are most likely to occur in conjunction with other wind energy developments, therefore the focus of cumulative visual effects assessment in this Chapter is on the interactions with other wind turbines. The definition in the WEDGs (DoEHLG, 2006) defines cumulative impacts in terms of wind farms, as the perceived effect on the landscape of two or more wind energy developments visible from any one place.

The GLVIA3 (LI & IEMA, 2013) and Nature Scot (2021) guidance also note that cumulative visual effects can be experienced **in combination**, where two or more developments are visible from one viewpoint, either **simultaneously** or **in succession**, and these are considered in the assessment of visual effects in Section 13.7.2.2.2. The viewpoints illustrate combined visibility, and analysis of the viewpoints as well as site visits and field work undertaken allows sequential visibility to be assessed.

Another type of cumulative visual effect includes where two or more developments are seen **sequentially**, where a viewer moves to another viewpoint or along a transport or recreational route and sees the same or different developments. The viewpoints illustrate the combined visibility and analysis of the viewpoints, route screening, site visits and field work undertaken, thereby allowing sequential visibility to be assessed.

The guidance on cumulative effects given in the WEDGs (DoEHLG, 2006) relating to the Site is as follows:

- *‘Similarity in the siting and design approach is preferred where a number of wind energy developments are located in the same landscape character area, particularly within the same viewshed. However, an alternative approach where a particular aesthetic effect is sought may be acceptable;*
- *Different wind energy developments can appear as a single collective unit if located near each other;*
- *It is preferable to avoid locating turbines where they can be seen one behind another, when viewed from highly sensitive key viewpoints (for example, viewing points along walking or scenic routes, or from designated views or prospects), as this results in visual stacking and, thus, confusion. This may not be critical, however, where the wind energy development to the rear is in the distant background;*
- *Wind energy developments within relatively close proximity to one another, while in different landscape character contexts, may be so close as to be within the same visual unit and, therefore, should involve the same siting and design approach’.*

The SNH Guidance v.3a (2017) states that:

‘...introducing turbines that are not similar in form, design, colour and scale may increase visual complexity and clutter’.

Therefore, the cumulative assessment concentrates on the following issues:

- Whether the existing turbines increase the spatial extent of turbines in the view;
- Whether the different wind energy developments can appear as a single collective unit or there is separation;
- Whether ‘visual stacking’ occurs; and
- Whether the contrast of different size and design between different wind developments creates visual clutter.

As cumulative visual effects depend on the aspect from which the turbines will be seen various viewpoints were selected to give a thorough overview of the how the existing turbines will appear in conjunction to turbines already present.

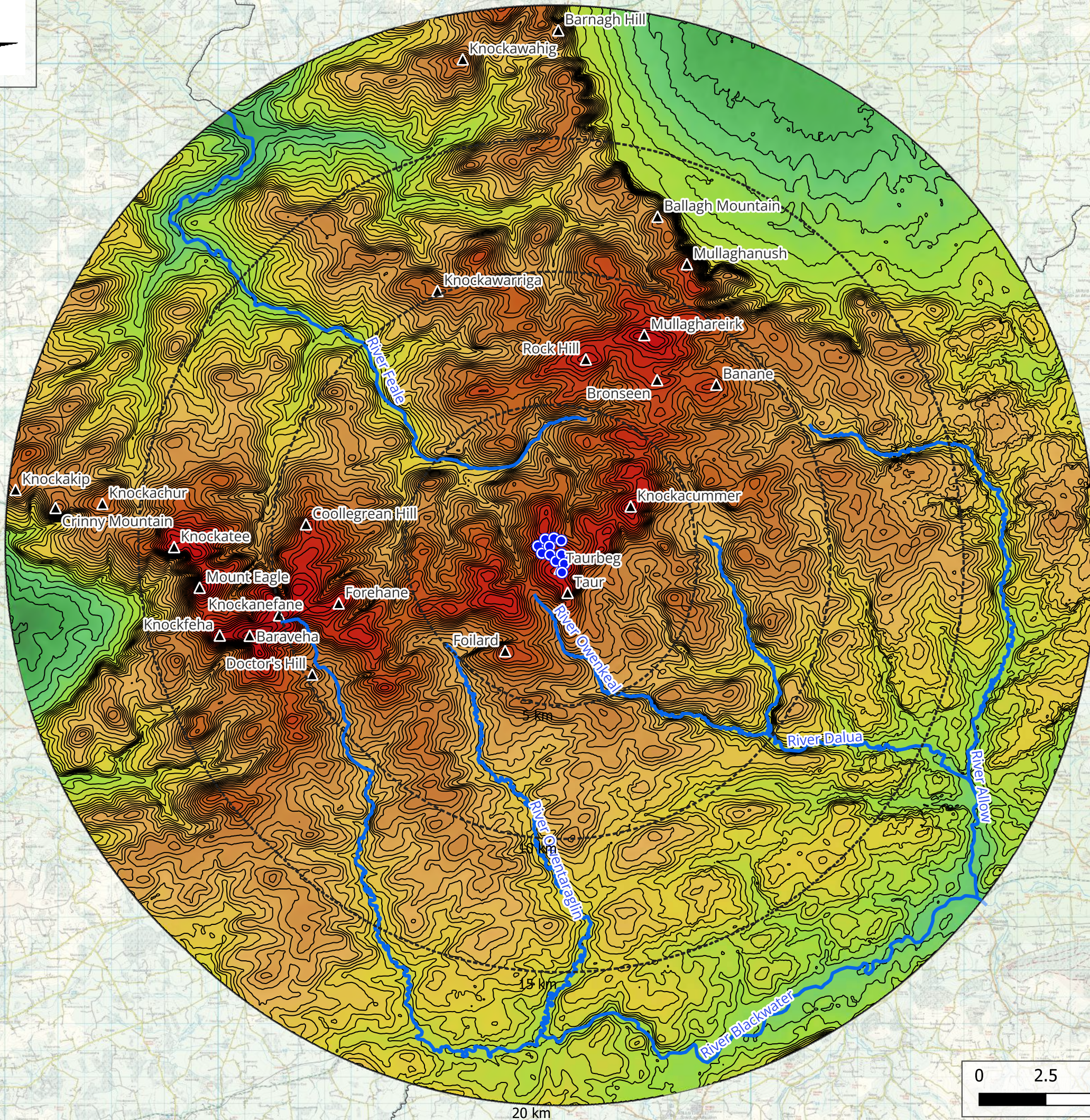
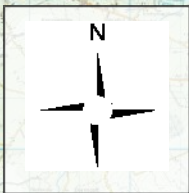
The assessment of cumulative effects is included in the viewpoint assessment tables in Section 13.7.2.2.2 of this Chapter.

13.3

Theoretical Visibility of the Existing Taurbeg Wind Farm: ZTV Versus Actual Visibility

The half-blade ZTV map of the existing Taurbeg Wind Farm and LVIA Study Area is shown below in Figure 13-3, with the following colour scheme:

- Orange: 1-3 turbines theoretically visible
- Green: 4-7 turbines theoretically visible
- Yellow: 8-10 turbines theoretically visible
- Navy: 11 turbines theoretically visible



Map Legend

--- LVIA Study Area

● Existing Taurbeg Turbines

▲ Mountains/Hills

— Prominent Rivers

— 10m Contours

Elevation m (AOD)

25

50

75

100

150

200

250

300

350

400

450

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Drawing No.

Figure 13-4

Drawing Title

Physical Features Map

Project Title

Taurbeg Wind Farm Extension of
Operational Life

Scale

1:150,000

Project No.

231030

Date

14.11.2024

Drawn By

KC

Checked By

JW



Figure 13-4 above depicts the elevation gradients and topographical features within the receiving landscape of the LVIA Study Area. These features define the distribution of theoretical visibility of the existing turbines as illustrated in Figure 13-3. As seen in the above figures, the Site is located on the peaks of Taurbeg Hill, which is part of the Mullaghareirk Mountains. The hills of Knockacummer, Taur and Foilard enclose the existing Taurbeg Wind Farm which visually screens views of the existing Taurbeg turbines in large portions of the LVIA Study Area. The undulating landforms within the Mullaghareirk Mountain range create narrow and short valleys throughout the LVIA Study Area which provides natural visual screening of the existing Taurbeg Wind Farm.

Distribution of Theoretical Visibility

In Figure 13-3, the ZTV map shows that there is mostly full theoretical visibility of the Taurbeg Wind Farm within 5km of the Site. Taurbeg Wind Farm is centred amongst the hills of Knockacummer, Taur and Foilard. These surrounding landforms provide some visual enclosure, this is represented by large areas with no theoretical visibility, particularly to the southwest and northeast of the LVIA Study Area.

The undulating landforms and narrow valleys of the Mullaghareirk Mountain range provide visual screening of Taurbeg Wind Farm from large areas of the wider landscape setting, resulting in substantial areas of no theoretical visibility to the southwest, west and northeast of the LVIA Study Area, particularly beyond 10km. The majority of the theoretical visibility is on the peaks of the undulating landforms, where there are very few sensitive receptors. There are very few areas of theoretical visibility at lower elevation within the narrow valleys of the Mullaghareirk Mountain range where receptors such as Rockchapel and the transport routes are located. There is intermittent theoretical visibility to the south, west and northwest of Taurbeg Wind Farm. Site visits and viewpoint assessment show that the actual visibility of the existing turbines is far less than the theoretical visibility shown by the ZTV mapping.



CH.13

LANDSCAPE AND VISUAL

END OF PART 1

13.4 Landscape Baseline

The Landscape Baseline reports relevant policy pertinent to the LVIA, as well a description of the receiving landscape of the Site and its wider setting. This section is divided into:

- **Landscape Designations and Policy Context** - Policy setting pertaining to the location and nature of the Site from a landscape perspective based on:
 - Cork County Development Plan 2022-2028
 - County Limerick development Plan 2022-28
 - County Kerry Development Plan 2022-28
- **Landscape Character of the Site** – A description of the physical landscape and characteristics of the Site and its immediate setting, this includes the following considerations:
 - Landscape characteristics based upon findings from site visits conducted in 2023 and 2024.
- **Landscape Character of the Wider Landscape Setting** – A description of the wider landscape setting, including the identification of designated Landscape Character Areas (LCAs) located within 15 km of the existing turbines and a preliminary analysis using ZTV.

13.4.1 Landscape Designations and Policy Context

This section reviews the policies and objectives of various planning policy documents relating to landscape, planning, and the locational siting of wind farms, as they relate to the Site.

The existing Taurbeg Wind Farm is located in County Cork, therefore, the Cork County Development Plan 2022-2028 (hereafter referred to as the CCDP) was consulted to identify landscape designations existent in the LVIA Study Area. Additionally, general landscape policy and landscape policy pertaining to wind energy development are also included in this section of the LVIA.

13.4.1.1 County Cork

Section 14.7 and 14.8 of the CCDP outline policies related to landscape and visual amenity within County Cork. The general objectives in relation to landscape from the CCDP 2022-28 are listed below.

“County Development Plan Objective GI 14-9: Landscape

- *Protect the visual and scenic amenities of County Cork’s built and natural environment.*
- *Landscape issues will be an important factor in all land use proposals, ensuring that a pro-active view of development is undertaken while protecting the environment and heritage generally in line with the principle of sustainability.*
- *Ensure that new development meets high standards of siting and design.*
- *Protect skylines and ridgelines from development.*
- *Discourage proposals necessitating the removal of extensive amounts of trees, hedgerows and historic walls or other distinctive boundary treatments.”*

In relation to Objective 14-9, this LVIA will address the impact of the Proposed Lifetime Extension on visual and scenic amenities of County Cork, including the nature of views and visual effects from designated scenic routes, which are addressed in Section 13.4.1.1.3 and Section 13.7.3.2. The siting and design of the existing Taurbeg Wind Farm is discussed in the context of ridgelines in Section 13.4.3. As the Taurbeg Wind Farm is already existing, there will be no construction phase, resulting in the removal of extensive trees, hedgerows, historic walls, or other distinctive boundary treatments.

“County Development Plan Objective GI 14-10:

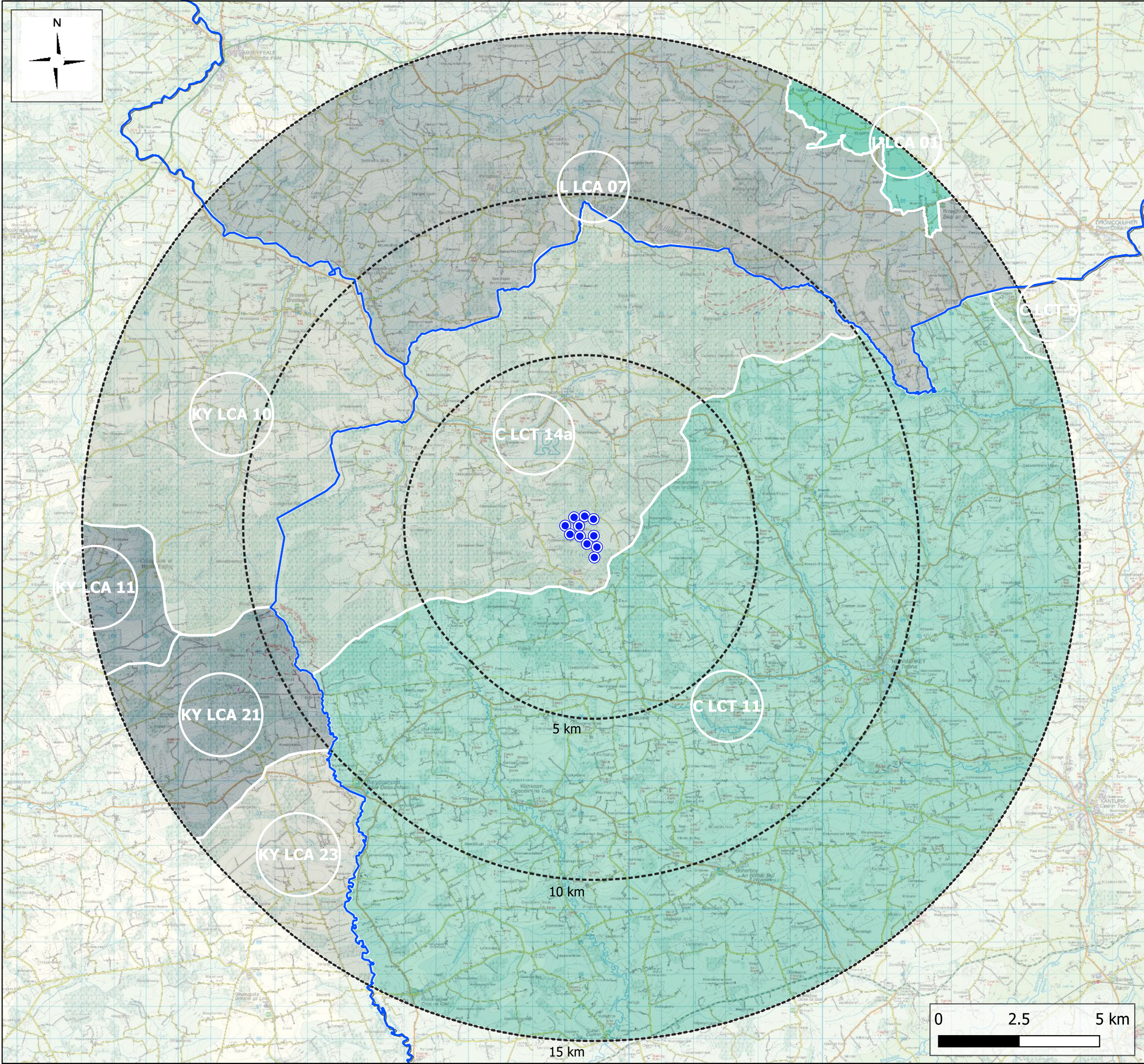
Ensure that the management of development throughout the County will have regard for the value of the landscape, its character, distinctiveness and sensitivity as recognised in the Cork County Draft Landscape Strategy and its recommendations, in order to minimize the visual and environmental impact of development, particularly in areas designated as High Value Landscapes where higher development standards (layout, design, landscaping, materials used) will be required.”

Regarding Objective GI 14-10, Section 13.4.1.1.1 shows that the Landscape Character Type – LCT - 14a – Fissured Marginal and Forested Rolling Upland is designated as Medium sensitivity and value in the Draft Landscape Strategy 2007 and discusses the recommendations for LCT 14a. LCT 14a is not designated as a County Cork ‘High Value Landscape’.

“County Development Plan Objective GI 14-11:

Have regard to the Draft Cork County Landscape Strategy (2007) in the preparation of plans and other policy guidance being prepared during the lifetime of the Plan. Review and update the Draft Cork County Landscape Strategy as soon as is practicable following the publication of a National Landscape Character Assessment as well as taking into account any associated guidelines. Whilst advocating the protection of such scenic resources the Plan also recognises the fact that all landscapes are living and changing, and therefore in principle it is not proposed that this should give rise to the prohibition of development along these routes, but development, where permitted, should not hinder or obstruct these views and prospects and should be designed and located to minimise their impact. This principle will encourage appropriate landscaping and screen planting of developments along scenic routes.”

In relation to Objective 14-11, this LVIA addresses effects of the Proposed Lifetime Extension on designated scenic routes. Viewpoints 1, 2 and 5 show that the existing Taurbeg Wind Farm is visible from designated scenic route 15 and 17 but does not obstruct any scenic views and are visible in the background. The views and visual effects from designated scenic routes are discussed further in Section 13.4.1.1.3 and Section 13.5.1.2.



Map Legend

- LVIA Study Area - 15km for assessment on of effects on designated LCAs
- County Borders
- Existing Taurbeg Turbines
- Co. Cork. Designated LCAs**
 - C-LCT-11 Broad Marginal Middleground Valleys
 - C-LCT-5 Fertile Plain with Moorland Ridge
 - C-LCT-14a Fissured Marginal and Forested Rolling Upland
- LCA Kerry 15km**
 - KY-LCA-10 Mount Eagle and Upper Clydagh River Valley
 - KY-LCA-23 River Blackwater and Rathmore
 - KY-LCA-21 The Brown Flesk River Valley
 - KY-LCA-11 Tralee and Castleisland Valley
- LCA Limerick 15km**
 - L-LCA-07 Agricultural Lowlands
 - L-LCA-01 Southern Uplands

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Drawing No.

Figure 13-5

LCA Map

Taurbeg Wind Farm Extension
of Operational Life

Scale	Project No.	Date	Drawn By	Checked By
1:115,000	231030	25.06.2025	KC	JW



13.4.1.1.1 Landscape Character Assessment

Cork County Council prepared a Draft Landscape Strategy in 2007. The Landscape Character Assessment (LCA) of County Cork established a set of 76 LCAs reflecting the complexity and diversity of the entire county. Considering the expanse and variety of County Cork's landscape, the character areas have been amalgamated into a set of 16 Landscape Character Types (LCTs) based on similarities evident within the various areas. These LCTs provide a more general categorisation of the county's landscape. The Landscape Character Assessment is contained in Volume 1, Appendix F of the CCDP and identifies designated LCTs as well as landscape sensitivity. As shown in Figure 13-5, the existing Taurbeg Wind Farm is located within LCT 14a - *Fissured Marginal and Forested Rolling Upland*. The policy and objectives in relation to LCT 14a is discussed below.

This LCT is designated as:

- **Landscape Value:** Medium
- **Landscape Sensitivity:** Medium
- **Landscape Importance:** Local

The Draft Landscape Strategy 2007 describes this LCT as a landscape with “*relatively steep but rolling mountainous upland, which is fissured, in places quite deeply, by narrow serpentine rivers but also which includes some broad flat ground*”. The key landscape characteristics are listed below as stated in the Draft Landscape Strategy 2007.

Landscape Key Characteristics - Land use, field, boundaries, trees, and wildlife

- “Includes the Mullaghareirk Mountains.
- Topography of this landscape is one of relatively steep and rolling mountainous upland, fissured by narrow river valleys and which slopes towards broad flat ground.
- Fields comprise grassland, much of which is of marginal agricultural quality, while there are also some areas of broadleaf woodland.
- Soils on these slopes and valley bottoms tend to be of poor quality and include blanket peat on upper slopes, which have resulted in intensive coniferous plantations.”

The existing Taurbeg turbines are located within a central part of the Mullaghareirk Mountains range where the landscape is relatively steep and rolling mountainous upland, fissured by narrow river valleys, as stated in the characteristics above.

Pressure for Change

- “**Windfarms** - Existing windfarm development has made a strong imprint in this landscape type. **This has been recognised as a strategic area for windfarms** and while further windfarm developments in this area will have a lasting influence on the landscape, their cumulative visual impacts should be thoroughly assessed. The spread of windfarms may also have impacts on traditional practices, for example the harvesting of turf on peat lands.

As stated below in Section 13.4.1.1.4, the existing Taurbeg turbines are located within an area designated ‘Normally Discouraged’. However, in the Draft Landscape Strategy 2007, the LCT was considered to be an area recognised as a ‘*strategic area for windfarms*.’ Taurbeg Wind Farm was constructed before LCT 14a was designated as ‘Normally Discouraged’. This has resulted in several wind farms being built in the uplands of the Mullaghareirk Mountain range. This included wind farms on upland areas such Knockacummer and Foilard. As determined in this LVIA, it is evident that the upland landscape characteristics of the Mullaghareirk Mountain range (LCT 14a) and wider landscape setting appropriately absorbs the existing wind farms.

The Draft Landscape Strategy 2007 sets out recommendations for each LCT within County Cork. The recommendations for LCT 14a - *Fissured Marginal and Forested Rolling Upland*, which are relevant to the Proposed Lifetime Extension are listed below:

Recommendations.

- *Maintain the visual integrity of this LCT, which has retained a dominantly undisturbed landscape.*
- *Recognise the value of the upland areas (Mullaghareirk Mountains) in this LCT particularly as a tourism resource for hill walking etc.*
- *Plantations and re-plantations should be planned and managed in a way that enhances the landscape and should be set back from peaks and ridges.*
- *Have regard to the impact of windfarms on the landscape. Such developments will need to be located and laid out in a sensitive manner.*

Since the Draft Landscape Strategy 2007, the visual integrity of the LCT has been altered by the addition of existing turbines to the landscape. The Proposed Lifetime Extension will not be a new addition to the landscape, that would alter visual integrity of this LCT, considering the Taurbeg turbines already exist within the landscape. The value of the upland areas is discussed in Section 13.4.1.1.1 and Section 13.7.2.1.2, which is designated as medium value and sensitivity in the CCDP 2022-28.

13.4.1.1.2 **Landscape Sensitivity Rating**

Section 14.8.4 of the CCDP states that a “The Sensitivity of each character type is defined as the ability to accommodate change or intervention without suffering unacceptable effects to its character and values.” The Landscape Character Assessment contained in Appendix F of the CCDP defines and classifies the LCAs according to the following classifications:

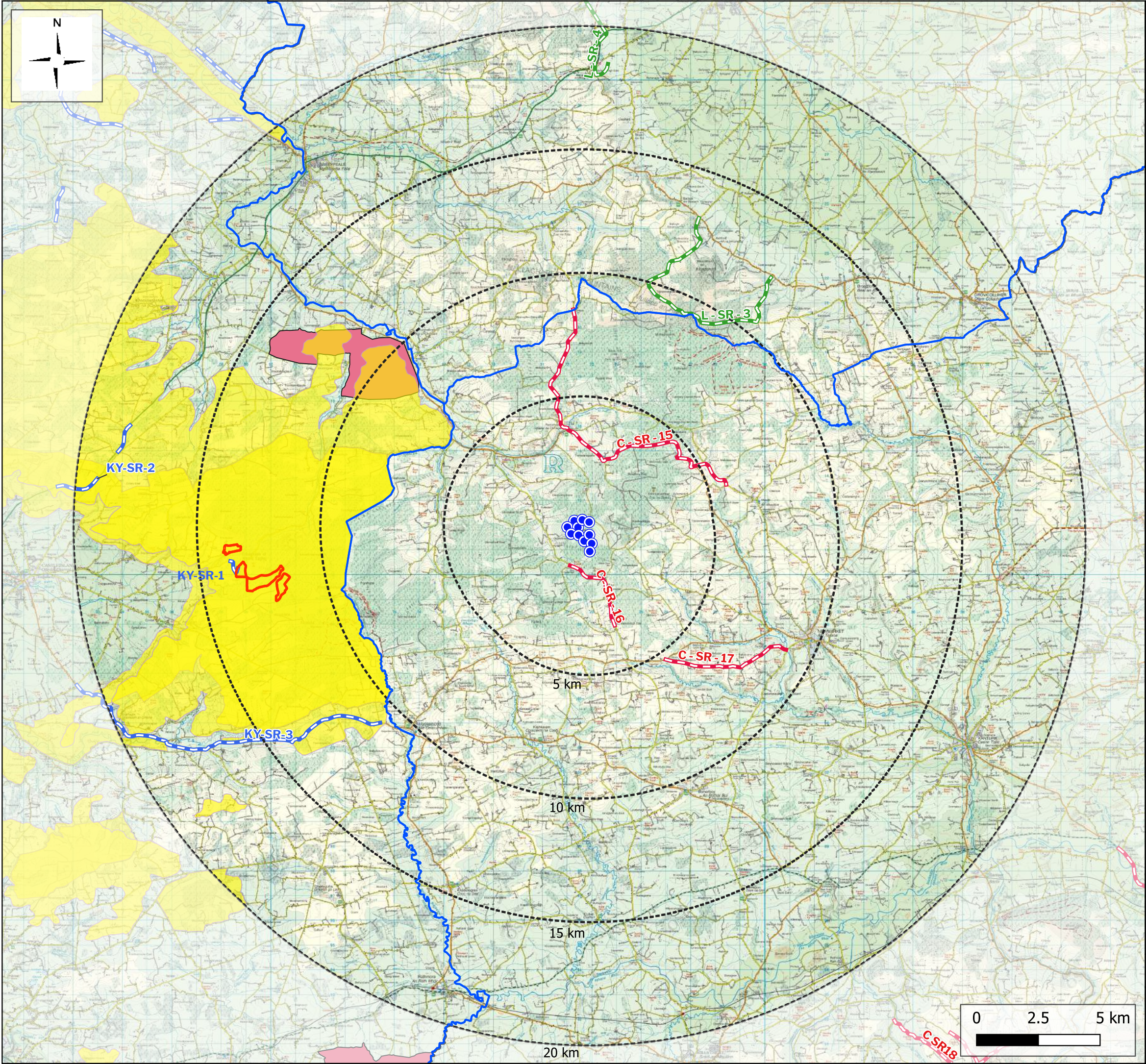
“Low sensitivity - landscapes are robust landscapes, which are tolerant to change, and which have the ability to accommodate development pressure. •

Medium sensitivity - landscapes can accommodate development pressure but with limitations in the scale and magnitude. In this rank of sensitivity, landscape elements can accept some changes while others are more vulnerable to change. •

High sensitivity - landscapes are vulnerable landscapes with the ability to accommodate limited development pressure. In this rank landscape quality is at a high level, landscape elements are highly sensitive to certain types of change. If pressure for development exceeds the landscape’s limitations the character of the landscape may change. •

Very high - sensitivity landscapes are extra vulnerable landscapes (e.g. seascape area with national importance) which are likely to be fragile and susceptible to change.”

As seen in Figure 13-5 the existing Taurbeg Wind Farm is located within a LCA 14a - *Fissured Marginal and Forested Rolling Upland*, which is classified as ‘**Medium**’ sensitivity in the Draft Landscape Strategy 2007.



Map Legend

- LVIA Study Area
- County Borders
- Existing Taurbeg Turbines
- Proposed Offsetting Lands
- Co. Cork Scenic Routes
- Co. Limerick Views and prospects
- Co. Kerry Views and Prospects
- Co. Kerry Archaeological Landscapes
- Co. Kerry Visually Sensitive Areas

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Drawing No.

Figure 13-6

Drawing Title

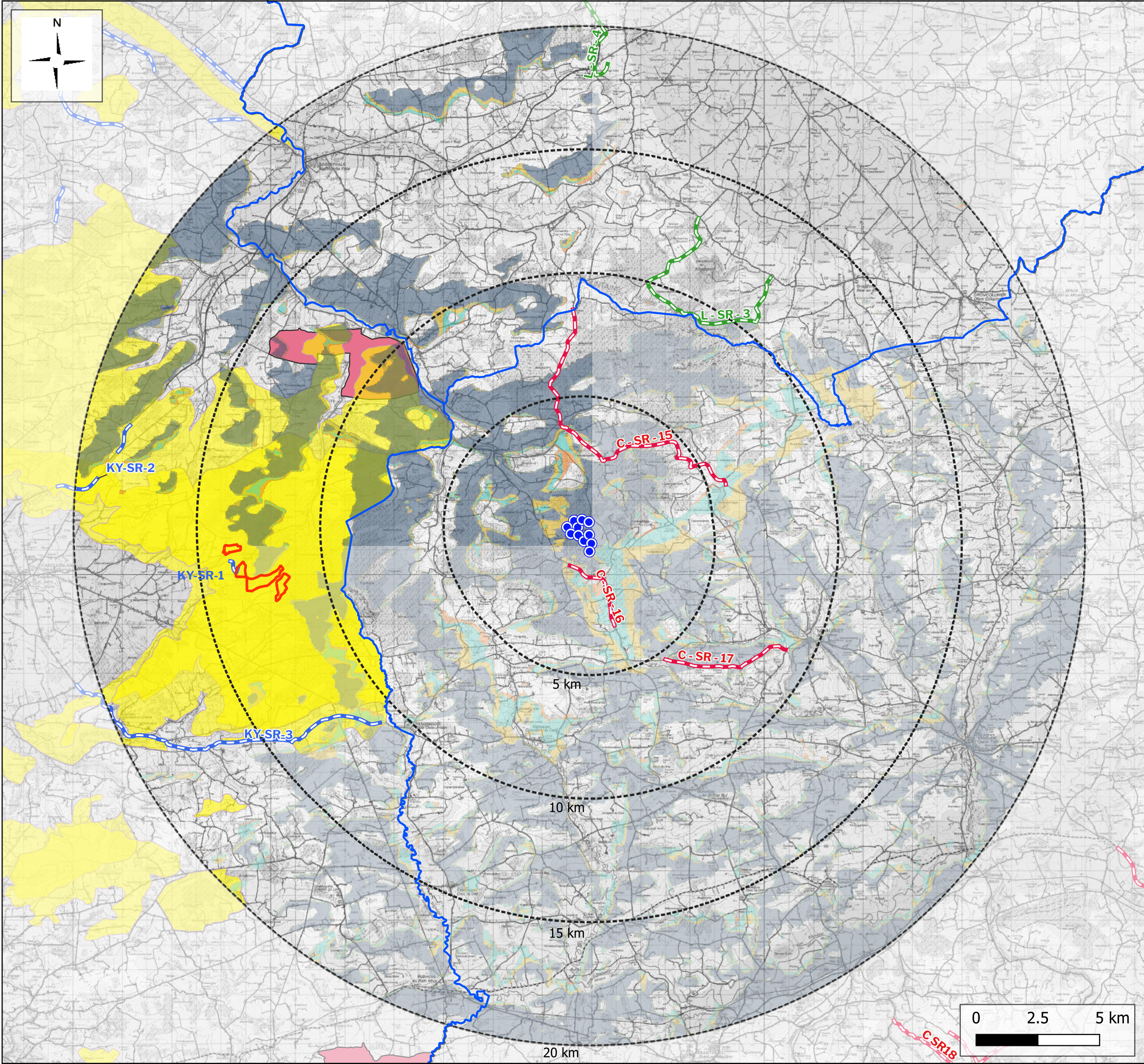
Policy Context Map

Project Title

Taurbeg Wind Farm Extension of Operational Life

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	231030	17.06.2025	KC	JW

MKO



Map Legend

- LVIA Study Area
- County Borders
- Existing Taurbeg Turbines
- Proposed Offsetting Lands
- Co. Cork Scenic Routes
- Co. Limerick Views and prospects
- Co. Kerry Views and Prospects
- Co. Kerry Archaeological Landscapes
- Co. Kerry Visually Sensitive Areas
- Zone of Theoretical Visibility**
 - 1-3 Turbines Theoretically Visible
 - 4-7 Turbines Theoretically Visible
 - 8-10 Turbines Theoretically Visible
 - 11 Turbines Theoretically Visible

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Drawing No.

Figure 13-7

Drawing Title

Policy Context Map and ZTV

Project Title

Taurbeg Wind Farm Extension of Operational Life

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	231030	17.06.2025	KC	JW



13.4.1.1.3 Protected Views and Scenic Routes

The Landscape Character Assessment for County Cork states that “*The County contains many vantage points from which views and prospects of great natural beauty may be obtained over both seascape and rural landscape.*” The CCDP states that these protected views and scenic routes the “*scenery and landscape are of enormous amenity value to residents and tourists and constitutes a valuable economic asset. The protection of this asset is therefore of primary importance in developing the potential of the County.*” In light of this the CCDP contains the following policy related to protected views and scenic routes.

“County Development Plan Objective GI 14-12: General Views and Prospects

Preserve the character of all important views and prospects, particularly sea views, river or lake views, views of unspoilt mountains, upland or coastal landscapes, views of historical or cultural significance (including buildings and townscapes) and views of natural beauty as recognized in the Draft Landscape Strategy.

County Development Plan Objective GI 14-13: Scenic Routes

Protect the character of those views and prospects obtainable from scenic routes and in particular stretches of scenic routes that have very special views and prospects identified in this Plan. The scenic routes identified in this Plan are shown on the scenic amenity maps in the CDP Map Browser and are listed in Volume 2 Heritage and Amenity Chapter 5 Scenic Routes of this Plan.

County Development Plan Objective GI 14-14: Development on Scenic Routes

a) Require those seeking to carry out development in the environs of a scenic route and/or an area with important views and prospects, to demonstrate that there will be no adverse obstruction or degradation of the views towards and from vulnerable landscape features. In such areas, the appropriateness of the design, site layout, and landscaping of the proposed development must be demonstrated along with mitigation measures to prevent significant alterations to the appearance or character of the area.

b) Encourage appropriate landscaping and screen planting of developments along scenic routes (See Chapter 16 Built and Cultural Heritage).

County Development Plan Objective GI 14-15: Development on the Approaches to Towns and Villages

Ensure that the approach roads to towns and villages are protected from inappropriate development, which would detract from the setting and historic character of these settlements.

There are three designated scenic routes within the LVIA Study Area. The existing Taurbeg turbines are visible from designated scenic route 15 and 17 as illustrated by ZTV mapping in Figure 13-7 (above) and validated during site visits. An assessment of the effects of the existing Taurbeg Wind Farm from these scenic routes in the context of policy objectives GI 14-12 and GI 14-13 is reported in Section 13.7.2.2.2

In relation Objective GI 14-14, The *Photographic Visualisation Booklet* illustrates that the existing Taurbeg turbines are sited in a visually coherent design on a broad hilltop. There are limited views of the existing Taurbeg turbines from designated scenic routes due to the topography of narrow valleys throughout the wider landscape setting as shown in Section 13.5.1.2. Regarding Objective GI 14-15, there will be visibility of the existing Taurbeg Wind Farm from the approach road to Rockchapel which is the closest settlement to the Site. As seen in Plate 13-16 and viewpoint 1, the existing Taurbeg Wind

Farm is located in the background of the images and does not alter the setting and historic character of Rockchapel.

There are three Co. Cork designated Scenic Routes within the LVIA Study Area as shown on Figure 13-6 These are listed in Table 13-10 below.

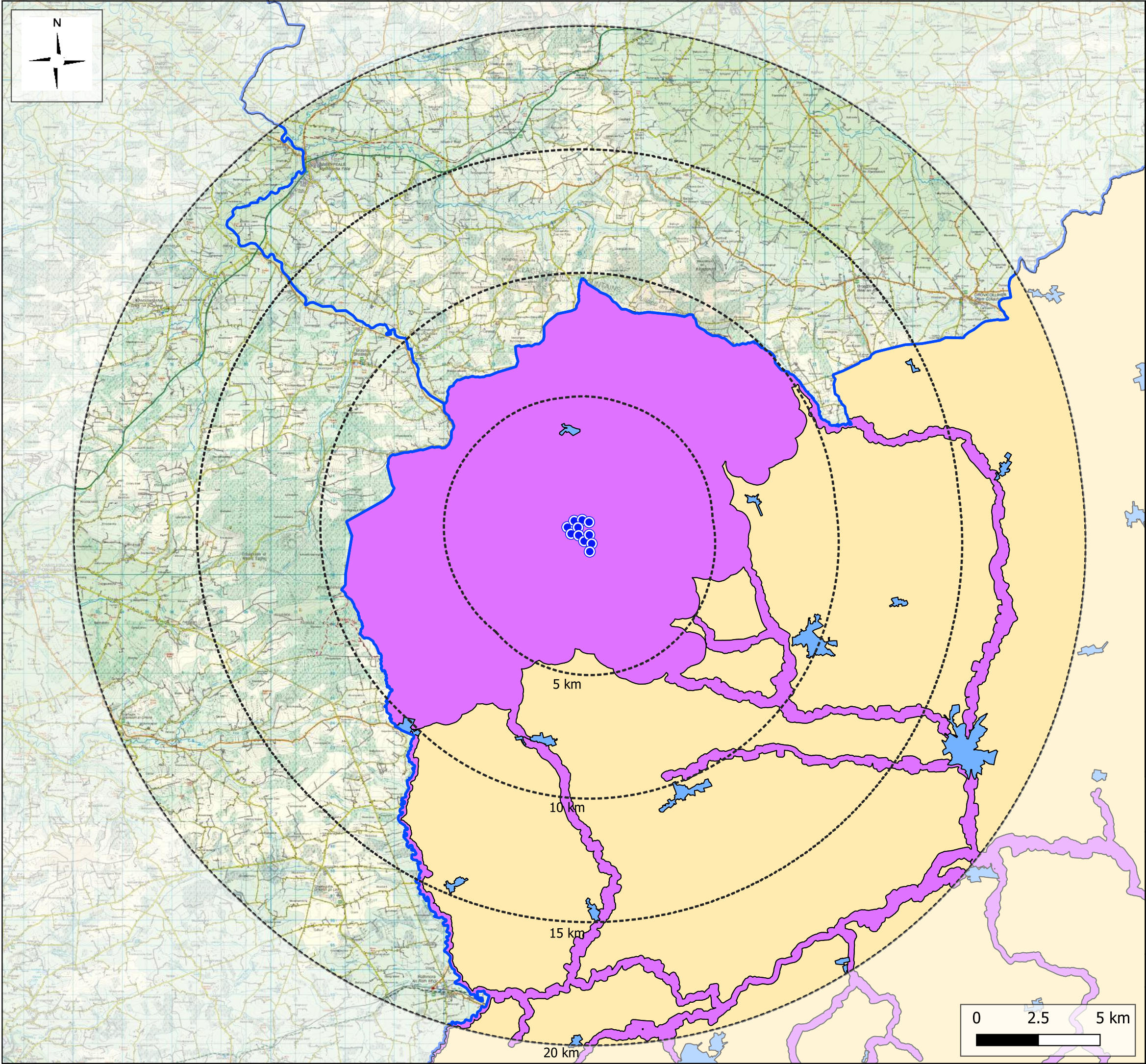
Table 13-10 County Cork Development Plan 2022-28 Designated Scenic Routes within the LVIA Study Area

Scenic Route	Does the Route adjoin a NHA, pNHA, SAC a SPA or SPA	Main Features of Land Cover	Description & General Views Being Protected	Key Characteristics of Land Use
S15	SAC	Poor scrub land, some improved grassland, forestry & wind farms	Local Road northwards from Meelin to Rockchapel to County Boundary Views of rolling upland landscape & the Feale River Valley	Coniferous forestry, settlement & wind farms
S16	No	Upland moor land scrub, coniferous forestry & some improved grassland	Local Road at Taur Views of rolling upland landscape	Settlement, one-off housing, subsistence farming & wind turbine
S17	SAC – Black Water River	Rough grazing land, improved grassland, settlement & rolling upland	Local Road West of Newmarket from Anne’s Bridge to Blueford Crossroads. Views of rolling landscape & the Glenlara & Owenkeel River Valleys	Agriculture

13.4.1.1.4 Wind Energy Strategy

The Wind Energy Strategy (WES) for County Cork is set out in *Volume 1* of the CCDP in Section 13.6. According to 13.6.2 the current wind farm capacity in County Cork is 603MW, but to reach national targets the capacity is expected to expand to 1,100MW. The WES uses three classifications for the suitability of areas for wind energy developments in County Cork. The three classifications are as follows:

- Acceptable in Principle
- Open to Consideration
- Normally Discouraged



Map Legend

- LVIA Study Area
- County Borders
- Existing Taurbeg Turbines
- Co. Cork Wind Energy Strategy**
- Acceptable in Principle
- Normally Discouraged
- Open to Consideration
- Urban Areas

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Drawing No.

Figure 13-8

Drawing Title

Co. Cork Wind Energy Strategy

Project Title

Taurbeg Wind Farm Extension of Operational Life

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	231030	14.11.2024	KC	JW



The existing Taurbeg Wind Farm is located within an area classified as Normally Discouraged as seen in Figure 13-8 above. In the WES, these areas are defined as follows:

- **Acceptable in Principle** – *“Commercial wind energy development is normally encouraged in these areas subject to protection of residential amenity particularly in respect of noise, shadow flicker, visual impact and the requirements of the Habitats, Birds, Water Framework, Floods and EIA Directives and taking account of protected species of conservation concern.”*
- **Open to Consideration** – *“Commercial wind energy development is open to consideration in these areas where proposals can avoid adverse impacts on:*
 - *Residential amenity particularly in respect of noise, shadow flicker and visual impact.*
 - *Urban areas and Metropolitan/Town Green Belts.*
 - *Natura 2000 Sites (SPA’s and SAC’s), Natural Heritage Areas (NHA’s), proposed Natural Heritage Areas and other sites and locations of significant ecological value.*
 - *Architectural and archaeological heritage.*
 - *Visual quality of the landscape and the degree to which impacts are highly visible over wider areas.*

In planning such development, consideration should also be given to the cumulative impacts of such proposals.”

- **Normally Discouraged** - *“Commercial wind energy developments will be discouraged in these areas which are considered to be sensitive to adverse impacts associated with this form of development (either individually or in combination with other developments). Only in exceptional circumstances where it is clear that adverse impacts do not arise will proposals be considered.”*

The existing Taurbeg Wind Farm is located within a “Normally Discouraged” area as seen in Figure 13-8. However this area has existing wind farms throughout the landscape, especially on upland areas. In addition, the landscape has been highly modified through agriculture, coniferous forestry and historic peat harvesting.

Section 13.6.3 of the CCDP 2022-28 sets out the wind strategy based on the following guidelines and a number of key policy considerations as follows:

- *“The approach taken by other adjoining Local Authorities (Kerry, Limerick, South Tipperary, and Waterford) to Wind Energy in their respective County Development Plans. Of particular importance are the instances where adjoining Counties have adopted a policy discouraging wind energy projects.*
- *The location of all existing and proposed wind energy developments and their cumulative impacts.*
- *The pattern of population distribution, so that the main centres of population can be avoided.*
- *Accessibility to the electricity distribution grid.*
- *Important or high value landscapes.*
- *Nature conservation sites and in particular Natura 2000 sites (SPA and SAC).*
- *The Water Framework Directive and River Basin Management Plans for the County, so that impacts on the rivers, lakes and other waterbodies of the County could be avoided.*
- *The Sustainable Energy Ireland (SEI) Wind Atlas, 2003 was utilised to identify areas with viable wind speeds.”*

The following objective is included in the CCDP in relation to wind energy

“ET 14-4: Wind Energy”

In order to facilitate increased levels of renewable energy production consistent with national targets on renewable energy and climate change mitigation as set out in the National Energy and Climate Plan 2021-2030, the Climate Action Plan 2021, and any updates to these targets, and in accordance with Ministerial Guidelines on Wind Energy Development, the Council will support further development of on-shore wind energy projects including the upgrading, repowering or expansion of existing infrastructure, at appropriate locations within the county in line with the Wind Energy Strategy and objectives detailed in this chapter and other objectives of this plan in relation to climate change, biodiversity, landscape, heritage, water management and environment etc.”

As mentioned in Section 13.4.1.1.1, the Draft Landscape Strategy 2007 for Co. Cork and previous county development plans designated LCT 14a as a ‘strategic area’ for wind. The existing Taurbeg Wind Farm is located on a landscape designated as medium sensitivity which is not currently designated as ‘important’ or ‘high value’ landscape. It is therefore reasoned that the ‘Normally Discouraged’ designation is not attributed to the Landscape sensitivity. The primary reason for this area to be designated as ‘Normally Discouraged’ in the current Cork wind energy strategy is likely attributed to the designation of nature conservation sites in this area. Effects on designated conservation sites are addressed in Chapter 6 – *Biodiversity*.

13.4.1.2 Landscape and Visual Designations and Relevant Policy of Other Counties within the LVIA Study Area – Kerry and Limerick

13.4.1.2.1 Co. Kerry

Landscape Sensitivity

Section 11.6 of the KCDP 2022-28 discusses objectives in relation to landscape and visual designations. Section 11.6.2 discusses the objectives in relation to landscape sensitivity and are listed below.

KCDP 11-76

“Have regard to any future National Landscape Character Assessment, Regional Landscape Assessments and Landscape Character Map, and the publication of Section 28 Guidelines on Landscape Character Assessment.”

KCDP 11-77

“Protect the landscapes of the County as a major economic asset and an invaluable amenity which contributes to the quality of people’s lives.”

KCDP 11-78

“Protect the landscapes of the County by ensuring that any new developments do not detrimentally impact on the character, integrity, distinctiveness or scenic value of their area. Any development which could unduly impact upon such landscapes will not be permitted.”

The landscape sensitivity of County Kerry’s landscapes is discussed as part of the landscape character areas. A preliminary analysis in Section 13.4.4.1 scopes in or out LCAs which will be assessed further in Section 13.7.2.1.2.

‘Visually Sensitive Areas’ are identified in Section 11.6.3.1 of KCDP 2022-28. They are large, landscape scale areas of County Kerry where planning and development must be appropriately balanced with the unique and distinctive landscape and visual sensitivities of the county. The Visually Sensitive Areas in the LVIA Study Area are mapped previously with the ZTV in Figure 13-7. As shown in the ZTV, there is very limited theoretical visibility of the Existing Taurbeg turbines in these Visually Sensitive Areas.

The Proposed Offsetting Measures include permanent removal of forestry and restoration of farmland for the benefit of hen harrier in lands located within a Visually Sensitive Area. The Proposed Offsetting Measures are located approximately 12km to the west of the Existing Taurbeg Wind Farm. Effects of the Proposed Project on the ‘Visually Sensitive Areas of the landscape in the LVIA Study Area will be assessed in terms of landscape and visual effects and discussed further in relation to the Proposed Offsetting Measures lands in Section 13.7.2.3.

Views and Prospects

Section 11.6.5 of the KCDP 2022-28 discusses the objectives in relation to views and prospects, which are listed below.

KCDP 11-79

“Preserve the views and prospects as defined on Maps contained in Volume 4.”

KCDP 11-80

“Facilitate the sustainable development of existing and the identification of new Viewing Points along the route of the Wild Atlantic Way in conjunction with Fáilte Ireland, while ensuring the protection of environmental attributes in the area through the implementation of environmental protection objectives, standards and guidelines of this Plan.”

KCDP 11-81

“Prohibit developments that have a material effect on views designated in this plan from the public road or greenways towards scenic features and/or public areas.”

Three Designated Scenic Routes from the KCDP 2022-28 are located within the LVIA Study Area and shown on Figure 13-6. There is no theoretical visibility of the existing Taurbeg Wind Farm from these three designated scenic routes as illustrated in Figure 13-7. They are therefore scoped out from further assessment in this LVIA.

Archaeological Landscapes

Section 8.3.2 of the KCDP 2022-28 discusses the ‘Archaeological Landscapes’ and the objectives in relation to these landscapes.

KCDP 8-28

“Ensure the active protection of the 19 identified, significant archaeological landscapes outlined in Volume 3 with particular emphasis on the landscape settings, views to and from the landscapes and monument/feature inter-visibility within these landscapes.”

There is one ‘Archaeological Landscape’ within the LVIA Study Area as seen in Figure 13-7. Volume 3, Section 4 – *Archaeological Landscapes*, states that the archaeological landscape within the LVIA Study area, which is of regional significance is the:

“Largest ecclesiastical enclosure in the county, hengiform earthwork, large hilltop enclosure overlooking the Feale, fulachtaí fiadh, enclosures. Evidence suggest that this was an important landscape from prehistoric times into the medieval period, located as it is on the natural territorial boundary formed by the Feale. Evidence suggests activity from the Early Bronze Age to the Medieval period.”

The physical fabric of the ‘Archaeological Landscape’ is not altered by the existing Taurbeg Wind Farm. There is very limited theoretical visibility within the designated ‘Archaeological Landscape’. Site visits determined there is even less actual visibility. The existing Taurbeg turbines are setback from the ‘Archaeological Landscape’, and do not alter the setting of this landscape. The Archaeological landscapes will not be discussed further in this chapter.

13.4.1.2.2 Co. Limerick

Landscape Character Areas

Section 6.4.1 – *Landscape Assessment and Landscape Character Areas* of the LDP 2022-28 outlines the policy in relation to LCAs in Co. Limerick

Policy EH P8 – Landscape Character Areas

“It is a policy of the Council to promote the distinctiveness and where necessary safeguard the sensitivity of Limerick’s landscape types, through the landscape characterisation process in accordance with the Draft Guidelines for Landscape and Landscape Assessment (2000) as issued by the Department of Environment and Local Government, in accordance with the European Landscape Convention (Florence Convention) and with A National Landscape Strategy for Ireland – 2015/2025. The Council shall implement any relevant recommendations contained in the Department of Arts, Heritage and the Gaeltacht’s National Landscape Strategy for Ireland, 2015 – 2025.”

The LCAs of Co. Limerick are illustrated on Figure 13-5. Section 13.4.4.1 of this Chapter scopes in or out LCAs which will be assessed further in Section 13.7.2.1.2.

Views and Prospects

Section 6.4.2 of the LDP 2022-28 outlines the policy in relation to views and Prospects. The Views and Prospects are shown in Map 6.2 – *Views and Prospects* of the LDP 2022-28 and are reproduced in Figure 13-6 of this Chapter.

Objective EH O31 – Views and Prospects

- a) *“Preserve, protect and encourage the enjoyment of views and prospects of special amenity value or special interests and to prevent development, which would block or otherwise interfere with views and/or prospects.*
- b) *In areas where scenic views and prospects are listed in the Plan, there will be a presumption against development, except that required to facilitate farming and appropriate tourism and related activities. The development must be appropriately designed so that it can be integrated into the landscape.”*

There are two designated scenic routes within the LVIA Study Area in County Limerick. Limerick scenic route 3 (See Figure 13-7) has a stretch of approximately 2.2km within an area zones as full theoretical visibility of the existing Taurbeg Wind Farm out of approximately 11.2 km of designated scenic route 3. Actual visibility determined there is no visibility of the existing Taurbeg Wind Farm considering the coniferous forestry and Dromdeeveen Wind Farm are obstructing views of Taurbeg Wind Farm. As for designated scenic route 4, there is no theoretical visibility of the existing Taurbeg Wind Farm. Therefore, the existing Taurbeg Wind Farm will not alter the setting and visual sensitivity

of the Designated Scenic Routes. The Co. Limerick Designated Scenic Routes will not be discussed further in this Chapter

13.4.2 Landscape Character of the Wind Farm Site

Landscape character refers to the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how people perceive this. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement, and creates the particular sense of place found in different areas. The identification of landscape character as outlined in the *Landscape and Landscape Assessment: Consultation Draft of Guidelines for Planning Authorities Guidelines* (DoELG, 2000) comprises the identification of primarily physical units (areas defined by landform and landcover) and, where appropriate, of visual units.

The Site was visited during 2023 and 2024 where a preliminary analysis of topography, drainage, landcover and land use was conducted in conjunction with other LVIA surveys. Information gathered during these visits along with desk-based studies have informed the following site descriptions. The Site is deemed to be of **‘Low’** sensitivity. The following subsections will provide outline why the Site is of low sensitivity through figures and images captured during site surveys.

Land Cover and Land Use

Landcover is the term used to describe the combinations of vegetation and land use that cover the land surface. It comprises the more detailed constituent parts of the landscape and encompasses both natural and human-made features. The landcover of the Site can be seen in Figure 13-9 below.

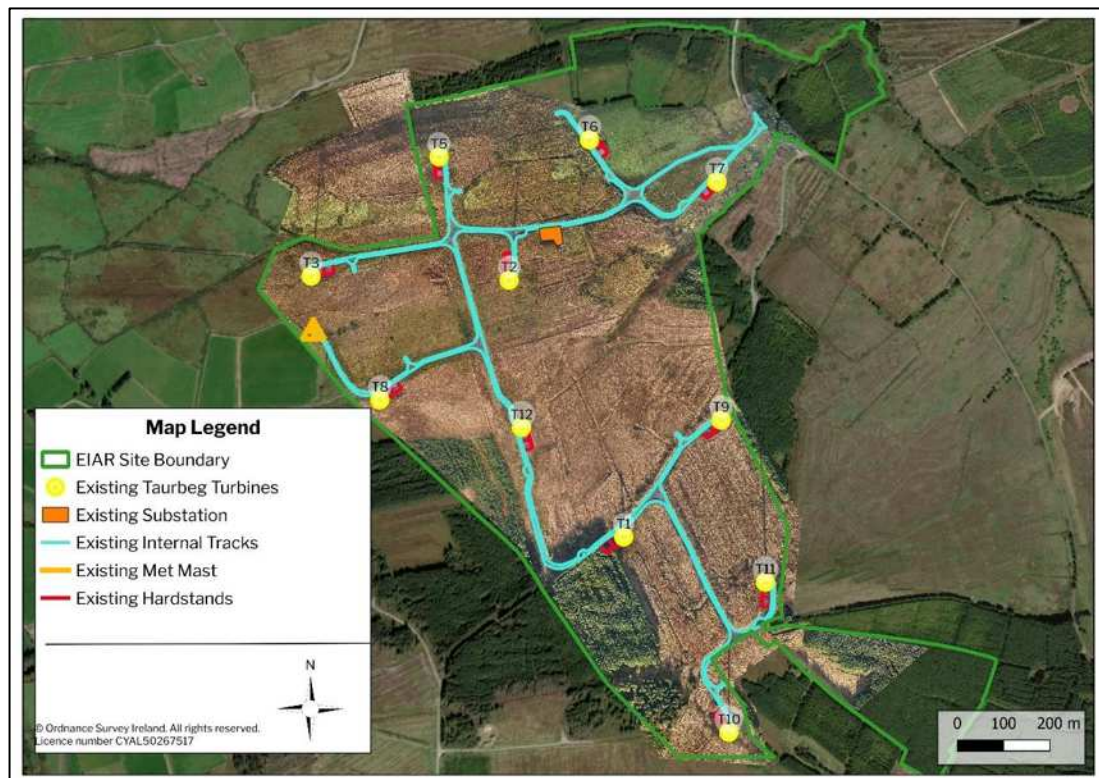


Figure 13-9 Drone Orthomosaic of the Existing Taurbeg Wind Farm

Figure 13-9 above illustrates the landcover and land use of the Site captured from a drone survey carried out in 2024. The landcover primarily consists of the infrastructure of the existing wind farm, peatland, marshy grassland, and coniferous forestry. There is a small area of agriculture fields between

T6 and T7 to the north of the Site. Plate 13-1 and Plate 13-2 below shows that the majority of the landcover within the Site consists of peatland.



Plate 13-1 Existing Taurbeg Turbines among Peatlands and Coniferous Forestry



Plate 13-2 Peatlands within the Site.

Commercial forestry surrounds the Site to the south, southwest and areas to the east as seen in Plate 13-3, Plate 13-4 and Plate 13-5 below.



Plate 13-3 Coniferous Forestry Located to the Southeast of the Existing Taurbeg Wind Farm



Plate 13-4 Coniferous Forestry Located to the West of the Existing Taurbeg Wind Farm



Plate 13-5 View towards Existing Turbine T9 showing Coniferous Forestry behind the Structure at the East of the Site

Plate 13-6 shows agricultural fields within the Site. This is also evident in Figure 13-9, where the agricultural fields are located between T6 and T7.



Plate 13-6 Fields Used for Pastural Lands to the West of the Site

Landform and Drainage

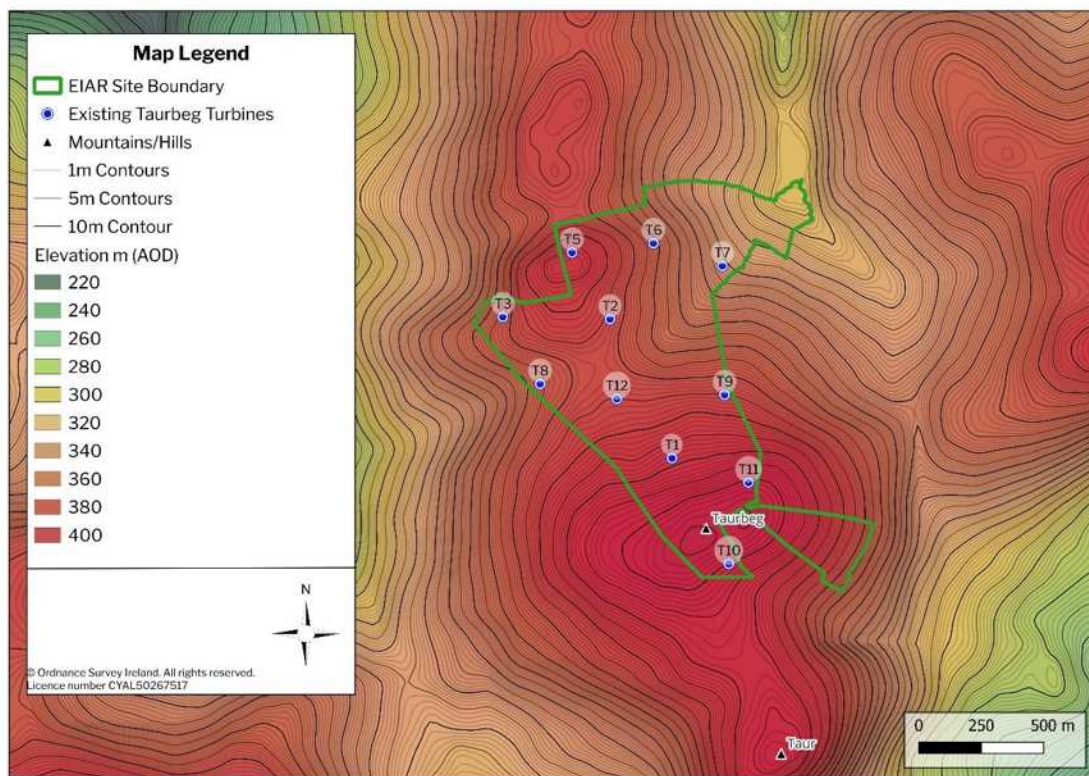


Figure 13-10 Topography of the Site

Figure 13-10 above shows the topography of the Site, which is a broad plateau of upland between two peaks near turbine T5 to the north and turbine T10 to the south, which can be seen in Plate 13-7. Much of the Site is approximately 370 metres AOD (Above Ordnance Datum) and the highest level is in the southern part of the Site at 405 metres AOD.



Plate 13-7 Drainage Ditches seen throughout the Existing Wind Farm Site.

Views within the Wind Farm Site

The Site is generally a large, remote enclosed landscape. Views within the Site itself are generally contained by the coniferous forestry enclosing the Site to the southwest and parts of the east, as well as the surrounding landform characteristics. To the east of the Site, there are open views onto the Knockacummer Windfarm. Plate 13-8 shows views from the south of the Site on an elevated point facing north.



Plate 13-8 Views from the South to the North from an Elevated Vantage Point Within the Wind Farm Site

38 kV Substation

The existing substation is located in the centre of the Site. The substation as seen below in Plate 13-9 and is located on a flat plateau enclosed by coniferous forestry and undulating landforms within the Site. The substation is visible from Knockacummer Wind Farm to the northeast of the existing Taurbeg Wind Farm. There is no visibility of the existing substation from sensitive receptors outside the Site.



Plate 13-9 Views Northeast towards the On-site Substation

13.4.3 Landscape Character of the Proposed Offsetting Lands

The Proposed Offsetting Measures lands are located approximately 12km west of the existing Taurbeg wind farm. These Proposed Offsetting lands are located in an upland landscape south of the existing Mount Eagle Wind Farm in Co. Kerry. They comprise four parcels of land as shown in Figure 13-11 below. Three of the land parcels comprise commercial forestry and are located at high elevation on the southern slopes of Mount Eagle. One area of the Proposed Offsetting lands comprises an agricultural field currently used as pasture for livestock. The character of the Proposed Offsetting lands has been highly influenced and modified by the previous and existing land uses of commercial forestry and agriculture.

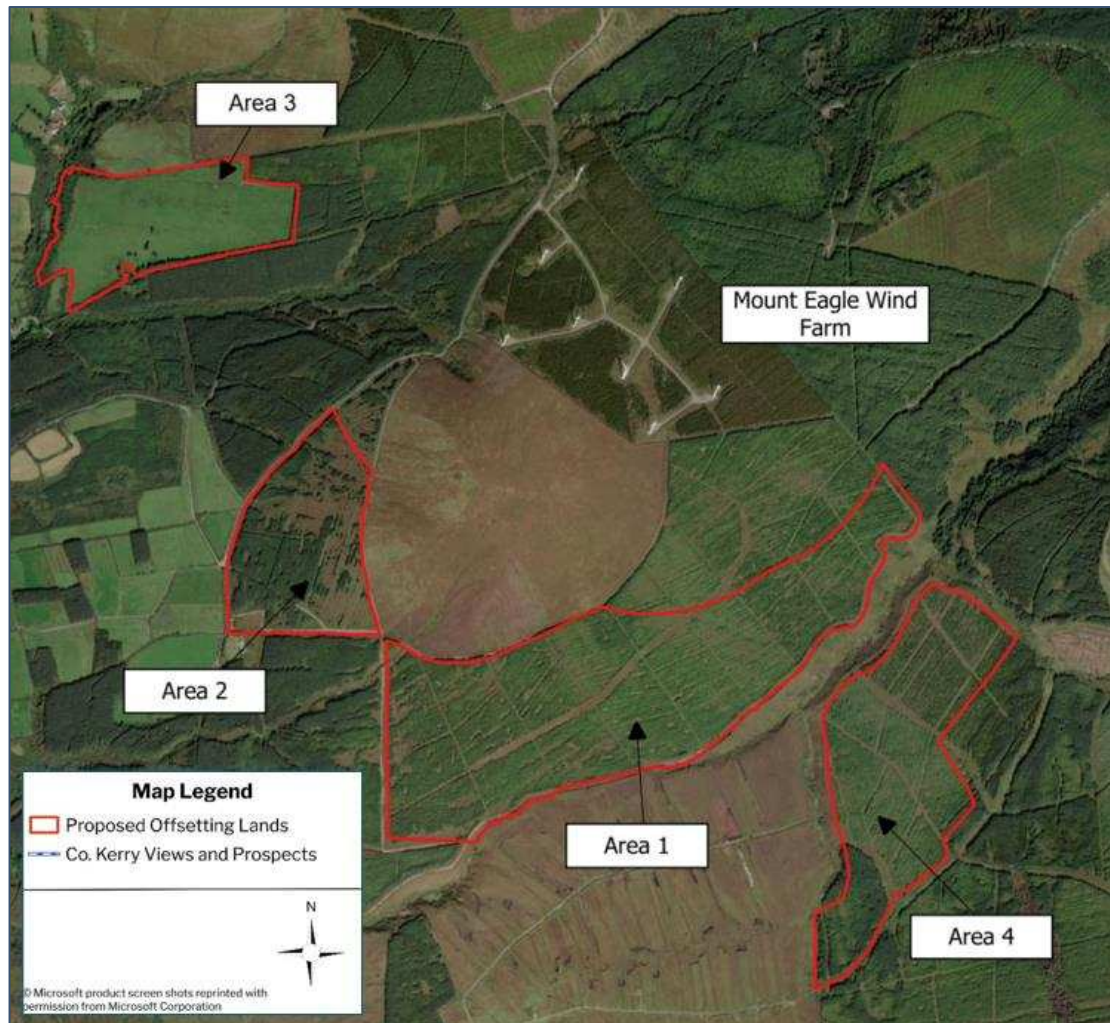


Figure 13-11 Proposed Offsetting Lands

The Proposed Offsetting Measures include restoration of Hen Harrier habitat in the four areas of land shown in the map above, delineated by the red line. Measures for the agricultural field to the northwest (Area 3) include implementation of a rotational grazing scheme, planting of wildlife seed crop, hedgerow enhancement, scrub planting, cessation of fertiliser application and predator fencing. It is also proposed to permanently remove commercial forestry in Areas 1, 2 and 4. This will create more biodiverse upland habitat for foraging hen harrier. Areas of patchy scrub will be planted in Areas 1 and 4 in order to create a diversity of vegetation structures to provide cover and resources for hen harrier prey species. A detailed description of the Proposed Offsetting Measures are included in Appendix 7-7.

The Proposed Offsetting lands are located within an area designated as visually sensitive in KCDP; this designation is discussed previously in Section 13.4.1.2.1. As shown in Figure 13-11, designated Scenic Route KY-SR-1 is located on the western slopes of Mount Eagle adjacent to two areas of the Proposed Offsetting lands. There are long ranging views across the landscape to the west from this designated scenic route. The high quality scenic amenity from this route is focused in the opposite direction of the Proposed Offsetting lands. Effects arising due to the proposed changes to the Proposed Offsetting lands are assessed on the scenic amenity of designated KY-SR-1 and the character of the visually sensitive landscapes areas in section 13.7.2.3

Although the Proposed Offsetting lands are located in an area designated as visually sensitive, the sensitivity of the of the Proposed Offsetting lands is **Low**, due to the landscape being modified for commercial forestry and agriculture.

13.4.4 Landscape Character of the Wider Landscape Setting

The immediate surrounding area of the Site consists of an undulating rural landscape of the Mullaghareirk Mountains comprising agricultural lands, coniferous forestry and existing wind farms as seen in Plate 13-10 below.



Plate 13-10 View northwest towards the Existing Taurbeg Wind Farm Overlooking the Agricultural Landscape

The landscape to the south and southeast of the site and Mullaghareirk range is designated as LCT 11 - *Broad Marginal Middleground Valleys*. This area features a relatively even terrain within the broad, shallow valley of the River Blackwater. The river is fed by tributaries flowing from higher ground to the north and south. At elevated points, the land rises steeply into a more mountainous landscape, while at lower levels, it transitions into gently sloping, fertile fields. The land is generally of marginal agricultural quality, consisting of small to medium-sized fields bordered by mixed broadleaf hedgerows. Dairy farming dominates the land use, with farmsteads and individual houses scattered across the area.

The landscape to the north of the LVIA Study Area is designated as LCA 07 – *Southern Uplands*, in the LDP 2022-28. The Mullaghareirk range, spanning the borders of County Limerick, Cork, and Kerry, serves as the defining feature of this landscape character area. This gently undulating range rises to an almost plateau-like formation near the Cork border. The vegetation varies from improved hill grasslands, often wet in nature, to disturbed peatland habitats such as blanket bog, and dry and wet heath. These habitats are largely fragmented, appearing in patches disrupted by commercial forestry and improved grasslands. Commercial forestry, much of which is approaching maturity, is a prominent characteristic of the region.

The west of the LVIA Study Area is made of separate and distinct narrow valleys such as Mount Eagle and Upper Clydagh River Valley. Tralee and Castleisland Valley, and The Brown Flesk River Valley. Ridges to the west of the LVIA Study Area are dissected by a number of river valleys. Pasture is the main landcover as one moves further east in the LVIA Study Area, while the eastern side is marked by forestry and peat bogs. A similar landscape pattern is observed in the western part, mirroring the area's topography. LCA 23 - River *Blackwater and Rathmore* lies parallel to the River Blackwater, which defines the eastern boundary with County Cork. The northern boundary is marked by high terrain and largely follows the route of the R577. Barna, rising to 320 meters, defines the northwest corner of the LCA.

Rockchapel is a small village located approximately 3.5km to the north of the existing Taurbeg Wind Farm. Rockchapel is located within a narrow valley between Taurbeg hill and Bronseen hill. On site appraisals determined there is no visibility from within this valley due to the steep incline of Taurbeg hill, as is addressed in the following section Visual Baseline. The largest settlements in the LVIA Study Area, Newmarket and Kanturk, are located to the southwest of the existing Taurbeg Wind Farm. Smaller settlements are located beyond 5km within County Cork including Ballydesmond,

Knocknagree and Boherboy. The townlands of Glasheenanargid to the west, Foiladaun to the northwest and Taur to the south consist of small rural clusters of residential dwellings within 3km of the existing Taurbeg Wind Farm. The existing Taurbeg Wind Farm is in a rural area and surrounded by a network of small local roads. The regional road R576 travels from the northwest through Rockchapel connecting it to Newmarket and Kanturk. The national road, N72 located to the south of the LVIA Study Area travels in east-west orientation. Other notable transport routes within county Cork in the LVIA Study Area include the regional roads R578, R579 and the R580. For the most part, the transport routes are located within the small narrow valleys which have limited theoretical visibility. Section 13.5.1 discusses visibility from the receptors listed above where theoretical visibility occurs.

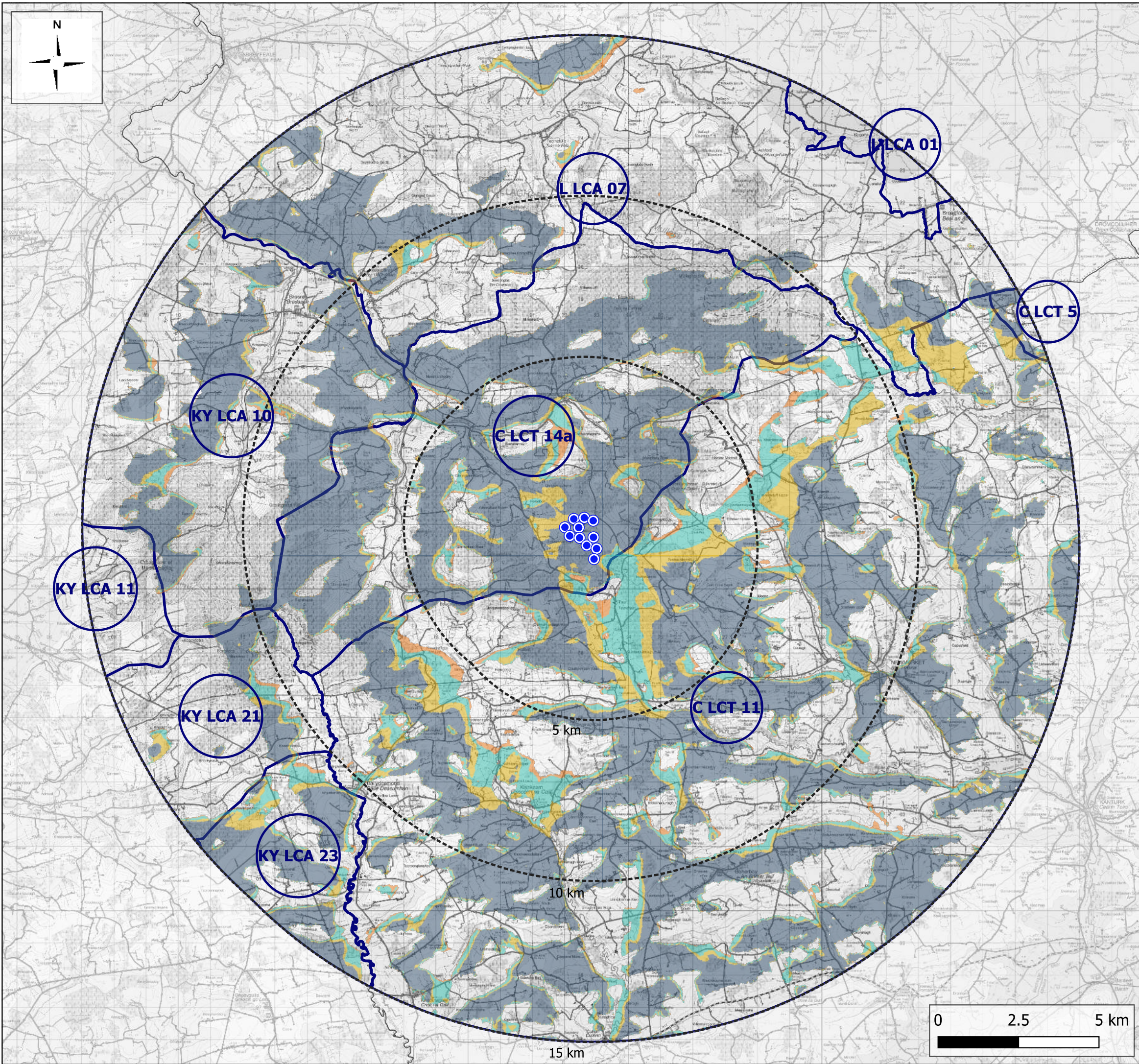
13.4.4.1 Designated Landscape Character Areas (LCAs)

As noted in Section 13.2.1, the LVIA Study Area for assessment of landscape character extends to 15km from the existing turbines. In the previous section - Landscape Designations and Policy Context, 9 No. designated LCAs were identified within 15km of the existing turbines, in Counties Cork, Kerry and Limerick.

LCA Preliminary Analysis

A map showing all LCAs within 15km and the distribution of theoretical visibility of the existing turbines occurring in each LCA is shown in Figure 13-12 shown below.

Each LCA is listed below in Table 13-11 as well as a description of theoretical visibility within each LCA, as indicated by the ZTV in Figure 13-12. Several LCAs identified in the LCA Study Area (15km for landscape character) have very small areas of theoretical visibility indicated by the ZTV map in Figure 13-12 and very small portions of these LCAs are located within the 15km LCA Study Area. The potential visibility of the existing turbines was appraised during site surveys (multiple surveys conducted during 2023, and 2024) from all LCAs with very limited or partial theoretical visibility. The ZTV and on-site visibility appraisals determines which LCAs are Scoped in for full assessment later in this Chapter, this is reported below.



Map Legend

--- LVIA Study Area - 15km for assessment of effects on designated LCAs

● Existing Taurbeg Turbines

Co. Cork Designated LCAs

□ C-LCT-11 Broad Marginal Middleground Valleys

□ C-LCT-5 Fertile Plain with Moorland Ridge

□ C-LCT-14a Fissured Marginal and Forested Rolling Upland

Co. Limerick Designated LCAs

□ L LCA 01 - Agricultural Lowlands

□ L LCA 07 - Southern Uplands

Co. Kerry Designated LCAs

□ KY-LCA-10 Mount Eagle and Upper Clydagh River Valley

□ KY-LCA-23 River Blackwater and Rathmore

□ KY-LCA-21 The Brown Flesk River Valley

□ KY-LCA-11 Tralee and Castleisland Valley

Zone of Theoretical Visibility

1-3 Turbines Theoretically Visible

4-7 Turbines Theoretically Visible

8-10 Turbines Theoretically Visible

11 Turbines Theoretically Visible

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Drawing No.

Figure 13-12

Drawing Title

LCAs with ZTV Map

Project Title

Taurbeg Wind Farm Extension of Operational Life

Scale	Project No.	Date	Drawn By	Checked By
1:115,000	231030	23.02.2025	KC	JW

Table 13-11 Preliminary LCA Analysis Table

Map Ref	LCA	Theoretical Visibility (TV) as indicated by ZTV	Actual Visibility	Scoped in for Assessment
Up to 5km				
C LCT 14a	Fissured Marginal and Forested Rolling Upland	Within 5km there is mainly full theoretical visibility with large areas of no theoretical visibility. There is reduced theoretical visibility between 5 and 10km. The majority of the theoretical visibility is on the peaks of upland areas surrounding the Site.	There is very limited actual visibility outside 5km due to coniferous forestry and the high elevations surrounding the existing Taurbeg Wind Farm. There is actual visibility on higher elevated vantage points such as north of Rockchapel. Within the narrow lower elevated valleys there is no visibility due to the steep incline of the surrounding landforms.	Yes
C LCT 11	Broad Marginal Middle ground Valleys	Within 5km there is mainly partial theoretical visibility with large areas of no visibility. To the southwest within 5km there is an area of higher elevation will full theoretical visibility. Outside of 5km the full theoretical visibility is reduced and very patchy.	There is limited visibility due to Taur hill, foulard hill and Knockacummer hill visually screening views from large areas of the LCT. There is visibility at higher elevated vantage points in limited areas.	Yes
5 to 10km				
KY LCA 10	Mount Eagle and Upper Clydagh River Valley	There is nearly full theoretical visibility within 10km to the existing Taurbeg Wind Farm. There are large areas from 10 to 15km of no theoretical visibility.	Considering the large areas of coniferous forestry and field patterns to northwest of the existing Taurbeg Wind Farm, there is very limited actual visibility towards the Site from within this LCA. Any visibility of the existing Taurbeg Wind Farm within this	Yes

			LCA is from local roads and residential receptors located approximately 6.8km from the Site.	
KY LCA 21	The Brown Flesk River Valley	There is a small stretch of full theoretical visibility from Cordal wind farm and Mount Eagle Bog which are located on upland areas of modified landscapes.	There is very limited actual visibility of the existing Taurbeg wind farm from this LCA due to the upland areas of Doctor's Hill and Forehane partially screening the existing Taurbeg turbines	No - considering there is very limited actual and theoretical visibility from within this LCA as described.
L LCA 07	Southern Uplands	There is very little full theoretical visibility from within this LCA. The majority of the full theoretical visibility is to the northwest around the settlement of Caherhayes and the townlands of Mountcollins Upper and Reenagillee. There are small areas of full theoretical visibility on the local road going through Dromdeeven wind farm.	There is very limited actual visibility. Elevated vantage points such as the townland of Acres as seen in Plate 13-15 and the settlement (has no designation within the LCDP) has visibility of the existing Taurbeg Wind Farm.	Yes
10 to 15km				
C LCT 5	Fertile Plain with Moorland Ridge	There is very limited theoretical visibility within this LCT.	There is no actual visibility from this LCT considering the distance to the existing Taurbeg Wind Farm, the tall tree lines and hedgerows lining the field patterns obstruct any views of the existing Taurbeg Wind Farm.	No - There is a very small section of the LCT within the LCA Study Area. There is very limited visibility within this LCT.
KY LCA 11	Tralee and Castleisland Valley	There is primarily no ZTV within this LCA.	There is limited actual visibility occurs within this LCA considering Mount Eagle is obstructing any views of the existing Taurbeg Wind Farm.	No - There is very little theoretical visibility within the LCA and there is there is

				very limited actual visibility.
KY LCA 23	River Blackwater and Rathmore	The ZTV is disjointed and irregular within this LCA.	There is actual visibility from an unnamed local road to the northeast within this LCA that is located on an elevated vantage point. Coniferous forestry and vegetation on the R577 Regional Road and local roads within the LCA have no actual visibility.	No - considering the setback distance of this LCA, there is very limited actual visibility within the LCA. There is an unnamed local road with open views towards the existing Taurbeg Wind Farm. However, the existing Taurbeg turbines are located in the background and will have no significant impacts on the LCA
L LCA 01	Agricultural Lowlands	There is no theoretical visibility within this LCA	There is no actual visibility within this LCA	No

An impact assessment of the effects on the 4 No, LCTs scoped in for assessment in the table above are included in Section 13.7 -*Likely and Significant Landscape and Visual Effects*.



CH.13 LANDSCAPE AND VISUAL

END OF PART 2

13.5

Visual Baseline

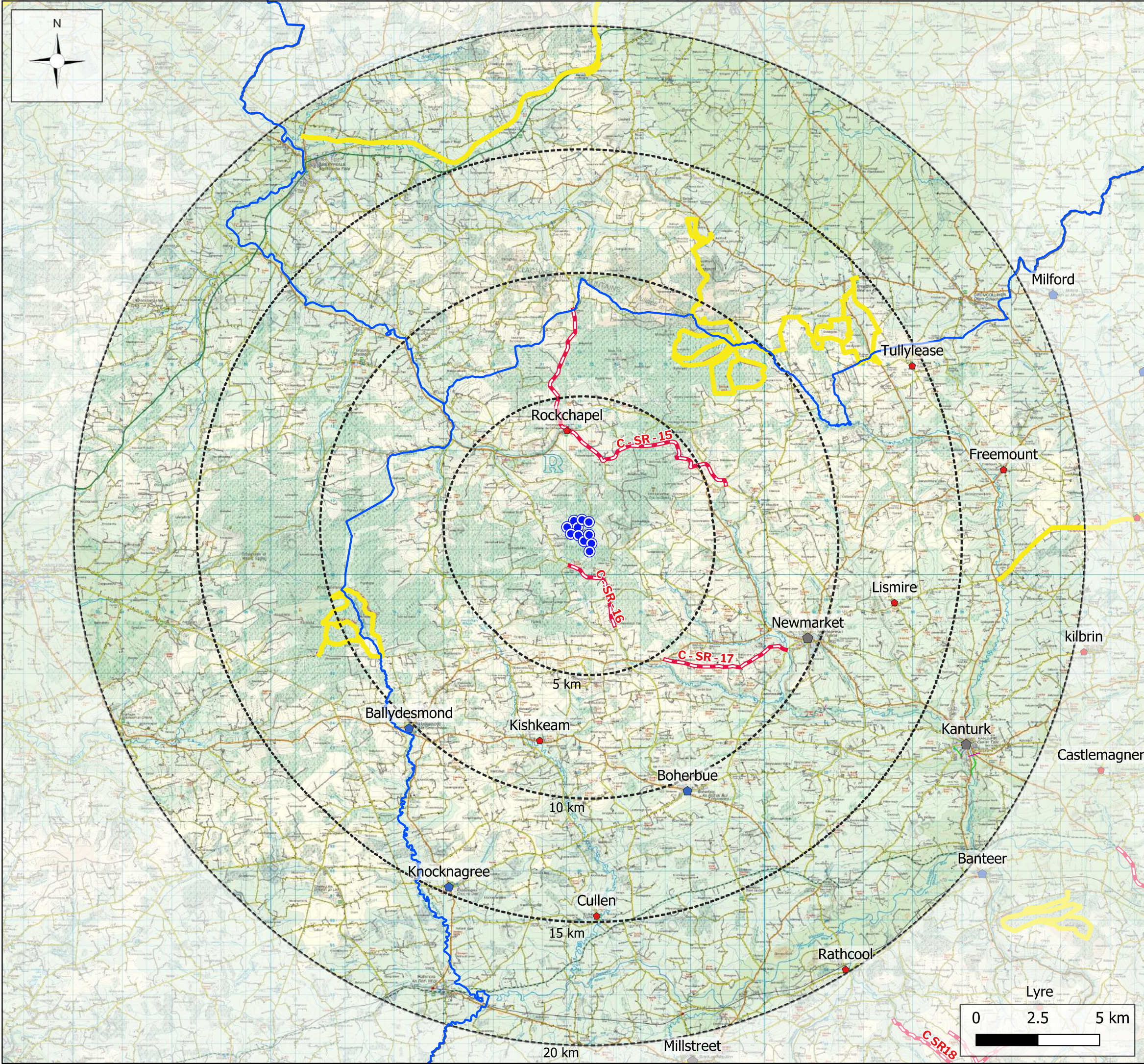
The main purpose of establishing the visual baseline is to identify the key visual receptors that should be considered for assessment. The visual baseline exercise uses ZTV mapping as a tool to determine where no on-site visibility appraisals are required. However, as the Taurbeg turbines already exist within the landscape, the focus of this section is to determine the extent to which the Taurbeg turbines are visible from visual receptors in the LVIA Study Area as determined from on-site visibility appraisals. An outcome of the visual baseline exercise was the identification of the 6 No. representative viewpoints which are included in the Volume 2 Visualisation Booklet used as part of the visual impact assessment.

13.5.1

Visibility of the Existing Taurbeg Wind Farm – Views towards Taurbeg Wind Farm

This section reports the visibility of the existing Taurbeg Wind Farm from key sensitive visual receptors during on-site visibility appraisals. Receptors were visited where ZTV indicated the existing turbines would be theoretically visible. This section also identified receptors and locations used as Viewpoints. Viewpoints are locations from which visual effects are assessed using photographic visualisations (see Section 13.2). Overall on site surveys determined the existing Taurbeg turbines are only visible from a very small number of receptors in a very sparsely populated rural landscape. To this end, the following visual receptors have been identified within the LVIA Study Area:

- Settlements;
- Residential Receptors in close proximity;
- Waymarked Walking Routes, Scenic Routes and Three Counties Scenic Area;
- Transport Routes.



Map Legend

- LVIA Study Area
- County Borders
- Existing Taurbeg Turbines
- Co. Cork Scenic Route
- Waymarked Trails

Settlement Hierarchy

- Main Town
- Key Village
- Village

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Drawing No.

Figure 13-13

Drawing Title

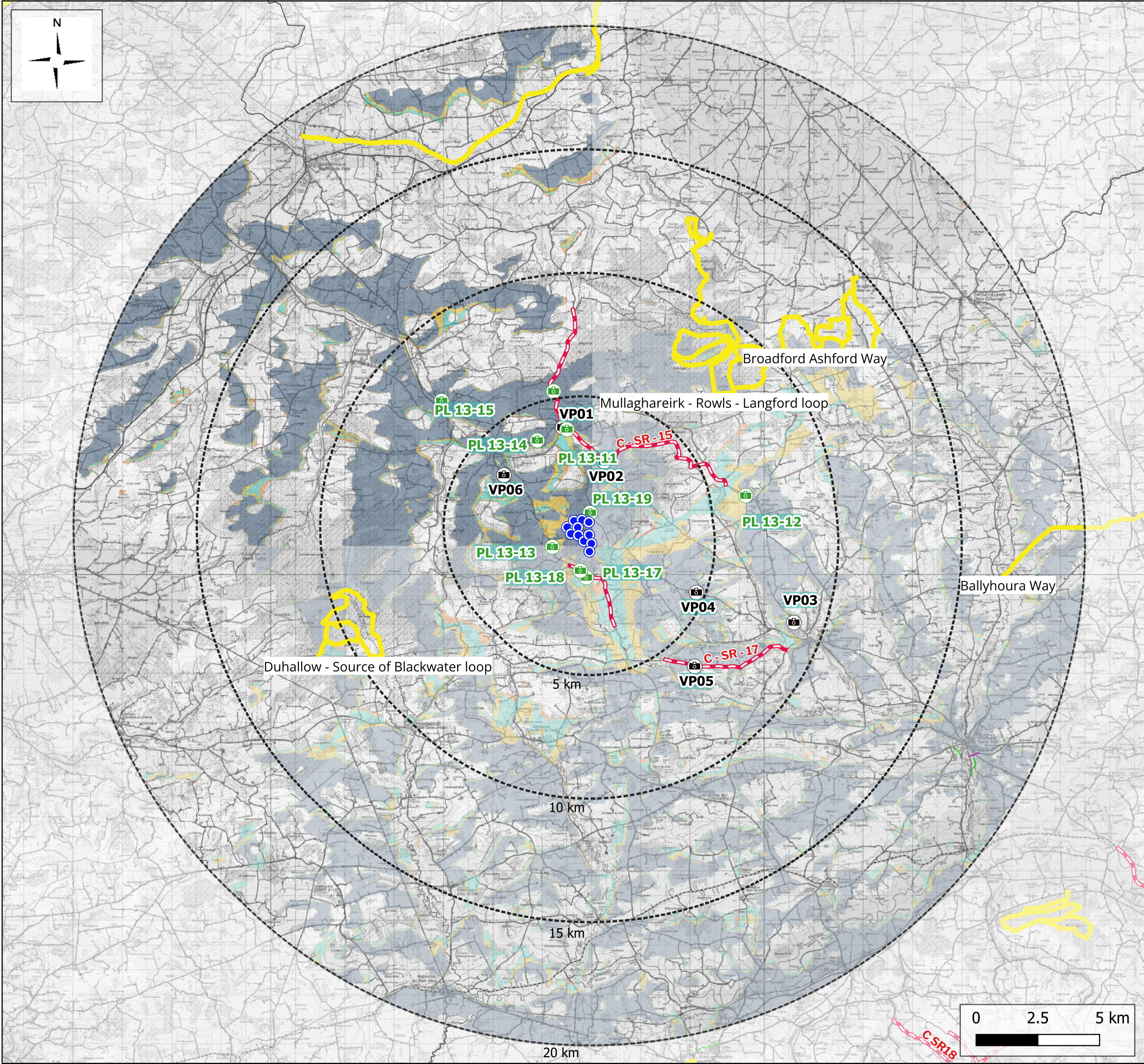
Visual Baseline

Project Title

Taurbeg Wind Farm Extension of Operational Life

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	231030	24.05.2025	KC	JW





Map Legend

- LVIA Study Area
- County Borders
- Existing Taurbeg Turbines
- Viewpoint Locations
- Plate Locations
- Waymarked Trails
- Co. Cork Scenic Routes

Settlement Hierarchy

- Town
- Small Village
- Village
- Rural Cluster

Zone of Theoretical Visibility

- 1-3 Turbines Theoretically Visible
- 4-7 Turbines Theoretically Visible
- 8-10 Turbines Theoretically Visible
- 11 Turbines Theoretically Visible

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Drawing No.

Figure 13-14


Drawing Title

Visual Baseline with ZTV

Project Title

Taurbeg Renewable Energy Development

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	231030	14.11.2024	KC	JW



13.5.1.1 Settlements

Rockchapel

The closest settlement to the existing Taurbeg Wind Farm is Rockchapel which is located approximately 3.5km north of the existing Taurbeg Wind Farm as seen in Figure 13-13. Rockchapel is designated as a village within the CCDP 2022-28 settlement hierarchy. Rockchapel is located within a narrow valley at a lower elevation to it's the immediate surrounding setting. Rockchapel has no visibility of the existing Taurbeg Wind Farm from within the village itself as seen in Plate 13-11 below. There is visibility of the existing Taurbeg turbines from higher elevated vantage point to the north of Rockchapel as seen in Viewpoint 1, which is located at Grotto Terrace overlooking the village of Rockchapel. Rockchapel is scoped in for further assessment.



Plate 13-11 View South towards the Existing Taurbeg Wind Farm from within the Village of Rockchapel

Newmarket

The largest settlements within the LVIA Study Area are Newmarket and Kanturk. Newmarket is located approximately 9km from the existing Taurbeg Wind Farm. There is no visibility within the actual town of Newmarket itself. A local road named Kerry Road in Newmarket is elevated with intermittent vegetation lining the local road. Between intermittent mature trees there are long ranging views across the landscape on this local road in the direction of the existing Taurbeg Wind Farm. The turbines are visible in the background of the view. Viewpoint 3 represents views from the immediate setting of Newmarket, with more open views and residential dwellings in closer proximity to the existing Taurbeg Wind Farm. Newmarket is scoped in for further assessment.

Kanturk

Kanturk is located approximately 16.9km from the existing Taurbeg Wind Farm. Visibility appraisals determined there is no actual visibility of the existing Taurbeg turbines from Kanturk or its immediate setting. Visibility is restricted due to the nature of the built environment on the outskirts of the town and the vegetation which line the field patterns and the transport routes. Kanturk is scoped out from further

assessment considering there is no actual visibility from the town. There are no impacts on the settlement of Kanturk.

Boherbue

Boherbue is designated as a key village in the CCDP 2022-28 settlement hierarchy and is located approximately 10.4km south of the existing Taurbeg Wind Farm, with full theoretical visibility. On site surveys carried out in 2024 determined that there is no actual visibility within Boherbue itself due to the built-up nature and there is no visibility within the immediate setting of Boherbue. Considering the dense vegetation lining the transport routes surrounding Boherbue there are no open views of the existing Taurbeg Wind Farm. Boherbue is scoped out from further assessment considering there is no actual visibility.

Meelin

Meelin is not a designated settlement in the CCDP 2022-28; however, it is a rural cluster with open views towards the existing Taurbeg Wind Farm from adjacent local roads, as seen in Plate 13-12 below. There is no visibility from within the settlement itself. Meelin is scoped in for further assessment.



Plate 13-12 View West from a Local Road in Close Proximity to Settlement Cluster Meelin

Other settlements within the LVIA Study Area

Within 10km of the existing Taurbeg Wind Farm, there are no other settlements. Beyond 10km, three settlements have full theoretical visibility: Rathmore (Co Kerry), Knocknagashel (Co Kerry) and Mountcollins (Co Limerick). However, on site visibility appraisals determined that there is no visibility from within the settlements themselves. Considering their setback distance from the existing Taurbeg Wind Farm, there will be no significant impacts on these settlements, and they are scoped out of further assessment.

Residential dwelling to the west of the Existing Taurbeg Wind Farm

Plate 13-13 below shows a view from a residential dwelling (H33) located to the west of the existing Taurbeg Wind Farm, approximately 821m from the nearest existing turbine T8. The residential dwelling is located on an elevated vantage point with views orientated in the opposite direction to the existing Taurbeg Wind Farm. This dwelling is located at a setback distance greater than 500m which complies with the 2006 WEDGs in relation to turbine setback from residential receptors. The existing turbines also adhere to the 2019 draft WEDGs in relation to turbine setback from residential receptors i.e. a minimum 4 x tip height ($108.2\text{m} \times 4 = 432.8\text{m}$). Note however no update or final 2019 WEDGs were subsequently published. Viewpoints 1, 2 and 4 represent views from residential receptors with

open views towards the existing Taurbeg turbines. These Viewpoints are discussed below in Section 13.7.2.2.2



Plate 13-13 View East from a Local Road and Residential Dwelling in Close Proximity to the Existing Taurbeg Wind Farm

Residential Dwellings to the northwest of the Existing Taurbeg Wind Farm from an elevated vantage point west of Rockchapel

Residential Dwellings to the west of Rockchapel located on an elevated vantage point have long ranging views across the landscape towards the existing Taurbeg Wind Farm. Plate 13-14 is located approximately 3.9km northwest of the nearest existing Taurbeg turbine T5. The residential dwellings are orientated with their primary visual amenity to the south, in the direction of the existing Taurbeg turbines (middle wind farm) and the cumulative wind farms Glentane (right wind farm) and Knockacummer Wind Farm (left wind farm). The existing turbines are located in the background of the image and do not obstruct any views of the ridgeline and rolling hills. Considering the residential dwellings are setback from the existing Taurbeg Wind Farm by field patterns and the elevation changes, no significant effects are deemed to arise.



Plate 13-14 View South from an Elevated Vantage Point on a Local Road - Stagmount

13.5.1.2 Waymarked Walking Routes, Scenic Routes and Three Counties Scenic Area

Waymarked Trails

Sixteen waymarked trails were identified in the LVIA Study Area. As seen in Figure 13-14, all the trails have very limited theoretical visibility. Small portions of the Mullaghareirk-Rowls-Langford Loop, Broadford Ashford Way, Duhallow - Source of Blackwater Loop and Ballyhoura Way have theoretical visibility. The closest waymarked trail is the Mullaghareirk-Rowls-Langford Loop, located approximately 7.3km from the nearest existing turbine, T7, with full theoretical visibility at its nearest

point to the existing Taurbeg Wind Farm. However, the trail has no actual visibility due to it being visually screened by coniferous forestry. There are no significant impacts on any waymarked walking trails considering there is no or very limited visibility of the existing Taurbeg Wind Farm from all trails. All waymarked trails have been scoped out from further assessment.

Three Counties Scenic Area

Plate 13-15 below shows the view near to the ‘Three Counties Scenic Area’. The area contains a small public park at the point where the county borders of Cork, Kerry and Limerick meet. The image below is captured from an elevated vantage point. The existing Taurbeg Turbines are visible from this view. However, there is very limited visibility of the existing Taurbeg Turbines from the lower elevation at the ‘Three Counties Scenic Area’.



Plate 13-15 View Southeast from an Elevated Vantage Point Overlooking the Three Counties Scenic Area and Agricultural Landscape

Cork Designated Scenic Route 15

Plate 13-16 shows a view from the approach road, north of Rockchapel, looking towards the existing Taurbeg Wind Farm from designated scenic route 15. The coniferous forestry visually screens views of the existing Taurbeg Wind Farm for the most part when approaching the village of Rockchapel. Open Views of the existing Taurbeg turbines on the Cork designated scenic routes 15 are represented by Viewpoints 1 and 2 in the Visualisation Booklet.



Plate 13-16 View South from Designated Scenic Route 15 towards the Existing Taurbeg Wind Farm on approach to the Village Rockchapel

Cork Designated Scenic Route 16

County Cork designated Scenic Route 16 is the closest designated scenic route to the existing Taurbeg Wind Farm. On this scenic route, there are large areas of theoretical visibility, as seen above in Figure 13-14. Plate 13-17 below shows there is no visibility of the existing Taurbeg Wind Farm from areas on designated scenic route 16 due to Taur hill visually screening the existing turbines. The existing Glentane Wind Farm is visible from this scenic route to the west of the designated scenic route. The scenic view is to the southwest from designated scenic route 16, which has views in the opposite direction to the existing Taurbeg Wind Farm onto the upland areas of Co Kerry.



Plate 13-17 View northwest from Designated Scenic Route 16 towards the Existing Taurbeg Wind Farm

Plate 13-18 illustrates the one of the very few views where the existing Taurbeg Wind Farm is visible from designated scenic route 16. T10 is partially visible due to the incline in the topography to the north of the local road.



Plate 13-18 View North from Designated Scenic Route 16 towards the Existing Taurbeg Wind Farm.

13.5.1.3 Transport Routes

L5005 Local Road

Numerous local roads surround the existing Taurbeg Wind Farm. The L5005 local road travels from south of Rockchapel ascending to the wind farm entrance. L5005 has limited visibility of the existing Taurbeg Wind Farm until very close proximity to the Site, as seen in Plate 13-19. The coniferous forestry visually screens views towards the existing turbines for the majority of the L5005 local road.



Plate 13-19 View South from Local Road near the Entrance of the Existing Taurbeg Wind Farm

R576 Regional Road

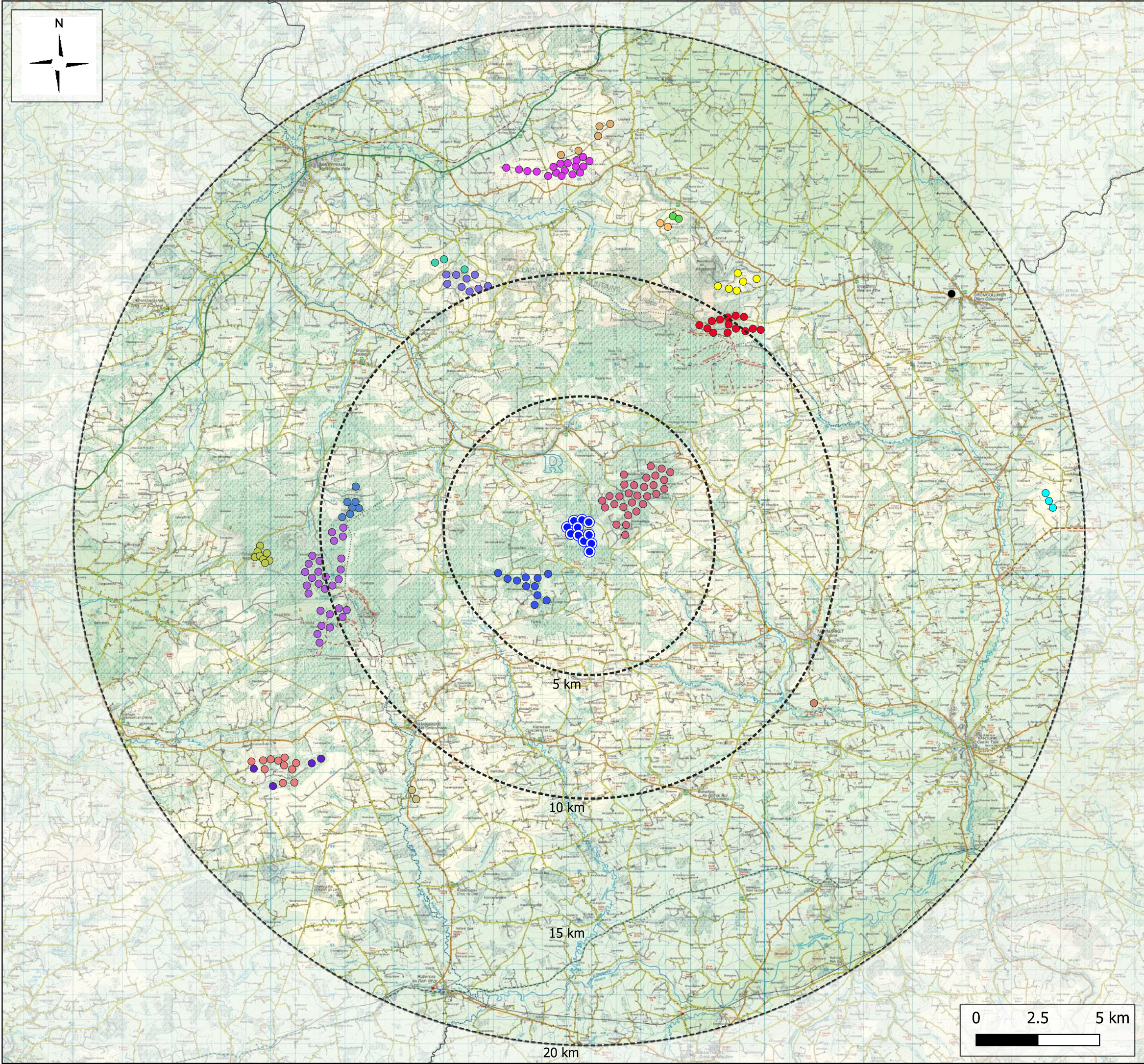
The R576 regional road traverses from Newmarket located south of the existing Taurbeg Wind Farm, through Rockchapel located north of the existing Taurbeg Wind Farm. There is very limited theoretical visibility from R576 within 5km of the existing Taurbeg Wind Farm. On-site visibility appraisals carried out in 2024 determined that actual visibility is even less considering the visual screening by coniferous forestry, residential dwellings and farm sheds. The R576 is represented by Viewpoint 2, captured at one of the few locations where the existing Taurbeg turbines are visible from R576.

13.6

Cumulative Context

In terms of cumulative landscape and visual effects, other wind energy projects are of primary focus, as only these would be described as very tall vertical elements in the landscape with the potential to give rise to significant cumulative effects. Other wind energy developments, within 20km of Taurbeg Wind Farm, were identified by searching past planning applications lodged through the various planning authority (Cork County Council and An Bord Pleanála) online planning portals. The information identified in the initial planning search was then used to verify, by means of a desk-based study and ground-truthing, whether any permitted wind energy developments had been constructed.

As shown in the cumulative baseline map, the cumulative wind farm search did not identify any permitted or proposed wind farms in close proximity to the existing Taurbeg Wind Farm. Considering that the existing Taurbeg Wind Farm and all other surrounding wind energy developments are built and operational, the cumulative landscape and visual impact assessments in this Chapter were predominantly guided by visibility appraisals conducted during site visits. Cumulative assessments in this Chapter have also been informed by the photographic imagery captured in the field, which is included in the Photographic Visualisation Booklet and in imagery in Section 13.5.1 of this report.



Map Legend

- LVIA Study Area
- County Borders
- Existing Taurbeg Turbines
- Other Turbines within the LVIA Study Area**
 - Ballagh WF
 - Coolleagreen WF
 - Cordal WF
 - Dromcolliher Wind Turbine
 - Dromdeeveen WF
 - Glentane WF/ Glentanemacelligot WF
 - Gortnacloghy WF
 - Kilberehert WF
 - Knockacummer WF
 - Knockawarriga WF 1
 - Knockawarriga WF 2
 - Mauricetown/ Ashford WF
 - Mount Eagle WF
 - Newmarket Wind Turbine
 - Rathcahill WF
 - Scartaglen WF 1
 - Scartaglen WF 2
 - Tournafulla WF
 - WED Cross

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Drawing No.

Figure 13-15

Drawing Title

Cumulative Context

Project Title

Taurbeg Wind Farm Extension of Operational Life

Scale	Project No.	Date	Drawn By	Checked By
1:150,000	231030	11.12.2024	KC	JW



Within 5 km of the existing Taurbeg Wind Farm, there are two existing wind farms; Knockacummer Wind Farm located to northeast, and Glentane Wind Farm located to the southwest as seen in Figure 13-15 above. The focus of the assessment of cumulative effects in this chapter focusses on the interactions with these two existing developments. Taurbeg Wind Farm is located between these two existing wind farms. When viewed from a distance, the three existing wind farms take up a wide spatial extent across the upland areas from certain vantage points. However, on site visibility appraisals determined that cumulative views of all three wind farms are localised to within 10 km, where there are wide open views of the upland landscape. Viewpoints 1, 3, 4 and 5 show clear, visible separation between the existing wind farms. It is evident from these viewpoints that the three existing wind farms are located on separate landforms within the landscape. The existing Taurbeg Wind Farm and the existing Knockacummer Wind Farm appear as one wind farm in viewpoint 2, with the existing Taurbeg turbines located in the background of the image beyond the Knockacummer turbines. This is due to the close proximity of the viewpoint to Knockacummer Wind Farm.

There are several other wind farms located within the LVIA Study Area, all located in the uplands of the Mullaghareirk Mountain range stretching from Co. Limerick to Co. Kerry. These other existing turbines cannot generally be viewed in conjunction with the existing Taurbeg Wind Farm. Considering the landforms surrounding the existing Taurbeg Wind Farm, there is very limited cumulative visibility of Taurbeg Wind Farm with the other existing wind farms. However, the other wind farms are visible throughout the majority of the LVIA Study Area considering their spread and number within the upland landscape.

13.7 Likely and Significant Landscape and Visual Effects

13.7.1 ‘Do-Nothing’ Scenario

If the Proposed Lifetime Extension were not to proceed, the existing Taurbeg Wind Farm turbines will be decommissioned in 2026, as per the existing permission. A Decommissioning Plan is proposed as part of this Lifetime Extension application and is detailed further in Section 4.7 in Chapter 4 of this EIAR and in Appendix 4-3.

If the Proposed Lifetime Extension were not to proceed, the opportunity to generate renewable energy and electrical supply to the national grid would be lost, as would the opportunity to further contribute to meeting government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. Should this occur, the impact would be neutral in the context of this EIAR.

If the Proposed Offsetting Measures were not to proceed, existing land use of plantation forestry and agricultural practises within the Proposed Offsetting Lands would continue and the Proposed Offsetting Measures would not take place.

13.7.2 Extended Operational Phase Effects

This planning application is applying for a 10 year extension to the operational life of the existing Taurbeg Wind Farm. In terms of duration, as per the EPA (2022) guidance for information to be contained in EIARs, 10 years constitutes to ‘Medium-Term’ effects. Whether a visual effect is deemed to be positive, negative, or neutral, involves a degree of subjectivity. For example, what appears to be a positive effect to one viewer could be deemed to be negative by another viewer. However, this Chapter assumes that all landscape and visual effects will be ‘Negative’. Therefore, all effects reported in this section are ‘**Medium-Term**’ and ‘**Negative**’.

13.7.2.1 Landscape Effects

The Existing Wind Farm Site – Landscape Effects

The infrastructure of the existing Taurbeg Wind Farm is directly located on peatlands in an upland area of the Taurbeg hill surrounded by commercial forestry. The landscape of the existing Taurbeg Wind Farm is an existing wind farm and is deemed to be of ‘**Low**’ landscape sensitivity. The magnitude of effect from the Proposed Lifetime Extension is deemed to be ‘**Moderate**’. Therefore, resulting in Medium Term ‘**Slight**’ landscape effects. It must be acknowledged that the wind farm infrastructure including the turbines, site access roads, turbine hardstands, substation and grid infrastructure are existing infrastructure. Therefore, ultimately, there will be **no change** to the existing character and landscape of the Site as a result of the Proposed Lifetime Extension.

The landscape and visual effects of non-turbine components of the wind farm (substation, roads, hardstands etc...) are highly localised to the upland environment Site itself. These ancillary elements of the existing Taurbeg Wind Farm (non-turbine infrastructure) are discernible from receptors in the wider landscape setting and therefore have no impact on the wider landscape and its characteristics. The non turbine components are therefore not considered further in this chapter. As stated in Section 13.1.1.1, the existing turbines are the ‘essential aspects’ of the development from a landscape and visual perspective and are the key features and focus of the impact assessments reported in the following sections of this Chapter.

The following sections report how the Proposed Lifetime Extension impacts the character of the landscape and specific landscape receptors.

13.7.2.1.2 Effects on Designated Landscape Character Types and Areas

An assessment of the effects on landscape character was undertaken for four Landscape Character Types (LCTs) and Landscape Character Areas (LCAs) within the 15km LCA Study Area which were identified previously as having potential for visibility of the existing Taurbeg turbines, see Landscape Receptor Preliminary Analysis in Section 13.4.4.1. The assessment criteria and grading scales that aided the assessment of landscape effects are detailed in Section 13.2.6. Individual assessments were carried out for each LCT and LCA. The tables below assess the landscape effects on LCTs and LCAs from the existing Taurbeg Wind Farm.

Table 13-12 Landscape Character Assessment - LCT 14a - Fissured Marginal and Forested Rolling Uplands

LCT 14a – Fissured Marginal and Forested Rolling Uplands	
Distance from Site to Nearest/Furthest Area of LCT	The 11 no. existing turbines are located within this LCT. At its furthest point this LCT stretches approximately 9.7km from the nearest existing turbine.
LCT Key Characteristics (Draft Landscape Strategy 2007)	<ul style="list-style-type: none"> ➤ <i>“Includes the Mullaghareirk Mountains.</i> ➤ <i>Topography of this landscape is one of relatively steep and rolling mountainous upland, fissured by narrow river valleys and which slopes towards broad flat ground.</i> ➤ <i>Fields comprise grassland, much of which is of marginal agricultural quality, while there are also some areas of broadleaf woodland.</i> ➤ <i>Soils on these slopes and valley bottoms tend to be of poor quality and include blanket peat on upper slopes, which have resulted in intensive coniferous plantations. Character Areas Map.”</i>
Landscape Sensitivity (Definition from Section 13.2.6.1)	<p>CCDP has provided their own landscape sensitivity designations for LCT 14a. The designations within the CCDP, the landscape sensitivity is determined to be Medium.</p> <p>The LCT is within an area designated as ‘Normally Discouraged’. However, at the time of construction of the Taurbeg Wind Farm, the Draft Landscape Strategy 2007 designated this area as an area strategic for wind farm developments.</p>
Visibility of the Existing Taurbeg Wind Farm within the LCT	The northwest and west of this LCT have clear open views towards the existing Taurbeg Wind Farm from the local roads and residential dwellings in close proximity. Beyond 5km, there are very limited views of the existing Taurbeg Wind Farm due to dense vegetation along the local roads, undulating landscapes and coniferous forestry.
‘Do-Nothing’ Scenario	In a Do-Nothing Scenario, 11 No. Turbines of the existing Taurbeg Wind Farm will be decommissioned when their planning permission expires in 2026. In a Do-Nothing Scenario, these turbines will not be visible within this LCT, reducing the number of turbines effecting the landscape of this LCT
Cumulative Landscape Effects	Two other existing wind developments are located within LCT 14a along with the existing Taurbeg Wind Farm. Knockacummer and Glentane Wind Farms are located southern extent of LCT 14a and northern extent LCT 11.

	<p>The existing Glentane Wind Farm (11 No. turbines) is located to the southwest of the existing Taurbeg Wind Farm. Glentane Wind Farm for the most part is visible in combination with the existing Taurbeg turbines. They appear visually separated from vantage points throughout the LCT due to their siting on separate, distinct landforms, in differing field patterns and within separate stands of coniferous forestry.</p> <p>The existing Knockacummer Wind Farm is the largest wind farm in the LCA Study Area (29 No. turbines). Knockacummer Wind Farm is located in the immediate setting of the existing Taurbeg Wind Farm to the northeast. From beyond 3km, the existing Taurbeg and Knockacummer Wind Farms appear visually separated due to their siting on separate, distinct landforms, in differing field patterns and within separate stands of coniferous forestry. Viewpoint 2 was captured from close proximity, with the two wind farms appearing as one; this is one of very few vantage points where the two wind farms may appear in this manner. In general, the two wind farms appear coherent across the ridgeline of the upland landscape.</p> <p>The three wind farms of Taurbeg, Knockacummer and Glentane can be viewed in combination, as seen in viewpoints 3 and 4. The combination of the existing turbines is viewed along the ridgeline in the background of the images. The existing Taurbeg turbines are located between the other two wind farms, Knockacummer Wind Farm and Glentane Wind Farm. The three wind farms are of a wide horizontal extent from viewpoint 4. Viewpoint 3 is captured at a greater set back distance where the existing turbines do not take up a large portion of the view.</p> <p>All three existing wind farms are visible from designated scenic route 15 within this LCT. However, as shown in viewpoints 1 and 2, the existing turbines do not disrupt highly sensitive views and are viewed in the background of the images. In combination, the three wind farms contribute cumulative landscape effects on the character of this LCT.</p>
Magnitude of Change (Definition from Section 13.2.6.3)	<p>Moderate</p> <p><i>“A more limited loss of or change to landscape features over a medium extent which will result in some change to landscape features and aesthetics. Could include the addition of some new uncharacteristic features or elements that would lead to the potential for change in landscape character in a localised area or part of a landscape character area. Would include moderate effects on the overall landscape character that do not affect key characteristics. The effects could be long- to medium-term and/or partially reversible.”</i></p>
Significance of Effect	<p>Medium × Moderate = Moderate/Minor = Moderate (EPA 2022)</p> <p><i>“An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.”</i></p>
Mitigating Factors	<ul style="list-style-type: none"> ➤ The Co. Cork Draft Landscape Strategy 2007 designated LCT 14a is a strategic area for wind farms at the time of the original planning permission and construction of the existing Taurbeg Wind Farm. ➤ There is very limited visibility of the existing Taurbeg Wind Farm from this LCT in comparison to ZTV map (See Figure 13-12) due to the roadside vegetation and coniferous forestry to the north and

	south-west, which visually screen the existing Taurbeg turbines from sensitive receptors within this LCT.
Residual Effect	<p>Moderate (EPA 2022)</p> <p><i>“An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.”</i></p>

Table 13-13 Landscape Character Assessment - LCT 11 – Broad Marginal Middle Ground Valleys

LCT 11 – Broad Marginal Middle Ground Valleys	
Distance from site to Nearest/Furthest Area of LCT	LCT 11 – Broad Marginal Middle Ground Valleys is located approximately 550m from the nearest existing turbine (T10).
LCT Key Characteristics (Draft Landscape Strategy 2007)	<ul style="list-style-type: none"> ➤ <i>“The main agricultural land use is dairy farming.</i> ➤ <i>Small to medium size fields bounded by mixed broadleaf hedgerows.</i> ➤ <i>The hedgerows and vegetation that forms the road boundaries is of medium height and in some areas it restricts views of the surrounding landscape.</i> ➤ <i>Relative evenness of terrain across the broad shallow valley of the River Blackwater, fed by several tributaries draining the higher ground to the north and south.</i> ➤ <i>At higher altitudes, the ground rises relatively steeply to meet a more mountainous landscape, while lower down the ground spreads out into gently sloping fertile land.”</i>
Landscape Sensitivity (Definition from Section 13.2.6.1)	<p>CCDP has provided their own landscape sensitivity designations for LCT 11. The designations within the CCDP for the landscape sensitivity is determined to be High.</p> <p>It should be noted that the existing Taurbeg turbines are setback from the Rivers Blackwater and Dalua and do not alter the scenic setting or the physical fabric of these landscape receptors.</p>
Visibility of the Existing Taurbeg Wind Farm within the LCT	There is very limited visibility of the existing Taurbeg Wind Farm from LCT 11 due to dense vegetation along roadsides and undulating landscapes which afford limited open views towards the existing turbines. The primary areas with visibility of the existing turbines within LCT 11 are of higher elevated vantage points overlooking the landscape and valleys. There is very limited visibility of the existing turbines from prominent landscape receptors such as The River Blackwater and River Dalua. The existing Taurbeg turbines do not significantly impact the sensitivities, visual characteristics and setting of these prominent rivers.
‘Do-Nothing’ Scenario	In a Do-Nothing Scenario, 11 No. Turbines of the existing Taurbeg Wind Farm will be decommissioned when their planning permission expires in 2026. In a Do-Nothing Scenario, these turbines will not be visible within this LCT, reducing the number of turbines affecting the landscape of this LCT

Cumulative Landscape Effects	<p>Three existing wind farms are located within LCT 11: Knockacummer Glentane and WED Cross (2 No. turbines) Wind Farms. The existing Taurbeg turbines are located approximately 550m outside this LCT.</p> <p>The existing Taurbeg turbines are viewed in combination with the Knockacummer and Glentane Wind Farms to the north of this LCT. Viewpoints 3, 4 and 5 represent views from this LCT and show that the existing wind farms are viewed in a visually coherent manner across the upland landscape in the background of the images. The three wind farms are of a wide horizontal extent in viewpoints 4 and 5. However, they do not obstruct any highly sensitive views and do not significantly alter the setting of the landscape.</p> <p>The WED Cross Wind Farm is located to the very west of this LCT on the Cork Kerry Border in the townland of Lackanastocka. There is no combined visibility of the WED Cross Wind Farm with existing wind farms Knockacummer or Glentane, within this LCT.</p> <p>There is likely to be no significant cumulative landscape effects on this LCT from the Proposed Lifetime Extension.</p>
Magnitude of Change (Definition from Section 13.2.6.3)	<p>Slight</p> <p><i>“The loss of or change to landscape features of limited extent, or changes to landscape character in smaller areas. Changes would not affect key characteristics. The addition of any new features or elements to the landscape would only result in low-level changes to the overall aesthetics of the landscapes. Changes to the landscape are more evident at a local level and not over a wide geographical area. The effects could potentially be medium- to short-term and/or reversible.”</i></p>
Significance of Effect	<p>High × Slight = Moderate/Minor = Moderate (EPA 2022)</p> <p><i>“An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.”</i></p>
Mitigating Factors	<ul style="list-style-type: none"> ➤ Although the existing Taurbeg Turbines are visible from this LCT, they do not significantly impact key landscape and visual sensitivities within this LCT. ➤ There is very limited visibility of the existing Taurbeg Wind Farm due to the undulating landscape, the landform Taurhill, roadside vegetation and coniferous forestry to the south and west. ➤ The existing Taurbeg turbines are setback from prominent rivers within the LCT such as River Blackwater and Dalua and does not alter or disrupt the setting of these rivers.
Residual Effect	<p>Slight (EPA 2022)</p> <p><i>“An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.”</i></p>

Table 13-14 Landscape Character Assessment - LCA 10 – Mount Eagle and Upper Clydagh River Valley

LCA 10 – Mount Eagle and Upper Clydagh River Valley

Distance from Site to Nearest/Furthest Area of LCA	<i>LCA 10 – Mount Eagle and Upper Clydagh River Valley</i> is located approximately 6km from the nearest existing turbine (T5).
LCA Key Characteristics (Volume 1 – Appendix 7)	<ul style="list-style-type: none"> ➤ <i>The Clydagh and Owveg River valleys split the area. Both of these rivers flow in a northerly direction towards the River Feale. In between these valleys and to their sides are higher areas which contain smaller river valleys.</i> ➤ <i>Pasture covers a large part of the western and northern part of the area. There would also be almost an equal amount of coniferous forestry in the area, with a significant area of this in the southeastern corner. Forestry is also found in the western part of the area. Moors and heathland, along with peat bog can also be found, reflective of the elevated nature of parts of the area.</i> ➤ <i>The area falls generally from the south to the north. There would be views from the N21 in this direction.</i> ➤ <i>The southeastern corner is designated an area of Secondary Special Amenity in the Kerry County Development Plan 2015-2021. Archaeological landscape as listed in the Kerry County Development Plan 2015-2021 in the Brosna area. There are also views & prospects on the N21. This area is in general elevated, with views across the area. A landscape designation could therefore be considered for this area.</i>
Landscape Sensitivity (Definition from Section 13.2.6.1)	<p>KCDP has provided their own landscape sensitivity designations for LCA 10. The designations within the KCDP for the landscape sensitivity is determined to be Low/Medium.</p> <p>There are two KCDP landscape designations within this LCA. However as discussed above in Section 13.4.1.2, there will be no direct landscape effects on these designations. The LCA has been highly modified by humans for coniferous forestry and wind farms.</p>
Visibility of the Existing Taurbeg Wind Farm within the LCA	The ZTV shows primarily full theoretical visibility within 10km of the existing Taurbeg Wind Farm. The majority of the ZTV within 10km of the existing Taurbeg Wind Farm from within LCA 10 is within agricultural fields, coniferous forestry, and local roads, which are of low sensitivity. On-site appraisals determined there is a lot less visibility due to the hills of the Mullaghareirk Mountain range surrounding the existing Taurbeg Wind Farm and coniferous forestry located in in the direction of the turbines. Some elevated vantage points with agricultural fields and local roads have visibility.
‘Do-Nothing’ Scenario	In a Do-Nothing Scenario, 11 No. Turbines of the existing Taurbeg Wind Farm will be decommissioned when their planning permission expires in 2026. In a Do-Nothing Scenario, these turbines will not be visible within this LCA, reducing the number of turbines effecting the landscape of this LCA
Cumulative Landscape Effects	<p>There are three existing wind farms located within this LCA: Cordal 1 (28 turbines), Coolleagreen (7 turbines) and Mount Eagle 1 (8 turbines). These three wind farms are located within Co. Kerry’s designated visually sensitive areas.</p> <p>The existing Taurbeg Wind Farm is not visible in combination with Coolleagreen or Cordal 1 Wind Farms. There is visibility from Mount Eagle 1 Wind Farm, of the existing Taurbeg turbines</p>

	On balance, there is likely to be no significant cumulative landscape effects on this LCT from the Proposed Lifetime Extension.
Magnitude of Change (Definition from Section 13.2.6.3)	Slight <i>“The loss of or change to landscape features of limited extent, or changes to landscape character in smaller areas. Changes would not affect key characteristics. The addition of any new features or elements to the landscape would only result in low-level changes to the overall aesthetics of the landscapes. Changes to the landscape are more evident at a local level and not over a wide geographical area. The effects could potentially be medium- to short-term and/or reversible.”</i>
Significance of Effect	Medium × Slight = Minor = Slight (EPA 2022) “An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.”
Mitigating Factors	<ul style="list-style-type: none"> ➤ The existing Taurbeg Turbines do not alter the material and physical fabric of this LCA. ➤ Although the existing Taurbeg Turbines are visible from this LCT, they do not significantly impact key landscape and visual sensitivities within this LCA. ➤ There is very limited visibility of the existing Taurbeg Wind Farm due to the undulating landscape, the landform Taurhill, vegetation along the roads and coniferous forestry. ➤ The existing Taurbeg turbines are setback from any designated landscapes within the LCA and does not significantly alter the setting of these designated landscapes.
Residual Effect	Not Significant (EPA 2022) “An effect which causes noticeable changes in the character of the environment but without significant consequences.”

Table 13-15 Landscape Character Assessment - LCA 07 - Southern Uplands

LCA 07 – Southern Uplands	
Distance from Site to Nearest/Furthest Area of LCA	LCA 07 – Southern Uplands is located approximately 6.7km from the nearest existing turbine (T5).
LCA Key Characteristics (Chapter 6 – Table 6.1)	<ul style="list-style-type: none"> ➤ “The Mullaghareirk range of hills, which straddles the County Limerick, Cork and Kerry boundaries, is the principal defining feature of this landscape character area. ➤ This is a gently undulating range of hills, which rises to almost a plateau near the Cork border. ➤ Vegetation cover ranges from improved hill grassland, which tends to be wet in nature to disturbed peatland habitats, such as blanket bog, dry and wet heath.

	<ul style="list-style-type: none"> ➤ <i>Few of these habitats are intact, occurring only in patches interrupted by coniferous forestry and improved grassland.</i> ➤ <i>Coniferous forestry, most of which is nearing maturity, is a dominant feature of this area."</i>
Landscape Sensitivity	<p>The LDP does not provide landscape sensitivity ratings.</p> <p>LCA 07 is an upland area. The landscape has been highly modified landscape for coniferous forestry and agriculture. It features upland areas with long-ranging views across the landscape looking onto the Mullaghareirk Mountain range. There is one designated views and prospects within this LCA; however, there is no visibility of the existing Taurbeg Wind Farm. There are no other designated landscape sensitives within this LCA.</p> <p>On balance, the landscape sensitivity is deemed to be Low.</p>
Visibility of the Existing Taurbeg Wind Farm within the LCA	<p>The ZTV shows primarily no theoretical visibility within this LCA with a large area of full theoretical visibility to the west within the LCA. Site surveys carried out in 2024 determined that visibility of the existing Taurbeg Wind Farm only occurs in areas of elevated vantage point with opens views to the south across the landscape. These views only occur at the townlands of Caherhayes, Mountcollins and Acres (See Plate 13-15), where the existing Taurbeg Wind Farm is visible in the background.</p>
'Do-Nothing' Scenario	<p>In a Do-Nothing Scenario, 11 No. Turbines of the existing Taurbeg Wind Farm will be decommissioned when their planning permission expires in 2026. In a Do-Nothing Scenario, these turbines will not be visible within this LCA, reducing the number of turbines effecting the landscape of this LCA</p>
Cumulative Landscape Effects	<p>Existing wind farms Knockawarriga, Tournafulla, Dromdeeven, Rathcahill, Gortnacloghy and Mauricetown are all located within this LCA.</p> <p>The existing Taurbeg Wind Farm is visible from this LCT on elevated vantage points where there are open views across the landscape in the direction of the turbines. The existing Taurbeg turbines can be seen in combination with the Knockawarriga Wind Farm intermittently at Mountcollins village. When viewed in combination, the existing Taurbeg turbines appear small at scale from this distance and sited in the background of the view.</p> <p>On balance, there is likely to be no significant cumulative landscape effects on this LCT from the Proposed Lifetime Extension.</p>
Magnitude of Change (Definition from Section 13.2.6.3)	<p>Slight</p> <p><i>"The loss of or change to landscape features of limited extent, or changes to landscape character in smaller areas. Changes would not affect key characteristics. The addition of any new features or elements to the landscape would only result in low-level changes to the overall aesthetics of the landscapes. Changes to the landscape are more evident at a local level and not over a wide geographical area. The effects could potentially be medium- to short-term and/or reversible."</i></p>
Significance of Effect	<p><i>Low × Slight = Minor/Negligible = Not Significant (EPA 2022)</i></p>

	“An effect which causes noticeable changes in the character of the environment but without significant consequences.”
Mitigating Factors	<ul style="list-style-type: none"> ➤ The existing Taurbeg turbines are only visible from elevated vantage points within this LCA, such as near the village of Mountcollins. ➤ The existing Taurbeg turbines in the background of the view from this LCA. ➤ There are no designated landscapes within this LCA. ➤ The landscape baseline of this LCA ultimately remains the same.
Residual Effect	<p>Not Significant (EPA 2022)</p> <p>“An effect which causes noticeable changes in the character of the environment but without significant consequences.”</p>

Discussion of Landscape Effects on LCTs

As demonstrated in the Landscape Character Assessment tables above, no significant landscape effects are likely to occur in any of the LCTs and LCAs within the LCA Study Area. The greatest effects from the Proposed Lifetime Extension will occur on LCT 14a - Fissured Marginal and Forested Rolling Upland, where the existing Taurbeg turbines are located as seen in Table 13-12. A landscape effect of ‘Slight’ from the Proposed Lifetime Extension will occur on LCT 11 - Broad Marginal Middle Ground Valleys. The existing Taurbeg turbines are located in close proximity to LCT 11 at 550m as seen in Table 13-13. LCA 10 – Mount Eagle and Upper Clydagh River Valley and LCA 07 - Southern Uplands will have no significant effects on the Proposed Lifetime Extension as seen on Table 13-14 and Table 13-15.

13.7.2.2 Visual Effects

13.7.2.2.1 Selection of Viewpoints

Photographic visualisations were used to aid the assessment of the visual effects arising as a result of the existing Taurbeg turbines from 6 no. viewpoint locations, which are presented in EIAR Volume 2: Photographic Visualisations Booklet. These 6 No. viewpoint locations are shown on Figure 13-14. The locations chosen for viewpoints follow a detailed and extensive process, including review of baseline information, site visits, and high-quality photography at multiple locations within the LVIA Study Area. Many locations, which based on a desktop review had the potential for views of the existing Taurbeg turbines, had complete intervening visual screening or were visually screened to such an extent that the completion of photographic visualisations was not considered useful in terms of the assessment process, i.e., little or no visibility towards the existing turbines.

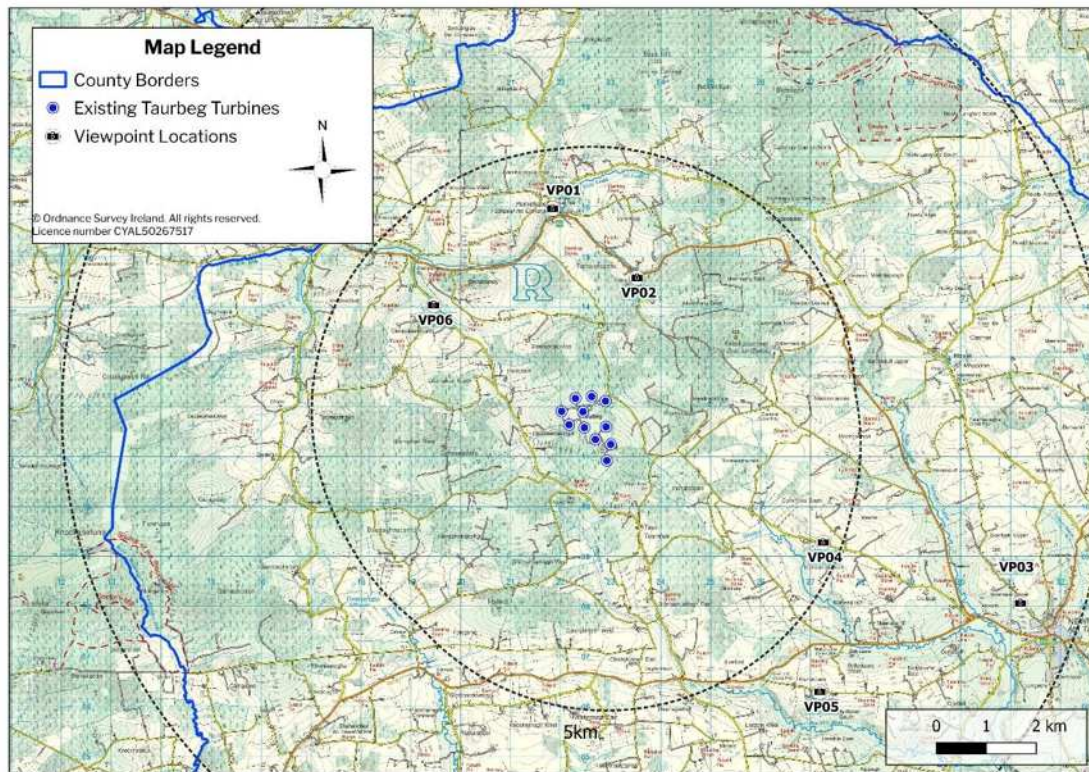


Figure 13-16 Photographic Visualisation Booklet Viewpoint Locations

The location specific details of the 6 No. viewpoints and the receptors they represent are described in the top row in each table below, and their locations are illustrated in Figure 13-16 above.

It is not possible to present every view and every location by means of viewpoints. The choice of viewpoint locations is influenced by both the views available and the type of viewer. Care was taken to provide a range of views from various geographic perspectives (distance, orientation, and elevation).

13.7.2.2.2 Viewpoint Assessment Tables

The following tables assess visual effects arising as a result of the existing Taurbeg Wind Farm from the 6 No. viewpoints. The existing Taurbeg Wind Farm contains already built infrastructure, which is operational, and currently visible in the existing landscape. As is evident by the visualisations, the Proposed Lifetime Extension amounts to little or no change to the current views of the existing turbines. As detailed in the methodology, the term 'Magnitude of Change' is used in the impact assessment tables below. In the context of this assessment, where the turbines already exist in the landscape, the magnitude of the continued impact of the turbines is considered. In order to facilitate the visual impact assessments included in this Chapter and effectively determine the continued visual impact of the existing turbines, the magnitude of change was determined by considering the change that would occur against a 'do-nothing scenario' where the turbines would become absent from the landscape.

The wireline visualisations in the *Photographic Visualisation Booklet* are useful visual aids for the identification of other wind energy developments in the landscape and discussion of cumulative visual effects reported in the tables below.

Table 13-16 Viewpoint Assessment Tables

Viewpoint 1 – Designated Scenic Route 15 - Rockchapel			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from designated scenic route 15 north of the village Rockchapel. ➤ Approximately 3.7km north of existing turbine T5. ➤ Grid Reference: E 521805.548 N 616028.692 ➤ No. of turbines visible: 3/11 		
LCA and Sensitivity	LCT 14a – Fissured Marginal and Forested Rolling Upland – Low/Medium	Visual Receptor(s) and Sensitivity	Designated scenic route 15 – High Residents – Medium Rockchapel – Medium
'Current View' Description	The image shows an elevated view overlooking the village of Rockchapel located within the River Feale Valley. The topography ascends to the background of the image to Taurbeg hill. Dense vegetation and tall treelines line the agricultural farmland south of Rockchapel. There are large areas of coniferous forestry located on Taurbeg hill which visually screen the towers of the existing Taurbeg turbines.		
Do - Nothing Scenario	In a “Do-Nothing” scenario, the 11 No. turbines of the existing Taurbeg Wind Farm will be decommissioned. Hence, all turbines would become absent from this view.		
Proposed View Description (focus on description of the existing turbines)	From this viewpoint location, 3 No. of the existing turbines are visible along the horizon in the image. T3 and T6 blade tips are visible above Taurbeg hill and the treeline of coniferous forestry. T5 is the most prominent and clearly visible above the treeline; however, T5 is visible in the background of the image and does not obstruct any scenic views.		
Cumulative Effects	<p>The existing Taurbeg Wind Farm is located between Glentane Wind Farm on the right and Knockacummer Wind Farm on the left. The Glentane turbines are identified in the wireline view but are not actually visible from this viewpoint due to visual screening from a tract of forestry. Many turbines of the Knockacummer Wind Farm are visible across the skyline in the left of the view and cause some visual effects from this viewpoint.</p> <p>Only one Taurbeg turbine is clearly visible, and only blades are visible on two other Taurbeg turbines, it therefore has a very limited contribution to the cumulative visual effects experienced from this viewpoint.</p> <p>Knockacummer Wind Farm extends further left from this image. There is visible separation between Taurbeg and Knockacummer turbines. They are sited on separate and distinct landforms. No likely significant cumulative effects are deemed to arise at this viewpoint.</p>		
Sensitivity of Visual Receptor(s) (Definition – from Section 13.2.7.1)	<p>High</p> <p>Viewpoint 1 was captured on a Co. Cork designated scenic route which represents receptors of ‘High’ sensitivity on account of this designation. This viewpoint is captured on an elevated vantage point overlooking village of Rockchapel, which is the closest settlement to the existing Taurbeg turbines.</p>		

Viewpoint 1 – Designated Scenic Route 15 - Rockchapel	
Magnitude of Change (Definition from Section 13.2.7.2)	Slight <i>“The proposal would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered but will remain similar to the baseline existing situation.”</i>
Significance of Effect	High × Slight = Moderate/Minor = Moderate (EPA, 2022) <i>“An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.”</i>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The existing turbines are sited in sparsely settled upland landscape with adequate setback distance from the high-sensitivity designated Scenic Route 15. ➤ This photo visualisation does not represent all views from SR 15 or Rockchapel village; the existing turbines will primarily be visually screened behind areas of mature vegetation, residential dwellings and the local topography along the route and within the settlement. ➤ Whilst SR 15 is a designated scenic route in the CCDP and considered high sensitivity, it is not a well-trafficked tourism route and is unlikely to be considered a destination of national renown drawing high numbers of travellers.
Residual Effect (incl. mitigating factors)	Slight (EPA, 2022) <i>“An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.”</i>

Viewpoint 2 – Designated Scenic Route 15			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from designated Scenic Route 15 in the townland Meentinnny West ➤ Approximately 2.5km northeast of existing turbine T6. ➤ Grid Reference: E 523492.717 N 614644.109 ➤ No. of turbines visible: 3/11 		
LCA and Sensitivity	LCT 14a – Fissured Marginal and Forested Rolling Upland – Low/Medium	Visual Receptor(s) and Sensitivity	Designated Scenic Route 15 – High Residents – Medium R567 Regional Road – Low
'Current View' Description	The image comprises a small agricultural field, commercial forestry and other mature vegetation throughout the image. A residential dwelling is located to the left of the image.		
Do - Nothing Scenario	In a “Do-Nothing” scenario, 11 No. turbines of the existing Taurbeg Wind Farm will be decommissioned. Hence, all turbines would become absent from this view.		

Viewpoint 2 – Designated Scenic Route 15	
Proposed View Description (focus on description of the existing turbines)	From this viewpoint location, 3 No. of the existing Taurbeg turbines are visible in the background of the image (as identified in the wireline view, the turbines seen to the left of the image in closer proximity to this viewpoint are the existing Knockacummer turbines). T9, T10 and T11 of the existing Taurbeg Wind Farm are visible above the treelines in the distant background. The remaining existing Taurbeg turbines are visually screened by the localised topography, coniferous forestry and other mature treelines.
Cumulative Effects	The existing Taurbeg Wind Farm is located in the background beyond Knockacummer Wind Farm. The two wind farms are viewed as one wind farm from this viewpoint. Knockacummer Wind Farm extends further left from this view; however, the Knockacummer turbines are primarily visually screened by local topography, vegetation and one residential dwelling. No likely significant cumulative effects are deemed to arise at this viewpoint.
Sensitivity of Visual Receptor(s) (Definition – from Section 13.2.7.1)	Medium Although this viewpoint was captured on designated Scenic Route 15 which is of high-sensitivity, there are no unique or distinctive scenic views from this section of SR15. A residential dwelling is the closest residential receptor to the existing Taurbeg turbines. However, it is located at a setback distance of 2.5km and its views are orientated in the opposite direction to the existing Taurbeg turbines.
Magnitude of Change (Definition from Section 13.2.7.2)	Slight <i>“The proposal would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered but will remain similar to the baseline existing situation.”</i>
Significance of Effect	Medium × Slight = Minor = Slight (EPA, 2022) <i>“An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.”</i>
Mitigation Factors	<ul style="list-style-type: none"> ➤ Only one residential receptor is experiencing visual effects as shown in the photo visualisation from this view. ➤ The existing turbines are sited in sparsely settled upland landscape with adequate setback distance from the high-sensitivity designated Scenic Route 15. The existing turbines (Knockacummer and Taurbeg) do not impact the key scenic sensitivities of the designated scenic route. ➤ Whilst SR 15 is a designated scenic route in the CCDP and considered high-sensitivity, it is not a well-trafficked tourism route and is unlikely to be considered a destination of national renown drawing high numbers of travellers.
Residual Effect (incl. mitigating factors)	Slight (EPA, 2022) <i>“An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.”</i>

Viewpoint 3 – Newmarket			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from Scarteen road in the townland Scarteen Lower and representing the town Newmarket. ➤ Approximately 8.7km southeast of existing turbine T10. ➤ Grid Reference: E 531168.499 N 608129.779 ➤ No. of turbines visible: 6 		
LCA and Sensitivity	LCT 11 – Fissured Marginal and Forested Rolling Upland – High	Visual Receptor(s) and Sensitivity	Newmarket – Medium
'Current View' Description	The image shows a long-ranging view across a sparsely settled and rural landscape which comprises of agricultural fields, hedgerows, trees and occasional residential dwellings throughout the image. The topography descends to the left of the image. The existing Glentane and Knockacummer turbines are visible within the current view.		
Do - Nothing Scenario	In a “Do-Nothing” scenario, 11 No. turbines of the existing Taurbeg Wind Farm will be decommissioned. Hence, all turbines would become absent from this view.		
Proposed View Description (focus on description of the existing turbines)	6 No. existing Taurbeg turbines are visible from this viewpoint in a linear array above the distant horizon. T1, T10 and T11 are clearly visible from this view, however, a mature tree line in the middle distance visually screens the remaining 5 existing turbines from this view. Although all turbines would likely be visible in winter months when these trees have lost their foliage. At this distance (8.7km) the existing Taurbeg turbines are relatively small features and comprise a small portion of the long ranging landscape view.		
Cumulative Effects	The existing Taurbeg turbines are located between the existing Glentane Wind Farm on the left and the existing Knockacummer Wind Farm on the right. The three windfarms are viewed as a linear array across the background of this view. The Knockacummer and Taurbeg Wind Farms are viewed as a continuous wind farm in the background of the image. Cumulative visual effects arise.		
Sensitivity of Visual Receptor(s) (Definition – from Section 13.2.7.1)	Medium This viewpoint was captured within the immediate setting of the largest town in the LVIA Study Area, Newmarket. Newmarket is setback by an undulating rural landscape from the existing Taurbeg turbines at 8.7km.		
Magnitude of Change (Definition from Section 13.2.7.2)	Slight <i>“The proposal would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered but will remain similar to the baseline existing situation.”</i>		
Significance of Effect	Medium × Slight = Minor = Slight (EPA, 2022)		

Viewpoint 3 – Newmarket	
	<i>“An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.”</i>
Mitigation Factors	<ul style="list-style-type: none"> ➤ This is one of the few views of the existing Taurbeg turbines from Newmarket. ➤ There is limited visibility from the immediate setting of Newmarket. ➤ The existing turbines are sited in sparsely settled upland landscape with adequate setback distance from the town of Newmarket. ➤ The number of residential receptors experiencing visual effects as shown in the photo visualisation is few.
Residual Effect (incl. mitigating factors)	<p>Slight (EPA, 2022)</p> <p><i>“An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.”</i></p>

Viewpoint 4 – Commons South			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from a local road in the townland of Commons South. ➤ Approximately 4.6km southeast of existing turbine T10. ➤ Grid Reference: E 527219.744 N 609346.253 ➤ No. of turbines visible: 11/11 		
LCA and Sensitivity	LCT 11 – Broad Marginal Middleground Valleys – High	Visual Receptor(s) and Sensitivity	Resident Dwellings – Medium Local Road - Low
'Current View' Description	The image shows a medium-ranging view towards Taurbeg hill from an elevated vantage point. The image comprises a local road, vegetation lining the local road and rolling hills in the background. Coniferous forestry can be viewed across the rolling hills. A residential dwelling is located at the right foreground of the image. The existing Glentane and existing Knockacummer turbines are visible in the current view.		
Do - Nothing Scenario	In a “Do-Nothing” scenario, 11 No. turbines of the existing Taurbeg Wind Farm will be decommissioned. Hence, all turbines would become absent from this view.		
Proposed View Description (focus on description of the existing turbines)	The existing Taurbeg turbines are located in the uplands in the background of the image. Most of the existing Taurbeg turbines are clearly visible from this view. Several turbines are partially visible as they are located on the northern slopes of Taurbeg hill with the towers and nacelles visually screened by the intervening landform (e.g. T8 and T3).		
Cumulative Effects	The existing Taurbeg turbines are located between existing Glentane Wind Farm at the left of the image and existing Knockacummer Wind Farm to the right. The three wind farms take up a wide horizontal extent across the		

Viewpoint 4 – Commons South	
	ridgeline in the background of the image and cumulative visual effects do arise. From this vantage point, the three wind farms are visually separated and are seen on separate and distinct landforms.
Sensitivity of Visual Receptor(s) (Definition – from Section 13.2.7.1)	Medium This viewpoint represents a cluster of approximately 7 residential receptors at a setback distance of 4.6km to the existing Taurbeg turbines.
Magnitude of Change (Definition from Section 13.2.7.2)	Moderate <i>“The change in the view may involve partial obstruction of existing view or partial change in character and composition of the baseline through the introduction of new elements or removal of existing elements. Likely to occur at locations where the existing turbines are partially visible over a moderate or medium extent, and which are not in close proximity to the proposed development. Change may be readily noticeable but not substantially different in scale and/or character from the surroundings and wider setting.”</i> The magnitude of change is deemed medium on account of cumulative.
Significance of Effect	Medium × Moderate = Moderate/Minor = Moderate (EPA, 2022) <i>“An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.”</i>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The number of residential receptors experiencing visual effects as shown in the photo visualisation is few. ➤ The primary residential visual amenity of the residential dwelling is orientated in the opposite northeast to southwest direction, which is the opposite direction to the existing turbines within the current view.
Residual Effect (incl. mitigating factors)	Slight (EPA, 2022) <i>“An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.”</i>

Viewpoint 5 – Designated Scenic Route 17	
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from designated Scenic Route 17 in the townland of Barnacurra. ➤ Approximately 6.2km southeast of existing turbine T10. ➤ Grid Reference: E 527149.403 N 606355.459 ➤ No. of turbines visible: 8/11

Viewpoint 5 – Designated Scenic Route 17			
LCA and Sensitivity	LCT 11 – Broad Marginal Middleground Valleys – High	Visual Receptor(s) and Sensitivity	Designated Scenic Route 17 – High . Residential - Low
'Current View' Description	The image shows a long-ranging view across the landscape onto rolling hills in the background of the image. The image comprises agricultural fields and low hedgerows lining the field patterns. Coniferous forestry is seen across the rolling hills in the background of the image. Occasional residential dwellings and farm buildings are visible throughout the image, it is a very sparsely populated rural landscape. The existing Taurbeg turbines and existing Knockacummer turbines are visible in the current view.		
Do - Nothing Scenario	In a “Do-Nothing” scenario, all 11 No. turbines of the existing Taurbeg Wind Farm will be decommissioned. Hence, all turbines would become absent from this view.		
Proposed View Description (focus on description of the existing turbines)	The majority of the existing Taurbeg turbines are visible upon and just beyond Taurbeg hill. The hill partially screens some of the existing turbines from view. T2 and T10 are clearly visible from this view as they are sited on top of Taurbeg hill and not beyond the ridgeline.		
Cumulative Effects	The existing Taurbeg turbines are located to the left of the existing Knockacummer Wind Farm which comprises a large horizontal array of turbines across the uplands in the background of the view. There is clear visible separation between the two wind farms as they are sited on separate and distinct landforms. Cumulative visual effects occur as the existing wind farms combined take up a wide horizontal extent across the background of the image. It should be noted that all the Glentane turbines are visible beyond the hay bales in the foreground (see the wireline view), further extending the horizontal extent of the existing turbines across the landscape in the background of the image. However, the existing Knockacummer turbines take up a much wider spatial extent to the existing Taurbeg turbines, which are partially visually screened by the topography. The existing turbines do not obstruct any views but are visible from the designated scenic route.		
Sensitivity of Visual Receptor(s) (Definition – from Section 13.2.7.1)	High The viewpoint was captured on SR 17, which is a designated scenic route within the CCDP 2022-28. Therefore, the overall sensitivity for this viewpoint is high.		
Magnitude of Change (Definition from Section 13.2.7.2)	Slight <i>“The proposal would be partially visible or visible at sufficient distance to be perceptible and result in a low level of change in the view and its composition and a low degree of contrast. The character of the view may be altered but will remain similar to the baseline existing situation.</i>		
Significance of Effect	High × Slight = Moderate/Minor = Moderate (EPA, 2022)		

Viewpoint 5 – Designated Scenic Route 17	
	<i>“An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.”</i>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The existing turbines are sited in sparsely settled upland landscape with adequate setback distance from the high-sensitivity designated Scenic Route 17. ➤ This photo visualisation does not represent all views from SR 17. Primarily, the existing turbines will be intermittently visible behind areas of mature vegetation and the local topography along the route. ➤ Whilst SR 17 is a designated scenic route in the CCDP and considered high-sensitivity, it is not a well-trafficked tourism route and is unlikely to be considered a destination of national renown drawing high numbers of travellers.
Residual Effect (incl. mitigating factors)	<p>Slight (EPA, 2022)</p> <p><i>“An effect which causes noticeable changes in the character of the environment without affecting its sensitivities..”</i></p>

Viewpoint 6 – Glenakeel North			
Viewpoint Description and Details	<ul style="list-style-type: none"> ➤ View from L1003 local road in the townland of Glenakeel North. ➤ Approximately 3.3km northwest of existing turbine T5. ➤ Grid Reference: E 519424.612 N 614098.376 ➤ No. of turbines visible: 10/11 		
LCA and Sensitivity	LCT 14a – Fissured Marginal and Forested Rolling Upland – Low/Medium	Visual Receptor(s) and Sensitivity	Residential Dwellings – Medium
'Current View' Description	The image shows a medium-ranging view towards Taurbeg hill, which is visible in the background of the image framed on either side by a small valley. The image comprises the L1003 local road, coniferous forestry, agricultural fields and residential dwellings to the right of the image.		
Do - Nothing Scenario	In a “Do-Nothing” scenario, all 11 No. turbines of the existing Taurbeg Wind Farm will be decommissioned. Hence, all turbines would become absent from this view.		
Proposed View Description (focus on description of the existing turbines)	The existing Taurbeg turbines are visible in the background image. They are irregularly spaced and clustered upon the most elevated landform. All turbines are viewed above the horizon and do not overlap or interfere with the complexity of lower ground. The existing met mast is visible from this location between T3 and T8. Several existing turbines are located behind the ascending topography with their lower towers visually screened. T7 is completely visually screened by the landform of Taurbeg hill.		

Viewpoint 6 – Glenakeel North	
Cumulative Effects	No other wind farms are visible and there are no cumulative effects from this viewpoint.
Sensitivity of Visual Receptor(s) (Definition – from Section 13.2.7.1)	Medium: The residential receptors located at this viewpoint have open views towards the existing Taurbeg turbines. The residential receptors are located approximately 3.3km from the existing Taurbeg turbines. Siting of the existing turbines adheres to the <500m setback distance from residential receptors recommended in the WEDGS (DoEHLG, 2006).
Magnitude of Change (Definition from Section 13.2.7.2)	Moderate <i>“The change in the view may involve partial obstruction of existing view or partial change in character and composition of the baseline through the introduction of new elements or removal of existing elements. Likely to occur at locations where the existing turbines are partially visible over a moderate or medium extent, and which are not in close proximity to the proposed development. Change may be readily noticeable but not substantially different in scale and/or character from the surroundings and wider setting.”</i>
Significance of Effect	Medium × Moderate = Moderate/Minor = Moderate (EPA, 2022) <i>“An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends”</i>
Mitigation Factors	<ul style="list-style-type: none"> ➤ The landform of Taurbeg hill visually screens the lower portion of the towers and hardstands for the majority of the exiting Taurbeg turbines, with T7 completely visually screened by Taurbeg hill. ➤ The number of residential receptors experiencing visual effects as shown in the photo visualisation is few. ➤ The existing Taurbeg turbines are setback approximately 3km from visual receptors represented by this viewpoint.
Residual Effect (incl. mitigating factors)	Moderate (EPA, 2022) <i>“An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.”</i>

No ‘Significant’ residual visual effects were found at any of the 6 viewpoint locations. A residual visual effect of ‘**Moderate**’ was deemed to arise at viewpoint 6. Viewpoint 6 was deemed a ‘Moderate’ residual visual effect due to the residential receptors with views overlooking the valley in the direction of the existing Taurbeg turbines. However, there are very few residential receptors experiencing visual effects as shown in viewpoint 6 and the turbines are well setback at a distance of 3km. A residual effect of ‘**Slight**’ was deemed to arise at the remaining four viewpoints.

13.7.2.2.3 Summary of Visibility Appraisal

Visibility appraisals determined that there is great variation in the degree of visibility of the existing Taurbeg Wind Farm depending on geographic location, proximity and local landscape characteristics. In general, actual visibility of the existing Taurbeg Wind Farm is far less than is shown by ZTV mapping. The wind farm is largely screened from view due to coniferous forestry and the topographic characteristics of the Mullaghareirk Mountain Range and other hills surrounding the Site. Where the existing turbines are visible, they appear irregularly spaced and clustered around the uplands of Taurbeg Hill, well set back from visual receptors. To the north, visual receptors are typically located at lower elevations in the narrow valleys of the Mullaghareirk Range and to the south the landscape is a very sparsely settled rural agricultural landscape. The existing turbines are well set back from large population centres and well trafficked road networks and are therefore seen from a very small number of visual receptors, therefore causing landscape and visual effects for a relatively small number of receptors. The existing Taurbeg Wind Farm is setback from high-sensitivity visual receptors by features of the rural landscape such as extensive field patterns, rolling hills and coniferous forestry. Views of the existing turbines will be intermittent as a result of the numerous rolling hills, local terrain and vegetation in the landscape. The greatest potential for significant visual effects is upon residential visual amenity, and less so on other sensitive visual receptors such as recreational amenities and protected scenic amenities. Overall, the existing Taurbeg turbines are only visible from a very small number of receptors in a very sparsely populated rural landscape.

13.7.2.2.4 **Residential Visual Amenity**

The Wind Energy Development Guidelines (WEDGs) for Planning Authorities (DoEHLG) were published in 2006. The Draft Revised WEDGs (DoHPLG) were consulted on in 2019. Note however no update or final 2019 WEDGs were subsequently published. The existing Taurbeg Wind Farm was granted planning permission in 2003 and became operational in 2006. Therefore, the WEDGs (DoEHLG, 2006) had not yet been published prior to the consent and commissioning of Taurbeg Wind Farm. Current best practice for wind farm design in relation to residential visual amenity is a minimum 500m setback distance as set out in the WEDGs (DoEHLG, 2006). In the case of the existing Taurbeg Wind Farm, the turbines are well set back from residential visual amenity. The closest dwelling (H10) is located at a setback distance of 731m from T8. As illustrated in Figure 13-17, the turbines are set back from residential receptors, far beyond the standard set back distances set out in the WEDGs (DoEHLG, 2006). The existing turbines also adhere to the 2019 Draft WEDGs in relation to turbine setback from residential receptors i.e. a minimum $4 \times \text{tip height}$ ($108.2\text{m} \times 4 = 432.8\text{m}$).



Figure 13-17 Residential Receptors in Close Proximity to the Existing Taurbeg Turbines

Section 13.5.1, in the visibility appraisal of this Chapter discusses the visibility from residential receptors with clear open views of the existing Taurbeg Wind Farm. Viewpoints 2 and 6 represent views from residential dwellings within 4km of the existing Taurbeg turbines and have open views towards the Site.

Photographic visualisations are one of the tools employed during the LVIA in order to inform the assessment of landscape and visual effects. It would be a disproportionate measure to include an individual photographic visualisation from every residential dwelling, and this is not required to conduct a thorough and robust assessment of landscape and visual effects. In line with the guidance laid out in the GLVIA3 (LI & IEMA, 2013), the viewpoints selected for the LVIA conducted were informed by a range of factors, including “ZTV analysis, fieldwork, and desk research” (para 6.18, GLVIA3 (LI & IEMA, 2013)). Furthermore, the GLVIA3 (LI & IEMA, 2013), states that representative viewpoints are:

“selected to represent the experience of different types of visual receptors, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ” (para 6.19 GLVIA3 (LI & IEMA, 2013)).

The assessment of visual effects on the small number of residential receptors in very close proximity to the Site in the townlands of Tauremore, Glasheenanargid, Foiladaun, Glennakeel North and Meentinn West were informed by Visibility Appraisals and Photographic Visualisations– See Section 13.5.1 and 13.7.2.2.2 previously. The townlands are shown above in Figure 13-17.

Tauremore located immediately to the south of the existing Taurbeg Wind Farm consists of a rural, clustered settlement. Views towards the Site are presented by Plate 13-17 and Plate 13-18 in Section 13.5.1. The localised landform Taur hill is located to the south of the Site and visually screens views of the existing Taurbeg turbines from the majority of residential receptors in this town land. An overall residual visual effect of ‘**Not Significant**’ was deemed to arise from the Proposed Lifetime Extension.

Residential Receptors in the townland of Foiladaun which are of ‘High’ sensitivity have limited visibility of the existing Taurbeg turbines due to dense roadside screening. The residential receptors in the

townland of Foiladaun are located on the side of the gently sloping valleys. The undulating landforms of Taurbeg hill further visually screen the existing Taurbeg turbines from residential receptors in the townland of Foiladaun. Considering there is limited visibility of the existing Taurbeg turbines from residential receptors in Foiladaun, the visual effects are deemed to be **‘Not Significant’**.



Plate 13-20 Residential Receptor located approximately 821m from the nearest existing Taurbeg turbine T8 in the townland of Glasheenanargid

The residential receptor (H33) located in the townland of Glasheenanargid are of ‘High’ sensitivity due to being located approximately 821m from the nearest existing turbine T8 as stated in Section 13.5.1. Plate 13-13 represents views towards the existing Taurbeg turbines from the residential receptor, H33. The Residential receptor is located on an elevated point with views in the opposite direction to the existing Taurbeg turbines. There is dense vegetation located behind the residential receptor, which further visually screen views of the existing Taurbeg turbines. On balance, an overall residual visual effect of **‘Slight’** is deemed to arise on this residential receptor.

Viewpoint 2 represents views from the townland of Meentinny West. There is one residential receptor in the townland of Meentinny West with visibility. As seen in Table 13-16 – Viewpoint 2, the overall residual effect is deemed to be **‘Slight’**.

The greatest effects on residents’ visual amenity will occur at residential receptors located on the L1003 local road to the northwest of the existing Taurbeg turbines in the townland of Glennakeel North. Viewpoint 6, located approximately 3.3km from the nearest turbine T5, was deemed to have a sensitivity of **‘Medium’**. Considering that views of the residential receptors located in close proximity to Viewpoint 6 are focused in the direction of the turbines, the magnitude of change is deemed to be **‘Moderate’**. However, the turbines do not disrupt any scenic views and are located on and behind the ridgeline. Overall, this viewpoint is deemed to have a **‘Moderate’** Medium-Term’ residual visual effect.

13.7.2.3 Proposed Offsetting Lands-Landscape and Visual Effects

Section 13.4.3 describes the character of the Proposed Offsetting lands. As reported in Section 13.4.3, these lands are highly modified by forestry and agriculture, and landscape sensitivity of the Proposed Offsetting lands is ‘Low’. The character of the Proposed Offsetting lands will be altered by the restoration of farmland through planting wildlife crop, hedgerow management and predator fencing as well as permanent removal of forestry. The magnitude of change is deemed to ‘Slight’ and highly localised. Once the Proposed Offsetting Measures have been implemented, landscape effects on the Proposed Offsetting lands themselves will be Positive, Long-Term and **‘Not Significant’**.

As reported in Section 13.4.3, the Proposed Offsetting lands are located within an area designated as ‘visually sensitive’ in the KCDP, it is a large landscape area considered to be ‘High’ sensitivity. This ‘visually sensitive’ designation comprises a large area of the landscape and the Proposed Offsetting lands are very small portion of this landscape. As the proposed interventions will cause highly localised changes to the landscape, they will have a ‘Negligible’ magnitude of change to the character and visual

sensitivities of the designated area. Overall residual landscape effects in the visually sensitive area is ‘Not Significant’.

Designated scenic route KY-SR-1 is located adjacent to the Proposed Offsetting lands as described in Section 13.4.3 and shown in Figure 13-11. Designated KY-SR-1 represents receptors of ‘High’ sensitivity. The high quality scenic amenity from this scenic route is directed out towards the open landscape to the west from the elevated vantage point from the western side of Mount Eagle. The Proposed Offsetting lands are located to the east and north of the scenic route and will therefore not impact the key scenic views and sensitivities from this designated scenic route. The visual changes to the landscape include changes to landcover arising from deforestation of forestry, enhancement of hedgerows and planting and changes to the composition of grassland. A ‘Negligible’ magnitude of change is deemed to arise for local receptors and designated scenic route KY-SR-1. The overall residual visual effects arising from the proposed measures within the Proposed Offsetting lands are deemed to be Positive, Long-Term and ‘Not Significant’.

13.7.2.4 Cumulative Landscape and Visual Effects

Cumulative Landscape Effects

As reported and mapped previously in Section 13.6: ‘Cumulative Context’, the existing Knockacummer Wind Farm and the existing Glentane Wind Farm are located to either side of the existing Taurbeg Wind Farm. All three wind farms are located in the same upland landscape, part of the Mullaghareirk Mountain range. Therefore, Taurbeg Wind Farm is seen within the same visual unit as Glentane and Knockacummer Wind Farms. However, stands of coniferous forestry and distinct local landforms (Knockacummer hill and Foilard) separate Taurbeg Wind Farm from the other two. These three existing wind farms collectively contribute to cumulative effects on the landscape at the southern extent of the Mullaghareirk Mountain Range. As reported in the LCA Assessment Tables previously (Table 13-12, Table 13-13, Table 13-14 and Table 13-15) the existing Taurbeg Wind Farm contributes to cumulative effects on the character of both LCT 14a and LCT 11 in combination with Glentane and Knockacummer Wind Farms. The impact assessment tables account for cumulative landscape effects and the residual landscape effects on these LCT 14a and LCT 11 were Moderate and Slight respectively.

There are no designated high-sensitive landscapes within the CCDP 2022-28 within the LVIA Study Area (e.g. No Co. Cork High Value Landscapes). The existing Taurbeg, Knockacummer and Glentane Wind Farms are visible from designated scenic routes across a wide horizontal extent; however, they are located in the background of views and do not disrupt any designated scenic views as seen in the *Photographic Visualisation Booklet*.

The *Photographic Visualisation Booklet* effectively illustrates the representative cumulative effects on the landscape character of this area. The visual effects of the existing Taurbeg Wind Farm in combination with the existing Glentane and Knockacummer turbines (and other developments) were comprehensively analysed and discussed previously in Section 13.7.2.2 Viewpoint Assessment Tables.

Cumulative impacts on the character of the wider landscape are likely to be greatest where the existing turbines are visible in conjunction with other wind farm developments. As shown in the Cumulative Context map, there are many other wind energy developments in the wider landscape of the LVIA Study Area. Most of these other wind energy developments (except Glentane and Knockacummer Wind Farm) are well set back and separate from the existing Taurbeg Wind Farm and have no visual or landscape connectivity and therefore the contribution of Taurbeg Wind Farm to these cumulative effects is limited. The setback distances between projects and the narrow valleys between prominent landforms create relatively small and separate visual units within the upland areas of the Mullaghareirk Mountain Range. These characteristics give this landscape the capacity to absorb and accommodate multiple wind energy developments, thus the cumulative effects to the landscape are deemed

acceptable. On balance, there will be no significant cumulative effects on the landscape of the LVIA Study Area from the Proposed Lifetime Extension.

Cumulative Visual Effects

In the case of the existing Taurbeg Wind Farm, there are many scenarios and interactions where cumulative visual effects may occur. These scenarios include interactions between the existing Taurbeg turbines and other energy developments (wind farms or grid infrastructure), as well as those with other man-made landscape features (quarries, transport networks and overhead telecommunication lines) and land uses. Guidance for the assessment of cumulative effects of onshore wind farms (SNH, 2012; NatureScot, 2021) clearly states the following:

‘At every stage in the process the focus should be on the key cumulative effects which are likely to influence decision making, rather than an assessment of every potential cumulative effect’;

‘The level of information generated can distract attention from the most significant cumulative effects which are likely to influence the consenting decision. Assessments should therefore focus on the most significant cumulative effects and conclude with a clear assessment of those which are likely to influence decision making’.

Following this guidance, a primary focus is given to the cumulative effects likely to occur as a result of other existing, permitted and proposed wind turbines identified in the LVIA Study Area, as other wind energy developments are likely to cause the greatest and most significant cumulative and in combination visual effects. Cumulative visual effects were assessed previously in Section 13.7.2.2.2: *Viewpoint Assessment Tables*, where discussion of cumulative visual effects was incorporated into the impact assessments from the 6 No. Viewpoints.

There are 19 No. other existing wind farms located within 20km of the existing turbines (2 no. of these comprise of single turbines). These wind farms are located primarily in the upland areas of the Mullaghareirk Mountain range and foothills. On-site surveys carried out in 2023 and 2024 determined that the existing Taurbeg turbines are only visible with two other existing wind farms within the LVIA Study Area, Glentane and Knockacummer Wind Farms. The *Photographic Visualisation Booklet* illustrates views of the combined wind farms.

The combined wind farms are viewed across a wide horizontal extent on the upland areas of the southern extent of the Mullaghareirk Mountain range. Viewpoints 1, 3, 4 and 5 show the combined turbines to be visible as an extended linear array of turbines upon elevated ridgelines in the background of the images. There is typically visual separation between the three wind farms by slight valleys between separate and distinct landforms. The combined wind farms have the greatest effects from viewpoints 4 and 5 due to the wide horizontal extent of the existing turbines visible across the ridgeline. In general, the collective group of turbines are visible in a linear layout across the ridgeline in a coherent manner. On site visibility appraisals determine that the existing Taurbeg, Glentane and Knockacummer Wind Farms do not surround or enclose any visual receptors in the LVIA Study Area.

Viewpoint 1 shows the combined views of the existing Taurbeg and Knockacummer Wind Farms from the designated scenic route 15 and approach road to Rockchapel from the north. In that view, the existing Taurbeg turbines are located behind the ridgeline, with only three turbines visible. The combined wind farms are visually separated by distinct landforms, as well as coniferous forestry and differing field patterns. The combined wind farms make up a small portion of the horizontal extent, with no turbines visible to the right of the image. The combined wind farms are located in the background of the image and do not disrupt any scenic views from the designated scenic route. Viewpoint 5 was captured on designated scenic route 17, and the combined view of the existing turbines does not obstruct designated scenic routes of high sensitivity.

Viewpoint 2 represents views from designated scenic route 15 to the northeast of the existing Taurbeg Wind Farm. Taurbeg and Knockacummer Wind Farm appear as one wind farm from this view. The existing turbines are viewed above the treeline of coniferous forestry. Three Knockacummer and three Taurbeg turbines are visible from this view. The Taurbeg turbines are located beyond the Knockacummer turbines in the background of the view. The existing turbines do not obstruct any designated scenic routes from this viewpoint. Overall, the combined visibility of the existing windfarms Taurbeg, Glentane, and Knockacummer appears in a coherent ridgeline in the background of the viewpoints.

As shown in the Cumulative Context map, there are many other wind energy developments in the wider landscape of the LVIA Study Area. Most of these other wind energy developments (excepting Glentane and Knockacummer Wind Farm) are well set back and separate from the existing Taurbeg Wind Farm and have no visual or landscape connectivity and therefore the contribution of Taurbeg Wind Farm to these cumulative effects is limited. The setback distances between projects and the narrow valleys between prominent landforms create relatively small and separate visual units within the upland areas of the Mullaghareirk Mountain Range. These characteristics give this landscape the capacity to absorb and accommodate multiple wind energy developments, thus the cumulative effects to the landscape are deemed acceptable. On balance, there will be no significant cumulative effects on visual receptors within the LVIA Study Area from the Proposed Lifetime Extension.

13.7.3 Decommissioning Phase

Decommissioning of the existing Taurbeg wind farm is currently set to be carried out in 2026, i.e. 20 years from the grant of permission for the 11 No. turbines, under the current planning permission. The Proposed Lifetime Extension would extend the operation of the existing wind farm for a further 10 years, thereby postponing decommissioning until 2036.

Condition 7 of the current planning permission states:

‘The structures shall be removed at the expiration of a period of 20 years beginning on the date of commissioning of the development.’

As part of the Proposed Lifetime Extension, a Decommissioning Plan is presented in Appendix 4-3 of this EIAR.

The landscape and visual effects during decommissioning are anticipated to be of a similar nature as those occurring during the original construction phase. The most important element of decommissioning from a landscape and visual impact perspective is the dismantling and removal of the wind turbines. The process of turbine dismantling and removal will occur for a limited period and will predominately involve cranes being set-up adjacent to the turbines during the dismantling process.

Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines would be disassembled in reverse order to how they were erected. It is proposed to leave turbine foundations in place underground and to cover them with earth and reseed as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environment nuisances such as noise, dust and/or vibration.

During decommissioning of the wind farm, it is intended to limit groundworks other than to rehabilitate constructed areas such as turbine bases and hardstanding areas. This will be done by covering with topsoil to encourage vegetation growth and reduce run-off and sedimentation. The turbines will be removed and transported off-site, and the turbine concrete bases will remain in the ground and backfilled.

It is proposed that existing roadways within the Site will be left in-situ, as appropriate, to facilitate on-going access and commercial forestry uses. It is proposed to leave underground cables in place, as they are installed below a level likely to be impacted by typical agricultural works.

Removal of the turbines and ancillary infrastructure from the Site will result in a Short-term, Slight, Negative visual effect. The Decommissioning Plan included as Appendix 4-3 of this EIAR will be agreed with the Local Authority prior to any commencement of decommissioning activities. The plan provides details of the methodologies to be employed throughout decommissioning, the environmental controls to be implemented, the Emergency Response Procedure to be adopted, the methods for reviewing compliance and an indicative programme of decommissioning works.

13.8

Conclusion

It is important to re-iterate that Taurbeg Wind Farm is an existing project, and this EIAR is being prepared in support of a planning application to extend the operational lifespan of the existing Taurbeg Wind Farm beyond 2026 by a further 10 years.

This Chapter assesses the likely significant landscape and visual impacts arising as a result of the Proposed Lifetime Extension. Although all elements of the project are assessed, the Chapter focuses upon the turbines, as they are deemed to be the essential aspects of the proposal under assessment from a landscape and visual perspective (see Section 13.2.1 previously). This Chapter describes the baseline landscape and assesses the direct effects on the landscape of the Site, as well as effects on landscape character and the impact on sensitive landscape receptors and LCTs and LCAs. Visibility of the existing turbines was assessed from receptors within a study area extending 20km from the existing turbines and visual effects were determined from information gathered during multiple site visits as well as other tools such as ZTV mapping and photographic visualisations.

The Site is located in an upland area in the Mullaghareirk Mountains, an undulating landscape consisting of coniferous forestry and peatlands. The sensitivity of the landscape within the Site was deemed to be 'Low' considering the landscape has been highly modified for coniferous forestry; agriculture and the existing Taurbeg Wind Farm itself. The magnitude of effect was deemed to be 'Moderate' considering the continued impact of the wind farm on the character of this upland landscape. Overall, the existing Taurbeg Wind Farm is deemed to have Medium-term, **'Slight'**, Negative landscape effects within the Site itself, which will be highly localised to the Taurbeg Wind Farm itself.

The wider landscape setting consists of rolling hills, narrow valleys and landforms such as Knockacummer hill, Taur hill and Foilard hill, which slightly enclose the infrastructure of the existing Taurbeg Wind Farm. There are two other existing wind farms in close proximity to the existing Taurbeg Wind Farm. Glentane Wind Farm is located to the southwest and Knockacummer Wind Farm to located to the northeast of the existing Taurbeg Wind Farm. The three wind farms combined are mostly visible within the same visual unit, as shown in viewpoints 3, 4 and 5. The three wind farms appear visually separate on distinct landforms, although collectively comprise an extensive linear array of turbines upon upland ridges. The three wind farms combined are of a wide horizontal extent as seen in viewpoints 4 and 5 but are coherent in siting and design as they appear in a linear layout across the ridgelines in the background of the views.

The Proposed Lifetime Extension will have the highest effect on LCT 14a – *Fissured Marginal and Forested Rolling Upland*. The residual effects on this LCT were deemed to be **'Moderate.'** However, there is limited visibility of the existing Taurbeg Wind Farm from a large proportion of this LCT, far less than shown in the ZTV map (See Figure 13-12). Due to the nature of boundary vegetation, forestry, and localised undulations, visual exposure of the existing Taurbeg Wind Farm is limited in this LCT and there are no significant effects on its key characteristics and sensitivities. A residual effect of 'Slight' was given to LCT 11 - *Broad Marginal Middle Ground Valleys*. Kerry LCA 10 - *Mount Eagle and*

Upper Clydagh River Valley and Limerick LCA 07 – *Southern Upland* were deemed to have a residual effect of ‘Not Significant’.

Once the Proposed Offsetting measures are implemented, they will have a positive Long-Term landscape and visual effect on the upland landscape of Mount Eagle. The Proposed Offsetting lands will be improved through restoration of farmland and permanent removal of forestry. The residual landscape and visual effects were deemed to ‘Not Significant’.

Visual effects arising as a result of the existing Taurbeg Wind Farm are localised and have the greatest impact on residential receptors. Viewpoint 6, which represents residential receptors on the L1003 local road with open views of the existing Taurbeg Wind Farm, was deemed to have a residual Medium-Term ‘**Moderate**’ visual effect. However, the residential dwellings are well setback from the existing Taurbeg Wind Farm by approximately 3km and there are very few residential receptors which experience the view and visual effects shown in viewpoint 6. The remaining four viewpoints, which represent designated scenic Route 15, designated scenic route 17 and residential receptors with open views towards the existing Taurbeg Wind Farm, were deemed to have Medium-term ‘**Slight**’ residual visual effects.

The Wind Energy Development Guidelines (WEDGs) for Planning Authorities (DoEHLG) were published in 2006. The Draft Revised WEDGs (DoHPLG) were consulted on in 2019. Note however no update or final 2019 WEDGs were subsequently published. The existing Taurbeg Wind Farm was granted planning permission in 2003 and became operational in 2006. Therefore, the WEDGs (DoEHLG, 2006) had not yet been published prior to the consent and commissioning of Taurbeg Wind Farm. Current best practice for wind farm design in relation to residential visual amenity is a minimum 500m setback distance as set out in the WEDGs (DoEHLG, 2006). In the case of the existing Taurbeg Wind Farm, the turbines are well set back from residential visual amenity. The closest dwelling (H10) is located at a setback distance of 731m from T8. The turbines are set back from residential receptors, far beyond the standard set back distances set out in the WEDGs (DoEHLG, 2006) The existing turbines also adhere to the 2019 Draft WEDGs in relation to turbine setback from residential receptors i.e. a minimum 4 x tip height (108.2m x 4 = 432.8m).

The townlands of Tauremore, Glasheenanargid, Foiladaun, Glennakeel North and Meentinn West were assessed in relation to residential receptors in the immediate setting of the existing Taurbeg turbines. The greatest visual effects will occur on residential receptors in the townland of Glennakeel North which are represented by Viewpoint 6. A residual effect of ‘**Moderate**’ was deemed to arise on residential receptors in close proximity to this viewpoint. However, the residential receptors located in close proximity to viewpoint 6 are located at a setback distance of approximately 3km. The residential receptors in the townlands of Meentinn West represented by viewpoint 2 and Glasheenanargid represented by Plate 13-20 were deemed to have an overall residual effect of ‘**Slight**’. An overall residual effect of ‘**Not Significant**’ was deemed to arise on residential receptors in the townlands of Tauremore and Foiladaun.

Overall, the existing Taurbeg turbines are only visible from a very small number of receptors in a very sparsely populated rural landscape.



CH.13

LANDSCAPE AND VISUAL

END OF PART 3

Environmental Impact Assessment Report (EIAR)

Taurbeg Wind Farm Extension of Operational Life

Chapter 14 – Cultural Heritage





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Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



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14.

ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

14.1

Introduction

IAC Archaeology has prepared this chapter to assess the impact, if any, on the archaeological, architectural and cultural heritage resource as a result of the Proposed Lifetime extension of the existing Taurbeg Windfarm, County Cork and the Proposed Offsetting Lands, in County Kerry (Figure 14.1). This chapter was compiled by Faith Bailey (BA (Hons), MA, MIAI, MCIFA) and Jacqui Anderson (BA, MA, MIAI) of IAC Archaeology.

This study determines, from existing records, the nature of the archaeological, architectural and cultural heritage resource in and within the study area of the Site and the study area of the Proposed Offsetting Lands, using appropriate methods of study.

Desk-based assessment is defined as a programme of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic, and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage assets (CfA 2014).

This leads to the following:

- Determining the presence of known cultural heritage assets that may be affected by the Proposed Project;
- Assessment of the likelihood of finding previously unrecorded archaeological remains during the construction programme;
- Determining the potential impact upon the setting of known cultural heritage sites in the study area (2km from the Site boundary and 100m from the Proposed Offsetting Lands); and
- Suggested mitigation measures based upon the results of the above research.

The study involved detailed interrogation of the archaeological and historical background of the Proposed Project and study area. This included information from the Record of Monuments and Places of Counties Cork and Kerry, the topographical files of the National Museum of Ireland, and cartographic and documentary records. Inspection of the aerial photographic and satellite imagery coverage of the Proposed Project held by Bing Maps, and Google Earth has also been carried out. A field inspection was carried out during May 2024 in order to identify any known archaeological, architectural and cultural heritage sites and previously unrecorded features, structures, and portable finds within the Proposed Project.

14.1.1

Definitions

In order to assess, distil and present the findings of this study, the following definitions apply:

‘Cultural Heritage’ where used generically, is an over-arching term applied to describe any combination of archaeological, architectural, and cultural heritage features, where the term:

- ‘Archaeological heritage’ is applied to objects, monuments, buildings or landscapes of an (assumed) age typically older than AD 1700 (and recorded as archaeological sites within the Record of Monuments and Places).

- ‘Architectural heritage’ is applied to structures, buildings, their contents and settings of an (assumed) age typically younger than AD 1700.
- ‘Cultural heritage’, where used specifically, is applied to other (often less tangible) aspects of the landscape such as historical events, folklore memories and cultural associations.

14.1.2 Consultation

Following the initial research, a number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the Proposed Project and the Proposed Offsetting Lands study areas, as follows:

- Department of Housing, Local Government and Heritage – the Heritage Service, National Monuments and Historic Properties Section: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database; Preservation Orders and Register of Historic Monuments;
- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland;
- Cork County Council: Planning Section;
- Kerry County Council: Planning Section
- Historical and Ordnance Survey Maps.

14.1.3 Guidance And Legislation

The following legislation, standards and guidelines were consulted as part of the assessment.

- National Monuments Act, 1930 to 2014;
- The Planning and Development Act, 2000 (as amended);
- Heritage Act, 1995 (as amended);
- Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), 2015, EPA;
- Guidelines on the Information to be Contained in Environmental Impact Assessment Report 2022, EPA;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht, and Islands; and
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000.
- Cork County Development Plan, 2022-2028
- Kerry County Development Plan, 2022-2028

14.2 Methodology

14.2.1 Desktop Study

A 2km study area, measured from the boundary of the Proposed Lifetime Extension site, was analysed for this assessment (as shown in Figure 14.1). A separate 100m study area was examined for the Proposed Offsetting Lands. The following sources were examined, and a list of heritage assets and areas of archaeological, architectural and cultural heritage potential was compiled:

- Record of Monuments and Places for Counties Cork and Kerry;
- Sites and Monuments Record for Counties Cork and Kerry;
- National Monuments in State Care Database;
- List of Preservation Orders;
- Register of Historic Monuments;
- Topographical files of the National Museum of Ireland;

- Cartographic and documentary sources relating to the receiving environment;
- The development plans for Counties Cork and Kerry;
- National Inventory of Architectural Heritage Counties Cork and Kerry (Architectural & Garden Survey);
- Aerial photographs;
- Excavations Bulletin (1970–2025); and
- Place name analysis

Record of Monuments and Places (RMP) was established under Section 12 (1) of the National Monuments Act 1994 (as amended) which provides that the Minister for Housing, Local Government and Heritage (DoHLGH) shall establish and maintain a record of monuments and places (RMP) where it is known that such monuments exist. The record comprises of a list of monuments and relevant places and mapping showing each monument and relevant place in respect of each county in the State. Sites recorded on the RMP all receive statutory protection under the National Monuments Act.

Sites and Monuments Record (SMR) holds documentary evidence and records of field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Service as termed ‘un-located sites’ and cannot be afforded legal protection. As a result, these are omitted from the RMP. SMR sites are also listed on a website maintained by the DoHLGH – www.archaeology.ie. It should be noted that revisions are proposed to the RMP and SMR, with some sites listed as redundant records and proposed for removal and other, newly discovered sites, proposed for inclusion.

National Monuments in the State Care Database is a list of all the National Monuments in the State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of each monument. A National Monument receives statutory protection and is described as ‘a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto’ (National Monuments Act, 1930, Section 2). The Minister for the DoHLGH may acquire National Monuments by agreement or by compulsory order. The State or Local Authority may assume guardianship of any National Monument (other than dwellings). The owners of National Monuments (other than dwellings) may also appoint the Minister or the Local Authority as guardian of that monument if the State or Local Authority agrees. Once the site is in ownership or guardianship of the State, it may not be interfered with without the written consent of the Minister.

Preservation Orders List and/or Temporary Preservation Orders, can be assigned to a site or sites that are deemed to be in danger of injury or destruction. Orders are allocated under the National Monuments Act, 1930. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the National Monuments Act, 1954. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister (DoHLGH).

Register of Historic Monuments was established under Section 5 of the National Monuments (Amendment) Act, 1987 and requires the Minister to establish and maintain such a record. Historic monuments and archaeological areas included in the register are afforded statutory protection under the National Monuments (Amendment) Act, 1987. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the RMP.

The topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources are important in tracing land use development within the Site and its receiving environment as well as providing important topographical information on areas of archaeological potential and the construction of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape. These include current and former townland and parish boundaries.

Documentary sources were consulted to compile background information on the archaeological, architectural and cultural heritage receiving environment of the Proposed Project.

County Development Plans contain a catalogue of all the Protected Structures, archaeological sites and Architectural Conservation Areas within every county. The Cork County Development Plan (2022 – 2028) and Kerry County Development Plan (2022 – 2028) were examined as part of this assessment.

The National Inventory of Architectural Heritage (NIAH) was established under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. It is a government-based organisation tasked with making a nationwide record of locally, regionally, nationally and internationally significant structures dating to post-1700 AD, which in turn provides local authorities with a guide as to what structures to list within the Record of Protected Structures. Only those structures of regional importance or above are included in the Minister's recommendations for inclusion in the RPS. The NIAH have also carried out a nationwide desk-based survey of historic gardens, including demesnes that surround large houses. Whilst the NIAH Garden Survey was utilised as part of this assessment, this was carried out in conjunction with detailed analysis of the first edition Ordnance Survey maps and field inspection, in order to identify any designed landscapes within the receiving environment of the Proposed Project.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides information on the terrain and its likely potential for archaeology. Aerial photographs held by Ordnance Survey of Ireland (1995–2013), Google Earth (2012–2023) and Bing Maps (2024) were examined for this assessment.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is also available online (www.excavations.ie) from 1970-2025. Information from this resource is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files.

Place Names are an important part in understanding both the archaeology, history and cultural heritage of an area. Place names can be used for generations and in some cases have been found to have their roots deep in the historical past. The main references used for the place name analysis is Irish Local Names Explained by P.W Joyce (1870), and the Place Names Database of Ireland (www.loganim.ie).

14.2.2 Field Inspection

Field inspection is necessary to determine the extent and nature of archaeological, architectural, and cultural heritage remains and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.

The field inspection for the Proposed Lifetime Extension was carried out 21st May 2024 and entailed:

- Noting and recording the terrain type and land usage;
- Noting and recording the presence of known and previously unknown features of archaeological, architectural or cultural heritage significance;
- Verifying the extent and condition of recorded sites and structures (RMP/ RPS/ NIAH); and

- Visually investigating any suspect landscape anomalies to determine the possibility of their being anthropogenic in origin and of archaeological, architectural or cultural heritage significance.

A field inspection was not necessary for the Proposed Offsetting Lands as no excavation works are proposed within this area given the lands will be provided for improved habitat.

14.2.3 Impact Assessment Methodology

Each archaeological and cultural heritage receptor within the defined study areas have been assessed in terms of its sensitivity, the type of potential impact, magnitude of same and the potential significance of the effect/impact.

The quality and type of an impact can be classed as one of the following (as per the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022):

- Negative Impact: A change which reduces the quality of the environment, for example a change that will detract from or permanently remove an archaeological, architectural or cultural heritage site from the landscape;
- Neutral Impact: A change which does not affect the quality of the environment; or
- Positive Impact: A change which improves the quality of the environment, for example a change that improves or enhances the setting of archaeological, architectural or cultural heritage site.

The below terms are used in relation to the archaeological, architectural and cultural heritage and relate to whether a site will be physically impacted upon or not:

- Direct Impact: Where an archaeological/architectural/cultural heritage feature or site is physically located within the footprint of the Proposed Project and entails the removal of part, or all, of the monument or feature; and
- Indirect Impact: Where a feature or site of archaeological, architectural or cultural heritage merit or its setting is located in close proximity to the footprint of a development.

14.2.4 Significance of Effects

Impact Definitions (as defined by the EPA 2022 Guidelines):

- Imperceptible: An effect capable of measurement but without noticeable consequences.
- Not significant: An effect which causes noticeable changes in the character of the environment but without noticeable consequences
- Slight Effects: An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
- Moderate Effects: An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends.
- Significant Effects: An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
- Very Significant: An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
- Profound Effects: An effect which obliterates sensitive characteristics.

14.3 The Receiving Environment

14.3.1 Archaeological and Historical Background

14.3.1.1 Proposed Lifetime Extension

The Site is located within the townlands of Glasheenanargid, Taurbeg and Taurmore, in the parish of Clonfert and the barony of Duhallow, County Cork, within an upland marginal landscape. A 2km study area measured from the boundary of the Proposed Lifetime Extension Site, was analysed for this assessment.

There are no recorded archaeological monuments located within the Site; however, there are 12 recorded monuments within the study area, including one record which has since been made redundant (Figure 14-1, Table 14-1). No stray finds are recorded in the study area. There are no recorded structures of architectural merit within the Site or the study area. There are also no former designed landscapes within the Site or the study area. Two townland boundaries traverse the site, but do not appear to possess physical remains. No specific cultural heritage sites have been identified as part of this assessment.

Table 14-1 Recorded Monuments within the Proposed Lifetime Extension Study Area

RMP No.	Map ID on Figure 14.1	Townland	Classification	Distance from Site
CO013-022	1	Meentinny West	Mass-rock	462m north-northeast
CO013-039	2	Taurmore	Enclosure	532m south
CO013-023	3	Taurmore	Burial ground	600m south-southwest
CO013-024	4	Taurmore	Cairn - unclassified	692m south
CO013-034	5	Taurmore	Redundant record	770m south-southeast
CO013-032	6	Glasheenanargid	Kiln - lime	832m west
CO013-026	7	Taurmore	Ringfort - rath	888m south-southeast
CO013-025001	8	Taurmore	Kiln - lime	937m south
CO013-025002	9	Taurmore	Headstone	943m south
CO013-029	10	Taurmore	Quarry	1.09km south
CO013-021002	11	Glennaknockane	Souterrain	1.33km northwest
CO013-021001	12	Glennaknockane	Ringfort - rath	1.33km northwest

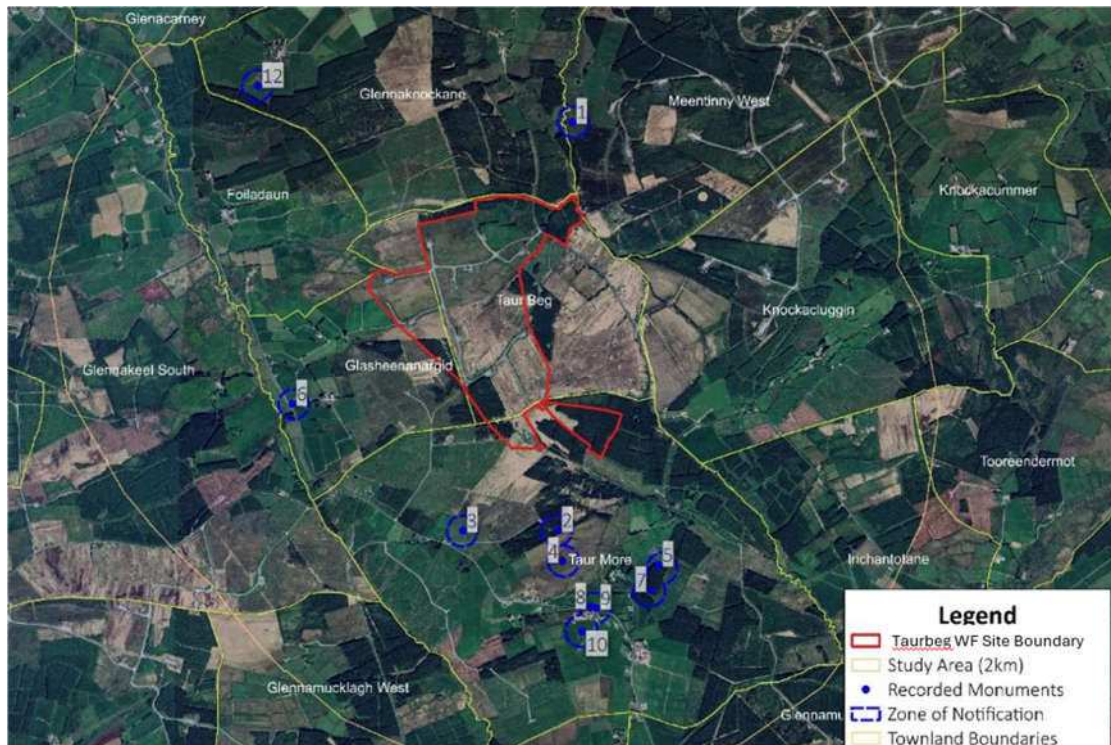


Figure 14-1: Site location showing archaeological monuments within the study area (After Google Earth 2022)

14.3.1.2 Proposed Offsetting Measures

The Proposed Offsetting Lands comprise four separate parcels of land in the townlands of Knockatee and Coom, in the parish of Ballincuslane and the barony of Trughanacmy, County Kerry. Please see Figure 14.2 below. A 100m study area was examined for the Proposed Offsetting Lands.

There are no recorded monuments within the 100m study area established for this assessment. The nearest example is a *fulacht fia* (KE040-069) located c. 550 southwest of the northernmost parcel. No stray finds are recorded from in the study area of the Proposed Offsetting Lands. There are no protected structures within the Proposed Offsetting Lands or the 100m study area. The Proposed Offsetting Lands are not located within an Architectural Conservation Zone. There are no structures listed in the NIAH within the Proposed Offsetting Lands or within the 100m study area. Similarly, there are no former designed landscapes within the site or the study area. No specific cultural heritage sites have been identified as part of this assessment; however, a number of townland boundaries are noted bordering the Proposed Offsetting Lands.

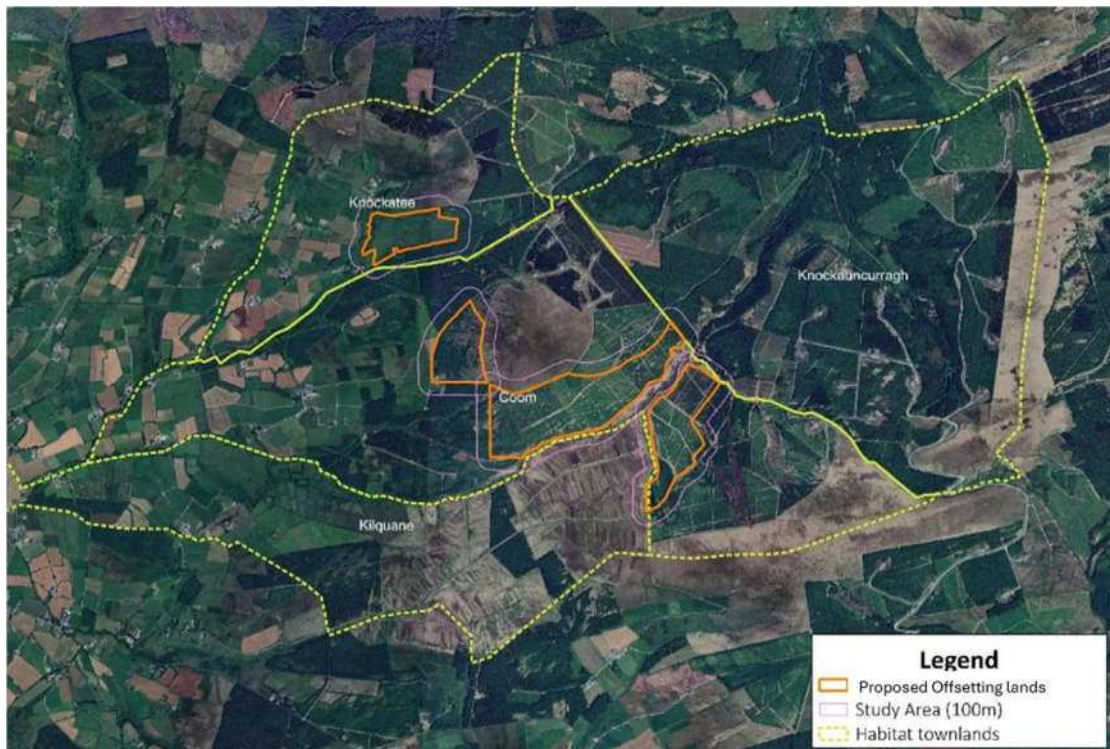


Figure 14-2: Proposed Offsetting Lands

14.3.2 Summary of Previous Archaeological Investigation

14.3.2.1 Proposed Lifetime Extension

A review of the Excavation Bulletin (1970-2025) has been carried out as part of this assessment. Unlicensed archaeological monitoring was undertaken of the groundworks associated with the existing Taurbeg Wind Farm. Nothing of archaeological significance was noted.

Archaeological monitoring of site investigations associated with wind turbine locations at a windfarm, was carried out c. 490m to the east of the Site, in the townlands of Knockacummer, Meentiny West and Knockacluggin (Licence No. 08E0713). No features or deposits of archaeological significance were discovered during the works (Carroll 2009).

Unlicensed archaeological monitoring of the excavation of test pits associated with a wind farm development in Gleenakeel South and Glentanemacelligot, c. 1.4km southwest of the Site, did not identify any features of archaeological potential (Bennett 2009:150).

14.3.2.2 Proposed Offsetting Measures

The Excavations Bulletin (1970-2025) was reviewed and this confirmed that no previous archaeological investigations have taken place within the Proposed Offsetting lands or the 100m study area to date.

14.3.3 Cartographic Analysis

14.3.3.1 Proposed Lifetime Extension

14.3.3.1.1 First Edition Ordnance Survey Map, 1844, scale 1:10,560

This is the first accurate depiction of the Site. The northern extent of the Site is shown on this mapping as agricultural land while the southern extent is shown as upland marginal land. No archaeological features are shown within the boundary of the Site. A small building is shown within or within close proximity of the footprint of existing Turbine 6 (T6) (Figure 14.3).

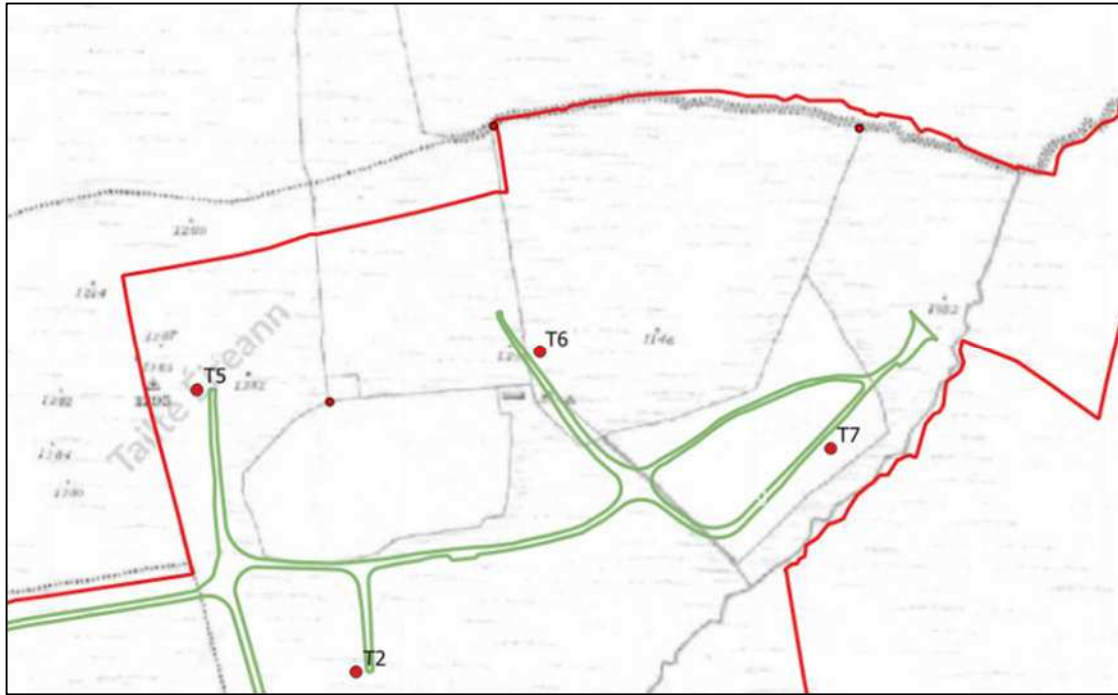


Figure 14-3: Extract from the first edition OS map of 1844 showing the approximate location of T6 and proposed road network

14.3.3.1.2

Ordnance Survey Map, 1907, scale 1:2,500

By the time of this map, a local roadway has been constructed in the northeast extent of the site. A small vernacular farmyard, comprising two structures and a lime kiln, is located immediately west of the roadway. The farmyard structures were located within the site within the footprint of the current entrance, while the lime kiln would have been located immediately south of the entrance to the existing wind farm. (Figure 14.3)

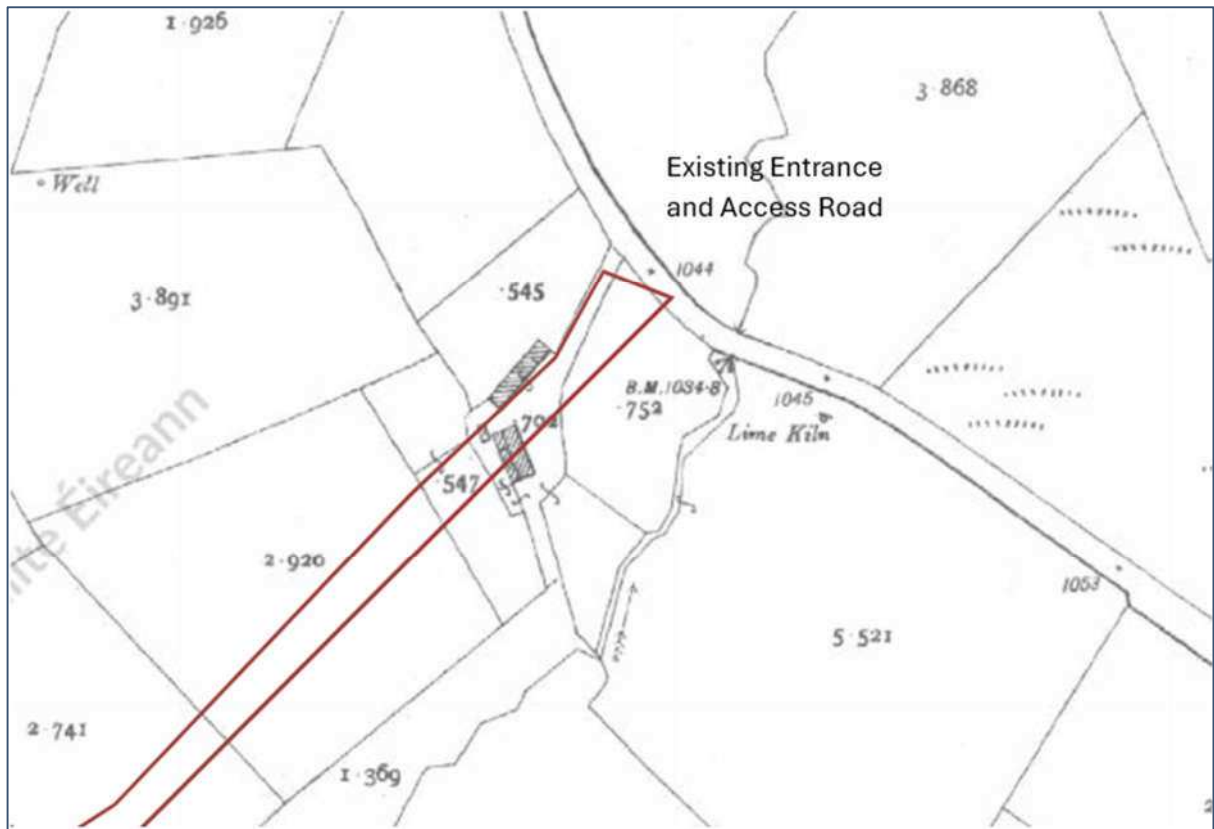


Figure 14-4: Extract from the historic OS map of 1907 showing the approximate location of the existing entrance and access road

14.3.3.2 Proposed Offsetting Measures

The cartographic sources depict the Proposed Offsetting Lands to be located in a rural marginal landscape. The first OS map of 1844 shows the southernmost parcel of land is bordered by a stream, labelled Glengarriff Stream, located c. 48m north. This section of the Proposed Offsetting Lands is c. 20m west of the townland boundary between the townlands of Coom and Knockauncurragh, which is formed by a small unnamed watercourse, which meets the Glengarriff Stream. The townland boundary between Coom and Kilquane is shown c. 10m to the west of this section of the Proposed Offsetting Lands, although modern mapping shows this same boundary traverses the western extent of the Proposed Offsetting Lands. No features of archaeological, architectural or cultural heritage potential are depicted within the southernmost parcel of the Proposed Offsetting Lands. The largest portion of the Proposed Offsetting Lands is located in Coom to the immediate south of Mount Eagle. This section is bordered on its east end by the townland boundary between Coom and Knockauncurragh, which appears to survive as a forestry boundary. The Glengarriff Stream is located partially within the southern boundary of this section of the Proposed Offsetting Lands. No features of archaeological, architectural or cultural heritage potential are depicted within the largest parcel of the Proposed Offsetting Lands.

The smaller parcel of the Proposed Offsetting Lands within the townland of Coom is depicted in the first edition OS mapping as marginal land to the west of Mount Eagle. This section is bordered to the northwest by a small informal trackway. The northernmost parcel of the Proposed Offsetting Lands is shown on the first edition OS map of 1844 as in Knockatee townland. This section is subdivided into a number of fields and is bordered by a local road to the south. A vernacular farmstead is present to the immediate south of the Proposed Offsetting Lands, which comprises two structures north of the access road and two other larger structures to the south of the road (Figure 14.5). By the time of the later OS map of 1894, there is little significant change to the three southern sections of the Proposed Offsetting Lands within the townland of Coom. In the northernmost section, a new house and access round have been constructed, while the two buildings north of the local road have been removed (Figure 14.6). The southern structures of the vernacular group remain present.

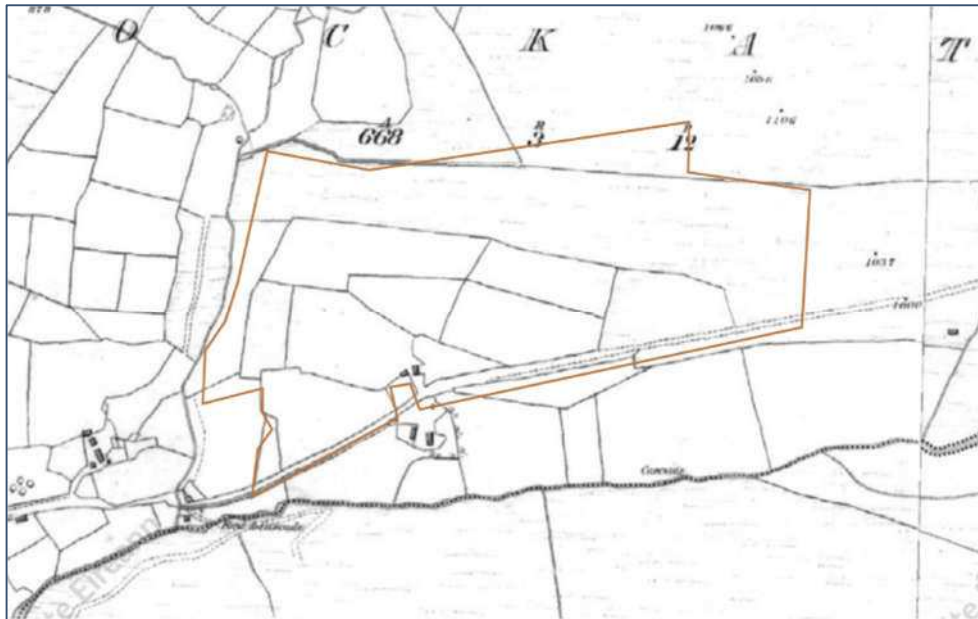


Figure 14-5: Extract from first edition OS map of 1844 showing the approximate outline of the northern parcel of the Proposed Offsetting Lands

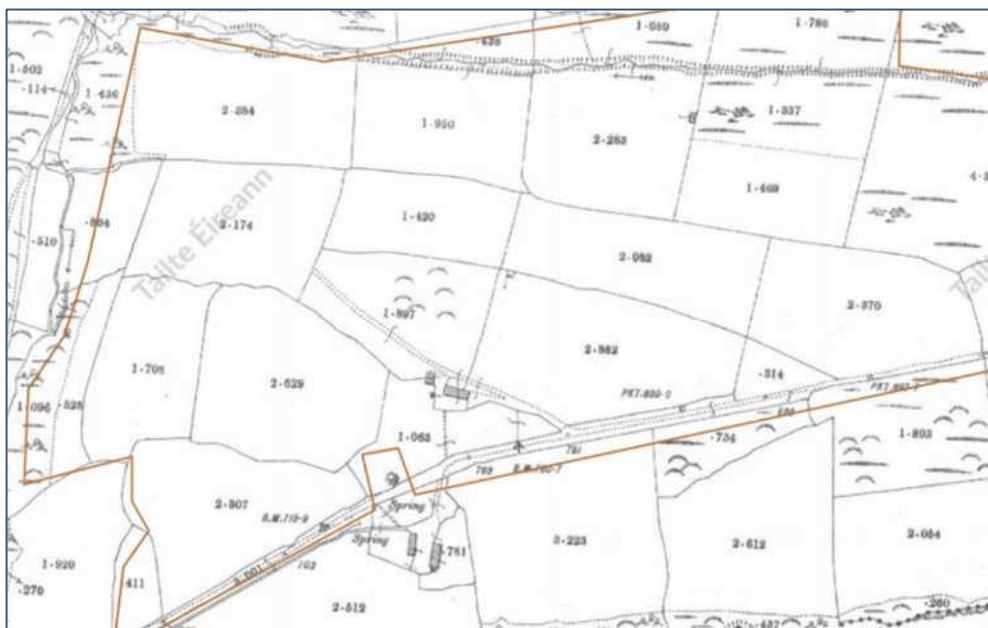


Figure 14-6: Extract from first edition OS map of 1894 showing the approximate outline of the northern parcel of the Proposed Offsetting Lands

14.3.4 County Development Plans

14.3.4.1 Cork County Development Plan 2022-2028

14.3.4.1.1 Archaeology

Objective HE 16-2 of the County Development Plan:

Secure the preservation (i.e. preservation in situ or in exceptional cases preservation by record) of all archaeological monuments and their setting included in the Sites and Monuments Record (SMR) (see www.archaeology.ie) and the Record of Monuments and Places (RMP) and of sites, features and objects of archaeological and historical interest generally.

There are no recorded monuments within the boundary of the Site. There are 12 recorded monuments within the study area, including one redundant record (Table 14-1, Figure 14-1). The redundant record was initially interpreted as an archaeological monument and was included as a RMP site. It represents a depression or quarry and has been reclassified as redundant (SMR file). It remains subject to statutory protection until the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 is fully implemented.

None of the recorded monuments within the study area are National Monuments in State Care or subject to Preservation Orders.

14.3.4.1.2 **Record of Protected Structures**

Objective HE 16-14 of the Cork County Development Plan

Record of Protected Structures

- a) The identification of structures for inclusion in the Record will be based on criteria set out in the Architectural Heritage Protection Guidelines for Planning Authorities (2011).*
- b) Extend the Record of Protected Structures in order to provide a comprehensive schedule for the protection of structures of special importance in the County during the lifetime of the Plan as resources allow.*
- c) Seek the protection of all structures within the County, which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. In accordance with this objective, a Record of Protected Structures has been established and is set out in Volume Two Heritage and Amenity, Chapter 1 Record of Protected Structures.*
- d) Ensure the protection of all structures (or parts of structures) contained in the Record of Protected Structures. e) Protect the curtilage and attendant grounds of all structures included in the Record of Protected Structures.*
- f) Ensure that development proposals are appropriate in terms of architectural treatment, character, scale and form to the existing protected structure and not detrimental to the special character and integrity of the protected structure and its setting.*
- g) Ensure high quality architectural design of all new developments relating to or which may impact on structures (and their settings) included in the Record of Protected Structures.*
- h) Promote and ensure best conservation practice through the use of specialist conservation professionals and craft persons.*
- i) In the event of a planning application being granted for development within the curtilage of a protected structure, that the repair of a protected structure is prioritised in the first instance i.e. the proposed works to the protected structure should occur, where appropriate, in the first phase of the development to prevent endangerment, abandonment and dereliction of the structure.*

There are no structures included on the Record of Protected Structures within the Site boundary or the study area.

14.3.4.1.3 **Architectural Conservation Areas**

Object HE 16-17 of the Cork County Development Plan:

Areas of Special Planning Control Establish areas of special planning control within Architectural Conservation Areas where appropriate. These areas will include a scheme setting out objectives for

the conservation and enhancement of the special character of the area and will be based on an Architectural Appraisal of each town.

There are no Architectural Conservation Areas within the Site boundary or the study area.

14.3.4.2 **Kerry County Development Plan 2022-2028**

14.3.4.2.1 **Archaeology**

Objective KDCP 8-24 of the Kerry County Development Plan:

- (i) *Secure the preservation in situ of all sites, features, protected wrecks and objects of archaeological interest within the county. In securing such preservation the Council will have regard to the advice and recommendations of the National Monuments Service, Department of Housing, Local Government and Heritage, the National Museum of Ireland, and the County Archaeologist.*
- (ii) *Ensure that proposed development (due to location, size, or nature) which may have implications for the archaeological heritage of the county will be subject to an Archaeological Assessment (including Underwater Archaeological Impact Assessment) which may lead to further subsequent archaeological mitigation – buffer zones/exclusion zones, monitoring, pre-development archaeological testing, archaeological excavation and/or refusal of planning permission. This includes areas close to archaeological monuments, development sites which are extensive in area (half hectare or more) or length (1km or more) or include potential impacts on underwater cultural heritage and development that requires an Environmental Impact Assessment.*

There are no recorded monuments within the Proposed Offsetting Lands or within the 100m study area.

14.3.4.2.2 **Record of Protected Structures**

Objective KDCP 8-40 of the Kerry County Development Plan:

Ensure that any development, modification, alteration, or extension affecting a protected structure and/or its setting including designed landscape features and views, is compatible with the special character of that structure.

There are no protected structures within the Proposed Offsetting Lands or within the 100m study area.

14.3.4.2.3 **Architectural Conservation Areas**

Objective KDCP 8-44 of the Kerry County Development Plan:

Ensure developments in an ACA have a positive impact on the intrinsic character of the area, respect the existing streetscape and layout, and are compatible in terms of design, materials, traffic, views, and intensity of site use.

The Proposed Offsetting Lands are not located within an Architectural Conservation Area.

14.3.5 **National Inventory of Archaeological Heritage**

14.3.5.1 **Proposed Lifetime Extension**

14.3.5.1.1 **NIAH Building Survey**

There are no structures listed on the NIAH Building survey within the Site boundary or the 2km study area.

14.3.5.1.2 **NIAH Garden Survey**

There are no designed landscapes within the study area of the Proposed Project, included in the NIAH Garden Survey or shown on the first editions OS map of 1844. The rural and upland nature of the surrounding environs would not have been appealing as a setting for a large country estate.

14.3.5.2 **Proposed Offsetting Measures**

14.3.5.2.1 **NIAH Building Survey**

There are no structures listed in the NIAH Building Survey within the Proposed Offsetting Lands or the 100m study area.

14.3.5.2.2 **NIAH Garden Survey**

There are no designed landscapes listed in the NIAH Garden Survey within Proposed Offsetting Lands or the 100m study area.

14.3.6 **Topographical Files of the National Museum of Ireland**

14.3.6.1 **Proposed Lifetime Extension**

Information on artefact finds from the study area in County Cork have been recorded by the National Museum of Ireland since the late 18th century. There are no recorded stray finds from the study area of the Proposed Project.

14.3.6.2 **Proposed Offsetting Measures**

Information on artefact finds from the study area in County Kerry have been recorded by the National Museum of Ireland since the late 18th century. There are no recorded stray finds from the study area of the Proposed Offsetting Lands.

14.3.7 **Aerial Photographic Analysis**

14.3.7.1 **Proposed Lifetime Extension**

Inspection of the aerial photographic coverage of the Site held by the Ordnance Survey (1995–2013), Google Earth (2012–2023) and Bing Maps (2024) revealed that prior to the construction of the existing windfarm development area comprised upland marginal land. The construction of the existing Taurbeg Wind Farm was carried out between 2005 and 2006(OSI) and comprises access roads and Turbines 1 to 12. There have been no changes to the Site since its construction.

14.3.7.2 **Proposed Offsetting Measures**

The aerial imagery of the Proposed Offsetting Lands held by the Ordnance Survey (1995–2013), Google Earth (2012–2023) and Bing Maps (2024) was analysed as part of this assessment but did not reveal any previously unknown features of archaeological potential. The lands are marginal in nature and occupied by a mixture of rough pasture, scrub and commercial forestry.

14.3.8 Cultural Heritage

There are no specific cultural heritage sites within the Site or the surrounding study area, although the archaeological features described above do form part of the cultural heritage resources.

14.3.8.1 Toponymy of Townlands

14.3.8.1.1 Proposed Lifetime Extension

Townland and topographic names are an invaluable source of information on topography, land ownership and land use within the landscape. They also provide information on history, archaeological monuments and folklore of an area. A place name may refer to a long-forgotten site and may indicate the possibility that the remains of certain sites may still survive below the ground surface. The main references used for the place name analysis is Irish Local Names Explained by P.W Joyce (1870) and logainm.ie. A description and possible explanation of each place name in the 5km study area of the proposed wind farm site are provided in Table 14-2 below.

Table 14-2 Placename Analysis- Proposed Lifetime Extension

Townland	Origin	Derivation	Possible Meaning
Foildaun	Irish	<i>Faill an Deamhain</i>	Precipice of the stag
Glasheenanargid	Irish	<i>Glaisín an Airgid</i>	Little brook of the silver
Glenacarney	Irish	<i>Gleann Uí Chearnaigh</i>	O’Kearney’s Glen/ valley
Glennakeel South	Irish	<i>Gleann an Chaoil</i>	Glen of the narrow stream
Glennaknockane	Irish	<i>Gleann an Chnocáin</i>	Glen of the hillocks
Glennamucklagh East	Irish	<i>Gleann na Muclach</i>	Valley of the pig-styes or places where pigs are fed (likely divided into East and West at a later date)
Glennamucklagh West	Irish	<i>Gleann na Muclach</i>	Valley of the pig-styes or places where pigs are fed (likely divided into East and West at a later date)
Inchantotane	Irish	<i>Inse an Tóiteáin</i>	Island or holm of the burning
Knockacluggin	Irish	<i>Cnoc an Chloiginn</i>	Hill of the skull-shaped or bell-shaped top
Knockacummer	Irish	<i>Cnoc an Chomair</i>	Hill of the river-confluence
Meentinny West	Irish	<i>Mín Tine</i>	Smooth grassy patch of (the) fire (likely divided into East and West at a later date)
Taur Beg	Irish	<i>Teamhair</i>	This placename is of unclear origin- it may be related to the

Townland	Origin	Derivation	Possible Meaning
			<i>Teamhair Luachra</i> referred to in historical texts (likely divided into Beg (small) and More (big) at a later date)
Taur More	Irish	<i>Teamhair</i>	This placename is of unclear origin- it may be related to the <i>Teamhair Luachra</i> referred to in historical texts (likely divided into Beg (small) and More (big) at a later date)
Tooreendermot	Irish	<i>Tuairín Diarmada</i>	Dermot's little bleach/ green
Tooreennagrena	Irish	<i>Tuairín na Gréine</i>	Little sunny bleach/ green

14.3.8.1.2 **Proposed Offsetting Measures**

The townland names and possible meanings within the study area of the Proposed Offsetting Lands are detailed below in Table 14.3.

Table 14-3 Placename Analysis- Proposed Offsetting Measures

Townland	Origin	Derivation	Possible Meaning
Coom	Irish	<i>An Com</i>	The hollow
Knockatee	Irish	<i>Cnoc an Tí</i>	Hill of the house
Kilquane	Irish	<i>Cill Chuáin</i>	Church of St Cuáin
Knockauncurragh	Irish	<i>An Cnocán Corrach</i>	Rugged hillock

14.3.8.2 **Townland Boundaries**

Although not usually recorded as archaeological monuments in their own right, townland boundaries are important as cultural heritage features. It remains unclear how old some of these land units actually are, though it has been convincingly argued that many may date to at least the medieval period and, in some cases, may be significantly older than this (McErlean 1983; MacCotter 2008).

14.3.8.2.1 **Proposed Lifetime Extension**

In the case of the townland boundaries within the existing windfarm boundary, they remain present, outside of the existing infrastructure. The boundaries within the site are straight and uniform and likely date to the 19th century when boundaries within the marginal landscapes of Ireland were formalised by the Ordnance Survey Surveyors. The townland boundaries within the site separate Glasheenanargid, Taurbeg and Taurmore and are shown on Figure 14.1.

14.3.8.2.2 **Proposed Offsetting Measures**

There are no townland boundaries within the Proposed Offsetting Lands. Although the modern mapping places the Coom- Kilquane boundary within the western extent of the southernmost parcel of

the Proposed Offsetting Lands, analysis of the historic mapping confirmed that the correct location of the townland boundary is c. 10m to the west of this section.

14.3.9 Field Inspection

14.3.9.1 Proposed Lifetime Extension

A field inspection of the Site was carried out in May 2024 as part of this assessment. The weather conditions at the time comprised hill fog, which reduced visibility.

The existing entrance to the windfarm is defined by a wide recessed vehicular access point that runs from the local road (L5005) that borders the site to the northeast. The access track is formed by a compacted stone surface and splits into two sections to climb a northeast facing slope to the northwest of Turbine 7. It continues upslope with northerly aligned branches to Turbines 5 and 6. It also passes to the immediate north of a small service building and Turbine 2. To the south of Turbine 5 the landscape levels slightly, with the majority of the existing turbines located along the summit of the high ground, aligned roughly north-south. Here the access track turns south to service Turbines 8 and 12, before turning northeast to Turbines 1 and 9 and then south-southeast to Turbines 10 and 11. Each turbine location is characterised by the turbine itself and an area of adjacent hard standing, which originally functioned as a crane pad. The access tracks have been cut through the landscape to reduce slopes where possible. No additional ground works are proposed as part of the development under assessment. Plates 14-1 to 14-2 provide an overview of the development area and existing windfarm.

No previously unrecorded sites or structures of archaeological, architectural or cultural heritage potential were identified during the course of the field inspection.



Plate 14-1 Access track and Turbine 12, 2 and 5, facing north



Plate 14-2 Access track and Turbine 2, 12, 1, 9, 11, 10, facing south-southeast

14.3.9.2 **Proposed Offsetting Measures**

Field inspection was not required for the Proposed Offsetting Lands as no construction or excavation works are proposed within this parcel of land, with the tree stumps being left in-situ after felling.

14.4 **Likely Significant Effects and Associated Mitigation Measures**

14.4.1 **Do Nothing Alternative**

The 'Do-Nothing' alternative with regard to the Proposed Lifetime Extension, is to decommission the existing wind farm in 2026 when the current permission expires. As part of the decommissioning stage, the existing turbines would be dismantled, and all associated access roads, hardstands and turbine foundations removed; please see Section 4.7 in Chapter 4 of this EIAR for further details regarding decommissioning. The Proposed Lifetime Extension seeks to extend the operational life of the existing wind farm to 2036, at which stage the wind farm would be decommissioned.

14.4.2 **Construction Phase Potential Effects (Direct)**

No construction activities, groundworks or alterations to the existing wind farm are proposed as part of the Proposed Project. There will be therefore, no direct negative effects on the archaeological, architectural or cultural heritage as a result of the Proposed Lifetime Extension.

In addition, no intrusive works are proposed for the Proposed Offsetting Lands. Therefore, there will be no direct negative effects on the archaeological, architectural and cultural heritage resources as a result of the Proposed Offsetting Measures.

14.4.3 **Construction Phase Potential Effects (Indirect)**

There are no potential indirect effects on the archaeological, architectural or cultural heritage resource, as there are no construction activities proposed as part of the Proposed Lifetime Extension and the Proposed Offsetting Measures.

14.4.4 **Operational Phase Potential Effects (Direct)**

No direct impacts will occur in the archaeological, architectural and cultural heritage during the extended operational phase. This is due to the fact that there are no archaeological, architectural or cultural heritage sites within the Proposed Lifetime Extension site that will be directly affected by the extended operational phase of the wind farm.

14.4.5 **Operational Phase Potential Effects (Indirect)**

The baseline environment consists of the existing wind farm including turbines, existing roads and service building. The Proposed Lifetime Extension will not result indirect effects on the archaeological, architectural and cultural heritage resource as the existing turbines will remain in place which will not materially change the character of the existing baseline environment.

14.4.6 **Decommissioning Phase**

No effects are predicted upon the archaeological, architectural and cultural heritage resource as a result of decommissioning.

14.4.7 **Mitigation**

As there are no potential direct or indirect effects on the archaeological, architectural and cultural heritage resource, no mitigation is deemed necessary.

14.5 **Cumulative Effects**

As the existing wind farm is extant and forms part of the receiving environment, no cumulative effects are predicted with regards the Proposed Lifetime Extension., when considered with proposed surrounding developments.

Environmental Impact Assessment Report

Taurbeg Wind Farm Extension of Operational Life

Chapter 15 - Material Assets





DOCUMENT DETAILS

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Project Title: **Taurbeg Wind Farm Extension of Operational Life**

Project Number: **231030**

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Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



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15.

MATERIAL ASSETS

Material Assets are defined in the ‘Guidelines on the Information to be contained in Environmental Impact Assessment Reports’ (EPA, 2022) as ‘*built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure*’. They may be either of human or natural origin. The cultural assets of Archaeology and Cultural Heritage are addressed in Chapter 14 of this Environmental Impact Assessment Report (EIAR). Economic assets of natural heritage include non-renewable resources such as minerals or soils, and renewable resources such as wind and water. These assets are addressed in Chapter 8: Land, Soils and Geology, Chapter 9: Hydrology and Hydrogeology, Chapter 10: Air Quality, and Chapter 11: Climate. Tourism and amenity resources, which are also considered material assets, are addressed in Chapter 5 on Population and Human Health. The Population and Human Health chapter also addresses existing land-uses (economic assets), including forestry and agriculture.

For the purposes of this EIAR, the various project components are described and assessed using the following references: ‘Proposed Project’, ‘Proposed Lifetime Extension’, ‘Proposed Offsetting Measures’, ‘Proposed Offsetting Lands’ and the ‘Site’. Please see Section 1.1.1 of this EIAR for further details. A detailed description of the Proposed Project is provided in Chapter 4 of this EIAR.

15.1

Introduction

This chapter of the EIAR addresses the likely significant effects of the Proposed Lifetime Extension and Proposed Offsetting Measures on transportation infrastructure (Section 15.2), telecommunications and aviation (Section 15.3) and on other material assets (Section 15.3), which are economic assets of human origin, including telecommunications, aviation and utilities. This chapter of the EIAR has been prepared in accordance with the requirements of the EIA legislation and guidance outlined in Chapter 1: Introduction

The Proposed Lifetime Extension is being brought forward in response to local, national, regional and European policy regarding Ireland’s transition to a low-carbon economy, associated climate change policy objectives and to reduce Ireland’s dependence on imported fossil fuels for the production of electricity.

15.2 Traffic and Transport

This section of the EIAR assesses the effects on roads, traffic and transport of the traffic movements that will be generated during the extended operational and decommissioning phase of the Proposed Lifetime Extension as well as during the Proposed Offsetting Measures.

For the development of new wind farms, the construction phase is the critical period with respect to the traffic effects experienced on the surrounding road network, in terms of both the additional traffic volumes that will be generated on the road network, and the geometric requirements of the abnormally large loads associated with the wind turbine plant.

However, since the Proposed Lifetime Extension does not involve any construction work, any potential traffic and transport effects are limited to the extended operational and decommissioning phases of the Proposed Lifetime Extension and the Proposed Offsetting Measures.

15.2.1 Guidance and Legislation

This section of the EIAR has been completed in accordance with the guidance set out in Chapter 1: Introduction. The assessment uses standard terminology to describe the likely significant effects associated with the Proposed Project. Further information on the classification of effects used in this assessment is presented in Chapter 1. The scope of the traffic impact assessment presented is in accordance with TII's Traffic and Transport Assessment Guidelines) – PE-PDV-02045 with (2014), the scope reflecting the fact that the EIAR is for the extension of life of an existing wind farm in addition to a short period of works required for the Proposed Offsetting Measures. In addition, an assessment of the Taurbeg Wind Farm access junction is made with reference Geometric Design of Junctions - DN-GEO-03060, May 2023.

15.2.2 Statement of Authority

This section of the EIAR has been prepared by Alan Lipscombe of Alan Lipscombe Traffic and Transport Consultants Ltd. Alan is a competent expert in traffic and transport assessments. In 2007 Alan set up a traffic and transportation consultancy providing advice for a range of clients in the private and public sectors. Prior to this Alan was a founding member of Colin Buchanan's Galway office having moved there as the senior transportation engineer for the Galway Land Use and Transportation Study. Since the completion of that study in 1999, Alan has worked throughout Ireland on a range of projects including: major development schemes, the Galway City Outer Bypass, Limerick Planning Land-Use and Transportation Study, Limerick Southern Ring Road Phase II, cost benefit analyses (COBA) and various studies for the University of Galway. Before moving to Galway in 1997, Alan was involved in a wide variety of traffic and transport studies for CBP throughout the UK, Malta and Indonesia. He has particular expertise in the assessment of development related traffic, including many wind farm developments including the following: Ardderroo, Derrinlough, Knocknamork, Shehy More, Cloncreen, Derrykillew, Ballyhorgan, Lettergull, Barnadivane, Cleanrath, Knockalough, Sheskin South and Borrisbeg.

Alan has a BEng (hons) Degree in Transportation Engineering (Napier University, Edinburgh, 1989), is a member of Engineers Ireland and of the Institute of Highways and Transportation and is a TII accredited Road Safety Audit Team Member.

15.2.3 Scoping and Consultation

In order to assess the potential for significant effects on local traffic in the vicinity of the Site, scoping requests were made to the Department of Transport and Transport Infrastructure Ireland. Please refer to Section 2.9 of Chapter 2 of this EIAR for details in relation to the EIA scoping exercise

Department of Transport

The Department of Transport responded to scoping via an email dated 27th February 2024, stating that it had no observations at that time and requested to be kept informed of any further developments in the future.

Transport Infrastructure Ireland

Transport Infrastructure Ireland (TII) responded to scoping via an email dated 1st of March 2024, in which it provided a list of general recommendations to be followed when preparing the EIAR. The issues raised by TII together with the Applicant's responses are provided in Table 15-1 below.

Table 15-1 Issues raised by TII in relation to the Proposed Lifetime Extension and Responses

ID	Comment/Recommendation	Response
1	Consultations should be had with relevant Local Authority / National Roads Design Offices with regards to locations of existing and future national roads schemes.	There will be no abnormal loads associated with either the Proposed Lifetime Extension or the Proposed Offsetting Measures. Neither the Site or the lands where Proposed Offsetting measures are accessed from the national road network.
2	TII would be specifically concerned as to potential significant impacts the development would have on the national road network (and junctions with national roads) in the proximity of the Proposed Project, including the potential haul route.	It is noted that the EIAR relates to the continued operation of the existing Taurbeg Wind Farm, which generates very low volumes of traffic, and the Offsetting lands, which will generate 10 HGV movements for 20 days only, as set out in Section 15.2.4.3. It is concluded that there are no significant traffic related impacts relating to either the Proposed Offsetting Measures or Proposed Lifetime Extension.
3	The Applicant, in preparing an EIAR, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works).	A review of the design of the existing access junction is undertaken with reference to TII guidelines, as discussed in Section 15.2.4.4 and shown in Figures 15-1 and 15-2.
4	The EIAR / EIS should consider the "Environmental Noise Regulations 2006" (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see "guidelines for the	The potential impacts of the Proposed Project with regards noise set out in Chapter 12 of this EIAR.

ID	Comment/Recommendation	Response
	Treatment of Noise and Vibration in National Road Schemes' (1st Rev, NRA 2004).	
5	<p>It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site with reference to impacts on the national road network and junctions of lower category roads with national roads.</p> <p>In relation to national roads, the Authority's Traffic and Transport Assessment Guidelines (2014) should be referred to in relation to proposed development with potential impacts on the national road network.</p> <p>The scheme promoters are advised to have regard to Section 2.2 of the NRA/TII TTA Guidelines which addresses requirements for sub-threshold TTA. Any improvements required to facilitate development should be identified. It will be the responsibility of the developer to pay for the costs of any improvements to national roads to facilitate the private development proposed as TII will not be responsible for such costs.</p>	<p>It is confirmed that the assessment presented in this section of the EIAR is undertaken in accordance with Traffic and Transport Assessment Guidelines, TII (2014) with the scope reflecting the fact that the EIAR is for the continuance of use of an existing wind farm in addition to a short period of minor works required as part of Proposed Offsetting Measures.</p>
6	The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required.	A Road Safety Audit has not been undertaken as the road infrastructure and access junction at the existing Taurbeg Wind Farm off the L5005 is existing.
7	In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network.	While very low volumes of HGV trips may travel to from the Site during the Proposed Offsetting Measures via the N21 to the west and the N72 from the south (a maximum of 10 movements in one day for a total of 20 days only), there will be no additional traffic movements generated by the Proposed Lifetime Extension.
8	With respect to turbine and associated delivery haul route(s) which utilise national roads, in	There will be no abnormal loads generated by the Proposed Lifetime

ID	Comment/Recommendation	Response
	relation to any proposed haul route, where abnormal 'weight' loads are proposed, separate structure approvals/permits and other licences may be required. All national road structures on the haul route through all the relevant County Council administrative areas should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal 'weight' load proposed.	Extension, with the HGV trips generated during the Proposed Offsetting Measures being standard trucks.
9	In addition, the haul route should be assessed to confirm capacity to accommodate abnormal 'length' loads and any temporary works required.	There will be no abnormal loads generated by either the Proposed Project or Proposed Offsetting Measures.
10	<p>The national road network is managed by a combination of PPP Concessions, Motorway Maintenance and Renewal Contracts (MMaRC) and local road authorities in association with TII.</p> <p>The applicant/developer should also consult with all PPP Companies, Motorway Maintenance and Renewals Contractors (MMaRC) and road authorities over which the haul route traverses to ascertain any operational requirements, including delivery timetabling, etc. to ensure that the strategic function of the national road network is safeguarded.</p>	The Proposed Project (including Proposed Offsetting Measures) will have no impact on the Motorway road network.
11	Where temporary works within any MMaRC Contract Boundary are required to facilitate the transport of turbine components to the Site, the applicant/developer shall contact thirdpartyworks@tii.ie in advance, as a works specific Deed of Indemnity will be needed by TII before the works can take place.	This is not applicable for the Proposed Project.
12	Additionally, any damage caused to the pavement on the existing national road arising from any temporary works due to the turning movement of abnormal loads (e.g. tearing of the surface course, etc.) shall be rectified in accordance with TII Pavement Standards and details in this regard shall be agreed with the Road Authority prior to the commencement of any development onsite.	There will be no abnormal load deliveries for the Proposed Project and so it is suggested that this is not applicable to the Proposed Project.
13	In the event of any Greenway and National Cycle Network Plan (NCN) proposals in the vicinity of the proposal or haul route,	Cork County Council will be consulted on this issue.

ID	Comment/Recommendation	Response
	consultation with the local authority internal project and/or design staff is recommended.	

15.2.4 Receiving Environment

15.2.4.1 Site Location

15.2.4.1.1 Proposed Lifetime Extension

The existing Taurbeg Wind Farm is located approximately 3.5km south of Rockchapel and 10.5km northwest of Newmarket, Co. Cork, in the townlands of Taurbeg, Glasheenargid and Taumore.

The existing wind farm comprises of 11 turbines, wind turbine foundations, hardstands, site access road and junction off the L5005 local secondary road, substation and met mast. The Taurbeg Wind Farm is connected to the national electricity grid at the existing Glenlara 110kV Substation. A 38kV underground cable runs between the onsite substation and a mast at the south of the site. A 38kV overhead line runs from the mast to the existing Glenlara 110kV Substation. The grid connection does not form part of the current planning application.

A site location map for the Proposed Lifetime Extension, is provided in Figure 1-1 of Chapter 1: Introduction.

15.2.4.1.2 Proposed Offsetting Lands

The Proposed Offsetting lands are located approximately 8km east of Castleisland, Co. Kerry in the townlands of Coom and Knockatee.

A site location map for the Proposed Offsetting lands, is provided in Figure 1-1 of Chapter 1: Introduction.

15.2.4.2 Local Road Network

15.2.4.2.1 Proposed Lifetime Extension

The existing Taurbeg Wind Farm is accessed for the purpose of routine maintenance via a single existing access junction located off the west side of the local L5005 road in the townland of Taurbeg. The access is located approximately 3.6km along the L5005 to the south of the junction with the R576 regional road. The location of the existing access is shown in the context of the local and regional road network in Figure 15-1.

15.2.4.2.2 Proposed Offsetting Lands

The existing lands are accessed for agricultural practises via the L10720 (Co. Kerry) to the northeast of the site. The forested areas of the site are accessed for forestry practises via the L10750.

15.2.4.3 Existing and Proposed Trip Generation

15.2.4.3.1 Proposed Lifetime Extension

The existing turbines are accessed via the onsite network of existing wind farm access roads, which are also shown in Figure 15-1. As the existing Taurbeg Wind Farm is currently operational, with no changes proposed, there is no construction phase associated with the Proposed Lifetime Extension. Therefore, there will be no new construction traffic generated by the continued operation of the existing Taurbeg Wind Farm.

During the Proposed Lifetime Extension, the wind farm will continue to be remotely monitored. The maintenance contractor for Taurbeg Wind Farm will be responsible for ensuring each turbine is well maintained. Each turbine is subject to a twice yearly maintenance schedule which includes twice yearly master maintenance and visual blade inspections. In addition, there will be a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes. The use of a crane on site may be required but this is only for major component repairs/change. All site roads and public roads are suitable for this access if required, as per the construction phase of the existing Taurbeg Wind Farm and no modifications are required. Typically, maintenance traffic will consist of four-wheel drive LGVs. The wind farm operations and maintenance manager will continue to attend the site regularly (in recent years this has averaged approximately 9 no. visits per year) to perform inspections and oversee maintenance works. The onsite substation and site tracks will also require periodic maintenance. The existing Taurbeg 38 kV Substation will continue to be operational 24 hours per day, 7 days a week throughout the year. Substations can be operated remotely and manually. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link. It is estimated that daily visits of one maintenance team will be made to the site for authorised persons and vehicles to undertake minor routine maintenance and inspection, if and when required. The level of activity required for the maintenance of the existing Taurbeg Wind Farm infrastructure is minimal.

The impact of these trips on local traffic during the Proposed Lifetime Extension is discussed in Section 15.2.5.3 below.

15.2.4.3.2 **Proposed Lifetime Extension- Decommissioning Phase**

It is estimated, on a precautionary basis, that 157 truckloads, traveling to and from the site, will be generated during the Decommissioning Phase, of which 88 will be abnormal loads, and 69 will be standard large articulated HGVs or trucks.

It is estimated that this will occur over a 3 to 6 month period.

15.2.4.3.3 **Proposed Offsetting Measures**

In addition to the above, there will also be some HGV movements generated during the deforestation works associated with the Proposed Offsetting Measures, which is described in detail in Appendix 7-7. It is estimated that as part of this work, 95.5 Ha of trees will be felled to waste material which will be retained on the site. There will be a further 10 Ha of trees felled which will be chipped and removed from the site. It is estimated that this will produce 2,000 tonnes of material or 80 x 25 tonne loads that will be removed from the site at a rate of 5 HGV loads, or 10 HGV movements per day on 20 separate days. The impact of these trips on the local traffic during the Proposed Offsetting Measures is discussed in Section 15.2.5.2 below.

15.2.4.4 **Existing Site Access**

A site visit was undertaken on Thursday 30th May 2024 in order to assess the existing Taurbeg Wind Farm access junction on the L5005, with images from the visit shown in Plates 15-1 to 15-4 Below.

As shown in Plate 15-1 below, the existing access is a wide gravel surfaced road with a width of approximately 12m at the mouth of the junction at the connection with the L5005. As shown in Plate 15-1, there are currently no junction markings or signs.



Plate 1 Existing Taurbeg Wind Farm Access Road – Taken from L5005

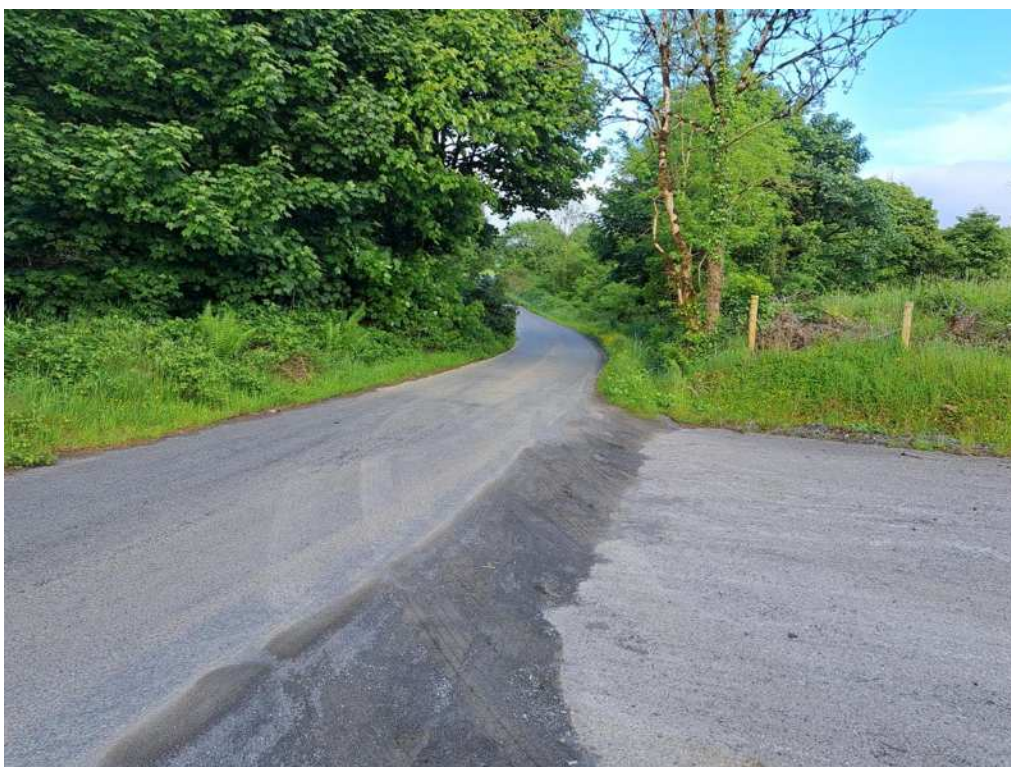


Plate 2 Looking east along L5005 – Taken from Taurbeg Wind Farm access road



Plate 3 Looking west along L5005 – Taken from Taurbeg Wind Farm access road

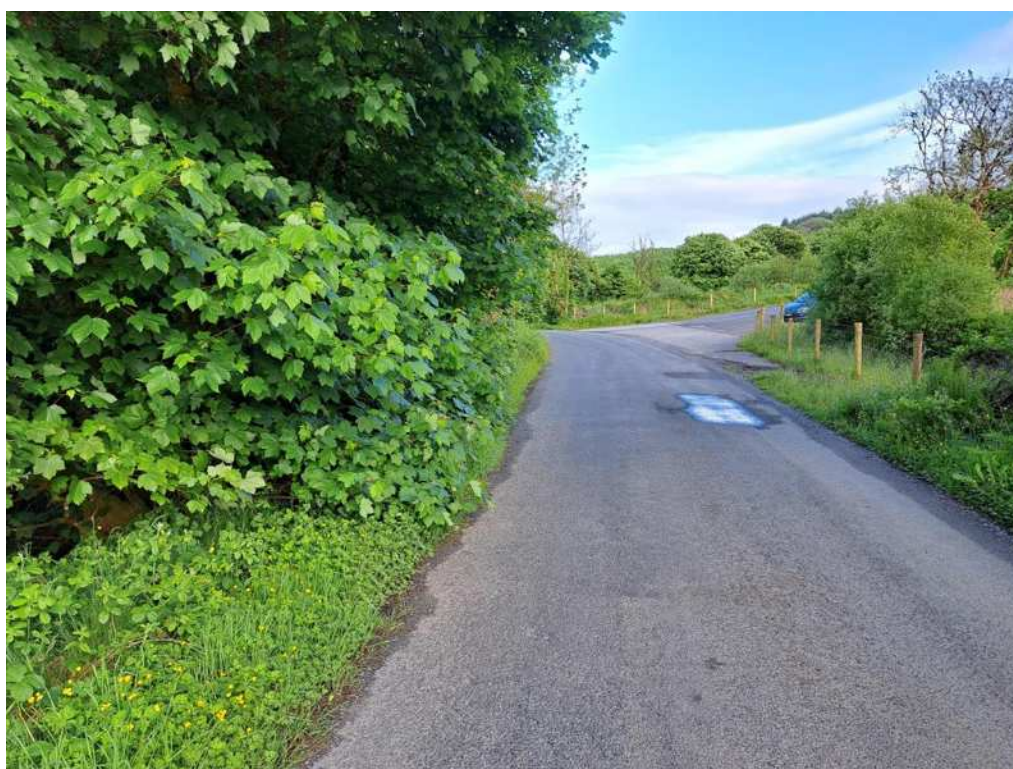


Plate 4 Looking east along L5005 with Taurbeg Wind Farm access road on right

During the site visit the available visibility splays for traffic exiting the existing Taurbeg Wind Farm were measured to be as follows:

- To the west, due to existing hedgerow / tree lines the available visibility splay was measured to be approximately 110m along the nearside carriageway edge of the

L5005 taken from a setback of 2.4m back from the carriageway edge along the location of the estimated centre of the access road.

- To the east, the available visibility splay was measured to be approximately 90m.

During the time of the site visit in May 2024, the default speed limit on the L5005 in the proximity of the Taurbeg Wind Farm access junction was 80 kph. However, as part of the Department of Transport's road safety program it is, however, proposed to reduce the speed limit on all local roads in Ireland from 80 kph to 60 kph from February 2025, so the lower speed limit is adopted for the purpose of this assessment.

It is noted that no specific visibility splays are recommended in the current Cork County Development Plan 2022 – 2028, so reference is made to the document DN-GEO-03060 Geometric Design of Junctions, TII, May 2023, which states that visibility splays of 90m should be provided for a design speed of 60 kph. Therefore, the existing visibility splays to the west and east of the existing site entrance are in compliance with this requirement.

Minor improvements to the existing Taurbeg Wind Farm access junction are included in the extended operational phase mitigation measures included in Section 15.2.5.3 in order to maximise safety for all road users.

15.2.5 Likely and Significant Effects and Associated Mitigation Measures

15.2.5.1 'Do-Nothing' Scenario

Under the Do-Nothing Scenario, the operational life of the Taurbeg Wind Farm would not be extended beyond 2026, the wind farm would be decommissioned, following the expiration of the current planning permission. Should this occur, the impact on local traffic would be slight, negative and short term in duration, arising from the implementation of the decommissioning plan included in this EIAR (Appendix 4-3). This plan details the removal of all turbine infrastructure from site. Cranes and heavy plant vehicles will be required onsite to disassemble each turbine tower and associated infrastructure. Excavators and HGVs will be required to dismantle the foundations and internal roads and transport the resulting material offsite for disposal or recovery. There will be additional trips generated by the site from staff required to undertake the decommissioning work onsite.

15.2.5.2 Proposed Offsetting Measures

As discussed in Section 15.2.4.3 above, there will be approximately 20 days when 5 HGV loads or 10 HGV movements per day will be generated to and from the Proposed Offsetting lands during the Proposed Offsetting Measures. It is estimated that the impact of these movements on local traffic will be negative, temporary and slight in terms of severity.

There will be **No Significant Effects** on local traffic as a result of the Proposed Lifetime Extension.

15.2.5.3 Extended Operational Phase - Proposed Lifetime Extension

During the Proposed Lifetime Extension, the majority of maintenance works on the Site will be completed by a two-person team travelling in a light goods vehicle. Maintenance crews will be required onsite to complete major component replacement on a sporadic basis, e.g. turbine component changes or onsite control building maintenance.

Typically, there are no more than two trips per day to the Site made by car or light goods vehicle. The direct effect on local traffic will be imperceptible neutral and medium-term given the very low volume of daily trips to the Site.

Further information on maintenance procedures on the Site is detailed in Section 4.6.2 of Chapter 4 of this EIAR.

Mitigation Measures

- The following minor improvements to the existing Taurbeg Wind Farm access junction are proposed to improve road safety during the Proposed Lifetime Extension. Junction delineated with edge of carriageway markings and STOP junction markings and STOP signs in accordance with Figure 7.35 of the Traffic Signs Manual, as shown in Figure 15-1.
- The trimming back of shrubs on the northside of the L5005 in order to provide forward visibility for traffic turning right into the Taurbeg Wind Farm site, as shown in Figure 15-2, and also to maintain the available visibility splays on the southern side of the L5005, also shown in Figure 15-2 is recommended.
- The introduction of junction warning signs W002L of the Traffic Signs Manual on the westbound approach to the Taurbeg Wind Farm access junction on the L5005, and W002R on the eastbound approach, in order to increase the conspicuity of the access junction. These signs should be located on the left side of the L5005 and approximately 100m in advance of the junction.

Extract from TSA Chapter 6 – Warning Signs





Junction radii are 9m - to be delineated with road markings

Junction markings to be as per Figure 7.35 of the Traffic Signs Manual

- Centreline RM 001
- STOP line RRM 017
- STOP lettering M114.

Junction stop signs to be as per RUS 027 of the Traffic Signs Manual.

NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-1 L5005 / Taurbeg Wind Farm access junction - Proposed junction markings and signs

PROJECT: Taurbeg Wind Farm Proposed Lifetime Extension, County Cork

CLIENT: Taurbeg Ltd

SCALE: 1:1000

AL PROJECT NO: 11550

DATE: 22.12.24

DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS



NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-2 L5005 / Taurbeg Wind Farm access junction - 2.4m x 90m visibility splays and 90m forward visibility

PROJECT: Taurbeg Wind Farm Proposed Lifetime Extension, County Cork

CLIENT: Taurbeg Ltd

SCALE: 1:1000

AL PROJECT NO: 11550

DATE: 22.12.24

DRAWN BY: AL

ALAN LIPSCOMBE
TRAFFIC & TRANSPORT CONSULTANTS

Residual Impacts

The Proposed Lifetime Extension will have **Medium-Term, Imperceptible, Neutral Effects** on local traffic as no changes to the existing infrastructure are proposed.

Significance of the Effects

Based on the assessment above, there will be **No Significant Effects** on local traffic as a result of the Proposed Lifetime Extension.

15.2.5.4 Decommissioning Phase

It is proposed to extend the lifetime of the existing wind farm by 10 years, thereby amending the required decommissioning date from 2026 to 2036. The proposed decommissioning works are outlined in Chapter 4, Section 4.7. A Decommissioning Plan is also presented in Appendix 4-3 of this EIAR.

Upon decommissioning of the existing Taurbeg Wind Farm, as proposed in 2036, cranes and heavy plant vehicles will be required onsite to disassemble the existing above-ground turbine structures. Turbine infrastructure including turbine towers, nacelles and rotor components will be separated and removed offsite for re-use or recycling. The Applicant has made a commitment not to send turbine blades to a landfill or incineration facility. Instead, the Applicant is committed to recycling the wind turbine components, insofar as possible. The exact approach for recycling the turbines has yet to be determined as it will be 10 years from now, however recycling will be carried out in accordance with best practice at that time.

It is proposed to leave the turbine foundations and hardstanding areas in-situ and to cover them with earth and reseed as appropriate. Leaving the turbine foundations and hardstanding areas in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete and crushed stone from the ground could result in significant environmental nuisance such as noise, dust and/or vibration. It is proposed to leave access roads in-situ, as these are in use by the participating landowners to access their lands and as existing walking trails. Underground cables within the wind farm site are laid inducting at a depth of more than 2m. The cabling will be removed while the ducting will be left in situ in order to avoid unnecessary effects on soils. While the actual number of loads that will be required to be removed from the wind farm components from the Site when the wind farm is decommissioned has not been determined at this stage, the impact in terms of traffic volumes will be significantly less than during the original construction stage.

15.2.5.4.1 Trip Generation – During Decommissioning

Table 15-2 below outlines an estimate of trip generations for the decommissioning of Taurbeg Wind Farm, including delivery of crane, plant, refuelling and delivery of soil. Table 15-3 estimates the trip generations for the removal of the 11 no. turbines following decommissioning of the wind farm. For the purpose of this assessment, it is assumed that this is a theoretically precautionary scenario, where there is no potential for turbine blades to be cut onsite and assumes that delivery of soil for covering hardstanding areas, foundations, etc. is required rather than sourcing soil onsite.

Table 15-2 Estimated trip generation for decommissioning phase

Material	Total Truck Loads	Truck type
Delivery of plant	5	Large Artic
Cranes for site	1	Large Artic
Additional Crane Materials Delivery	3	Large Artic
Refuelling for plant	5	Large Artic
Removal of plant	5	Large Artic
Delivery of Soil*	17	Large Artic
Total Truck Loads	36	
*For this table, the worst-case scenario is assumed. Therefore, delivery of soil is opted for rather than sourcing soil onsite		

Table 15-3 Estimated trip generation for the removal of the 11 no. turbines following decommissioning of the wind farm

Material	Units	Quantity per Unit	Total Quantity	Quantity per Truck	Total Truck Loads	Truck type
Nacelle	11	1	11	1	11	Extended Artic
Blades	11	3	33	1	33	Extended Artic
Towers	11	4	44	1	44	Extended Artic
Sub total					88	Extended Artic
Transformer	11	1	11	1	11	Large Artic
Blade hub	11	1	11	1	11	Large Artic
Other Components	11	1	11	1	11	Large Artic
Sub total					33	Large artic

Total Truck Loads	121	
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It is estimated, on a precautionary basis, that 157 truckloads, traveling to and from the site, will be generated during the Decommissioning Phase, of which 88 will be abnormal loads, and 69 will be standard large articulated HGVs or trucks.

The decommissioning phase will take approximately 3-6 months to complete from commencing the removal of turbines to the final reinstatement of the site. At this time, it is not possible to determine exactly when decommissioning will take place.

Mitigation Measures

As noted in the Scottish Natural Heritage (SNH) report *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013), reinstatement proposals for a wind farm are typically made far in advance, so within the proposed 10-year extension of operation of the site, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is therefore “best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm”.

Prior to decommissioning, an updated Decommissioning Plan, including material recycling/disposal and a Traffic Management Plan, will be developed to minimise impacts to local traffic. The updated decommissioning plan will be prepared in consultation with the local authority, and the final documentation will be agreed with the local authority in advance of decommissioning.

Residual Impact

As stated above, in the event that the existing wind farm is decommissioned in 2036, an updated Decommissioning Plan will be prepared and implemented in order to minimise the residual impacts. The decommissioning phase will likely result in a residual impact on local traffic that is a **Temporary, Slight, Negative Effect**.

Significance of the Effects

Based on the assessment above, there will be **No Significant Direct or Indirect Effects** on local traffic as a result of the decommissioning phase.

15.2.5.5 Cumulative Effects

The potential cumulative impact and associated effects between the Proposed Project and the projects described in Chapter 2 of this EIAR, hereafter referred to as the ‘other projects’, have been considered in terms of traffic and transport.

While there is no construction phase impacts associated with the Proposed Lifetime Extension, there are deforestation works (and associated traffic movements) proposed as part of the Proposed Offsetting Measures, with the impacts assessed in Section 15.2.5.2 to be slight. For the purpose of local traffic related cumulative impacts associated with the Proposed Offsetting lands, a 5km cumulative boundary was selected. No significant cumulative effects in relation to local traffic associated with the Proposed Offsetting Measures are envisaged.

Operational phase impacts on local traffic are imperceptible and therefore there are no significant cumulative effects in relation to local traffic associated with the Proposed Lifetime Extension or with the Proposed Offsetting Measures.

For the purpose of local traffic related cumulative impacts associated with the Proposed Lifetime Extension, the cumulative planning search as set out in Appendix 2-3 was reduced to a radius of 5km from the existing wind farm and substation. Following this, it was considered that there were no developments located within this 5km radius that had the potential to overlap with the decommissioning phase of the wind farm, and therefore there are No Significant Cumulative Effects in relation to local traffic associated with the extended operational life or the decommissioning phase of the Proposed Project in combination with other projects.

15.3 Telecommunications, Aviation and Other Material Assets

15.3.1 Introduction

This section of the EIAR assess the likely significant effects of the Proposed Lifetime Extension and Proposed Offsetting Measures on telecommunications, aviation and other material assets which include utilities or built services in the area such as electricity supply and transmission, water, gas and underground telecommunications. This section also considers waste management during the extended operational and decommissioning phases of the Proposed Lifetime Extension and Proposed Offsetting Measures.

This section describes the way in which wind turbines can potentially interfere with telecommunications signals or aviation activities. Likely significant effects are assessed in Section 15.3.6.

15.3.2 Statement of Authority

This section of the EIAR has been prepared by Gráinne Griffin and Natalia Stolarska of MKO and reviewed by Eoin McCarthy. Gráinne is an Environmental Scientist with MKO with over 3 years' experience in the environmental consultancy sector. Gráinne has experience in report writing, including Appropriate Assessments, Natura Impact Statements, feasibility studies and EIA screening reports and EIAR chapters including Material Assets chapters for large-scale renewable energy developments. Natalia is an Environmental Scientist with MKO having joined the company in September 2023. Since joining MKO, Natalia has become a member of the MKO Environmental Renewables Team which work on producing high quality Environmental Impact Assessment Reports for a variety of Renewable Energy clients.

Eoin is a Project Director with MKO with over 13 years of environmental consultancy experience. Eoin's key strengths and areas of expertise are in project management, environmental impact assessment, wind energy site selection and feasibility assessment.

15.3.3 Methodology and Guidance

The methodology for the assessment included in this section focuses particularly on the scoping and consultation exercise conducted with telecoms operators and aviation authorities. Scoping was carried out in line with the EPA Guidelines (EPA, 2022), and the 'Best Practice Guidelines for the Irish Wind Energy Industry' (Irish Wind Energy Association, 2012) which provides a list of telecommunications operators for consultation.

A full description of the scoping and consultation exercise is provided in Section 2.9 of Chapter 2 of this EIAR. Consultation with the telecommunications operators and aviation bodies informed the constraints mapping process, which in turn informed the layout of the Proposed Project.

The assessment of likely significant effects on material assets uses the standard methodology and classification of impacts as presented in Chapter 1 of this EIAR.

This section of the EIAR focuses on the Proposed Lifetime Extension and potential effects associated with telecommunications, aviation and other material assets. Given the nature of the Proposed Offsetting Measures, it is envisaged that the works will not have any effect on telecommunications, aviation or other material assets.

15.3.3.1 Legislation, Policy and Guidance

This section has been carried out in accordance with the 'EIA Directive' as amended by Directive 2014/52/EU and having regard, where relevant, to guidance and policy documents listed below:

- Cork County Development Plan 2022-2028
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022)
- Draft Air Corps Wind Farm/Tall Structures Position Paper (August 2014)
- Department of Environment, Heritage and Local Government (2006) Wind Energy Development Guidelines for Planning Authorities "the Guidelines"
- Department of the Environment, Heritage and Local Government (2019) Draft Revised Wind Energy Development Guidelines for Planning Authorities 'the draft Guidelines'
- Irish Wind Energy Association (2012) Best Practice Guidelines for the Irish Wind Energy Industry
- ESB Networks (2019) Code of Practice for Avoiding Danger from Overhead Electricity Lines.
- ESB (2017) EMF & You: Information about Electric & Magnetic Fields and the electricity network in Ireland

15.3.4 Receiving Environment

15.3.4.1 Broadcast Communications

Wind turbines, like all large structures, have the potential to interfere with broadcast signals, by acting as a physical barrier or causing a degree of scattering to microwave links. The most significant effect at a domestic level relates to a possible flicker effect caused by the moving rotor, affecting, for example, radio signals. The most significant potential effect occurs where the wind farm is directly in line with the transmitter radio path.

15.3.4.2 Domestic Receivers

Depending on local topography, a domestic receiver may receive broadcast signals from more than one location. The strength of the signal varies with distance from the transmitter, and the receiver's antenna is generally always directed towards the most local, and usually the strongest, broadcasting station.

There are two types of potential electromagnetic interference to domestic receivers, depending on the location of the receiver in relation to a wind farm. 'Shadowed' houses are located directly behind a wind farm, relative to the location from where the signal is being received. In this case, the main signal passes through the wind farm and the rotating blades can create a degree of signal scattering. In the case of viewers located beside the wind farm (relative to the broadcast signal direction), the effects are likely to be due to periodic reflections from the blade, giving rise to a delayed signal.

In both cases, i.e., shadowed houses located behind the wind farm and those located to the side of it, the effects of electromagnetic interference may depend to some degree on the wind direction, since the plane of rotation of the rotor will affect both the line-of-sight blockage to viewers located behind the wind farm and the degree of reflection to receivers located to the side.

15.3.4.3 Other Signal Types

Wind turbines have the potential to affect other signal types used for communication and navigational systems, for example tower-to-tower microwave communication links, and airborne and ground radar

systems. Interference with radar systems occurs when wind turbines are located close to an airport or directly in line with the instrument landing approach. These effects are generally easily dealt with by detailed micro-siting of turbines in order to avoid alignment with signal paths or by the use of repeater relay links out of line with the wind farm.

15.3.4.4 Existing and Built Services and Utilities

15.3.4.4.1 Electricity

Proposed Lifetime Extension

The Taurbeg Wind Farm is connected to the national electricity grid at the existing Glenlara 110kV Substation. A 38kV underground cable runs between the onsite substation and a mast at the south of the site. A 38kV overhead line runs from the mast to the existing Glenlara 110kV Substation.

There are no other 110kV or 38kV overhead electricity lines within or adjacent to the existing Taurbeg Wind Farm, with the closest 110kV overhead electricity line being c.2.2km west of Taurbeg Wind Farm site.

Proposed Offsetting Measures

There is no electrical infrastructure located within the Proposed Offsetting Lands. The closest 220kV overhead line is located c.4.5 km west of the Proposed Offsetting Lands.

15.3.4.4.2 Gas

Proposed Lifetime Extension

A data request was sent to Gas Networks Ireland in May 2025. The data returned concluded there are no gas pipelines within or near the existing Taurbeg Wind Farm.

Proposed Offsetting Measures

A data request was sent to Gas Networks Ireland in May 2025. The data returned concluded there are no gas pipelines within or near the Proposed Offsetting Lands.

15.3.4.4.3 Water

Proposed Lifetime Extension

The GSI do not map the presence of any registered Group Water Schemes (GWS) or Public Water Schemes (PWS) or associated source protection areas within the Site (www.gsi.ie). There are no PWS or GWS within 10km of the existing Taurbeg Wind Farm Site. The closest mapped GWS is the Kileedy GWS. The source protection area associated with this GWS is mapped ~11km to the northeast of the Site.

A search of private well locations (wells with location accuracy of 1–100m were only sought) was undertaken using the GSI well database (www.gsi.ie). Two wells (GSI Name: 1111SWW041 and 1111SWW040) are located to the northeast of the existing Taurbeg Wind Farm Site in the townland of Glennaheel South. These wells are mapped ~1.4km and 1.9km northwest of T3 and are listed as having

agricultural and domestic uses. According to the GSI (www.gsi.ie) these wells have a moderate yield class of 16.4m³/day.

The primary risks to the water environment during the extended operational phase are from hydrocarbon spillage and leakages along with surface water runoff and potential erosion issues (sediment entrainment) arising from the existing hardstand areas.

Proposed Offsetting Measures

The GSI do not map the presence of any registered Group Water Schemes (GWS) or Public Water Schemes (PWS) or associated source protection areas within the Proposed Offsetting Lands (www.gsi.ie). The closest mapped GWS is the Kileedy GWS. The source protection area associated with this GWS is mapped ~22km to the northeast of the Proposed Offsetting lands. The GSI map several local private wells/boreholes in the lands to the west of the Proposed Offsetting lands. These wells are used for agricultural and domestic purposes and are listed as having a poor to moderate yield class.

15.3.4.5 Waste Management Services

Proposed Lifetime Extension

There are no EPA-licensed or local authority-authorised waste facilities or activities located within the Site. The closest, authorised municipal waste facility is located approximately 29km southwest in Killarney, Co. Kerry.

It is not anticipated that any significant volume of waste will be generated within the Site during the Proposed Lifetime Extension as only a small number of operational and maintenance personnel will be present onsite during maintenance. All waste arising as a result of servicing and maintenance (e.g., lubrication oils, packaging from spare parts or equipment, unused paint etc.) will be removed from site and reused, recycled, or disposed of in accordance with best practice in an authorised facility.

Waste from the toilet facility will be removed from its storage tank by a licenced provider and disposed of in an authorised facility.

Proposed Offsetting Measures

There are no EPA-licensed or local authority-authorised waste facilities or activities located within the Proposed Offsetting Lands. The closest, authorised municipal waste facility is located approximately 19km southwest in Killarney, Co. Kerry.

It is not anticipated that any significant volume of waste will be generated within the Proposed Offsetting Lands during the Proposed Offsetting Measures as only a small number of forestry workers and maintenance personnel will be present onsite. All waste arising as a result of deforestation works and maintenance will be removed from site and reused, recycled, or disposed of in accordance with best practice in an authorised facility.

15.3.5 Scoping and Consultation

15.3.5.1 Telecommunications Operators

As part of the EIAR scoping and consultation exercise, MKO contacted ComReg (Commission for Communications Regulation) to identify licensed telecommunication operators in the vicinity of the Site whose infrastructure may be impacted by the Proposed Lifetime Extension. ComReg responded on the 17th of November 2023 with a list of the relevant national and regional broadcasters, fixed and mobile

telephone operators within 10km of the Site. The responses received by MKO from these consultees are summarised below in Table 15-4.

Table 15-4 Telecommunications Scoping Responses

ComReg Consultee	Initial Scoping Response	Potential for Interference Following Consultation Exercise	Action Required
Broadcasting Authority of Ireland	Received 30.11.2023	No	N/A
Cellnex	Received 19.12.2023	No	N/A
Dense Air	No Response	N/A	N/A
Eircom Ltd/Eir	Received 01.12.2023	No	N/A
ESB	No Response	N/A	N/A
Enet	Received 20.11.2023	No	N/A
EOBO Ltd.	No Response	N/A	N/A
Fastcom Broadband Limited	No Response	N/A	N/A
Hibernian Towers	Received 11.01.2024	No	N/A
Imagine Networks Ltd	Received 21.11.2023	No	N/A
Irish Rail	Received 21.11.2024	No	N/A
Ivertec Ltd.	Received 20.11.2023	No	N/A
JFK Communications Ltd.	Received 11.12.2023	No	N/A
JS Whizzy Ltd.	Received 04.03.2024	No	N/A
Lackabeha Services Ltd T/A Airwaves Internet	Received 04.03.2024	No	N/A
RTE Transmission Network (2m)	Received 20.11.2023	No	N/A
TETRA Ireland	No Response	N/A	N/A
Three Ireland Ltd	Received 20.11.2023	No	N/A
Towercom	Received 21.11.2023	No	N/A

ComReg Consultee	Initial Scoping Response	Potential for Interference Following Consultation Exercise	Action Required
Viatel	No Response	N/A	N/A
Virgin Media Ltd	Received 20.11.2023	No	N/A
Vodafone Ireland Ltd	Received 30.11.2023	No	N/A
Western Broadband Network	Received 20.11.2023	No	N/A

The full scoping responses received from all operators are provided in Appendix 2-1.

As outlined in the table above, there are no confirmed telecommunications links located within the Site. Responses were received from various operators which confirmed there to be no presence of telecommunications links within the Site. It should be noted that Cellnex responded stating that one telecoms installation is present within the affected area, with the links on the tower being owned by Three Ireland, Vodafone, Imagine, Eir and Tetra. The correspondence stated that there may be interference with these links and the providers should be contacted directly, however this is unlikely given the wind farm is existing. Each of these operators were subsequently contacted, with each operator confirming no impact being anticipated. No response has been received from Tetra.

Given the nature of the Proposed Offsetting Measures, which consist of permanent removal of forestry and restoration of farmland for the benefit of hen harrier, no interference is anticipated on telecommunications links in the area.

15.3.5.2 Aviation

Irish Aviation Authority

On February 21st, 2024, the Irish Aviation Authority sent an email requesting details regarding the specifications of the lights for the turbines at the current wind farm, such as candela value, Type B/C, medium or low intensity lighting, and colour.

Planning Ref 02/3608 Condition 18 states the following in relation to aviation lighting requirements:

Model Cegelec ZA 768 red low intensity Type A obstacle lighting or similar shall be installed on all turbines if required by the IAA, full details shall be submitted to and agreed with the IAA before development commences’.

Following consultation with the IAA in 2004 only the turbine with the highest elevation (Turbine no.11) required lighting. Refer to copy of correspondence in Appendix 15-1.

On March 22nd 2024, the IAA responded further stating:

“For information, having reviewed the information provided, it should be noted that the historic aviation warning light or obstacle lighting specification associated with Taurbeg Windfarm would not be in compliance with the requirements of ICAO (International Civil

Aviation Organization) or EASA (European Aviation Safety Agency) with regard to the marking and lighting of obstacles.

Since the original planning was granted, revisions to the standards and recommended practices as outlined by ICAO and the requirements as specified in European Regulation by EASA would now necessitate that the full geographical perimeter of the wind farm should be lighted to provide appropriate visual warning to pilots operating in the vicinity.

Therefore, should a formal planning application be submitted for the extension of the lifetime of Taurbeg WF, the Authority will make observations to the effect that a new obstacle lighting scheme shall need to be agreed with the applicant.”

Irish Air Corps

A scoping response was received from the Irish Air Corps, the Department of Defence on the 29th of August 2024. In their response, they made the following observation, clarifying that any Irish Air Corps requirements are separate to any IAA requirements:

“All turbines should be illuminated by Type C, Medium intensity, Fixed Red obstacle lighting with a minimum output of 2,000 candela to be visible in all directions of azimuth and to be operational H24/7 days a week. Obstacle lighting should be incandescent or, if LED or other types are used, of a type visible to Night Vision equipment. Obstacle lighting used must emit light at the near InfraRed (IR) range of the electromagnetic spectrum, specifically at or near 850 nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light.”

The existing Taurbeg Wind Farm has been in operation since March 2006 and no aviation issues have arisen in that time, with the wind farm operating as per Condition 18 of the schedule of conditions. No changes to the existing wind farm infrastructure or turbine dimensions are proposed. Furthermore, the Proposed Offsetting Measures are not expected to give rise to any aviation issues.

15.3.5.3 Utilities

Uisce Éireann

A scoping request was sent to Uisce Éireann on the 15th of February 2024. A response was received on the 7th of March 2024 stating that they do not have the capacity to comment on individual projects, but general aspects of Water Services should be considered in the EIA where relevant. Some of the items to consider are listed below. Please see Chapter 2, Section 2.9 for a full list of Uisce Éireann comments. It should be noted that the Proposed Lifetime Extension does not intend to connect into Irish Water assets.

1. *Ensure no ensure that there will be no negative impact to Irish Waters Drinking Water Source(s) during the construction and operational phases of the development. Hydrological/hydrogeological pathways between the applicant's site and receiving waters should be identified as part of the report.*
2. *Any and all potential impacts on the nearby reservoir as public water supply water source(s) are assessed, including any impact on hydrogeology and any groundwater/surface water interactions.*
3. *If a development requires a connection to either a public water supply or sewage collection system, the developer is advised to submit a Pre-Connection Enquiry (PCE) enquiry to Irish Water to determine the feasibility of connection to the Irish Water network.*
4. *The applicant shall identify any upgrading of water services infrastructure that would be required to accommodate the Proposed Project.*

5. *In relation to a development that would discharge trade effluent—any upstream treatment or attenuation of discharges required prior to discharging to an Irish Water collection network.*

ESB

A scoping request was sent to the ESB on the 20th of November 2023 and again on the 30th of November 2023, 4th of January 2024 and 29th of February 2024. No response has been received to date.

Eirgrid

A scoping request was sent to Eirgrid on the 15th of February 2024, with a follow up request issued on the 19th of August 2024. No response has been received to date.

15.3.6 Likely Significant Effects and Associated Mitigation Measures

15.3.6.1 ‘Do-Nothing’ Scenario

The Do-Nothing alternative to extending the lifetime of the existing Taurbeg Wind Farm would be to decommission the wind farm once the current planning permission expires in 2026. In the do-nothing alternative, the Proposed Offsetting Measures will not take place. Should this occur, there will be no impacts on telecommunications, aviation or other material assets.

15.3.6.2 Extended Operational Phase

15.3.6.2.1 Telecommunications

Pre-Mitigation Impact

Scoping responses were received from 2RN, BAI, Cellnex, Enet, Eir, ESB Telecommunications, EOBO Ltd., Imagine, Ivertex, JFK Communications, JS Whizzy Ltd., Lackabeha Services Ltd., TETRA Ireland, Three Ireland, Viatel, Virgin Media Ltd., Vodafone and Western Broadband Network during the period of November 2023 to February 2024, affirming that the Proposed Lifetime Extension will have no negative impact on their transmission links. See Table 15-4 for further details. Therefore, the Proposed Lifetime Extension will have no impact on telecommunications.

Mitigation and Monitoring Measures

No telecoms operators have highlighted issues regarding the Proposed Lifetime Extension, therefore no mitigation measures are proposed. A dedicated Community Liaison Officer employed by the Applicant will be available for contact to householders in the area should any interference be caused by the Proposed Lifetime Extension

Residual Impact

The Proposed Lifetime Extension will have no residual impact on telecommunications.

Significance of Effects

The Proposed Lifetime Extension will have no significant direct or indirect effects on telecommunications.

15.3.6.2.2

Aviation**Pre-Mitigation Impact**

As detailed above planning condition no. 18 of the existing permission (N/2002/3608) states that:

'Model Cegelec ZA 768 red low intensity Type A obstacle lighting or similar shall be installed on all turbines if required by the IAA, full details shall be submitted to and agreed with the IAA before development commences'.

The existing Taurbeg Wind Farm is in compliance with Condition 18 and as such, the Proposed Lifetime Extension will have no impact on aviation.

Mitigation and Monitoring Measures

The Applicant will coordinate with the IAA should a grant of permission be issued, to ensure that the development remains in compliance with all IAA requirements including lighting requirements. Any further details will be agreed with the Department of Defence, Air Corps and the IAA. The coordinates and elevations for the existing turbines has been supplied to the IAA, as is standard practice for all wind farm developments.

Residual Impact

The Proposed Lifetime Extension will have no residual impact on aviation as all lighting and other requirements will continue to be met by the Applicant.

Significance of Effects

There will be no significant direct or indirect effects on aviation operations due to the Proposed Lifetime Extension.

15.3.6.2.3

Other Material Assets**Pre-Mitigation Impact**

There will be no operational phase impacts or associated effects on other material assets associated with the Proposed Lifetime Extension.

Mitigation and Monitoring Measures

No mitigation measures are proposed.

Residual Impact

The Proposed Lifetime Extension will have no residual impact on other material assets.

Significance of Effects

There will be no significant direct or indirect effects on other material assets due to the Proposed Lifetime Extension.

15.3.6.3 **Proposed Offsetting Measures**

15.3.6.3.1 **Telecommunications**

Pre-Mitigation Impact

Given the nature of the Proposed Offsetting Measures, which consist of permanent removal of forestry and restoration of farmland for the benefit of hen harrier, no interference is anticipated on telecommunications links in the area. As such, the Proposed Offsetting Measures will have no impact on telecommunications.

Mitigation and Monitoring Measures

No mitigation measures are proposed.

Residual Impact

The Proposed Offsetting Measures will have no residual impact on telecommunications.

Significance of Effects

The Proposed Offsetting Measures will have no significant direct or indirect effects on telecommunications.

15.3.6.3.2 **Aviation**

Pre-Mitigation Impact

Given the nature of the Proposed Offsetting Measures, which consist of permanent removal of forestry and restoration of farmland for the benefit of hen harrier, no interference is anticipated with aviation. As such, the Proposed Offsetting Measures will have no impact on aviation.

Mitigation and Monitoring Measures

No mitigation measures are proposed.

Residual Impact

The Proposed Offsetting Measures will have no residual impact on aviation.

Significance of Effects

There will be no significant direct or indirect effects on aviation operations due to the Proposed Offsetting Measures.

15.3.6.3.3 **Other Material Assets**

Pre-Mitigation Impact

There will be no impacts or associated effects on other material assets associated with the Proposed Offsetting Measures.

Mitigation and Monitoring Measures

No mitigation measures are proposed.

Residual Impact

The Proposed Offsetting Measures will have no residual impact on other material assets.

Significance of Effects

There will be no significant direct or indirect effects on other material assets due to the Proposed Offsetting Measures.

15.3.6.4 Decommissioning Phase

The existing wind turbines onsite are expected to have a lifespan beyond 30 years. Following the end of their useful life, the wind turbines may be replaced with a new set of turbines, subject to planning permission being obtained, or the Taurbeg Wind Farm will be decommissioned fully as described in Chapter 4 and the accompanying decommissioning plan in Appendix 4-3.

The works required during the decommissioning phase are described in Section 4.7 in Chapter 4 of this EIAR. Any impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurred during the construction phase, however to a lesser extent. Based on the assessment outlined above, there will be no significant effects on telecommunications, aviation or other material assets as part of the decommissioning phase.

15.3.6.5 Cumulative Effects

The potential for impact between the Proposed Lifetime Extension, and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Lifetime Extension will have on the surrounding environment when considered cumulatively and in combination with relevant existing permitted or proposed projects and plans, as set out in Chapter 2 of this EIAR.

Similarly for the Proposed Offsetting Measures, the potential for impact between the Proposed Offsetting Measures, and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Offsetting Measures will have on the surrounding environment when considered cumulatively and in combination with relevant existing permitted or proposed projects and plans

Please see Section 2.11 of Chapter 2 for cumulative assessment methodology.

15.3.6.5.1 **Proposed Lifetime Extension**

Telecommunications and Aviation

During the development of any large project that holds the potential to affect telecoms or aviation, the Developer is responsible for engaging with all relevant telecoms operators and aviation authorities to ensure that the proposals will not interfere with television or radio signals by acting as a physical barrier. In the event of any potential impact, the developer for each individual project is responsible that the necessary mitigation measures are in place. Therefore, as each project is designed and built to avoid impacts arising, a cumulative impact cannot arise.

The existing Taurbeg Wind Farm has been operational since 2006 and no changes to the existing wind farm infrastructure are proposed. Therefore, no impacts on telecommunications and aviation are

anticipated. There will be no significant cumulative effects in relation to telecommunications and aviation associated with the Proposed Lifetime Extension in combination with other projects.

Other Material Assets

The potential for cumulative impacts with other wind farms is considered. There are 6 no. operational wind farms located within 10km of the existing Taurbeg Wind Farm. There will be a significant positive cumulative effect on electrical supply with the Proposed Lifetime Extension along with the existing operational wind farms within the area.

There are no construction works proposed as part of the Proposed Lifetime Extension. Therefore, based on the assessment above, there is no potential for cumulative effects on built services. There will be minimal volumes of waste during the Proposed Lifetime Extension, therefore there will be no cumulative significant effects on waste management.

The potential for cumulative effects with these nearby energy developments are not significant from the perspective of built services and waste management.

There were no other potential cumulative effects identified as part of this assessment.

15.3.6.5.2 **Proposed Offsetting Measures**

Telecommunications and Aviation

Given the nature of the Proposed Offsetting Measures, no interference is anticipated on telecommunications links or aviation in the area. As such, the Proposed Offsetting Measures will have no impact on telecommunications. There will be no significant cumulative effects in relation to telecommunications and aviation associated with the Proposed Offsetting Measures in combination with other projects.

Other Material Assets

Given the minor scale of works proposed as part of the Proposed Offsetting Measures, consisting of deforestation, there is no potential for cumulative effects on built services. With the deforestation works being temporary in nature, there will be minimal volumes of waste during the Proposed Offsetting Measures, therefore there will be no cumulative significant effects on waste management.

There were no other potential cumulative effects identified as part of this assessment.

Environmental Impact Assessment Report

Taurbeg Wind Farm Extension of Operational Life

Chapter 16 – Major Accidents and Natural
Disasters





DOCUMENT DETAILS

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Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



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16.

MAJOR ACCIDENTS AND NATURAL DISASTERS

16.1

Introduction

This section of the Environmental Impact Assessment Report (EIAR) describes the likely significant adverse effects on the environment arising from the vulnerability of the Proposed Project (consisting of the Proposed Lifetime Extension and Proposed Offsetting Measures) as detailed in Chapter 4, to risks of major accidents and/or natural disasters, as well as the potential of the Proposed Project itself to cause potential major accidents and/or natural disasters. It has been completed in accordance with the guidance set out by the Environmental Protection Agency (EPA) in ‘*Guidelines on Information to be contained in Environmental Impact Statements*’ (EPA, 2022) and the European Commission in relation to Environmental Impact Assessment of Projects (Directive 2011/92/EU, as amended by 2014/52/EU), namely ‘*Guidance on the preparation of the Environmental Impact Assessment Report*’.

The assessment of the vulnerability of the Proposed Project to major accidents and/or natural disasters, as well as the risk of the Proposed Project itself causing major accidents and/or natural disasters is carried out in compliance with the EIA Directive (2014/52/EU) which states the need to assess:

“the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or natural disasters which are relevant to the project concerned.”

The objective of this assessment is to ensure that appropriate precautionary actions are taken for the Proposed Project:

“because of their vulnerability to major accidents and/or natural disasters, are likely to have significant adverse effects on the environment”.

Based on the requirements of the EIA Directive, this chapter seeks to determine:

- The relevant major accidents and/or natural disasters, if any, that the Proposed Project could be vulnerable to or could cause;
- The potential for these major accidents and/or natural disasters to result in likely significant adverse environmental effect(s); and
- The measures that are in place, or need to be in place, to prevent or mitigate the likely significant adverse effects of such events on the environment.

As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: ‘Proposed Lifetime Extension’, ‘Proposed Project’, ‘Proposed Offsetting Measures’, ‘Proposed Offsetting Lands’ and the ‘Site’. Please see Section 1.1.1 of this EIAR for further details. A detailed description of the Proposed Project is provided in Chapter 4 of this EIAR.

16.1.1

Statement of Authority

This section of the EIAR has been prepared by Natalia Stolarska, Michéal Cahill and reviewed by Eoin McCarthy. Natalia is an Environmental Scientist with MKO having joined the company in September 2023. Natalia holds a BSc (Hons) in Earth and Ocean Science from University of Galway and an MSc in Environmental Leadership from University of Galway. Natalia’s key strengths and areas of expertise are in drafting EIAR report chapters, environmental impact assessment screening reports, wind farm feasibility studies and QGIS mapping. Since joining MKO in September 2023, Natalia has been

involved in a range of wind farm projects, assisting with field work, client briefing notes, constraints mapping and drafting EIAR chapters, with more projects in the pipeline.

Michéal Cahill is a Graduate Environmental Scientist with MKO with over a years experience in environmental consultancy. Michéal holds a first-class honours degree in Environmental Science at University of Galway and was awarded the Professor Emer Colleran Medal for his academic achievements. Prior to taking up his position with MKO in June 2024, Michéal previously worked as an environmental sustainability intern with RPS Group. Michéal has previous experience in the preparation and review of Environmental Impact Assessment Reports for both offshore and onshore wind farm projects, as well as aiding in the research and design phase of a proposed pumped hydroelectric storage plant.

Eoin is a Senior Environmental Scientist with over 13 years of environmental consultancy experience. Eoin holds a B.Sc. (Hons) in Environmental Science from NUI, Galway. Eoin took up his position with MKO in June 2011. Eoin's key strengths and areas of expertise are in project management, environmental impact assessment, wind energy site selection and feasibility assessment. Since joining MKO, Eoin has progressed from Graduate to Senior level and has been heavily involved on a significant range of energy infrastructure, tourism, waste permit, flood relief scheme and quarrying projects. He has overseen the design phase and applications of some of the largest wind energy projects in Ireland. In his role as project manager, Eoin works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs. Eoin is also involved in the development of project strategy for the projects that he manages. He has held the role of project manager and EIAR co-ordinator on over 700MW worth of wind energy projects. Within MKO Eoin plays a large role in the management of and sharing of knowledge with junior members of staff and works as part of a large multi-disciplinary team to produce EIA Reports.

16.2 Assessment Methodology

16.2.1 General

The following sources of information and literature pertinent to the area were used in the preparation of this section:

- Census of Ireland 2016; 2022.
- South-West Regional Planning Guidelines 2010-2022;
- Regional Spatial and Economic Strategy for the Southern Region (RSES) 2020;
- Cork County Council – Major Emergency Plan 2021
- Health Service Authority advice for Health and Safety in the Renewable Sector.¹
- Rialtas na hÉireann 2021-2022 National Risk Assessment: Overview of Strategic Risks²
- Fáilte Ireland
- EU Council Directive 2012/18/EU of 4th July 2012 on the Control of Major Accident Hazards Involving Dangerous Substances (COMAH Directive/ Seveso III Directive).
- European Communities Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the “COMAH Regulations”)
- ArcGIS SEVESO Map Viewer

Major accidents or natural disasters are hazards that have the potential to affect the existing Taurbeg Wind Farm and lead to environmental effects directly and indirectly. These include accidents during

¹ Health Service Authority advice for Health and Safety in the Renewable Sector
https://www.hsa.ie/eng/your_industry/renewable_energy/

² Rialtas na hÉireann 2021-2022 National Risk Assessment: Overview of Strategic Risks.
<https://www.gov.ie/pdf/?file=https://assets.gov.ie/220847/1291534a-9b27-4c05-92ed-d3bd21adc89a.pdf#page=null>

the extended operational and decommissioning phases, caused by operational failure and/or natural hazards. The assessment of the risk of major accidents and/or disaster is considered in relation to the information required to be provided in the EIAR, i.e., population and human health, biodiversity, land and soil, hydrology and hydrogeology, air quality, climate, material assets, cultural heritage and the landscape.

16.2.2 Legislative Context

16.2.2.1 Legislation

An assessment of the following key elements was undertaken in accordance with the EIA Directive (2014/52/EU):

- The vulnerability of the existing Taurbeg Wind Farm to potential accidents and disasters
- The Proposed Lifetime Extension's potential to cause major accidents or disasters which pose a risk to human health, cultural heritage and/or the environment (hydrology, soils, habitats, flora and fauna).

The information relevant to major accidents and/or disasters to be included in the EIAR is set out in Section 8 of Annex IV of the EIA Directive as follows:

“(8) A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies”.

16.2.2.2 Guidance Documents

The following guidance documents have been consulted in the preparation of this section:

- European Commission. (2017). Environmental Impact Assessment of Projects – Guidance on the preparation of Environmental Impact Assessment Reports
- Environmental Protection Agency (2022), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Department of Environment, Heritage and Local Government (2010) *A Guide to Risk Assessment in Major Emergency Management*
- Environmental Protection Agency (2014) Guidance on Assessing and Costing Environmental Liabilities
- Department of Defence (2020) A National Risk Assessment for Ireland

On a regional scale, Cork falls under the scope of the Major Emergency Management South Region (MEM)³.

³ HSE South East (Area 5) Emergency Plan: Covering Geographical Areas of Counties Carlow, Kilkenny, South Tipperary, Waterford and Wexford, November 2019)

16.2.3

Categorisation of the Baseline Environment

A desk-study has been completed to establish the baseline environment for which the proposed risk assessment is being carried out. This will influence both the likelihood and the impact of a major accident or natural disaster. Local and regional context has been established prior to undertaking the risk assessment to develop an understanding of the vulnerability and resilience of the area to emergency situations.

Further detail on the baseline environment is provided in Section 16.3.

16.2.4

Impact Assessment Methodology

16.2.4.1

Introduction

A wind farm is not a recognised source of pollution. It is not subject to Industrial Emissions Directive regulation or any other Environmental Protection Agency environmental regulatory consent. Should a major accident or natural disaster occur the potential sources of pollution onsite during the extended operational and decommissioning phases are limited and of low environmental risk. Sources of pollution with the potential to cause significant environmental pollution and associated negative effects such as bulk storage of hydrocarbons or chemicals, storage of wastes, management of flammable materials etc. are limited and so there is an inherent low level of environmental risk associated with major accident or natural disaster impacts occurring within the Site and causing environmental damage.

There is low potential for significant natural disasters to occur at the Site and Proposed Offsetting lands. Ireland is a geologically stable country with a mild temperate climate. The potential natural disasters that may occur are therefore limited to issues such as flooding and fire and are described in the sections below.

Major industrial accidents involving dangerous substances pose a significant threat to humans and the environment; such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The existing Taurbeg Wind Farm is not regulated or connected to or close to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations i.e., SEVESO sites and so there are no potential effects from this source. Likewise, the Proposed Offsetting lands are not regulated or connected to or close to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations i.e., SEVESO sites and so there are no potential effects from this source

The Site has low potential to cause natural disasters or major accidents. As detailed in Section 8.3.3 in Chapter 8 Land Soil and Geology, there are sections of peat identified within the Site and the Proposed Offsetting Lands on the published soils map (www.epa.ie) and published subsoils maps (www.gsi.ie).

Blanket peat is found at the existing Taurbeg Wind Farm Site and Proposed Offsetting Lands. Blanket peat in both areas has been significantly degraded due to agricultural land improvement and commercial forestry. The existing Taurbeg Wind Farm is located in an upland site, therefore there is potential for peat slides. The GSI have classified this area with a moderately low-moderately high potential for landslides. The GSI have classified the Proposed Offsetting lands with a “low” to “high” potential for landslides. The areas of high susceptibility are located on the western slopes of Mount Eagle.

Site walkovers and peat probing surveys were carried out and peat thickness within the Proposed Offsetting Lands ranged from 0 to 3.2m with a median value of 1.6m. 23% of the recorded peat depths within the Proposed Offsetting Lands were less than 1m and 72% were less than 2m.

Any risks associated with flooding, impacts on infrastructure, accidents etc are addressed in the sections below.

Current EIA practice already includes an assessment of some potential accidents and disaster scenarios such as pollution incidents to ground and watercourses as well as assessment of flooding events. These are described in detail in the relevant EIAR assessment chapters (Refer to Chapters 5 to 15 for further detail).

16.2.4.2 Site Specific Risk Assessment Methodology

A site-specific risk assessment identifies and quantifies risks focusing on unplanned, but possible and plausible events occurring during the extended operational and decommissioning phases of the Proposed Lifetime Extension and the Proposed Offsetting Measures. The approach to identifying and quantifying risks associated with the Proposed Lifetime Extension and Proposed Offsetting Measures by means of a site-specific risk assessment is derived from the EPA ‘*Guidance on Assessing and Costing Environmental Liabilities*’ document⁴. The following steps were taken as part of the site-specific risk assessment:

- Risk Identification
- Risk Classification, likelihood and consequence, and
- Risk Evaluation

16.2.4.2.1 Risk Identification

Risks have been reviewed through the identification of reasonably foreseeable risks in consultation with relevant contributors to this EIAR. The identification of risks has focused on non-standard but plausible incidents that could occur at the Site during the extended operational, and decommissioning phases.

In accordance with the European Commission EIAR Guidance, risks are identified in respect of the project’s:

1. *Potential to cause accidents and/or disasters,*
2. *Vulnerability to potential disaster/accident*

16.2.4.2.2 Risk Classification

Classification of Likelihood

After identifying the potential risks, the likelihood of occurrence of each risk has been assessed. An analysis of safety procedures and proposed environmental controls was considered when estimating likelihood of identified potential risks occurring. Table 16-1 defines the likelihood ratings that have been applied.

The approach adopted has assumed a ‘risk likelihood’ where one or more aspects of the likelihood description are met.

Table 16-1: Classification of Likelihood (Source: DoEHLG, 2010)

Ranking	Likelihood	Description
1	Extremely Unlikely	May occur only in exceptional circumstances; once every 500 or more years.

⁴ EPA (2014) *Guidance on assessing and costing environmental liabilities*. Available at https://www.epa.ie/publications/compliance-enforcement/licensees/reporting/financial-provisions/EPA_OEE-Guidance-and-Assessing-WEB.pdf

2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities, or communities; and / or little opportunity, reason or means to occur; may occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisation's worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years.
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Classification of Consequence

The consequence rating assigned to each risk has assumed that all proposed mitigation measures and/or safety procedures have failed to prevent the major accident and/or disaster. Furthermore, the Cork County Council Major Emergency Plan will work to reduce the consequence of any major accident or disaster. The consequence of the impact if the event occurs has been assigned as described in Table 16-2.

The consequence of a risk to/from the Proposed Project has been determined where one or more aspects of the consequence description are met, i.e., risks that have no consequence have been excluded from the assessment.

Table 16-2: Classification of Impact (Source: DoEHLG, 2010)

Ranking	Likelihood	Impact	Description
1	Minor	Life, Health, Welfare Environment Infrastructure Social	Small number of people affected; no fatalities and small number of minor injuries with first aid treatment. No contamination, localised effects <€0.5M Minor localised disruption to community services or infrastructure (<6 hours).
2	Limited	Life, Health, Welfare Environment Infrastructure Social	Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements. Simple contamination, localised effects of short duration €0.5-3M

Ranking	Likelihood	Impact	Description
			Normal community functioning with some inconvenience.
3	Serious	Life, Health, Welfare Environment Infrastructure Social	Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated. External resources required for personal support. Simple contamination, widespread effects or extended duration €3-10M Community only partially functioning, some services available.
4	Very Serious	Life, Health, Welfare Environment Infrastructure Social	5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated. Heavy contamination, localised effects or extended duration €10-25M Community functioning poorly, minimal services available
5	Catastrophic	Life, Health, Welfare Environment Infrastructure Social	Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated. Very heavy contamination, widespread effects of extended duration. >€25M Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.

Risk Evaluation

Once classified, the likelihood and consequence ratings have been multiplied to establish a 'risk score' to support the evaluation of risks by means of a risk matrix.

The risk matrix sourced from the DoEHLG *Guide to Risk Assessment in Major Emergency Management* and as outlined in Table 16-3 indicates the critical nature of each risk. This risk matrix has therefore been applied to evaluate each of the risks associated with the Proposed Project. The risk matrix is colour coded to provide a broad indication of the critical nature of each risk:

- The red zone represents 'high risk scenarios':



- > The amber zone represents ‘medium risk scenarios’, and
- > The green zone represents ‘low risk scenarios.’

Table 16-3: Classification of Impact (Source: DoEHLG, 2010)

		Consequence Rating				
		1.Minor	2.Limited	3. Serious	4.Very Serious	5.Catastrophic
Likelihood Rating	5.Very Likely					
	4. Likely					
	3. Unlikely					
	2. Very Unlikely					
	1. Extremely Unlikely					

16.3

Baseline Conditions

The functional areas of Cork County Councils fall under the South Major Emergency Region. The Major Emergency Plans prepared by Cork County Council (2021) outlines the following potential major emergency scenarios in the county:

- **Natural**
 - Flooding & Severe Weather.
- **Transportation**
 - Aircraft Collision / Loss
 - Major Road / Rail Incident;
 - Hazardous materials incident (Transportation);
 - Ship and Port incident;
 - Marine Emergency in Port (Passenger Ferry).
- **Technological**
 - Fire / Explosion / Toxic Cloud release at industrial site;
 - Seveso sites;
 - Loss of critical infrastructure;
 - Water contamination/pollution incident.
- **Civil**
 - Fire/ Major Crowd Safety incident;
 - Epidemics/pandemics;
 - Water Rescue.

Site/event Specific Emergency Plans for Cork County Council:

1. Severe Weather Plan (excluding flooding)
2. Flood Emergency Response Plan
3. Drinking Water Incident Response Plan

4. External Emergency Plans for Upper Tier Seveso Sites
5. Inter-Agency Emergency Plan for Cork Airport
6. Inter-Agency Emergency Plan for the Jack Lynch Tunnel
7. Bantry Bay Port Emergency Plan
8. Oil Spill / Hazardous Noxious Substances Contingency Plan

The risks which are most relevant to this assessment are described below.

16.3.1 Meteorological

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. The existing Taurbeg Wind Farm is located in County Cork, approximately 47.5 km west of the Atlantic Coastline at its closest point. The Proposed Offsetting lands are located in County Kerry, approximately 29km west of the Atlantic Coastline at its closest point. The dominant influence on Ireland's climate is the Atlantic Ocean. As a consequence, Ireland does not suffer from the extremes of temperature experienced by many other countries at similar latitude. The hills and mountains, many of which are near the coasts, provide shelter from strong winds and from the direct oceanic influence.

The Met Éireann weather station at Shannon Airport is the nearest weather and climate monitoring station to both the existing Taurbeg Wind Farm and the Proposed Offsetting Lands that has meteorological data recorded for the 30-year period from 1991 – 2020. The monitoring station is located approximately 50km to the North of Taurbeg Wind Farm. The wettest months are November and December, and typically, April and May the driest. July is the warmest month with an average temperature of 16°C. The mean annual temperature recorded at Shannon Airport was 10.7°C.

Wind speeds at Shannon Airport are greater than 16.7 kilometres per hour (9 knots), from November to April. The windiest month of the year at Shannon Airport is February, with an average monthly wind speed of 18.7 kilometres per hour (10.1 knots). The months of May to October tend to be more settled on average. The calmest month of the year in Shannon Airport is August, with an average monthly wind speed of 15.4 kilometres per hour (8.3 knots).

In relation to icy conditions, the wind turbines are fitted with anti-vibration sensors, which detect any imbalance caused by icing of the blades. The sensors cause the turbine to wait until the blades have been de-iced prior to beginning operation.

Turbine blades are manufactured of glass reinforced plastic which prevent any likelihood of an increase in lightning strikes within the Site of the Proposed Lifetime Extension or the local area. Lightning conduction cables, encased in protection conduits, follow the electrical cable run, from the nacelle to the base of the turbine.

The works programme for the Proposed Offsetting Measures and decommissioning stage of the existing Taurbeg Wind Farm will take account of weather forecasts and work will be suspended in the case of extreme weather events.

The following forecasting and weather warning systems are available and will be used on a daily basis to direct proposed activities:

- General Forecasts: Available on a national, regional and county level from the Met Éireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;
- Weather Warning or Advisories: Met Éireann's main suite of warnings are issued by the duty forecaster between 10am and midday and are updated as necessary as new information becomes available. In general, warnings will not be issued more than 60-

hours ahead of the expected adverse weather but advisories on potential hazards are issued up to a week in advance. The three warning categories are:

- Yellow: Not unusual weather. Localised danger.
- Orange: Infrequent. Dangerous/disruptive.
- Red: Rare. Extremely dangerous/destructive.
- MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale;
- 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;
- Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and,
- Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.

16.3.2 Natural

16.3.2.1 Proposed Lifetime Extension

The existing Taurbeg Wind Farm is located in an upland area with the River Feale being located in the northeastern section of the Site. This river is susceptible to flooding, with the closest single flood event being 3.5km north of the Site. No past flooding events have been identified within the Site itself, with the Site also not being in a flood zone.

There is coniferous forestry present at the Site, leading to a low possibility of forest fires at the Site. Earthquake, tsunami and volcanic eruptions are not considered to be a risk to the Proposed Lifetime Extension either, due to its location inland c. 42km from the nearest coastline), and the lack of tectonic activity ever recorded in the area.

16.3.2.2 Proposed Offsetting Measures

The Proposed Offsetting Lands are located in upland area, with the Clydagh River being located in the southeastern section of the site. No past flooding events have been identified within the Site itself, with the site also not being in a flood zone. There are deforestation works and farmland restoration measures proposed as part of the Proposed Offsetting Measures.

Earthquake, tsunami and volcanic eruptions are not considered to be a risk to the Proposed Offsetting Measures, due to its location inland c. 29km from the nearest coastline), and the lack of tectonic activity ever recorded in the area.

16.3.3 Peat Stability

16.3.3.1 Proposed Lifetime Extension

The existing Taurbeg Wind Farm is located in an upland area which is dominated by peat bogs, agricultural pastures, coniferous forestry, transitional woodland scrub and renewable energy production. The risk of landslide or rock slide are also considered to range from low to high, with the majority of the site having a Landslide Susceptibility Classification of moderately low according to the GSI.

There are no construction activities associated with the Proposed Lifetime Extension, and therefore no peat stability assessment has been carried out at the Site.

The original EIAR found that the existing Taurbeg Wind Farm was suitable from a peat stability perspective, and the existing wind farm was constructed without any peat stability issues. The main risk related to the construction work activities and earthworks are associated with the construction of the wind farm. The risks are significantly lower for an operational wind farm.

There have been no reported occurrences of ground instability or peat slides during the both the construction and operational phase of the Taurbeg Wind Farm.

16.3.3.2 Proposed Offsetting Measures

The Proposed Offsetting Lands are covered in blanket peat with undulating terrain and widespread coniferous forestry, with the exception of the agricultural field in the north of the site which contains improved agricultural land. Peat thicknesses recorded during the site walkovers within the Proposed Offsetting Lands from 111 no. probes ranged from 0m to 3.2m with an average depth of 1.6m. 23% of recorded peat thicknesses within the Proposed Offsetting Lands were under 1m, and 72% were under 2m.

An analysis of peat sliding was carried out across the Proposed Offsetting Lands for both the undrained and drained conditions. The purpose of the analysis was to determine the Factor of Safety (FoS) of the peat slopes.

Please see Chapter 8 Geology and Soils and Appendix 8-1 Peat Stability Assessment for more details.

16.3.4 Transportation

16.3.4.1 Proposed Lifetime Extension

The Proposed Lifetime Extension will utilise the existing road network for maintenance and decommissioning activities. Typically, there are no more than 12 trips per year to the Site made by car or light goods vehicle for maintenance purposes. Traffic associated with the extended operational and decommissioning stages of the Proposed Lifetime Extension is addressed in Chapter 15 of this EIAR.

16.3.4.2 Proposed Offsetting Measures

The Proposed Offsetting Measures will utilise the existing road network for the proposed deforestation works and farmland restoration. Further detail on traffic impacts are addressed in Chapter 15 of the EIAR.

16.3.5 Technological

16.3.5.1 Proposed Lifetime Extension

As the Proposed Lifetime Extension is located in a rural area, the risk of any industrial incidents interacting with the Site are low. The closest lower tier SEVESCO site is LP Gas Filling Services, Quaterstown Industrial Estate, Mallow, Co. Cork located approximately 34.5km south east of Taurbeg Wind Farm. The closest upper tier SEVESCO site is Irish Distillers (Perno Ricard), Dungourney, Co. Cork located 72.5km east of the Site.

16.3.5.2 Proposed Offsetting Measures

As the Proposed Offsetting Lands are located in a rural area, the risk of any industrial incidents interacting with the Site. The closest lower tier SEVESCO site West Cork Distillers Limited, Bioatlantis, Clash Industrial Estate, Tralee in Co. Kerry located approximately 24km west of the Proposed Offsetting Lands. The closest upper tier SEVESCO site is National Oil Reserves Agency Ltd., Tarbert, Co. Kerry located approximately 37km north of the Proposed Offsetting Lands.

16.3.6 Civil

16.3.6.1 Proposed Lifetime Extension

The Proposed Lifetime Extension is located in a rural area, c.3.5km south of Rockchapel. As highlighted in Chapter 5, there are 6 Sensitive Receptors located within 1km of the existing turbine locations. The closest Sensitive Receptor (H10) is located approximately 731 metres from the nearest turbine location (T8). Therefore, due to these low population numbers, civil concerns such as overcrowding and epidemics are not considered to be a risk to the Proposed Lifetime Extension.

16.3.6.2 Proposed Offsetting Measures

The Proposed Offsetting Measures are located in a rural area, c.8km east of Castleisland. There are 22 dwellings located within 1km of the Proposed Offsetting Lands. The closest Sensitive Receptor (H10) is located approximately 60m south from proposed deforestation works. Therefore, due to these low population numbers, civil concerns such as overcrowding and epidemics are not considered to be a risk to the Proposed Offsetting Measures.

16.3.7 Turbine Safety

16.3.7.1 Proposed Lifetime Extension

Turbines pose no threat to the health and safety of the general public. The Department of the Environment, Heritage and Local Government (DoEHLG)'s *'Wind Energy Development Guidelines for Planning Authorities 2006'* (the Guidelines) state that there are no specific safety considerations in relation to the operation of wind turbines. Fencing or other restrictions are not necessary for safety considerations. People or animals can safely walk up to the base of the turbines.

The Guidelines state that there is a very remote possibility of injury to people from flying fragments of ice or from a damaged blade. However, most blades are composite structures with no bolts or separate components and the danger is therefore minimised. There is also a remote possibility of injury or environmental damage due to the unlikely possibility of turbine collapse or component damage.

16.3.7.2 Proposed Offsetting Measures

There is no wind farm infrastructure proposed within the Proposed Offsetting Lands, with works proposed being limited to deforestation of coniferous forestry and farmland restoration.

16.3.8 Electromagnetic Interference

16.3.8.1 Proposed Lifetime Extension

Underground electric cables are common practice throughout the country and installation does not give rise to any specific health concerns.

The extremely low frequency (ELF) electric and magnetic fields (EMF) associated with the operation of the cables fully comply with the international guidelines for ELF-EMF set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), a formal advisory agency to the World Health Organisation, as well as the EU guidelines for human exposure to EMF. Accordingly, there is no operational impact on sensitive receptors (residential or other uses), construction staff, operational & maintenance staff users of the site as the ICNIRP guidelines are not exceeded at any distances even directly above the cables.

The ESB document ‘EMF & You’ (ESB, 2017)⁵ provides further practical information on EMF. Further details on the potential impacts of electromagnetic interference to telecommunications and aviation are presented in Chapter 15 Material Assets of this EIAR.

16.3.8.2 **Proposed Offsetting Measures**

There is no electrical cabling proposed within the Proposed Offsetting Lands, with works proposed being limited to deforestation of coniferous forestry and farmland restoration.

16.3.9 **Loss of Critical Infrastructure**

16.3.9.1 **Proposed Lifetime Extension**

EirGrid operates and develops Ireland’s electricity grid. This includes interconnecting to neighbouring grids and running the wholesale electricity market. The grid safely brings power from generators such as wind farms to the ESB network that supplies homes and business in Ireland. It also brings power directly to large energy users. There are two types of electricity generation: synchronous generation and non-synchronous generation. Synchronous generation produces the same amount of electricity all the time e.g. fossil fuels. Non-synchronous generation produces a varying amount of electricity depending on the energy available. Eirgrid operate the grid from National Control Centres (NCCs) in Dublin and Belfast, matching electricity production to customer demand, switching from synchronous to non-synchronous where required to ensure no power outages.

The Existing Taurbeg Wind Farm connects into the existing onsite 38kV substation.

There are no Gas Networks Ireland (GNI) pipelines within the Site.

16.3.9.2 **Proposed Offsetting Measures**

There are no Eirgrid or ESB infrastructure such as substations or overhead lines located within the Proposed Offsetting Lands.

There are no Gas Networks Ireland (GNI) pipelines within the Proposed Offsetting Lands.

16.4 **Risk Assessment**

This section outlines the possible risks associated with the Proposed Lifetime Extension and Proposed Offsetting Measures for the extended operational and decommissioning phases.

These risks have been assessed in accordance with the relevant classification as outlined in Table 16-1 and 16-2.

⁵ *EMF & You: Information about Electric & Magnetic Fields and the electricity network in Ireland* Available at: https://esb.ie/docs/default-source/default-document-library/emf-public-information_booklet_v9.pdf?sfvrsn=0.

As outlined above, the consequence rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster i.e., pre-mitigation.

16.4.1 Likely Significant Effects

16.4.1.1 Do-Nothing Scenario

If the Proposed Project were not to proceed, the 11 no. turbines comprising the existing Taurbeg Wind Farm would be decommissioned in 2026 under the requirements of its current planning permission and would lose the opportunity to continue to contribute clean energy into the national grid, as would the opportunity to contribute to local, national and EU policy. Existing land use at the Proposed Offsetting Lands would continue and the Proposed Offsetting Measures would not take place.

16.4.1.2 Identification of Effect During Extended Operation

Risks specific to the Proposed Lifetime Extension have been identified and are presented in Table 16-4.

Table 16-4: Risk Register –Extended Operational Phase

Risk ID	Potential Risk	Possible Cause
Potential vulnerability to disaster risks		
A	Severe Weather Risk to operational activity on site, blade or turbine damage	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.
B	Flooding Risk of flooding in areas surrounding the Site impacting the operational phase and leading to environmental emissions	Extreme weather- periods of heavy rainfall and snow, taking into account climate change and strong winds
Potential to cause accidents and / or disasters.		
C	Industrial Accident-Fire / Gas Explosion	Equipment or infrastructure failure; Electrical problems; and Employee negligence.
D	Collapse / damage to structures	Earthquake, extreme weather events; and Vehicular collisions due to driver negligence on public roads.
E	Traffic Incident Collisions onsite and offsite with vehicles involved in operation of Proposed Lifetime Extension	Driver negligence or failure of vehicular operations on site roads. Traffic Management not implemented

F	Loss of Critical Infrastructure	Electrical fault at wind farm substation bay
G	Contamination Discharge or spillage of fuel, chemical solvents, sewage or wastewater onto subsoils and into watercourse or percolated to groundwater	A vehicular incident on the public road involving fuel, wastewater or sewage transportation in the extended operational phase. Spill or leak of oil during operational maintenance.

16.4.1.3 Identification of Effect During Decommissioning

Risks specific to the decommissioning of the existing Taurbeg Wind Farm have been identified and are presented in Table 16-5.

Table 16-5 Risk Register Decommissioning Phase

Risk ID	Potential Risk	Possible Cause
Potential vulnerability to disaster risks		
H	Severe Weather Risk to decommissioning activity on Site leading to environmental emissions	Extreme weather- periods of heavy rainfall and snow, taking into account climate change and strong winds.
I	Flooding of site Risk of flooding in the Site impacting the decommissioning phase and leading to environmental emissions	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.
J	Peat Stability	Extreme weather and periods of heavy rainfall.
Potential to cause accidents and / or natural disasters.		
K	Traffic Incident Collisions onsite and offsite with vehicles involved in decommissioning of the existing Taurbeg Wind Farm	Driver negligence or failure of vehicular operations on site roads. Traffic Management not implemented.
L	Collapse / damage to structures	Earthquake, extreme weather events; and Vehicular collisions due to driver negligence on Site and public roads.

M	Contamination Discharge or spillage of fuel, chemical solvents onto subsoils and into watercourse or percolated to groundwater	Accidental fuel spillage during delivery to site. Failure of fuel storage tank or tanks in plant and machinery and vehicles leading to uncontrolled emissions.
O	Industrial Accident – Fire / Gas Explosion	Equipment or infrastructure failure, Electrical problems; and; Employee negligence.

These risks have been assessed in accordance with the relevant classification (Refer to Table 16-1 and Table 16-2) and the resulting risk analysis is given in Table 16-6.

The risk register is based upon possible risks associated with the Proposed Lifetime Extension. As outlined in Section 16.2.4.2, the consequences rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster. A summary of the findings can be found in Table 16-6.

16.4.1.4 Assessment of Effect Summary – Proposed Lifetime Extension

Table 16-6: Risk Assessment Summary – Proposed Lifetime Extension

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
Extended Operational Phase								
A	Severe Weather	Extreme weather-periods of heavy rainfall or snow, taking into account climate change and strong winds	Illness or loss of life;	2	<p>The risk of severe weather is low when considering the weather conditions recorded over the last 30 years within the area.</p> <p>All operation and site maintenance activities will be paused should a Status Red weather warning alert be issued by Met Eireann, as is standard practice⁶.</p>	1	The risk of severe weather conditions during the extended operational phase will result in a minor consequence in that a ‘small number of people would be affected’ should a severe weather event occur, with ‘no fatalities and a small number of minor injuries with first aid treatment’.	2
B	Flooding	Extreme weather-periods of heavy rainfall, taking into account climate change and strong winds	<p>Illness or loss of life;</p> <p>Groundwater Flooding;</p> <p>Flooding to surrounding and downhill properties.</p>	2	The risk of flooding is considered very low within the Site when taking into account the Flood Risk Assessment in Chapter 9 of the EIAR. The on-site	1	The result of flooding during the extended operational phase will result in a minor consequence in that a ‘small number of	2

⁶ <https://www.met.ie/met-eireann-warning-system-explained>



Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
			Damage to, or depletion of aquatic habitats and species.		drainage system ensures that runoff from the site is at Greenfield pre-development rates and has not increased the downstream flood risk;		people would be affected' should flooding occur with 'no fatalities and a small number of minor injuries with first aid treatment'.	
C	Industrial Accident Fire / Gas Explosion	Equipment or infrastructure failure; Fuel spillage/storage Electrical problems; and Employee negligence	Illness or loss of life; Damage to, or depletion of habitats and species; and Impacts on ambient air quality.	2	Fuel is securely stored on-site and given good site maintenance and visual inspections are carried out regularly, fuel is not considered to be a significant fire risk. In accordance with Chapter 19 of the Safety, Health and Welfare at Work Act 2005 (the 2005 Act), the existing Taurbeg Wind Farm shall be subject to a fire safety risk assessment which would assist in the identification of any major risks of fire on site, and mitigation of the same during operation.	2	Should a fire/explosion occur at the Site, a limited consequence would occur in that there would be 'a limited number of people affected' with 'localised effects of short duration' on people and environmental receptors due to the nature of the existing Taurbeg Wind Farm and the upkeep and maintenance of fuel storage during the extended operational stage that would result in any such incident. There will be 'normal community functioning' in the area with 'some	4



Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
							inconvenience'. The 'generic command, control & co-ordination systems' as well as the 'common elements of response' detailed in the Cork Major Emergency Plans will work to reduce the consequence (both on people and the environment) of potential fire/explosions at the Site.	
D	Collapse/ damage to structures	Earthquakes, extreme weather events; and Vehicular collisions due to driver negligence.	Injury or loss of life. Movement of peat within the Site; Sedimentation of nearby watercourse; Damage to, or depletion of aquatic habitats and species;	1	According to the Irish National Seismic Network (INSN), earthquakes measuring ~2 on the Richter Scale are "normal" in terms of seismicity in Ireland. These are known as microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. As such, buildings in Ireland are extremely unlikely to be damaged or collapse due to seismic activity.	1	The risk of infrastructure collapse during the extended operational phase will result in a minor consequence in that 'small number of people would be affected' and no real likelihood of any impact on any environmental receptors.	1

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					<p>Having regard to public speed limits within the existing Taurbeg Wind Farm, it is envisaged that a collision between a vehicle and any site infrastructure would not result in significant damage/collapse.</p> <p>Mitigation measures regarding vehicular accidents can be found in Chapter 15; Material Assets.</p>			
E	Traffic Incident	<p>Driver negligence or failure of vehicular operations on existing Taurbeg Wind Farm roads.</p> <p>Traffic Management not implemented</p>	Injury or loss of life.	2	<p>A limited number of vehicles will be permitted on the Site as part of the extended operational phase.</p> <p>As such, it can be determined that there is some ‘opportunity, reason or means’ for a vehicle collision to occur on the Site, ‘at some time.’ An unlikely risk is therefore predicted</p> <p>The current on-site speed limit of 20km/h will be enforced during the</p>	1	A minor consequence is predicted. Having regard to on-site speed limits and vehicular movements, a ‘small number of people would be affected’ should a vehicular collision occur, with ‘no fatalities and small number of minor injuries with first aid treatment.’	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					extended operational phase of the Proposed Lifetime Extension, with speed limit signs being positioned at the entrance and junctions within the Site..			
F	Loss of Critical Infrastructure	Equipment or infrastructure failure; Electrical problems; and Employee negligence Landslide/ Earthquake; and Extreme weather conditions such as flooding and storms.	Injury or loss of life	1	ESB operate the grid from National Control Centres matching electricity production to customer demand, switching from synchronous to non-synchronous where required to ensure no power outages. The existing Taurbeg Wind Farm is connected to the national grid via the existing Glenlara Substation, and any shortages or failures will not impact other connections to the same substation	2	Should a power failure occur at the Existing Taurbeg Wind Farm 38kV substation, it will result in a limited number of people affected- localised effects of short duration	2
G	Contamination	Mismanagement of hazardous materials e.g. oil by turbine maintenance	Damage to, or depletion of aquatic habitats and species Contamination of local drinking water supplies and groundwater aquifers.	2	All hazardous wastes, if any, from the maintenance of the turbines and substation (including transformers) will be stored securely in bundled containers/areas	1	The risk of a fuel spillage or impact on surround drainage during the extended operational stage will result in a limited	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		Mismanagement of general waste and welfare facilities waste.	Accidental spillage during refuelling onto subsoils		<p>before being collected by an authorised waste contractor and brought to an EPA licensed waste facility.</p> <p>The wastewater holding tank at the substation will be emptied when required by a licenced contractor.</p> <p>Mitigation measures to be employed that will reduce the likelihood of contamination risks are outlined in Section 8.6 of Chapter 8: Geology & Soils and Section 9.5 of Chapter 9: Hydrology.</p>		consequence in that there would be ‘a limited number of people affected’ with ‘localised effects of short duration’ through the use of bunded containment areas and off-site refuelling during operation. The potential residual environmental effects are described in detail in Chapter 9: Hydrology, which concludes that there will be no significant environmental effects.	
Decommissioning Phase								
H	Severe Weather	Extreme weather-periods of heavy rainfall, taking into account climate change and strong winds	<p>Illness or loss of life;</p> <p>Sedimentation of onsite watercourse</p> <p>Damage to, or depletion of aquatic habitats and species;</p>	2	<p>The risk of severe weather is low when considering the weather conditions recorded over the last 30 years within the area.</p> <p>Decommissioning works will be paused should a Status Red weather warning alert be issued by Met</p>	1	The risk of severe weather conditions during the decommissioning phase will result in a minor consequence in that ‘small number of people would be affected’ should a severe weather event	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					Eireann as is standard practice		<p>occur, with ‘no fatalities and a small number of minor injuries with first aid treatment’.</p> <p>Decommissioning will not require significant excavations works. There is no real likelihood of any impact on any environmental receptors</p>	
I	Flooding	Extreme weather-periods of heavy rainfall, taking into account climate change and strong winds	<p>Illness or loss of life;</p> <p>Sedimentation of nearby watercourse;</p> <p>Damage to, or depletion of aquatic habitats and species.</p>	2	The risk of flooding is considered very unlikely as per the detailed assessment in Chapter 9 and Appendix 9-1 of the EIAR.	1	The risk of flooding during the decommissioning phase will result in a minor consequence in that ‘small number of people would be affected’ should a severe weather event occur, with ‘no fatalities and a small number of minor injuries with first aid treatment’.	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
J	Peat Stability	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds	Damage to, or contamination of aquatic habitats and species. Movement of peat within the site; Sedimentation of nearby watercourse	1	It is proposed to leave turbine foundations in place underground and to cover them with soil and reseed as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option as excavation works will be avoided.	2	Should a peat stability failure occur at the Existing Taurbeg Wind Farm, it will result in a limited number of people affected with localised effects of short duration	2
K	Traffic Incident	Driver negligence or failure of vehicular operations on site roads. Traffic Management not implemented	Injury or loss of life.	3	A limited number of vehicles will be permitted on the Site as part of the decommissioning phase. As such, it can be determined that there is some 'opportunity, reason or means' for a vehicle collision to occur on site, 'at some time.' An unlikely risk is therefore predicted. An agreed speed limit will be enforced on the Site during all decommissioning works, with speed limit signs being positioned at the entrance and junctions within the Site.	1	A minor consequence is predicted. Having regard to on-site speed limits and vehicular movements, a 'small number of people would be affected' should a vehicular collision occur, with 'no fatalities and small number of minor injuries with first aid treatment.'	3

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
L	Collapse/ damage to structures	<p>Earthquake, extreme weather events;</p> <p>Vehicular collision due to driver negligence on public roads.</p>	<p>Injury or loss of life.</p> <p>Movement of peat within the site;</p> <p>Sedimentation of nearby watercourse;</p> <p>Damage to, or depletion of aquatic habitats and species.</p>	1	<p>According to the Irish National Seismic Network (INSN), earthquakes measuring ~2 on the Richter Scale are “normal” in terms of seismicity in Ireland. These are known as microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. As such, buildings in Ireland are extremely unlikely to be damaged or collapse due to seismic activity.</p> <p>Having regard to public speed limits within the existing Taurbeg Wind Farm, it is not predicted that any collision of vehicles and any infrastructure would result in significant damage/collapse.</p>	1	The risk of infrastructure collapse during the decommissioning phase will result in a minor consequence in that ‘small number of people would be affected’ and no real likelihood of any impact on any environmental receptors.	1
M	Contamination	<p>Fuel spillage during delivery to site.</p> <p>Failure of fuel storage tank or tanks in plant</p>	<p>Damage to, or depletion of aquatic habitats and species</p> <p>Discharge to groundwater</p>	2	As outlined in Appendix 4-3, fuel volumes stored on site will be minimised. Any storage areas will be appropriately sited and	2	The risk of a fuel spillage or impact on surrounding drainage during the decommissioning	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
		<p>and machinery and vehicles.</p> <p>Drainage and seepage water resulting from infrastructure removal;</p> <p>Erosion of sediment from site drainage channels.</p>	<p>Release of suspended solids to surface watercourses and could result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies</p>		<p>bunded to ensure containment and prevent spillages of fuel. No fuels, chemicals or solvents will be stored outside of the confines of the Site.</p> <p>Setback distances from sensitive hydrological features means that adequate room is maintained for the proposed drainage measures as detailed in Chapter 9.</p>		<p>stage will result in a limited consequence in that there would be 'a limited number of people affected' with 'localised effects of short duration' through the use of bunded containment areas during decommissioning. The potential residual environmental effects are described in detail in Chapter 9 which concludes that there will be no significant environmental effects.</p>	
N	Industrial Accident-Fire/ Gas Explosion	<p>Ignition of fuel storage tanks or fuel tanks in plant, machinery and vehicles</p> <p>Equipment and Infrastructure failures;</p> <p>Spillage of fuel;</p> <p>Employee Negligence</p>	<p>Illness or loss of life;</p> <p>Forest fires;</p> <p>Damage to or depletion of habitats and species;</p> <p>Impacts on ambient air quality</p>	2	<p>As outlined in chapter 9 of this EIAR, refuelling will take place off-site wherever possible, and machinery and plant will be inspected regularly for leaks and fitness for purpose. Only designated trained operatives will be authorised to refuel plant and machinery within the designated refuelling station and all refuelling equipment</p>	2	<p>The risk of an industrial accident fire/ Gas explosion during the decommissioning stage will result in a limited consequence in that there would be 'a limited number of people affected' with 'localised effects of short duration' through the use of designated refuelling</p>	4



Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					<p>will be fitted with a lock system;</p> <p>Setback distances from sensitive hydrological features, as well as bunding of fuel storage systems means that adequate room is provided to reduce the impact of industrial accidents and hydrological features</p>		<p>areas and regular equipment inspection during decommissioning.</p> <p>The potential residual environmental effects are described in detail in Chapter 9 which concludes that there will be no significant environmental effects</p>	

16.4.1.4.1 Risk Scores – Proposed Lifetime Extension

The risk assessment for each of the potential risks identified are consolidated in Table 16-7 which provides their ‘risk score.’ A corresponding risk matrix is provided in Table 16-8, which is colour coded in order to provide an indication of the critical nature of each risk. As outlined in Section 16.2.4.2 above, the red zone represents ‘high risk’ scenarios’, the amber zone represents ‘medium risk scenarios and the green zone represents ‘low risk scenarios.

Table 16-7: Risk Scores – Proposed Lifetime Extension

Risk ID	Potential Risk	Likelihood Rating	Consequence Rating	Risk Score
Extended Operational Phase				
A	Severe Weather	2	1	2
B	Flooding	2	1	2
C	Industrial Accident- Fire / Gas Explosion	2	2	4
D	Collapse/ damage to structures	1	1	1
E	Traffic Incident	2	1	2
F	Loss of Critical Infrastructure	1	2	2
G	Contamination	2	1	2
Decommissioning Phase				
H	Severe Weather	2	1	2
I	Flooding	2	1	2
J	Peat Stability	1	2	2
K	Traffic Incident	3	1	3
L	Collapse/ damage to structures	1	1	1
M	Contamination	2	2	4
N	Industrial Accident- Fire / Gas Explosion	2	2	4

Table 16-8: Risk Matrix – Proposed Lifetime Extension

		Consequence Rating				
		1.Minor	2.Limited	3. Serious	4.Very Serious	5.Catastrophic
Likelihood Rating	5.Very Likely					
	4. Likely					
	3. Unlikely	K				
	2. Very Unlikely	A,B,E, G, H, I,	C, M,N			
	1. Extremely Unlikely	D, L	F,J			

Table 16-7 presents the potential risks identified during the extended operational and decommissioning phases of the existing Taurbeg Wind Farm all of which can be classified as ‘low risk’ scenarios.

The scenario with the highest risk score in terms of a major accident and/or natural disaster during the extended operational and decommissioning phase of the existing Taurbeg Wind Farm is identified below.

16.4.1.4.2 **Contamination During Extended Operational and Decommissioning Phase**

There is a potential risk of contamination from site activities during the extended operational and decommissioning phases from potential release of hydrocarbons. The risk of contamination was given a risk score of 4 on a very precautionary basis. However, as outlined in Chapter 8 Land, Soil and Geology and Chapter 9 Hydrology and Hydrogeology, measures will be put in place to reduce the risk of accidental spillage and contamination of pollution risk to surface water features and associated ecosystems, subsoils, groundwater, and to terrestrial ecology.

The risk of contamination is ‘very unlikely’ to occur and will have ‘limited’ consequences should it do so, representing a ‘low-risk scenario’ during the extended operational and decommissioning phases.

The conclusions in the relevant chapters of the EIAR conclude that there will be no significant residual effects associated with this potential impact.

16.4.1.4.3 **Fire/Explosion During Extended Operational and Decommissioning Phase**

There is potential risk of fires/explosions at the Site. However, as outlined in Section 16.2, the scope of this assessment has been based on the understanding that the Proposed Lifetime Extension will operate in line with current best practice. Furthermore, in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, the Proposed Lifetime Extension shall be subject to a fire safety risk assessment which will assist in the identification of major risks of fire on site.

Therefore, the risk of fires/explosions occurring on the Site, resulting in a major accident and/or disaster was given a risk score of 4 on a very precautionary basis. This indicates a scenario that is very unlikely to occur and having limited consequences should it do so, representing a low-risk scenario during both the extended operational or decommissioning phase.

16.4.1.4.4 **Mitigation Measures**

Please refer to Chapter 18 Schedule of Mitigation and Monitoring Measures which details all proposed mitigation and monitoring measures for the extended operational and decommissioning of the existing Taurbeg Wind Farm.

As outlined in Section 16.4.1 Likely Significant Effects, the scenario with the highest risk score in terms of the occurrence of major accidents and/or disasters was identified as ‘Contamination’ of the Site and risk of ‘Fire/Gas Explosions’ during the extended operational and decommissioning phases of the Proposed Lifetime Extension.

The existing Taurbeg Wind Farm was designed and built in line with the best practice measures as set out in its original planning application and Environmental Impact Statement (EIS), and as such mitigation against the risk of major accidents and/or disasters was embedded through the design.

16.4.1.4.5 **Contamination During Extended Operational and Decommissioning Phases**

Potential effects associated with contamination during extended operational and decommissioning phases are addressed fully in Chapter 8 Land Soil and Geology and Chapter 9 Hydrology and Hydrogeology of this EIAR. The mitigation measures outlined therein as well as the procedures and measures described in the Decommissioning Plan (Appendix 4-3) to protect environmental receptors as well as the procedures will ensure that the risk from these sources is low.

Fire/Explosion During Extended Operational Phase

The Proposed Lifetime Extension will also be subject to a fire safety risk assessment in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, which will assist in the identification of any major risks of fire on site, and mitigation of the same during extended operation.

16.4.1.4.6 **Residual Effects**

The risk of a major accident and/or disaster during the extended operational and decommissioning phases of the Proposed Lifetime Extension is considered ‘low’ in accordance with the ‘*Guide to Risk Assessment in Major Emergency Management*’ (DoEHLG, 2010).

When the above mitigation is implemented, and all mitigation detailed in the EIAR is implemented, the residual effect(s) associated with the extended operational and decommissioning phases of the Proposed Lifetime Extension are not significant.

16.4.1.4.7 **Monitoring**

Please refer to Chapter 18 Schedule of Mitigation and Monitoring Measures which details all proposed mitigation and monitoring measures for the extended operational and decommissioning phases of the Proposed Lifetime Extension.

Extended Operational Phase

The operator of the existing Taurbeg Wind Farm will continue to assess the risk of major accidents and/or disasters on site on an on-going basis during the Proposed Lifetime Extension.

The maintenance programme, record of reported incidents, as well as general site activities will be monitored on an on-going basis to ensure risk of major accidents does not increase over time.

A Decommissioning Plan has been prepared (Appendix 4-3), the final detail of which will be agreed with the local authority prior to any decommissioning works. The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will be agreed with the competent authority at that time. The Decommissioning Plan includes mitigation and monitoring measures that will be in place during the decommissioning phase. These can also be found in a Chapter 18 Schedule of Mitigation and Monitoring Measures which sets out all proposed Mitigation and Monitoring Measures for all phases of the Proposed Lifetime Extension..

16.4.1.5 Identification of Effect During Proposed Offsetting Measures

Risks specific to the Proposed Offsetting Measures have been identified and are presented in Table 16-9.

Table 16-9: Risk Register – Proposed Offsetting Measures

Risk ID	Potential Risk	Possible Cause
Potential vulnerability to disaster risks		
A	Severe Weather Risk to operational activity on site	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.
B	Flooding Risk of flooding within the via pluvial flooding leading to environmental emissions.	Extreme weather- periods of heavy rainfall and snow, taking into account climate change and strong winds
C	Peat Stability Movement of peat within the site during Proposed Offsetting Measures	Not adhering to mitigation measures and recommendations outlined in PSRA Severe weather conditions- storm, flooding
Potential to cause accidents and / or disasters.		
D	Industrial Accident-Fire / Gas Explosion	Equipment or infrastructure failure; and Employee negligence.
E	Traffic Incident Collisions onsite and offsite with vehicles involved during Proposed Offsetting Measures works and monitoring.	Driver negligence or failure of vehicular operations on site roads. Traffic Management not implemented
F	Contamination	A vehicular incident on the public road involving fuel, wastewater or sewage

	Discharge or spillage of fuel, chemical solvents, onto subsoils and into watercourse or percolated to groundwater	<p>transportation during works on the Proposed Offsetting Lands.</p> <p>Spill or leak of hydrocarbons during ongoing monitoring and management of the Proposed Offsetting Lands .</p>
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These risks have been assessed in accordance with the relevant classification (Refer to Table 16-1 and Table 16-2) and the resulting risk analysis is given in Table 16-10.

The risk register is based upon possible risks associated with the Proposed Offsetting Measures. As outlined in Section 16.2.4.2, the consequences rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster. A summary of the findings can be found in Table 16-10.

16.4.1.6 Assessment of Effect Summary – Proposed Offsetting Measures

Table 16-10: Risk Assessment Summary – Offsetting Measures

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
Extended Operational Phase and Proposed Offsetting Measures								
A	Severe Weather	Extreme weather- periods of heavy rainfall or snow, taking into account climate change and strong winds	Illness or loss of life;	2	The risk of severe weather is low when considering the weather conditions recorded over the last 30 years within the area. Proposed Offsetting Measures will be paused should a Status Red weather warning alert be issued by Met Eireann, as is standard practice	1	The risk of severe weather conditions during the Proposed Offsetting Measures will result in a minor consequence in that ‘small number of people would be affected’ should a severe weather event occur, with ‘no fatalities and a small number of minor injuries with first aid treatment’	2
B	Flooding	Extreme weather- periods of heavy rainfall, taking into account climate change and strong winds.	Illness or loss of life; Groundwater Flooding; Flooding to surrounding and	2	The risk of flooding is considered very low within Proposed Offsetting Lands when taking into account the Flood Risk Assessment in Chapter 9 of the EIAR.	1	The result of flooding during the Proposed Offsetting Measures will result in a minor consequence in that a ‘small number of people would be affected’ should flooding occur with	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
			downhill properties. Damage to, or depletion of aquatic habitats and species				'no fatalities and a small number of minor injuries with first aid treatment'.	
C	Peat Stability	Extreme weather- periods of heavy rainfall; Not adhering to mitigation measures and recommendations outlined in PSRA.	Damage to, or contamination of aquatic habitats and species. Movement of peat within the site; Sedimentation of nearby watercourse	2	A comprehensive and robust Peat Stability Risk Assessment (PSRA) was undertaken by Fehily Timoney (refer to Appendix 8-1) for the Proposed Offsetting Measures. The Peat Stability Assessment was informed by the Scottish Government's 2017 guidance document, <i>Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments</i> . Ground investigation works carried out as part of the peat stability assessment included peat depth probing and shear strength testing. The extensive suite of ground investigations, the	2	The risk of peat instability during the Proposed Offsetting Measures will result in a limited consequence in that there would be 'a limited number of people affected' with 'localised effects of short duration'. Contamination of environment (e.g. watercourses, aquatic habitats and associated species), localised effects of short duration.	4

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					<p>robust peat stability assessment and the lessons learned from previous peat slide events on similar sites will ensure that the risk of such an event, occurring during the Proposed Offsetting Measures is minimised.</p> <p>The findings of the PSRA showed that the site has an acceptable margin of safety and is suitable for the Proposed Offsetting Measures. The findings include recommendations and control measures for the Proposed Offsetting Measures, all of which will be implemented in full to ensure that all works adhere to an acceptable standard of safety.</p>			
D	Industrial Accident Fire / Gas Explosion	<p>Equipment or plant failure;</p> <p>Fuel spillage/storage; and</p> <p>Employee negligence</p>	<p>Illness or loss of life;</p> <p>Damage to, or depletion of habitats and species; and</p>	2	<p>Fuel will not be stored on-site and therefore fuel is not considered to be a significant fire risk.</p> <p>Equipment and Plant will be regularly inspected to</p>	1	<p>Should a fire/explosion occur at the Proposed Offsetting lands, a limited consequence would occur in that a 'small number of</p>	2



Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
			Impacts on ambient air quality.		ensure they are in good condition.		<p>people would be affected' with 'no fatalities and a small number of minor injuries with first aid treatment'</p> <p>There will be no infrastructure or fuel storage during the Proposed Offsetting Measures that would result in any major incident, with any fire/explosion being caused by felling plant/machinery.</p> <p>There will be 'normal community functioning' in the area with 'some inconvenience' .</p>	
E	Traffic Incident	<p>Driver negligence or failure of vehicular operations on roads adjacent to the Proposed Offsetting Lands.</p> <p>Traffic Management not implemented</p>	Injury or loss of life	2	Plant and Machinery required for deforestation works will utilise the existing forestry tracks during the Proposed Offsetting works.	1	A minor consequence is predicted. Having regard to on-site speed limits and vehicular movements, a 'small	2

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
					<p>As such, it can be determined that there is some ‘opportunity, reason or means’ for a vehicle collision to occur on the Proposed Offsetting Lands, ‘at some time.’ An unlikely risk is therefore predicted.</p> <p>An on-site speed limit of 10km/h will be enforced during the Proposed Offsetting Measures.</p>		number of people would be affected’ should a vehicular collision occur, with ‘no fatalities and small number of minor injuries with first aid treatment.	
F	Contamination	<p>Mismanagement of hazardous materials e.g. oils used in machinery;</p> <p>Mismanagement of general waste and welfare facilities waste</p>	<p>Damage to, or depletion of aquatic habitats and species</p> <p>Contamination of local drinking water supplies and groundwater aquifers.</p>	2	<p>Any waste material generated during the Proposed Offsetting Measures will be collected by an authorised waste contractor and brought to an EPA licensed waste facility.</p> <p>Mitigation measures to be employed that will reduce the likelihood of contamination risks are outlined in Section 8.6 of Chapter 8: Geology & Soils and Section 9.5 of Chapter 9: Hydrology</p>	1	The risk of a fuel spillage or impact on surround drainage during the Proposed Offsetting Measures will result in a limited consequence in that there would be ‘a limited number of people affected’ with ‘localised effects of short duration’ through the use of off-site refuelling during works.	2



Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score (Consequence x Likelihood)
							The potential residual environmental effects are described in detail in Chapter 9: Hydrology, which concludes that there will be no significant environmental effects.	

16.4.1.6.1 Risk Scores – Proposed Offsetting Measures

The risk assessment for each of the potential risks identified are consolidated in Table 16-11 which provides their ‘risk score.’ A corresponding risk matrix is provided in Table 16-12, which is colour coded in order to provide an indication of the critical nature of each risk. As outlined in Section 16.2.4.2 above, the red zone represents ‘high risk’ scenarios, the amber zone represents ‘medium risk scenarios and the green zone represents ‘low risk scenarios.

Table 16-11: Risk Scores – Proposed Offsetting Measures

Risk ID	Potential Risk	Likelihood Rating	Consequence Rating	Risk Score
Proposed Offsetting Measures				
A	Severe Weather	2	1	2
B	Flooding	2	1	2
C	Peat Stability	2	2	4
D	Industrial Accident- Fire / Gas Explosion	2	1	2
E	Traffic Incident	2	1	2
F	Contamination	2	1	2

Table 16-12: Risk Matrix - Proposed Offsetting Measures

		Consequence Rating				
		1.Minor	2.Limited	3. Serious	4.Very Serious	5.Catastrophic
Likelihood Rating	5. Very Likely					
	4. Likely					
	3. Unlikely					
	2. Very Unlikely	A,B,D,E,F	C			
	1. Extremely Unlikely					

Table 16-11 and Table 16-12 presents the potential risks identified during the Proposed Offsetting Measures.

The scenario with the highest risk score in terms of a major accident and/or natural disaster during the Proposed Offsetting Measures is identified below.

16.4.1.6.2 Mitigation Measures – Proposed Offsetting Measures

Please refer to Chapter 18 Schedule of Mitigation and Monitoring Measures which details all proposed mitigation and monitoring measures for the Proposed Offsetting Measures.

As outlined in Section 16.4.1 Likely Significant Effects, the scenario with the highest risk score in terms of the occurrence of major accidents and/or disasters was identified as ‘Peat Stability’ during the Proposed Offsetting Measures

16.4.1.6.3 **Mitigation – Peat Stability Risk During Proposed Offsetting Measures Works**

Potential effects associated with peat stability as a result of the Proposed Offsetting Measures are addressed fully in Chapter 8 Land Soil and Geology of this EIAR. A dedicated PSRA has also been prepared, see Appendix 8-1 for further detail. The mitigation measures outlined therein to protect environmental receptors as well as the procedures will ensure that the risk from these sources is predicted to not be significant.

16.4.1.6.4 **Residual Effects**

The risk of a major accident and/or disaster during the Proposed Offsetting Measures is considered ‘low’ in accordance with the ‘*Guide to Risk Assessment in Major Emergency Management*’ (DoEHLG, 2010).

When the above mitigation is implemented, and all mitigation detailed in the EIAR is implemented, the residual effect(s) associated with the Proposed Offsetting Measures are not significant.

16.4.1.6.5 **Monitoring**

Please refer to Chapter 18 Schedule of Mitigation and Monitoring Measures, as well as Chapter 8 and Appendix 8-1 of this EIAR, which detail all proposed mitigation and monitoring measures for the risk of Peat Stability at the Proposed Offsetting lands. Additionally, a Hen Harrier Offsetting Plan has been prepared (Appendix 7-7), which details the above management and monitoring measures which will be undertaken at the Proposed Offsetting Lands.

The Proposed Offsetting Lands will continue to be assessed for the risk of major accidents and/or disasters on an ongoing basis.

Monitoring During Proposed Offsetting Measures – Peat Stability

Monitoring measures to assess peat stability on the Proposed Offsetting Lands are outlined in Chapter 8, 18 and Appendix 8-1 of this EIAR and include:

- Set up, maintain and report findings from monitoring systems, including sightline monitoring.
- Installation of monitoring posts is recommended where works are taking place in areas where peat depths exceed 2m
- Movement monitoring posts will be observed at least once a day with more frequent inspections which adjacent works are ongoing. Should movements be recorded the frequency of these inspections will be increased.
- The contractor will also develop a routine inspection of all areas surrounding work in peat, not just exclusively on the monitoring posts. These inspections will include an assessment of ground stability and drainage conditions.
- Maintain vigilance and awareness through Tool-Box-Talks on peat stability

Although the stability of the peat is considered to be safe for the activities proposed, it is important to consider the actions which will be carried out if signs of instability are identified during the outlined

monitoring or should a failure occur at the Proposed Offsetting Lands. Where excessive movement has been observed in the installed monitoring outlined above, the following increased monitoring measures will be taken:

- A competent Geotechnical Engineer will carry out an assessment of the peat instability including drainage. The competent Geotechnical Engineer will compile a report outlining the surveys undertaken, the potential cause of the instability, assessment of any increased risk caused by the instability, and the further measures required to manage this risk,
- An increased monitoring regime will be specified including increase in number of monitoring post lines, decrease on monitoring post spacing and an increase in the frequency of monitoring post observations,
- Should no further movement be detected, activities will be recommenced while maintaining the increased monitoring regime.

16.4.1.7 Cumulative Impact Assessment

A search in relation to plans and projects that may have the potential to result in a cumulative impact with the Proposed Lifetime Extension and Proposed Offsetting Measures on the environment was carried out as part of the EIAR. Both the Proposed Lifetime Extension and Proposed Offsetting Measures have been considered, in combination with existing, permitted and existing wind farms and plans (wind energy or otherwise), as set out in Appendix 2-3 of this EIAR. Please see section 2.8 for the cumulative assessment methodology.

Following a detailed assessment of the potential for any further impact when considered in combination with any or all of the plans and projects set out in set out in Appendix 2-3, both the Proposed Lifetime Extension and Proposed Offsetting Measures with mitigation measures in place, were found to have no potential for significant in-combination or cumulative effects. This is based on the low risk associated with both the Proposed Lifetime Extension and Proposed Offsetting Measures described in this Chapter of the EIAR and a review of the nature of the surrounding land uses and projects existing or intended in the surrounding area.

Environmental Impact Assessment Report

Taurbeg Wind Farm Extension of Operational Life

Chapter 17 - Interaction of the Foregoing





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Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



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17. INTERACTION OF THE FOREGOING

17.1 Introduction

The preceding Chapters 5 to 16 of this Environmental Impact Assessment Report (EIAR) identify the potential significant environmental effects that may occur in terms of Population and Human Health, Biodiversity (including Birds), Land, Soils and Geology, Hydrology and Hydrogeology (Water), Air Quality, Climate, Noise and Vibration, Archaeological, Architectural and Cultural Heritage, Landscape and Visual, Material Assets (including Traffic and Transport, Telecommunications and Aviation, Other Utilities) and Vulnerability to/from Major Accidents and Natural Disasters as a result of the Proposed Project as described in Chapter 4 of this EIAR. All of the potential significant effects of the Proposed Project and the measures proposed to mitigate them have been outlined in the preceding chapters of this EIAR. However, for any development with the potential for significant environmental effects there is also the potential for interaction between these potential significant effects. The result of interactive effects may exacerbate the magnitude of the effects or improve them or have a neutral effect.

A matrix is presented in Table 17-1 and 17-2 below to identify potential interactions of impacts between the various aspects of the environment already assessed in this EIAR. The matrix presented in Table 17-1 highlights the potential for the occurrence of positive, neutral or negative effects during the extended operational phase (O) and the Decommissioning phase (D) of the Proposed Lifetime Extension. The matrix presented in Table 17-2 highlights the potential for the occurrence of positive, neutral or negative effects during the Proposed Offsetting Measures.

It is considered that the potential effects during the decommissioning phase will be similar to typical wind farm construction phase effects, but of a lesser magnitude which has been assessed within their respective chapters, and these have been included in the interaction's matrix below. The matrix is symmetric, with each environmental component addressed in the chapters of this EIAR being placed on both axes of a matrix, and therefore, each potential interaction is identified twice.

The potential for interaction of impacts has been assessed throughout this EIAR, as part of the impact assessment process. While the work on all parts of the EIAR was not carried out by MKO, the entire project and all the work of all sub-consultants was managed and coordinated by the company. This EIAR was edited and collated by MKO as an integrated report of findings from the impact assessment process, by all relevant experts, and impacts that potentially interact have been assessed in detail in the individual chapters of the EIAR above and summarised in Section 17.2 and 17.3 below.

Where any potential negative impacts have been identified during the assessment process, these impacts have been avoided or reduced by design and the proposed mitigation measures, as presented throughout the EIAR and highlighted in Section 17.2 and 17.3 below.

17.1.1 Statement of Authority

This chapter of the EIAR was completed by Michéal Cahill and reviewed by Eoin McCarthy, both of whom work for MKO. Michéal Cahill is a Graduate Environmental Scientist with MKO with over a years' experience in environmental consulting.

Michéal holds a first-class honours degree in Environmental Science at University of Galway and was awarded the Professor Emer Colleran Medal for his academic achievements. Michéal has previous experience in the preparation of Environmental Impact Assessment Reports for both offshore and onshore wind farm projects. Michéal's key strengths and areas of expertise are in environmental impact assessment, the preparation and writing of high-quality reports, proficiency in geographic information systems, ecological assessment and risk assessment. As an environmental scientist within MKOs

environmental renewables team, Michéal is involved in the preparation and revision of a variety of reports for a range of energy infrastructure projects.

Eoin holds a B.Sc. (Hons) in Environmental Science from NUI, Galway and has 14 years' experience in Environmental consulting. In his role as project manager, Eoin works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs.

17.2 Interaction Matrix – Proposed Lifetime Extension

Table 17-1 Interaction Matrix: Potential for Interacting Impacts – Proposed Lifetime Extension

	Phase	Population and Human Health	Biodiversity	Ornithology	Land, Soils and Geology	Hydrology & Hydrogeology	Air Quality	Climate	Noise and Vibration	Cultural Heritage	Landscape and Visual	Material Assets	Vulnerability to Natural Disasters
Population and Human Health	O												
	D												
Biodiversity	O												
	D												
Ornithology	O												
	D												
Land, Soils and Geology	O												
	D												
Hydrology & Hydrogeology	O												
	D												
Air Quality	O												
	D												

	Phase	Population and Human Health	Biodiversity	Ornithology	Land, Soils and Geology	Hydrology & Hydrogeology	Air Quality	Climate	Noise and Vibration	Cultural Heritage	Landscape and Visual	Material Assets	Vulnerability to Natural Disasters
	D												
Climate	O												
	D												
Noise and Vibration	O												
	D												
Cultural Heritage	O												
	D												
Landscape and Visual	O												
	D												
Material Assets	O												
	D												
Vulnerability to Natural Disasters	O												
	D												

Legend:

No Interacting Effect:		Positive Effect:	
Neutral Effect:		Negative Effect:	

17.3 Impact Interactions – Proposed Lifetime Extension

17.3.1 Population and Human Health

Population and Human Health, Land, Soils and Geology and Air Quality

No groundworks are proposed during the extended operational phase. Site vehicles used for daily visits and occasional site maintenance will be run on fuels and plant will use hydraulic oils. No interaction of effects are anticipated between land soils and geology and population and human health during the extended operational phase. A medium term, slight, positive effect is predicted as a result of the production of clean, renewable energy from the Proposed Lifetime extension as the Taurbeg Wind Farm will continue to offset harmful greenhouse gas emissions emitted by fossil fuel powered sources.

The potential for excavation and movement of soils during the decommissioning phase of the Proposed Lifetime Extension may lead to generation of dust emissions which, consequently, have the potential to have a Temporary, Imperceptible, Negative Effect on local air quality and human health. Mitigation measures to reduce dust emissions generated during the decommissioning phase of the Proposed Lifetime Extension are presented in the Decommissioning Plan as outlined in Appendix 4-3 and Chapter 10: Air Quality.

Population and Human Health, and Hydrology and Hydrogeology

As described in Chapter 9: Hydrology and Hydrogeology of this EIAR, the extended operational phase does not involve any alterations to the site drainage or other on-site infrastructure and will not give rise to significant impacts to the water environment. No effects are anticipated on the Hydrology and Hydrogeology at the Existing Taurbeg Wind Farm. As such, no effects on human health due to water quality are anticipated during the Proposed Lifetime Extension.

The future decommissioning phase of the Proposed Lifetime Extension, in 2036, has the potential to give rise to some limited water pollution as a result of likely on-site activities (earthworks, use of hydrocarbons for plant and machinery), and any water pollution could have a potential significant negative effect on the health of other users of that water within the same catchment. Mitigation measures are presented in Chapter 9 of this EIAR, as well as Appendix 4-3, Decommissioning Plan, to minimise the potential of any such issues occurring. No Significant Effects on the hydrological and hydrogeological environment are envisaged during the decommissioning stage of the Proposed Lifetime Extension.

Population and Human Health, Air Quality and Climate

The Proposed Lifetime Extension will generate energy from a renewable source. This energy generated will offset energy and the associated emission of greenhouse gases from electricity-generating stations dependent on fossil fuels, thereby having a positive effect on climate and Air Quality. The Proposed Lifetime Extension will assist in reducing carbon dioxide (CO₂) emissions that would otherwise arise if the same energy were otherwise to be generated by conventional fossil fuel plants. This is a long-term significant positive effect on climate and air quality. As a result, the Proposed Lifetime Extension will have a medium-term, slight, positive effect on human health by reducing the dependence on fossil fuels and harmful greenhouse gasses when compared to the 'do-nothing' scenario (i.e. decommissioning of the existing Taurbeg Wind Farm in 2026).

While there will be greenhouse gas emissions associated with the decommissioning of the Existing Taurbeg Wind Farm, this will take place under the Electricity sector emissions ceiling and will can be

considered as offset by the operation of the Proposed Lifetime Extension within its operational life. This will have a short term, imperceptible negative effect on human health due to increased greenhouse gas emissions.

Population and Human Health and Noise & Vibration

During the extended operational phase, the turbines have the potential to generate noise but as identified in Chapter 12: Noise, the potential effects of these turbines on residential amenity is not anticipated to be significant. The potential worst effects at the nearest noise sensitive locations are medium term, imperceptible and neutral in nature. Mitigation measures and best practices to be adopted concerning noise are presented in Chapter 12.

The decommissioning of the Existing Taurbeg Wind Farm will give rise to noise emissions via plant and machinery use for decommissioning works and transport purposes. These operations will similarly have some effect on nearby noise sensitive receptors for the duration of the works. After mitigation measures are implemented, these in-combination effects are expected to have negative, not significant and short term effects on population and human health

Population and Human Health, and Landscape and Visual

No significant changes to the wind turbines have been carried out since the wind farm was commissioned or are proposed as part of the Proposed Lifetime Extension. The existing Taurbeg Wind Farm has been in operation for approximately 19 years and therefore forms part of the existing landscape setting. The existing wind farm and substation will remain aligned with the future landscape and visual designations and policies guiding the development of Co. Cork. Overall, the Proposed Lifetime Extension is deemed to have medium-term, slight, landscape effects. The scale, siting and design of the turbines is considered appropriate, as the turbines do not detract from the scenic amenity views and are readily absorbed into the surrounding landscape. From multiple viewpoints the existing Taurbeg Wind Farm combines with the Knockacummer and Glentane Wind Farms into an extensive linear array of turbines upon upland ridges. The landscape and visual impact assessment of the Proposed Lifetime Extension, included in Chapter 13 of this EIAR, provides Photographic visualisations which were used to assess the visual effects arising from Taurbeg Wind Farm from 6 No. viewpoint locations. The significance of the residual visual effect was not considered to be “Profound” or “Very Significant” or “Significant” at any of the 6 viewpoint locations. Receptors around Viewpoint (VP) 6 are deemed to have moderate medium-term residual visual effects on account of a few residential receptors having views overlooking the valley in the direction of the existing Taurbeg turbines. However, there are very few residential receptors experiencing visual effects as shown in viewpoint 6 and the turbines are well setback at a distance of 3km. Receptors represented by VPs 1, 2, 3, 4 and 5 are deemed to have slight medium-term residual visual effects as a result of the Proposed Lifetime Extension. These viewpoints are located on roads that provide access to more scenic amenities, and where some residential receptors have limited visibility of the existing Taurbeg Wind Farm due to mature boundary vegetation, undulating topography and the distance that these VPs are from the existing Taurbeg Wind Farm. The visual impact of the extended operational phase is not expected to have any significant impacts on residential amenity.

Whilst the removal of the turbines and ancillary infrastructure from the Site will result in a short-term, slight, negative visual effect, this is not anticipated to have any significant effects on population and human health.

Population and Human Health, and Material Assets

Chapter 15: Material Assets of this EIAR discusses how the extended operational and decommissioning phases of the existing Taurbeg Wind Farm will impact traffic volumes. The extended operational phase will have medium-term, imperceptible, neutral effect on traffic and transportation and will not give rise to any significant effects upon the local road network or road users. As such a medium term,

imperceptible, neutral effect on residential amenity is anticipated to occur during the Proposed Lifetime Extension.

The decommissioning phase of the existing Taurbeg Wind Farm will likely result in a residual impact to other road users that is short-Term, slight, negative in effect. As noted in Section 4.7 of Chapter 4: Description of the Project, reinstatement proposals for a wind farm are typically made far in advance, so within the proposed 10-year extension of operation of the site, technological advances and preferred approaches to reinstatement are likely to change. Therefore, in order to prevent limiting options too far in advance of actual decommissioning, the final decommissioning plan will be agreed with the Local Authority at least three months prior to decommissioning of the Taurbeg Wind Farm.

17.3.2 Biodiversity (including Birds)

Biodiversity, and Land, Soils and Geology

No excavations, groundworks or other disturbance to land or soils are included as part of the Proposed Lifetime Extension. Therefore, no disturbance to biodiversity related to land, soils or geology is likely during the Proposed Lifetime Extension.

The decommissioning phase of the Taurbeg Wind Farm may involve limited excavations and groundworks around the turbines, in order to return the site to beneficial use as agricultural land. Chapter 6: Biodiversity (including Birds) provides a full assessment of the likely effects and impacts upon habitats including designated sites, bats and other mammals and concludes that the Proposed Lifetime Extension is unlikely to give rise to significant effects on the ecological receptors.

Biodiversity and Hydrology and Hydrogeology

The decommissioning phase of the Taurbeg Wind Farm may cause potential habitat degradation due to sediment runoff and/ or hydrocarbon loss to waterbodies which is associated with turbine hardstand backfilling, increased vehicle use on site and increased traffic congestion. The implementation of mitigation measures to ensure there are no significant negative effects on hydrology are outlined in Chapters 6 and 9.

The limited site maintenance activities that will take place during the extended operational phase do not include any changes to the existing site drainage. With implementation of the mitigation measures outlined in Chapters 6 and Chapter 9 of this EIAR, no impacts to birds from the water environment are envisaged during the extended operational phase.

Site activities during the future decommissioning phase have the potential to give rise to some water pollution, and consequential indirect effects on birds and their prey species (such as disturbance and deterioration of habitat quality) that use waterbodies within the same catchment. Mitigation measures (as per Chapter 6) if implemented will ensure there are no significant effects on birds or their habitat. Further measures would also be included in a decommissioning plan to be agreed with the local authority in advance of works.

Biodiversity, and Air and Climate

The Proposed Lifetime Extension will help offset carbon emissions from fossil fuel-based electricity generation plants, which will help contribute to a slower increase in the rate of global warming and a reduction in air pollution. Consequently, this is likely, in combination with other renewable energy projects, to have a Medium-Term moderate Positive Effect on biodiversity.

During the decommissioning phase of the Taurbeg Wind Farm, increased vehicular and dust emissions within and around the site have the potential to be a nuisance for biodiversity thereby having a

Temporary, Slight, Negative Effect. The mitigation measures outlined in Chapter 6 of the EIAR will ensure that the potential for negative effects is reduced or eliminated.

Biodiversity, and Noise and Vibration

No potential impacts upon biodiversity from noise and vibration arising during the Proposed Lifetime Extension were identified in Chapter 6 of the EIAR.

Site activity during the decommissioning phase could give rise to noise that could be a nuisance for biodiversity (including birds), thereby having a temporary, slight, negative effect. Best practice mitigation measures are included in Chapter 6 and Chapter 10 to minimise the potential negative effect of noise generated during the decommissioning phase on biodiversity.

Biodiversity, and Landscape & Visual

No significant impacts are likely upon vegetation within the Site and surrounding area during the Proposed Lifetime Extension. As the existing wind farm have been in operation since March 2006, they have now considered to have become part of the normal landscape of the wider area. No significant visual effects are likely during the operational phase.

During the decommissioning phase of the Taurbeg Wind Farm, concrete foundations will not be removed from the ground as it is considered to be the least preferred option in terms of having potential effects on the environment. Therefore, the turbine foundations will be backfilled, covered with soil material and re-seeded resulting in a more environmentally prudent option. The backfilling and reseeded of the turbine foundations will have a permanent, moderate, positive effect on both biodiversity and landscape and visual.

17.3.3

Land, Soils and Geology

Land, Soils and Geology, and Hydrology and Hydrogeology

The Proposed Lifetime Extension will not include any groundworks (e.g. excavations) or other activities likely to result in ground disturbance or pollution, which may give rise to impacts upon the water environment. Occasional site road maintenance will be required as part of the Proposed Lifetime Extension which may result in a negative, imperceptible indirect effect on the water environment. Chapter 8 and 9 of the EIAR concluded that no significant effects to the subsurface environment will occur during the extension of the operational phase.

As identified in Chapter 8: Land Soils & Geology and Chapter 9: Hydrology and Hydrogeology of this EIAR groundworks such as soil compaction during the decommissioning phase has the potential to have an effect on water quality through potentially silt-laden runoff from the proposed works areas, however, it is anticipated that the disassembly and removal of the turbines will not have an impact on the hydrological/hydrogeological environment. Mitigation measures to ensure there are no significant, negative effects on water quality are presented in Chapters 8 & 9.

Land, Soils and Geology, and Cultural Heritage

No disturbance to the subsurface (soils and geology) is proposed as part of the Proposed Lifetime Extension. Chapter 14: Cultural Heritage concluded that as no groundworks will take place during the operational phase, no direct or indirect effects on archaeology, architecture and cultural heritage are identified.

There are no recorded archaeological monuments within the site, however, there are 12 recorded monuments within the study area, including one record which has since been made redundant

As detailed in Section 4.7 in Chapter 4 and in the Decommissioning Plan included as Appendix 4-3, upon decommissioning of Taurbeg Wind Farm, the wind turbines will be disassembled in reverse order to how they were erected. All above-ground turbine components will be separated and removed off-site for reuse or recycling. It is proposed to leave turbine foundations in place underground and to cover them with earth and reseed as appropriate. It is proposed that site roadways will be left in situ, as appropriate, to facilitate on-going access and forestry uses.

Given that minimal works will be required at the decommissioning phase, and it is proposed that the site roads be left in situ, no potential direct effects to the archaeological, architectural or cultural heritage resource are identified and no mitigation is proposed.

Land, Soils and Geology and Landscape and Visual

There are no likely significant changes on lands, soils and geology during the operational phase that could result in associated landscape and visual impacts.

The turbine hardstands and site roads will be left in-situ following the decommissioning of Taurbeg Wind Farm, nullifying the need for large excavations at the Site. Localised groundworks and excavations that may occur during the decommissioning phase are largely concerned with restoration of the site into a natural, vegetated state. Bearing this in mind, it is not anticipated that there will be interaction between land, soils and geology and landscape and visual.

Land, Soils and Geology and Climate

There are no earthworks proposed as part of the extended operation phase and therefore no significant effects are predicted.

During the decommissioning phase it is proposed to leave turbine foundations in place underground and to cover them with soil and reseed as appropriate. Plant and machinery used during the excavation of any material on site will use fossil fuels, which is predicted to have an imperceptible, short-term, negative effect on climate.

Land, Soils and Geology and Noise and Vibration

There are no earthworks proposed as part of the extended operation phase and therefore no significant effects are predicted on noise and vibration.

During the decommissioning phase it is proposed to leave turbine foundations in place underground and to cover them with soil and reseed as appropriate. Plant and machinery used during excavation works have the potential to produce noise and vibration.

17.3.4 Air

Air and Material Assets

Chapter 15: Material Assets of the EIAR assesses the traffic effects of the Proposed Lifetime Extension and found that typically, no more than 1-2 trips per month to the site are made by car or light goods vehicle. As per Chapter 10: Air Quality of the EIAR, there will be no significant direct or indirect effects to air quality associated with the Proposed Lifetime Extension. There will therefore be a Medium-term, Imperceptible, Negative Effect on air quality.

During the decommissioning phase, the movement of construction vehicles (e.g. cranes and heavy plant) both within, and to and from the site, has the potential to give rise to dust and exhaust emissions. This is assessed further in Chapters 10 and 15 of this EIAR, and mitigation measures are presented to

minimise any potential effects. The effects on air quality during the decommissioning phase due to the movement of construction vehicles to and from the Site will be short-term, imperceptible, negative Effects.

17.3.5 Landscape and Visual

Landscape and Visual, and Cultural Heritage

As described in Chapter 14: Cultural Heritage of this EIAR, as the Proposed Lifetime Extension is an extension of the operational lifetime of the existing Taurbeg Wind Farm, this will not change on the existing archaeological, architectural and cultural heritage resource, either within the site bounds or in the wider area. It is considered that no direct, nor indirect effects would occur at the extended operational phase. It is concluded in Chapter 14 that no built heritage structures will be impacted either directly or indirectly by the Proposed Lifetime Extension, since nothing additional to the existing baseline environment is being proposed as part of the Proposed Lifetime Extension.

As the existing wind farm is extant and forms part of the receiving environment, no cumulative effects are predicted on the cultural heritage resource with regards the Proposed Lifetime Extension, when considered with proposed surrounding developments. Given that no national monuments occur on the Site, and that many of the monuments are not readily visible, or on private lands, the Proposed Lifetime Extension will not hinder cultural heritage. A decommissioning plan will be agreed with the local authority at least three months prior to decommissioning of the Taurbeg Wind Farm. No significant landscape or visual effects on the existing cultural heritage features are likely to occur should the wind turbines and associated infrastructure be removed during the decommissioning phase.

17.3.6 Noise and Vibration

Noise and Vibration and Material Assets

No change to the baseline noise and vibration levels are predicted as a result of the extended operational phase when considering the material assets. A neutral, medium-term, imperceptible effect is predicted. During the decommissioning phase machinery and plant will travel to and from the site for all decommissioning works.

17.3.7 Major Accidents and Natural Disasters

As described in Chapter 16 of the EIAR, major accidents or natural disasters are hazards which have the potential to affect the existing Taurbeg Wind Farm and lead to environmental effects both directly and indirectly. These include accidents during the extended operation and decommissioning of Taurbeg Wind Farm caused by operational failure and/or natural hazards. The assessment of the potential for significant accidents or disasters is conducted in connection with the information that must be included in the EIAR. This includes aspects such as population and human health, biodiversity, land and soil, hydrology and hydrogeology, air quality, climate, material assets, cultural heritage, and landscape.

When the mitigation measures outlined in Chapter 16 of this EIAR are implemented, and all mitigation detailed throughout the entire EIAR is implemented, the residual effect(s) associated with the extended operation and decommissioning of Taurbeg Wind Farm are not significant.

17.4 Interaction Matrix – Proposed Offsetting Measures

Table 17-2 Interaction Matrix: Potential for Interacting Impacts – Proposed Offsetting Measure

	Population and Human Health	Biodiversity	Ornithology	Land, Soils and Geology	Hydrology & Hydrogeology	Air Quality	Climate	Noise and Vibration	Cultural Heritage	Landscape and Visual	Material Assets	Vulnerability to Natural Disasters
Population and Human Health												
Biodiversity												
Ornithology												
Land, Soils and Geology												
Hydrology & Hydrogeology												
Air Quality												
Climate												
Noise and Vibration												
Cultural Heritage												

Landscape and Visual												
Material Assets												
Vulnerability to Natural Disasters												

Legend:	No Interacting Effect:		Positive Effect:	
	Neutral Effect:		Negative Effect:	

17.5 Impact Interactions – Proposed Offsetting Lands

17.5.1 Population and Human Health

Population and Human Health, Land, Soils and Geology and Hydrology and Hydrogeology

The Peat Stability Risk Assessment of the Proposed Offsetting Lands was predominantly found to have an acceptable margin of safety, with some areas deemed to be of higher risk due to local topography. It is considered that these areas do not present a significant peat slide risk. With the implementation of mitigation measures outlined in Chapter 8 of this EIAR, it is considered that the Proposed Offsetting Measures will have a temporary, slight, negative effects on population and human health when considering sediment runoff and possible soil disturbance during deforestation works. There are no direct effects anticipated between population and human health and lands soils and geology.

Population and Human Health, Air and Climate

As part of the Proposed Offsetting Measures, it is proposed to permanently remove 105.5 ha of forestry which will create suitable habitat for hen harrier. The deforestation of these trees will cause long-term, imperceptible negative effect on air quality and climate due to the removal of these trees, which act as a carbon sink. However, through removal of plantation forestry, over time the habitat will revert back to a heath/ scrub mosaic which will have an overall larger carbon sink capacity than that of the commercial forestry. Therefore, the effect on climate associated with the Proposed Offsetting Measures is long term, slight positive. Furthermore, there will be temporary, slight, negative effects associated with the dust and vehicular emissions associated with deforestation on air quality. As such, a temporary, slight negative effect on human health is anticipated to occur.

Population and Human Health, and Hydrology and Hydrogeology

As described in Chapter 9: Hydrology and Hydrogeology of this EIAR, the Proposed Offsetting Measures do not involve any alterations to the site drainage. The permanent removal of forestry poses a risk to surface water quality in downstream receptors due to the release of suspended sediments, hydrocarbons from machinery and nutrient enrichment. Sediment runoff and possible soil disturbance during deforestation works also pose a risk to hydrological features at the Proposed Offsetting Lands. However, after the proposed mitigation measures outlined in Chapter 8 and 9 are implemented, the residual effect on hydrology is considered to be temporary, imperceptible and negative. As such, a temporary, imperceptible negative effect on human health is anticipated to occur.

Population and Human Health, Noise & Vibration

The Proposed Offsetting Measures will have a temporary, not-significant, negative effect on noise and vibration levels at the Proposed Offsetting Lands. Operational machinery and deforestation within the site have the potential to create noise and vibration for the duration of deforestation operations, however, it must be noted that the Proposed Offsetting Lands are situated in a sparsely populated area. Furthermore, 105.5 ha of the Proposed Offsetting Lands currently comprise of coniferous forestry plantation, meaning that tree felling would be a regular process undertaken in the area. The deforestation at the Proposed Offsetting Lands will be permanent and not cyclically repeated as is currently the case. Therefore, the Proposed Offsetting Measures will have a temporary, not-significant, negative effect on residential amenity.

Population and Human Health, and Landscape and Visual

The Proposed Offsetting Lands are located in an area which has been highly modified by the forestry and agricultural industry from its baseline natural state and as such its landscape sensitivity is 'Low'. The character of the Proposed Offsetting Lands will be altered by the measures which include grassland management, planting wildlife crop, hedgerow management and permanent removal of forestry. The magnitude of change is deemed to 'Slight' and highly localised. Once the measures have been implemented, landscape effects on the Proposed Offsetting Lands themselves will be Positive, Long-Term and 'Not Significant'. As reported in Chapter 13 of this EIAR, the Proposed Offsetting Lands are located within an area designated as 'visually sensitive' in the KCDP, which is a large landscape area considered to be 'High' sensitivity. Furthermore, designated scenic route KY-SR-1 is located adjacent to the Proposed Offsetting Lands. A 'Negligible' magnitude of change to the 'visually sensitive' area, as well as the Designated scenic route. The overall residual visual effects arising from the proposed measures within the Proposed Offsetting Lands on residential amenity are deemed to be long-term, 'not significant' and positive.

Population and Human Health, and Material Assets

There will be some HGV movements generated during the deforestation works at the Proposed Offsetting Lands due to the removal of approximately 2000 tonnes of chipped wood from the site. This will require 100, 20 tonne loads that will be removed from the site at a rate of 5 HGV loads, or 10 HGV movements per day on 20 separate days. As a result, it is estimated that the impact of these movements on residential amenity will be negative, temporary and slight. Furthermore, due to the nature of the work being carried out at the Proposed Offsetting lands, there will be no direct, nor indirect impacts on telecommunications and aviation.

17.5.2 Biodiversity (including Birds)

Biodiversity, and Land, Soils and Geology, Hydrology

During deforestation operations, there is potential for the of erosion of peat and spoil due to the disturbance of soils and subsoils associated with vehicle and plant movements. There is also potential for accidental spillage of petroleum hydrocarbons of plant and machinery which are highly toxic to humans and biodiversity. These also have associated potential effects on the geological and aquatic environments. However, when factoring in the mitigation measures outlined in Chapter 8 of this EIAR, the impacts on biodiversity are deemed to be temporary, imperceptible and negative.

Biodiversity, and Air and Climate

As part of the Proposed Offsetting Measures, it is proposed to permanently remove 105.5ha of coniferous forestry. Consequently, this will cause some carbon emissions and remove the carbon sequestration properties associated with the trees at the site. This will have a temporary, slight, negative effect on climate and air quality. Subsequently, the bog habitat underlying the plantation forestry will be restored back to a heath/scrub habitat over time following deforestation. This will have a positive impact on carbon sequestration and subsequent positive impact on biodiversity.

Biodiversity, and Noise and Vibration

There will likely be some disturbance to local flora and fauna in the area resulting from deforestation works associated with the Proposed Offsetting Measures. This is anticipated to be a temporary, slight negative effect on biodiversity.

Biodiversity, and Landscape & Visual

Once the Proposed Offsetting Measures are implemented, with the removal of forestry habitat, they will have a positive Long-Term landscape and visual effect on the upland landscape of Mount Eagle. The Proposed Offsetting Lands will be improved through grassland management, planting wildlife crop, hedgerow management and permanent removal of forestry to open up lands to Hen Harriers. The residual landscape and visual effects were deemed to 'Not Significant', with a positive impact being anticipated on biodiversity.

17.5.3 Land, Soils and Geology

Land, Soils and Geology, and Hydrology and Hydrogeology

As previously mentioned, the permanent removal of trees and operation of machinery within the Proposed Offsetting Lands bears the potential for erosion of peat and spoil due to the disturbance of soils and subsoils associated with vehicular and plant movements, release of suspended sediment attached to timber in stacking area, as well as potential petroleum hydrocarbon spills. The exposure of soil and subsoils due to vehicle tracking, compaction and skidding or forwarding extraction methods has the potential to provide a source of suspended sediment which can become entrained in surface water runoff and enter surface watercourses. When considered with the mitigation measures outlined in chapters 8 and 9 of this EIAR, it is deemed there will be a temporary, imperceptible, negative effect on hydrology.

Land, Soils and Geology, and Cultural Heritage

There are no protected monuments located within the Proposed Offsetting Lands and therefore it is predicted there is no potential for any significant interacting effects between lands soils and geology and cultural heritage. Furthermore, there are no excavation works associated with the Proposed Offsetting Lands, therefore no effect is anticipated on sub-surface archaeology.

Land, Soils and Geology, and Landscape and Visual

The overall aim of Proposed Offsetting Lands is to open up ~123.3ha of land to grassland / open heath habitats which are suitable for hen harrier. Currently these lands comprise of an agricultural field in the northwest (~17.7ha) and ~105.5ha of coniferous forestry. The agricultural field will be managed through grassland management, wildlife crop planting and hedgerow maintenance. Meanwhile the forested area will undergo deforestation. This will revert the Proposed Offsetting Lands into a more natural state than the current baseline environment, which has been highly modified by human activity. As such, the Proposed Offsetting Measures will have a positive effect on the land environment in these areas. Once the measures have been implemented, landscape effects on the Proposed Offsetting Lands themselves will be positive, long-term and 'Not Significant'.

17.5.4 Air and Climate

Air, Climate and Material Assets

Exhaust emissions associated with the Proposed Offsetting Measures will arise from machinery and vehicles that are required onsite for deforestation works. There will also be some HGV movements generated during the deforestation works at the Proposed Offsetting Lands due to the removal of approximately 2000 tonnes of chipped wood from the site. This will require 100, 20 tonne loads that will be removed from the site at a rate of 5 HGV loads, or 10 HGV movements per day on 20 separate days. Whilst the deforestation works and transportation will give rise to minor increases in dust and vehicle emissions, the implementation of the mitigation measures discussed in Chapter 10 and 11 of this

EIAR, and good management practices can prevent or minimise potential effects off-site. As such it is deemed that the Proposed Offsetting Measures will have a temporary, slight, negative effect on Climate and Air associated with vehicular operations and associated emissions.

17.5.5 **Landscape and Visual**

Landscape and Visual, and Cultural Heritage

As mentioned above, there are no protected monuments located within the Proposed Offsetting Lands. It is predicted that there will be no interacting effects between landscape and visual and cultural heritage features as a result of the Proposed Offsetting Measures.

17.5.6 **Major Accidents and Natural Disasters**

As described in Chapter 16 of the EIAR, major accidents or natural disasters are hazards which have the potential to affect the Proposed Offsetting Lands and lead to environmental effects both directly and indirectly. These include accidents during the deforestation and management of the area caused by operational failure and/or natural hazards. The assessment of the potential for significant accidents or disasters is conducted in connection with the information that must be included in the EIAR. This includes aspects such as population and human health, biodiversity, land and soil, hydrology and hydrogeology, air quality, climate, material assets, cultural heritage, and landscape. The risk of a major accident and/or disaster during the works at the Proposed Offsetting Lands is considered 'low' in accordance with the 'Guide to Risk Assessment in Major Emergency Management' (DoEHLG, 2010).

When the mitigation measures outlined in Chapter 16 of this EIAR are implemented, and all mitigation detailed throughout the entire EIAR is implemented, the residual effect(s) associated with the Proposed Offsetting Measures are not significant.

17.6 **Mitigation and Residual Impacts**

Where any potential interactive negative effects have been identified in the above, a full suite of appropriate mitigation measures has already been included in the relevant sections (Chapters 5-16) of the EIAR. These are also outlined in full in Chapter 16: Schedule of Mitigation Measures. The implementation of these mitigation measures will reduce or remove the potential for these effects. Information on potential residual impacts and the significance of effects, is also presented in each relevant chapter.

Environmental Impact Assessment Report

Taurbeg Wind Farm Extension of Operational Life

Chapter 18 – Schedule of Mitigation Measures





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Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



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18. SCHEDULE OF MITIGATION

18.1 Introduction

All mitigation and monitoring measures relating to the extended operational and decommissioning phases of the Proposed Lifetime Extension are set out in the relevant chapters of the EIAR. In addition, all mitigation and monitoring measures that will be implemented during the extended operational and decommissioning phases of the Proposed Lifetime Extension are outlined in Table 18-1 and Table 18-2 below. The mitigation measures can be grouped together according to their environmental field/topic under the following headings:

- Extended Operational Phase
- Decommissioning Phase

Mitigation and monitoring measures for the Proposed Offsetting Measures have also been considered, with these being outlined in Table 18-3 and Table 18-4.

By presenting the mitigation and monitoring proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the extended operational and decommissioning phases of the Proposed Lifetime Extension and the Proposed Offsetting Measures. The proposal for environmental management framework to be adhered to during the extended operational phase are set out in the Operational and Environmental Management Plan (OEMP) which is included as Appendix 4-2 of this EIAR. The tabular format in which the below information is presented can be further expanded upon during the operation and decommissioning phases to provide a reporting template for site compliance audits.

18.2

EIAR Mitigation Measures – Proposed Lifetime Extension

Table 18-1 Schedule of Mitigation- Proposed Lifetime Extension

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
Operational Phase				
MM1	EIAR Chapter 5	<p>Regarding <u>Health and Safety</u> during the extended operational phase:</p> <ul style="list-style-type: none"> ➤ Mitigation measures that are currently in place will continue during the extended operation of the wind farm to ensure that the risks posed to staff, landowners and the general public will remain negligible throughout the extended operational life of the wind farm. ➤ Access to the Taurbeg Wind Farm is controlled through a locked gate. ➤ Access to the turbines is through a door at the base of the structure, which will be locked at all times outside of maintenance visits. ➤ Signs are erected at suitable locations across the site as required for the ease and safety of operating the various components of the wind farm. These signs include: ➤ Buried cable route markers at regular intervals and change of cable route direction; ➤ Directions to relevant turbines at junctions; ➤ “No access to Unauthorised Personnel” at appropriate locations; ➤ Speed limits signs at site entrance and junctions; ➤ “Warning these Premises are alarmed” at appropriate locations; ➤ “Danger Overhead HV” at appropriate locations; ➤ “Warning – Keep clear of structures during electrical storms, high winds or ice conditions” at site entrance; ➤ “No unauthorised vehicles beyond this point” at specific site entrances; and 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ Other operational signage required as per site-specific hazards. ➤ All site visitors must complete a site-specific health and safety induction prior to entering the site ➤ Visitors must log onto the site on entry and log the site on exit by contacting a 24-hourly monitored control room ➤ Minimum site Personal Protective Equipment (PPE) is necessary in order to enter the site, including a hard hat, safety boots and hi-visibility clothing <p>During the operation of the wind farm regular maintenance of the turbines is carried out by the turbine manufacturer or appointed service company. A project or task specific Health and Safety Plan has been developed for these works in accordance with the site's health and safety requirements.</p>		
MM2	EIAR Chapter 5, Chapter 12, Chapter 13	<p>Regarding <u>Residential Amenity</u> during the operational phase:</p> <ul style="list-style-type: none"> ➤ All mitigation as outlined under noise and vibration and visual amenity in the EIAR, will be implemented in order to reduce insofar as possible impacts on residential amenity at properties located in the vicinity of the Existing Taurbeg Wind Farm. 		
MM3	EIAR Chapter 6, Chapter 9, Appendix 6-2	<p>Regarding Biodiversity Mitigation Measures during the extended operational phase, the following mitigation measures are proposed:</p> <p>Mitigation for Sensitive Aquatic Species</p> <ul style="list-style-type: none"> ➤ Natural vegetation filters are used regularly across the Site where the local drainage and topography allow attenuation of surface water runoff; ➤ Interceptor drains are installed up-gradient of infrastructure to collect clean surface runoff in order to minimise the amount of runoff reaching 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>areas where suspended sediment could become entrained. It is now directed to areas where it can be re-distributed onto natural vegetation;</p> <ul style="list-style-type: none"> ➤ Swales/roadside drains are used to collect runoff from access roads and turbines hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters; ➤ The existing drainage system at the site provides flood attenuation and has not resulted in any increased in the downstream flood risk; ➤ Temporary check dams and silt fencing arrangements will be placed along sections of access roads where maintenance works are being undertaken. Check dams will be constructed from a 4/40mm non-friable crushed rock. ➤ Road-going vehicles will be refuelled off site wherever possible; ➤ On-site refuelling will be carried out at designated refuelling areas at various locations throughout the site. Machinery will be refuelled directly by a fuel truck that will come to site as required; ➤ Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations; ➤ Fuel volumes stored on site will be minimised. Any fuel storage areas will be bunded appropriately for the fuel storage volume; ➤ The plant used will be regularly inspected for leaks and fitness for purpose; ➤ An emergency plan for the extended operational phase to deal with accidental spillages will be developed. Spill kits will be available to deal with accidental spillage in and outside the refuelling area; ➤ A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the lifetime extension; and, ➤ Adherence to Operational and Environmental Management Plan (refer to Appendix 4-2 of the EIAR). 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
MM4	EIAR Chapter 7, Appendix 7-7	<p>While no significant impacts were identified for any other bird species, the Proposed Lifetime Extension has the potential to displace hen harrier from the Site, in the absence of offsetting measures there is the potential for an ongoing significant (indirect) habitat loss effect. Accordingly, Proposed Offsetting Measures are proposed. The Proposed Offsetting lands are located in Knockatee and Coom, Co. Kerry, approximately 12km east from the Taurbeg Wind Farm site. Offsetting measures include permanent removal of c. 105.5 ha of commercial forestry and restoration of c.17.7 ha of farmland to good quality hen harrier habitat. Farmland restoration measures which will be implemented are the following:</p> <ul style="list-style-type: none"> ➤ Planting and restoring of hedgerow ➤ Rotational grazing scheme ➤ Linear wildlife crop sowing ➤ Cease on fertiliser application ➤ Predator Fencing <p>Further detail on the Proposed Offsetting Measures can be found in Appendix 7-7.</p>		
MM5	EIAR Chapter 8	<p>Regarding Land, Soils and Geology during the operational phase, the following mitigation measures are proposed:</p> <p>Oil used in transformers (at each turbine and at the substation) and any storage of oils or hydrocarbons within the control building compound could potentially leak during the operational phase and impact on soils and subsoils. During maintenance and service visits, some waste (lubricating and cooling oils, packaging from spare parts or equipment, unused paint, etc.) will arise. This will be recorded and removed from the Wind Farm Site and reused, recycled or disposed of in accordance with the relevant legislation in an authorised facility. Turbine transformers are located within the basement of each turbine (i.e. within the turbine hardstands), with dedicated concrete foundations. Oils for the purposes of cooling the turbine transformers are stored in bunded tanks within the turbine</p>		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>foundations, within a bund able to contain at least 110% of the volume stored. Any leaks would be contained within the turbine transformer units, and hydrocarbons would not be able to permeate to ground. Each transformer is also housed within bunds to prevent any unintended leaks or spillages. In addition:</p> <ul style="list-style-type: none"> ➤ All plant and machinery to be serviced before being mobilised to site; ➤ Road-going vehicles will be refuelled off site wherever possible; ➤ On-site refuelling will be carried out at designated refuelling areas at various locations throughout the site. Machinery will be refuelled directly by a fuel truck that will come to site as required Irrespective of the buffer distance and location of refuelling, interceptor drip trays will be available in accordance with standard good practice. Interceptor drip trays will be positioned under any stationary mobile plant to prevent oil contamination of the ground surface or water; ➤ Only designated trained and competent operatives will be authorised to refuel plant onsite. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations. ➤ Fuel pipes on plant outlets at fuel tanks etc. will be regularly checked and maintained to ensure that no drips or leaks to ground occur; 		
MM6	EIAR Chapter 9	<p>Mitigation Measures currently employed on the existing Taurbeg Wind Farm will be maintained during the Proposed Lifetime Extension. No additional drainage and runoff mitigation is proposed above what is already present during the extended operational phase. The below drainage mitigation measures are currently in operation at the Site;</p> <ul style="list-style-type: none"> ➤ Natural vegetation filters are used regularly across the Site where the local drainage and topography allow attenuation of surface water runoff; ➤ Interceptor drains are installed up-gradient of infrastructure to collect clean surface runoff in order to minimise the amount of runoff reaching 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>areas where suspended sediment could become entrained. It is now directed to areas where it can be re-distributed onto natural vegetation;</p> <ul style="list-style-type: none"> ➤ Swales/roadside drains are used to collect runoff from access roads and turbines hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters; ➤ The existing drainage system at the site provides flood attenuation and has not resulted in any increased in the downstream flood risk. 		
MM7	EIAR Chapters 10, 11	<p>Whilst no significant effects on air quality and climate are predicted with the Proposed Lifetime Extension, the following best practice mitigation measures have been proposed during the extended operational phase of the Project, with regards to Air and Climate:</p> <ul style="list-style-type: none"> ➤ Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise; ➤ When stationary, delivery and on-site vehicles will be required to turn off engines. ➤ Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements 		
MM8	EIAR Chapter 12	<p>An assessment of the operational wind turbine noise levels has been undertaken in accordance with best practice guidelines and procedures. The findings of the assessment have confirmed that no significant cumulative impacts or effects are predicted from the operational noise turbine levels associated with the Proposed Lifetime Extension. Therefore, no specific mitigation measures are required.</p>		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>If the Proposed Project is granted permission to continue operating, a commissioning noise survey can be carried out. In the unlikely event of any exceedances of the conditioned turbine noise limits being identified as a result of the Proposed Lifetime Extension, these exceedances will be mitigated through curtailment of turbine(s) in the relevant wind speed and wind directions. The curtailment strategy will be developed for the installed turbines to achieve the relevant noise criteria at all Sensitive Receptors.</p> <p>Amplitude Modulation</p> <p>In the event that a complaint which indicates potential excessive amplitude modulation (AM) associated with the Proposed Lifetime Extension, the operator will employ a qualified acoustic consultant to assess the level of AM in accordance with the methods outlined in the Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) <i>Amplitude Modulation Working Group Final Report: A Method for Rating Amplitude Modulation in Wind Turbine Noise</i> (9 August 2016) or subsequent revisions.</p> <p>The measurement method outlined in the IOA AMWG document, known as the 'Reference Method', will provide a robust and reliable indicator of AM and yield important information on the frequency and duration of occurrence, which can be used to evaluate different operational conditions including method to mitigate any excessive AM. These mitigation measures, if required, will consist of the implementation of operational controls for the relevant turbine type, which will include turbine curtailment under specific operational conditions.</p> <p>In the absence of widely accepted and robust planning conditions to control amplitude modulation (AM) from wind turbines, the commitments outlined in this EIAR are considered best practice. The proposed approach will ensure that any negative impacts arising from AM associated with the operation of the proposed development will be effectively addressed by the operator.</p>		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
MM9	EIAR Chapter 13	No significant effects have been predicted for the proposed extended operational phase in relation to Landscape and Visual Impacts, therefore no additional mitigation measures have been proposed.		
MM10	EIAR Chapter 14	No significant operational phase activities are proposed which would require further assessment. The continuation of the operational phase of the Project will not result in any further effects on setting to the Cultural Heritage resource. No significant effects have been predicted for the proposed extended operational phase in relation to Cultural Heritage, therefore no mitigation measures have been proposed.		
MM11	EIAR Chapter 15	<p>In relation to Material Assets, the following mitigation measures have been proposed for the extended operational phase of the Project:</p> <p>Road Safety</p> <ul style="list-style-type: none"> ➤ Junction delineated with edge of carriageway markings and STOP junction markings and STOP signs in accordance with Figure 7.35 of the Traffic Signs Manual, as shown in Figure 15-1. ➤ The trimming back of shrubs on the northside of the L5005 in order to provide forward visibility for traffic turning right into the Taurbeg Wind Farm site, as shown in Figure 15-2, and also to maintain the available visibility splays on the southern side of the L5005, also shown in Figure 15-2 is recommended. ➤ The introduction of junction warning signs W002L of the Traffic Signs Manual on the westbound approach to the Taurbeg Wind Farm access junction on the L5005, and W002R on the eastbound approach, in order to increase the conspicuity of the access junction. These signs should be located on the left side of the L5005 and approximately 100m in advance of the junction. 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>Telecommunications</p> <p>Whilst no telecoms operators have highlighted issues regarding the Proposed Lifetime Extension, a dedicated Community Liaison Officer employed by the Applicant will be available for contact to householders in the area should any interference be caused by the Proposed Lifetime Extension.</p> <p>Aviation</p> <p>The Applicant will coordinate with the IAA should a grant of permission be issued, to ensure that the development remains in compliance with all IAA requirements including lighting requirements. Any further details will be agreed with the Department of Defence, Air Corps and the IAA. The coordinates and elevations for the existing turbines has been supplied to the IAA, as is standard practice for all wind farm developments.</p>		
Decommissioning Phase				
MM12	EIAR Chapter 4	<p>In the event that the Proposed Lifetime Extension is decommissioned after the 10 years extension of life, an updated Decommissioning Plan will be prepared for agreement with the local authority. This will be a comprehensive plan updated in line with decommissioning methodologies that may exist at the time.</p> <p>The Final Decommissioning Plan will therefore be agreed with the Local Authority at least three months prior to decommissioning the Proposed Lifetime Extension.</p>		
MM13	EIAR Chapter 5	Residential Amenity and Health and Safety will be protected during the decommissioning Phase via the following mitigation measures:		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ Establishing channels of communication between the Applicant or contractor, Local Authorities and local residents; ➤ The hours of decommissioning works (and associated traffic movements) will, insofar as possible, be limited to avoid unsociable hours. Activities shall generally be restricted to between 07:00hrs and 19:00hrs Monday to Friday and between 07:00hrs and 13:00hrs on Saturdays, with no activities on Sundays or public holidays unless in the event of an emergency. However, to ensure that optimal use is made of good weather period or at critical periods within the programme (e.g., crane use) or to accommodate removal of large turbine component along public routes it could be necessary on occasion to work outside of these hours. Any such out of hours working will be notified in advance to the Local Authority and local residents. 		
MM14	EIAR Chapter 6, Decommissioning Plan	<p>Regarding Biodiversity at the site, the decommissioning phase will involve the following best practice mitigation measures:</p> <ul style="list-style-type: none"> ➤ All measures to mitigate the risks of contamination of watercourses as outlined in Chapter 9, will be fully implemented. ➤ The areas within 50m of the hard-stand and turbine foundations will be subject to a pre-works terrestrial ecology walkover to highlight any constraints that may be present (e.g. breeding or resting places of protected species, presence of Invasive Plant Species). ➤ If any significant constraints are identified appropriate controls will be developed and integrated into the live decommissioning plan ahead of the commencement of the work. ➤ If any Third Schedule Invasive species are present in or adjacent to the works footprint, an Invasive Species Management Plan (ISMP) will be developed, and all recommendations implemented in accordance with the contemporary best practice measures. 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ Speed limits will be enforced on internal roads. ➤ All edible wastes will be stored in covered segregated containers and disposed of at licensed facilities. ➤ No refuelling or other hydrocarbon related usage will be undertaken within 50m of any watercourse in relation to maintenance vehicles, plant or machinery. ➤ Any import of soil or fill necessary in the decommissioning process shall be from approved sources and appropriately tested or inspected to minimise the risk of import of invasive species. Only soil appropriate to the site (pH, soil type) will be used. The re-seeding or natural revegetation of reinstated areas will proceed on the advice of a suitably qualified ecologist. Any seed mix used will be on the approval of the ecologist. 		
MM15	Chapter 7, Decommissioning Plan	<p>Regarding Ornithology and Avian Populations, the decommissioning plan will include industry best practice measures to mitigate the impact of works on a bird, which may include the following:</p> <ul style="list-style-type: none"> ➤ All machinery will work from the existing access road corridor. ➤ Any required vegetation removal will be conducted in line with the provisions of the Wildlife Acts 1976-2021. ➤ Decommissioning works will begin outside the bird nesting season as defined by the Wildlife Act 1976 as amended (1st of March to the 31st of August). Any requirement for works to run into the subsequent breeding season will be subject to pre-works bird surveys to confirm the absence of breeding birds of conservation concern. If such breeding activity is identified during the works, the nest sites will be located, and no works shall be undertaken within an agreed buffer in line with industry best practise. 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> Noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. All plant and equipment for use will comply with the European Communities (Noise Emission By Equipment For Use Outdoors) Regulations, 2001, as amended (SI 632/2001). Plant machinery will also be turned off when not in use. Silt fences will be installed as an additional water protection measure around existing watercourses. An Environmental Clerk of Works and Project Ecologist will be appointed. Duties will include: Organise the undertaking of a pre-works walkover bird survey to ensure that significant effects on birds will be avoided. Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Site. Oversee management of ornithological issues during the works period and advise on ornithological issues as they arise. Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to decommissioning progress. Areas of marsh & fen are unaffected by traffic or storage of plant and materials. <p>Mitigation Measures to protect Red Grouse</p> <ul style="list-style-type: none"> Any decommissioning works envisioned to take place during the period April – July will be preceded by a pre-commencement survey to investigate the presence of breeding red grouse. The survey will follow the methodology outlined in Section 7.2.4.2.7 of Chapter 7 (i.e. a tape-lure survey during period December - March to identify territorial males); 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> Should territorial males be recorded during survey, then these works will be restricted to outside the main breeding season for red grouse, i.e. April – July <p>Mitigation Measures to protect Nightjar</p> <ul style="list-style-type: none"> Any works within 500m of the identified area of contiguous breeding habitat during the period May to August will be preceded by a pre-commencement survey to investigate whether any potential breeding nightjar are present within 500m of the proposed works. The survey will follow the methodology outlined in Section 7.2.4.2.6 (i.e. dusk surveys during period late May to July to identify churring males); Should churring males be recorded during the survey, then the works within 500m of the suitable breeding habitat will be restricted to outside the main breeding season for nightjar, i.e. May - August 		
MM16	Chapter 8, Decommissioning Plan	<p>Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled. All above-ground turbine components will be separated and removed off-site. It is proposed to leave turbine foundations in place underground and to cover them with soil and reseed as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option as excavation works can be avoided.</p> <p>It is proposed that site roadways will be left in situ, as appropriate and where required, to facilitate on-going access and any commercial forestry uses. It is proposed to leave underground cables in place where they are below a level likely to be impacted by typical agricultural works.</p> <p>During decommissioning, all plant and machinery will keep to existing infrastructure (e.g. tracks and hardstanding) and will not encroach upon adjacent habitats unless this is essential in order to progress the decommissioning works.</p>		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		Reinstatement (i.e. backfilling of the turbine foundations) will be carried out using site-won materials without compromising or damaging established/existing habitats. Hardstand areas will be covered with peatland vegetation/scraw or poorly humified peat to encourage vegetation growth and reduce run-off and sedimentation.		
MM17	Chapter 9	<p>The disassembly and removal of the turbines will not have an impact on the hydrological/hydrogeological environment at the wind farm site, however, mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the operational phase mitigation measures. These include:</p> <ul style="list-style-type: none"> ➤ Vehicles used during the Proposed Lifetime Extension will be refuelled off site before entering the site; ➤ Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns; ➤ An emergency plan for the extended operational phase to deal with accidental spillages and breakdowns will be contained in the Operational and Environmental Management Plan; ➤ All transformers and substation areas are bunded to 110% of the volume of oil used in each transformer/substation; and, ➤ An emergency plan for the extended operational phase to deal with accidental spillages will be contained in the Operational and Environmental Management Plan; ➤ Natural vegetation filters are used regularly across the Site where the local drainage and topography allow attenuation of surface water runoff; ➤ Interceptor drains are installed up-gradient of infrastructure to collect clean surface runoff in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It is now directed to areas where it can be re-distributed onto natural vegetation; 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> Swales/roadside drains are used to collect runoff from access roads and turbines hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters; <p>The existing drainage system at the site provides flood attenuation and has not resulted in any increased in the downstream flood risk.</p>		
MM18	EIAR Chapter 10, 11, Decommissioning Plan	<p>Regarding dust:</p> <ul style="list-style-type: none"> Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions; The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by the Site Manager for cleanliness, and cleaned as necessary; Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind; Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods; The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary; All site related traffic will have speed restrictions on un-surfaced roads to 15 kph; Daily inspection of the site to examine dust measures and their effectiveness, and, When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper. All vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>and machinery checklist which will be followed and updated if/when required.</p> <ul style="list-style-type: none"> ➤ When stationary, delivery and on-site vehicles will be required to turn off engines. ➤ Turbines and other infrastructure will be transported from the Site on specified routes only unless otherwise agreed with the Planning Authority (see Section 15.1 Chapter 15 for details) ➤ The Decommissioning Plan (Appendix 4-3) includes a Waste Management Plan (WMP) which outlines the best practice procedures that will occur during the decommissioning phase relating to waste material. The WMP will outline the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of the decommissioning of the Proposed Lifetime Extension. <ul style="list-style-type: none"> ○ Section 3.10 of the Decommissioning Plan (Appendix 4-3) for this EIAR refers to the methodology that will be utilised to manage onsite waste. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor, ○ The MRF facility will be local to the Site where possible to reduce the amount of emissions associated with vehicle movements. ○ Disposal of waste will be seen as a last resort. 		
MM19	EIAR Chapter 12	The contract documents will specify that the Contractor undertaking the decommissioning works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>The following best practice mitigation measures from these documents will be implemented as required for the duration of the decommissioning phase:</p> <ul style="list-style-type: none"> ➤ Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted; ➤ Establishing channels of communication between the contractor/developer, Local Authority and residents; ➤ Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; ➤ Selection of plant with low inherent potential for generation of noise and/or vibration where practical; ➤ Placing of noise generating / vibratory plant as far away from sensitive properties as practical within the site constraints, and; ➤ The hours of decommissioning activity will be limited to avoid unsociable hours where possible. Works operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Friday and Saturday between 7:00hrs and 13:00hrs. 		
MM20	EIAR Chapter 14	Regarding Cultural Heritage during the decommissioning phase, there will be minimal works required and it is proposed that site roads be left in-site. No potential direct impacts to the archaeological, architectural or cultural heritage resources were identified and therefore no mitigation is required to be proposed.		
MM21	EIAR Chapter 15	Prior to decommissioning, an updated Decommissioning Plan, including material recycling/disposal and a Traffic Management Plan, will be developed to minimise impacts to local traffic. The updated decommissioning plan will be prepared in consultation with the local authority, and the final documentation will be agreed with the local authority in advance of decommissioning.		

18.3

EIAR Mitigation Measures – Proposed Offsetting Measures

Table 18-2 Schedule of Mitigation - Proposed Offsetting Measures

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
Proposed Offsetting Measures				
MM1	Chapter 5	<p>A Health and Safety Plan and method statement will be produced by the contractor for the proposed deforestation works at the Proposed Offsetting Lands prior to the commencement of the works. The following mitigation measures will be implemented at the site:</p> <ul style="list-style-type: none"> ➤ A site induction will take place prior to any deforestation works commencing. All contractors involved in deforestation operations will be required to attend; ➤ An emergency procedure and evacuation plan has been devised for the site; ➤ Internal roadways will be maintained and open during working times to facilitate emergency vehicles or egress in the event of an accident. All site work vehicles will park at lay byes and will not obstruct traffic on the bog roads. Traffic signs and speed limits will be obeyed at all times; ➤ All site personnel must wear high visibility clothing and appropriate footwear on site; ➤ ‘Clean as you go’ policy will be implemented on site. All waste materials will be removed off site by contractor on daily/regular basis; ➤ Each site will have an adequate first aid kit, located within each worker’s vehicle; ➤ All accidents and dangerous occurrences will be reported to the contractor and applicant immediately; 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ All fuel/chemicals and machine service points will be a minimum of 50 meters away from water courses, drains or culverts that may lead to water courses. All chemicals will be removed from the site at the end of the day; ➤ There will be no lone working on the site. Workers will be present on the site in a minimum of pairs. Forest manager is to be contacted prior to access and upon exit of the site ➤ Site safety signage (Forestry Operations in Progress, No Public Entry and Exit & Entry points) will be erected and maintained on worksite; ➤ All plant, machinery and equipment will be in good working order and operators must be in possession of the relevant CSCS ticket; ➤ Fire extinguishers, first aid kits and pollution control kits will be available in each machine at all times; ➤ All accident and near misses will be reported to contractor and applicant. The works manager will complete the incident report form and record the incident in the incident reporting log. <p>There are no additional mitigation measures relative to drainage proposed for the Proposed Offsetting Lands. The following mitigation measures are already in place at the site and will continue to be left in place during the proposed deforestation works:</p> <ul style="list-style-type: none"> ➤ Natural vegetation filters are used regularly across the Site where the local drainage and topography allow attenuation of surface water runoff; ➤ Where possible, interceptor drains are installed up-gradient of infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It is now directed to areas where it can be re-distributed onto natural vegetation; and, 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>➤ Swales/roadside drains are used to collect runoff from access roads and turbines hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters.</p> <p>These mitigation measures have been effective in removing any silt generated during routine maintenance works.</p> <p>In addition to the above, temporary check dams and silt fencing arrangements will be placed along sections of access roads where maintenance works are being undertaken. Check dams will be constructed from a 4/40mm non-friable crushed rock.</p> <p>The works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites.</p>		
MM2	EIAR Chapter 6, Chapter 9	<p>Aquatic Biodiversity</p> <p>Forestry operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed in Section 9.5.2.1 of this EIAR.</p> <p>The following buffer zones will be implemented:</p> <ul style="list-style-type: none"> ➤ No disturbance to ground will occur within 5m of a relevant watercourse or within 10-20m for aquatic zones. ➤ In areas of higher sensitivity or where silt movement is more likely this zone will increase to 20m; ➤ In these sensitive areas, there will be no machines crossing any natural watercourse; ➤ Refuelling and maintenance of machines will occur at least 50m from watercourses. It is proposed that refuelling will only be completed at the 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>existing entrance to Area 2. This location is distant from any watercourses;</p> <ul style="list-style-type: none"> ➤ Use natural buffer zones to filter water from mound drains; ➤ Short, stepped mound drains to be used in moderately sloped areas; and, ➤ No drainage on very steep slopes, within delineated aquatic or buffer zones. <p>The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures (discussed below) to be properly installed and operate effectively. The buffer/setback zone will:</p> <ul style="list-style-type: none"> ➤ Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment; ➤ Avoid peat/soil disturbance and compaction within close proximity to surface watercourses; ➤ Avoid the entry of suspended sediment from works into watercourses; and, ➤ Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. <p>In addition to the application of buffer/setback zones, the following supplementary mitigation measures will be employed during deforestation works:</p> <p><u>Mitigation by Design:</u></p> <p>Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows:</p>		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ The felling coupes are carefully planned to ensure no unnecessary water crossings will be required. ➤ Machine combinations will be chosen which are most suitable for ground conditions at the time of deforestation, and which will minimise soils disturbance. The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines; ➤ All machinery will be operated by suitably qualified personnel; ➤ Checking and maintenance of forest roads and culverts will be on-going through any deforestation operations. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during deforestation works; ➤ These machines will traverse the site along specified off-road routes (referred to as brash mats); ➤ The location of brash mats will be chosen to avoid wet and potentially sensitive areas; ➤ Brash mats will be placed to support the vehicles on soft ground, reducing peat and mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall; ➤ Silt fences will be installed at the outfalls of existing drains downstream of deforestation areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any deforestation works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground;</p> <ul style="list-style-type: none"> ➤ In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on site during the Proposed Offsetting Measures; ➤ Double silt fencing will also be put down slope of deforestation areas which are located in close proximity to streams and/or relevant watercourses; ➤ Drains and silt traps will be maintained throughout all deforestation works, ensuring that they are clear of sediment build-up and are not severely eroded; ➤ Timber will be stacked in dry areas, and outside watercourse buffer zones. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites; ➤ Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff; ➤ Refuelling will occur at a designated refuelling area at the existing entrance to Area 2. This refuelling area is remote from all watercourses. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and, ➤ Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors. ➤ Deforestation works will only be carried out during periods of low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>Otter</p> <p>While no otter signs were identified within the Proposed Offsetting Lands, it is noted that otter is a mobile species and could potentially utilise the Proposed Offsetting Lands sporadically. As such, the following mitigation measures to protect otter during the deforestation works.</p> <ul style="list-style-type: none"> ➤ During deforestation and extraction (in areas where this applies), a minimum 10 m exclusion zone will be applied along the edge of any ‘aquatic zone’ (rivers/ streams) on or adjoining the Proposed Offsetting Lands. Machine traffic and timber stacking will not be permitted within this zone. Trees within the reach of the harvester arm will be permanently felled by harvester and stacked outside the exclusion zone. Trees outside machine reach will be felled manually. Felled trees will be winched out of the exclusion zone where appropriate and safe to do so, or removed by extended harvester arm, for subsequent processing outside the exclusion zone avoiding mobilisation of soils. All other requirements relating to water exclusion zones, as set out in Section 6.1 of the Standards for Felling & Reforestation (DAFM, 2019) and Section 9.5.2 of Chapter 9 of this report will be adhered to. ➤ Regarding any existing ‘relevant watercourses’ (drainage ditches), there will be no cleaning of any section of such watercourses within 50 m of an aquatic zone. ➤ There will be no woody scrub/ shrub removal as part of the Proposed Offsetting Measures. 		
MM4	EIAR Chapter 8, Appendix 8-1	A series of safety buffer zones (SBZ) and Felled Material Restriction (FMR) areas are proposed as mitigation for the deforestation works.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>Safety Buffer zones are areas identified during the initial phases of the PSRA and are highlighted as possessing a potential instability risk. The development of the safety buffer zones is a semi-automated approach that combines the developed polygon areas of the FoS results, areas of risk identified during the site walkovers, and potential risk areas identified from the examination of peat depths and site topography. It is noted that the results from all FoS analyses (drained/undrained, with and without surcharge) are used, highlighting areas indicative as having a FoS < 1 in the undrained scenario. Five Safety Buffer zones have been identified within the Proposed Offsetting Lands. It is considered that the low factor of safety calculated in these areas is caused by localised factors, and do not represent a global stability risk. Each safety buffer zone is located at the edge of the forestry, close to machine excavated firebreaks or small streams, with the locally higher slopes generating the low factor of safety score. It is considered that these areas do not present a significant peat landslide risk, provided the below mitigations are adhered to.</p> <p>These areas are to be marked out on site with warning tape, and the following mitigation measures adhered to:</p> <ul style="list-style-type: none"> ➤ No large plant is to enter the Safety Buffer zones. ➤ No logs, windrows, stone or other materials will be temporarily or permanently placed in the areas within the FMR areas. <p>Although the peat stability results and safety buffers have been considered in the siting of the Proposed Offsetting Measures, there are some locations where forestry work is required within a safety buffer zone. The stability assessment results at these locations suggest FoS values <1 in the surcharged scenario only and have FoS results >1.0 in the analysis without the surcharge. This suggests that the areas are of a low instability risk in their natural state but are unsuitable for the storage of felled logs or other materials.</p>		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>Felled Material Restriction (FMR) areas are identified at 18 locations within the Proposed Offsetting Lands.</p> <p>Certain mitigations must be adhered to within the FMR areas in future stages of the Proposed Offsetting Measures:</p> <ul style="list-style-type: none"> ➤ No logs, windrows, stone or other materials will be temporarily or permanently placed in the areas within the FMR areas, ➤ Any trees permanently felled in the area will be immediately removed and placed/ stored in an appropriate storage location, ➤ Plant used within these areas will be low ground bearing and only the necessary plant will be used here. No excessive quantity or size of plant will be stored in these areas, ➤ During, and for seven days following significant rainfall events, all works in the FMR areas will be halted, to prevent disturbance of potentially saturated peat. <p>Works Management</p> <p>The general requirements for the management of peat and the mitigation of peat instability at the Proposed Offsetting Measures are as follows:</p> <ul style="list-style-type: none"> ➤ Appointment of experienced and competent contractors; ➤ The forestry works on site should be supervised by experienced and qualified personnel; ➤ Allocate sufficient time for the project to proceed safely with all peat stability mitigation measures included in the programme; ➤ Set up, maintain and report findings from monitoring systems, including sightline monitoring; 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ Maintain vigilance and awareness through Tool-Box-Talks (TBTs) on peat stability; ➤ Prevent undercutting of slopes and unsupported excavations; ➤ Prevent placement of loads/overburden on marginal ground; ➤ Manage and maintain a robust drainage system. This will be the responsibility of the appointed contractor; ➤ Storage of felled material including windrows be carried out in the permitted areas only; ➤ All works will be halted during significant rainfall events, and for a minimum of one day afterwards; and ➤ A method statement and risk assessment (RAMS) which considers the potential causes and mitigations of peat instabilities and landslide is required and must be regularly communicated to all site staff. An observational approach by all site staff to the ground conditions and the risks should be promoted and any changes in the ground or site conditions should be reported and the risk dynamically assessed. <p>Drainage Measures</p> <p>Installation of targeted drainage measures would aim to isolate areas of susceptible peat from upslope water supply, re-routing surface (flushes/gullies) and subsurface (pipes) drainage around critical areas. Surface water drainage plans should be implemented to account for modified flows created by Proposed Offsetting Measures works, which in turn may affect peat stability, pollution and wildlife interests. Drainage measures need to be carefully planned to minimise any negative impacts.</p> <p>Furthermore, all proposed deforestation works will be in accordance with the best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and Forest Service guidance documents to ensure that deforestation results in minimal potential negative effects on the local peat, soil and subsoil environment.</p>		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>In addition, the following mitigation measures will be implemented during deforestation operations:</p> <p>Mitigation of adverse Effects due to the erosion of soils and exposed subsoils/peat</p> <ul style="list-style-type: none"> ➤ Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; ➤ The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines; ➤ All machinery will be operated by suitably qualified personnel; ➤ These machines will traverse the site along specified off-road routes (referred to as racks or brash mats); ➤ Brash mats will be placed on all routes off the forest road to support the vehicles on soft ground, reducing peat and mineral soil disturbance, compaction and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur; ➤ As deforestation progresses, the harvester will collect brash produced by the deforestation and place it in front of the machine before it advances forward along the brash mat; ➤ The condition of the brash mats will be continually monitored and fresh brash will be applied when the brash mat becomes heavily used and worn, ensuring that the mat remains effective throughout the Proposed Offsetting Measures; and, ➤ The location of brash mats will be chosen to avoid wet and potentially sensitive areas <p>Soil Contamination by Leakages and Spillages</p> <ul style="list-style-type: none"> ➤ All road-going vehicles will be refuelled off-site; 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ On-site re-fuelling will be required for forestry and excavator machinery; ➤ The on-site refuelling will be undertaken at a dedicated refuelling area at the existing entrance to Area 2. The refuelling will be completed using a double skinned bowser with spill kits kept on site for accidental leakages or spillages; ➤ The bowser will be refilled by a fuel lorry; ➤ Absorbent materials and pads will be kept on site in the event of accidental spillages; ➤ Only designated trained operatives will be authorised to refuel plant; ➤ Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; ➤ Fuels stored on-site will be minimised. All storage areas will be bunded appropriately for the duration of the Proposed Offsetting Measures. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area; ➤ Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage; ➤ The plant used during Proposed Offsetting Measures will be regularly inspected for leaks and fitness for purpose <p>Peat Stability</p> <p>The following control measures will ensure the management of the risks for this site:</p> <ul style="list-style-type: none"> ➤ Felling will be completed during periods of low rainfall; ➤ Appointment of experienced and competent contractors; ➤ The forestry works will be supervised by experienced and qualified personnel; 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ Allocate sufficient time for the project to proceed safely with all peat stability mitigation measures; ➤ Set up, maintain and report findings from monitoring systems, including sightline monitoring (installation of monitoring posts is recommended where works are taking place in areas where peat depths exceed 2m. Monitoring posts should be observed at least once a day); ➤ Maintain vigilance and awareness through Tool-Box-Talks on peat stability; ➤ Prevent undercutting of slopes and unsupported excavations; ➤ Prevent placement of loads/overburden on marginal ground; ➤ Manage and maintain a robust drainage system; ➤ Surface water drainage plans should be implemented to account for modified flows created by the works, which in turn may affect peat stability; ➤ Store felled material including windrow in permitted areas only; ➤ A method statement and risk assessment which considers the potential causes and mitigations of peat instabilities and landslide is required and must be regularly communicated to all site staff. An observational approach by all site staff to the ground conditions and the risks should be promoted and any changes in the ground or site conditions should be reported and the risk dynamically assessed. 		
MM5	EIAR Chapter 9	<p>Mitigation measures relating to potential effects of deforestation on water quality can be seen in MM1, MM2 and MM4 above.</p> <p><u>Mitigation by Design:</u></p> <p>Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows:</p>		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ The deforestation coupes are carefully planned to ensure no unnecessary water crossings will be required. ➤ Machine combinations will be chosen which are most suitable for ground conditions at the time of deforestation, and which will minimise soils disturbance. The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines; ➤ All machinery will be operated by suitably qualified personnel; ➤ Checking and maintenance of forest roads and culverts will be on-going through any deforestation operations. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during deforestation works; ➤ These machines will traverse the site along specified off-road routes (referred to as brash mats); ➤ The location of brash mats will be chosen to avoid wet and potentially sensitive areas; ➤ Brash mats will be placed to support the vehicles on soft ground, reducing peat and mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall; ➤ Silt fences will be installed at the outfalls of existing drains downstream of deforestation areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any deforestation works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground;</p> <ul style="list-style-type: none"> ➤ In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on site during the Proposed Offsetting works; ➤ Double silt fencing will also be put down slope of deforestation areas which are located in close proximity to streams and/or relevant watercourses; ➤ Drains and silt traps will be maintained throughout all deforestation works, ensuring that they are clear of sediment build-up and are not severely eroded; ➤ Timber will be stacked in dry areas, and outside watercourse buffer zones. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites; ➤ Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff; ➤ Refuelling will occur at a designated refuelling area at the existing entrance to Area 2. This refuelling area is remote from all watercourses. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and, ➤ Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors. <p>Deforestation will only be carried out during periods of low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses.</p>		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<p>Drain Inspection and Maintenance:</p> <p>The following items shall be carried out during inspection before deforestation and after:</p> <ul style="list-style-type: none"> ➤ Communication with forestry operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; ➤ Inspection of all areas reported as having unusual ground conditions; ➤ Inspection of main drainage ditches and outfalls. During inspections prior to deforestation, the main drainage ditches shall be identified. Ideally the inspection shall be carried out during rainfall; ➤ Following deforestation, all main drains shall be inspected to ensure that they are functioning; ➤ Extraction tracks near drains need to be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; ➤ Culverts on drains exiting the site will be unblocked; and, ➤ All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall. <p>In addition to this, Forestry operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed below, to ensure that deforestation and other forestry operations result in minimal potential negative effects to the receiving environment. These mitigation measures are tried and tested, best practice mitigation measures which are implemented at forestry sites across the country. The guidance documents include:</p>		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ Forestry Standards Manual (Forest Service, 2015) ➤ Environmental Requirements for Afforestation (Forest Service, 2016a) ➤ Land Types for Afforestation (Forest Service, 2016b) ➤ Forest Protection Guidelines (Forest Service, 2002) ➤ Forest Operations and Water Protection Guidelines (Coillte, 2013) ➤ Forestry and Water Quality Guidelines (Forest Service, 2000b) ➤ Forestry and the Landscape Guidelines (Forest Service, 2000c) ➤ Forestry and Archaeology Guidelines (Forest Service, 2000d) ➤ Forest Biodiversity Guidelines (Forest Service, 2000e) ➤ Forests and Water, Achieving Objectives under Ireland’s River Basin Management Plan 2018-2021 (DAFM, 2018) ➤ Coillte Planting Guideline SOP ➤ A Guide to Forest Tree Species Selection and Silviculture in Ireland (Horgan et al., 2003) ➤ Management Guidelines for Ireland’s Native Woodlands. Jointly published by the National Parks & Wildlife Service (Cross and Collins, 2017) ➤ Native Woodland Scheme Framework (Forest Service, 2018) ➤ Code of Best Forest Practice (Forest Service, 2000) <p>There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document “Forestry and Water Quality Guidelines” will be implemented during the deforestation activities.</p> <p>The following buffer zones will be implemented:</p> <ul style="list-style-type: none"> ➤ No disturbance to ground will occur within 5m of a relevant watercourse or within 10-20m for aquatic zones. 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		<ul style="list-style-type: none"> ➤ In areas of higher sensitivity or where silt movement is more likely this zone will increase to 20m; ➤ In these sensitive areas, there will be no machines crossing any natural watercourse; ➤ Refuelling and maintenance of machines will occur at least 50m from watercourses. It is proposed that refuelling will only be completed at the existing entrance to Area 2. This location is distant from any watercourses; ➤ Use natural buffer zones to filter water from mound drains; ➤ Short, stepped mound drains to be used in moderately sloped areas; and, ➤ No drainage on very steep slopes, within delineated aquatic or buffer zones. <p>The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures (discussed below) to be properly installed and operate effectively. The buffer/setback zone will:</p> <ul style="list-style-type: none"> ➤ Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment; ➤ Avoid peat/soil disturbance and compaction within close proximity to surface watercourses; ➤ Avoid the entry of suspended sediment from works into watercourses; and, ➤ Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. 		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
MM6	EIAR Chapter 10 and 11	<p>Mitigation measures to protect air quality and climate during the Proposed Offsetting Measures include:</p> <ul style="list-style-type: none"> ➤ Any vehicles or plant brought onsite during the extended operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise. ➤ When stationary, delivery and on-site vehicles will be required to turn off engines; ➤ Good management practice will be will occur on site. Good management practice, consists of good site design and layout, adopting appropriate working methods, choosing the right equipment and ensuring that the workforce understands the company's responsibilities and is familiar with good working practice and dust suppression techniques. ➤ Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements 		
MM7	EIAR Chapter 12	The contract documents will specify that the Contractor undertaking the works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.		

18.4

EIAR Monitoring Proposals – Proposed Lifetime Extension

Table 18-3 Schedule of Mitigation - Proposed Lifetime Extension

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Operational Phase					
MX1	EIAR Chapter 5 EIAR Chapter 12	Commissioning noise surveys will be undertaken to ensure compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of a wind farm being commissioned – in this instance, continuing its operation. If an exceedance of the noise criteria is identified as part of the commissioning assessment, the guidance outlined in the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken	Within 6 months of continued operation	As Required	Noise Consultant
MX2	Appendix 6-1 Bat Report	<p>Post Consent Bat Monitoring</p> <p>To assess the effects of the Proposed Lifetime Extension on bat activity, at least 3 years of post-consent monitoring is proposed. It will include static detector surveys, walked survey transects and dog-led carcass searching to record any bat fatalities resulting from potential collision.</p> <p>The results of post-consent monitoring will be utilised to assess any potential changes in bat activity patterns and to monitor the implementation of the mitigation strategy. Results of Year 1 surveys will assess whether adaptations to the monitoring plan are required, and further mitigations such as curtailment will be considered. If a further curtailment requirement is identified, a programme can be devised around key activity periods and weather parameters, as well as a potential increase in buffers.</p>	Years 1,2,3	Yearly	Project Ecologist

		<p>At the end of each year, the efficacy of the mitigation and monitoring plan will be reviewed, and any identified efficiencies incorporated into the programme. This approach allows for an evidence-based review of the potential for bat fatalities at the Site, to ensure that the necessary measures, based on a new baseline post-lifetime extension, are implemented for the protection of bat species locally. The effectiveness of any mitigation/curtailment needs to be monitored in order to determine (a) whether it is working effectively (i.e. the level of bat mortality is incidental), and (b) whether the mitigation/curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties.</p> <p>The below subsections provide additional detail on the proposed survey effort, timing, and mitigation.</p> <p>Monitoring Year 1</p> <p><i>Bat activity surveys</i></p> <p>Surveys for the Proposed Lifetime Extension will be carried out. Static monitoring shall take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). Full spectrum recording detectors shall be utilised for the same duration as during pre-application surveys and at the same density (NatureScot, 2021). The assessment of bat activity levels will follow the pre-application methodology, allowing uploaded activity data to be contrasted with a comparable reference range, allowing objective and robust interpretation. A specific focus will be required at turbine 9 in Spring and turbine 7 in Autumn. The static surveys at these two specific turbines will be of 20 days starting during the last week of April at T9 and in Autumn at T7 starting mid-August. Seasonal walked survey transects will also be conducted.</p> <p>Key weather parameters and other factors that are known to influence collision risk will be monitored and shall include:</p>			
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		<ul style="list-style-type: none"> ➤ Windspeed in m/s (measured at nacelle height) ➤ Temperature (°C) ➤ Precipitation (mm/hr) <p><i>Carcass searches</i></p> <p>Carcass searches, to monitor and record potential bat fatalities, shall be conducted at each turbine in accordance with NIEA Guidance. This will include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. Surveys will cover all activity seasons and the use of a trained dog detection team will be carried out to ensure maximum efficiency.</p> <p>Monitoring Years 2 & 3</p> <p>Monitoring surveys shall continue in Year 2 and 3, and in the event where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s). The performance of the curtailment programme in terms of its ability to respond to the changes in bat abundance based on temperature and wind speed shall be analysed to confirm it is neither significantly over- nor under- curtailment during different periods of bat activity.</p> <p>At the end of each year, the efficacy of the mitigation/curtailment programme shall be reviewed, and any identified efficiencies incorporated into the programme. The requirement for continued post-consent monitoring will also be considered. Should no bat fatalities be recorded in Year 1, curtailment (where applicable) in Year 2 and Year 3 could be reduced/re-evaluated or removed with monitoring continuing to inform this strategy.</p>			
MX3	Chapter 7	A detailed Bird Monitoring Programme has been prepared for the extended operational phase of the existing wind farm (refer to Appendix 7-8 for further details).	Weekly	n/a	Project Ornithologist

		<p>The programme of works will monitor parameters associated with collision, displacement/barrier effects and habituation during the extended operational phase. Surveys will be scheduled to coincide with Years 1, 2, 3, 5, and 10 of the Proposed Lifetime Extension. Monitoring measures are broadly based on guidelines issued by NatureScot (SNH, 2009). The following individual components are proposed:</p> <ul style="list-style-type: none"> ➤ Vantage point surveys from 4 no. locations. ➤ Monthly distribution and abundance surveys: breeding walkover surveys (adapted Brown & Shepherd) and winter walkover surveys. ➤ Targeted bird collision surveys (carcass searches) will be undertaken with trained dogs. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust. <p>Full details of all monitoring protocols are provided in Appendix 7-8.</p>			
MX4	Appendix 4.2: Operational and Environmental Management Plan	A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the lifetime extension.	Weekly	n/a	Applicant
MX5	Chapter 15	A dedicated Community Liaison Officer employed by the Applicant will be available for contact to householders in the area should any interference be caused by the Proposed Lifetime Extension	n/a	n/a	Applicant
	Decommissioning Phase				
MX6	Chapter 6, Decommissioning Plan	The Site Manager in consultation with the Ecological Clerk of Works (ECoW) will be responsible for employing the services of a suitably qualified ecologist and any other suitably qualified professionals as required throughout the decommissioning works.	As required	As required	ECoW/ Site Manager

MX7	Chapter 7	Decommissioning monitoring surveys will be undertaken prior to the commencement of works associated with decommissioning at the Site. Additionally, if works are to continue into the breeding season, surveys will be required monthly from April to July. The survey will include a thorough walkover survey to a 500m radius of the development footprint and all works areas, where access allows. If winter roosting or breeding activity of birds of high conservation concern is identified during the decommissioning phase (e.g. red grouse or nightjar), no works shall be undertaken within a species-specific disturbance buffer (e.g. Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007; Goodship and Furness, 2022) in line with industry best practice. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied	As required	As required	Project Ornithologist
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18.5

EIAR Monitoring Proposals – Proposed Offsetting Measures

Table 18-4 Schedule of Monitoring - Proposed Offsetting Measures

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Proposed Offsetting Measures					
MX1	Chapter 6 Biodiversity	<p>Invasive species management plan</p> <p>An invasive species management plan has been developed and is outlined below:</p> <ul style="list-style-type: none"> ➤ A pre-commencement survey for Rhododendron will be carried out within Areas 1, 2 and 4 of the Proposed Offsetting Lands to determine the extent and locations of Rhododendron prior to the Proposed Offsetting Measures taking place. ➤ All Rhododendron plants will be geolocated. ➤ A cut will be made at the base of each stem of each Rhododendron plant, after which a herbicide (glyphosate) will be applied to cut. ➤ Plants will be left in place and revisited for repeat treatment after 6 months. ➤ Rhododendron plants will not be interfered with during the deforestation operations in Areas 1, 2 and 4. ➤ After 1 year all, Rhododendron plants will be revisited to assess the effectiveness of treatment. ➤ If Rhododendron plants are dead, they will be cut at the base and left on site to decompose. ➤ If Rhododendron plants are alive then another treatment cycle as outlined above will be undertaken. 	Each year for first 10 year extension	As Required	Project Ecologist

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		<ul style="list-style-type: none"> ➤ An invasive species survey of Areas 1, 2 and 4 of the Proposed Offsetting Lands will be carried out each year following the Proposed Offsetting Measures for 10 years (2026-2036). This survey will be carried out by a competent ecologist. Any new areas of Rhododendron will be geolocated and subject to treatment. ➤ If seedling Rhododendron are identified during the yearly invasive species surveys, hand removal of emerging seedlings can be conducted in order to deal with any residual rhododendron. ➤ After 2036, the Applicant will commission an ecologist with the relevant experience to undertake invasive species surveys at 5-year intervals with a key focus on identifying Rhododendron seedlings or plants for removal 			
MX2	Chapter 7 Ornithology Appendix 7-7	<p>The following individual monitoring components for the Proposed Offsetting Measures are:</p> <ul style="list-style-type: none"> ➤ Foraging activity surveys from 2no. strategically located vantage points overlooking the Offsetting Lands that are sufficient distance to avoid influencing the flight activity within the area of interest. ➤ Passerine point count surveys along transect routes through the Offsetting Lands to provide a yearly index of passerine abundance 	Annually	As required	Project Ecologist
MX3	Appendix 8-1 Chapter 8	<p>The installation of movement monitoring posts is recommended for areas where works are taking place on or adjacent to identified peat depths greater than 2m.</p> <p>Movement monitoring posts will be installed upslope and downslope of the works areas and will be as outlined:</p>	Daily during Offsetting Measures Works	Daily	Felling Operatives

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		<ul style="list-style-type: none"> ➤ Posts will be 1m to 1.5m in length, installed at 5m intervals with no less than seven posts in each line of sight (~30m). ➤ A string line will in attached to the first and last post with all intermediate posts in contact with one side of the string line, ➤ A numbering system will be designs for the monitoring posts and a record will be kept of this numbering system. <p>Movement monitoring posts will be observed at least once a day with more frequent inspections which adjacent works are ongoing. Should movements be recorded the frequency of these inspections will be increased. Record will be kept of all monitor post inspections with reference to date, time and any relative movement between posts, if any. Any movement identified in the posts will be recorded with reference to the post numbering system. The contactor will also develop a routine inspection of all areas surrounding work in peat, not just exclusively on the monitoring posts. These inspections will include an assessment of ground stability and drainage conditions. These inspections should identify any cracking or deformation on the peat surface, excessive settlement on structures, drain blockages or springs etc.</p>			
MX4	Chapter 9 Hydrology	<p>Drain Inspection</p> <p>The following items shall be carried out during inspection pre-felling and after:</p> <ul style="list-style-type: none"> ➤ Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; ➤ Inspection of all areas reported as having unusual ground conditions; 	Pre and Post Felling	As Required	ECoW

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		<ul style="list-style-type: none"> ➤ Inspection of main drainage ditches and outfalls. During pre-felling inspections, the main drainage ditches shall be identified. Ideally the pre-felling inspection shall be carried out during rainfall; ➤ Following the permanent tree felling all main drains shall be inspected to ensure that they are functioning; ➤ Extraction tracks near drains need to be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; ➤ Culverts on drains exiting the site will be unblocked; and, ➤ All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall <p>Surface Water Quality Monitoring</p> <p>In line with standard forestry practice, and in combination with the above, grab sampling will be completed at additional sampling locations downstream of deforestation areas before, during (if the operation is conducted over a protracted time) and after the deforestation activity. The ‘before’ sampling should be conducted within 4 weeks of the deforestation activity, preferably in medium to high water flow conditions. The “during” sampling will be undertaken once a week or after rainfall events. The ‘after’ sampling will comprise as many sampling events as necessary to demonstrate that water quality has returned to pre-activity status (<i>i.e.</i> where an effect has been shown).</p> <p>Criteria for the selection of water sampling points include the following:</p>			

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		<ul style="list-style-type: none"> ➤ Avoid man-made ditches and drains, or watercourses that do not have year round flows, i.e. avoid ephemeral ditches, drains or watercourses; ➤ Select sampling points upstream and downstream of the forestry activities; ➤ It is advantageous if the upstream location is outside/above the forest in order to evaluate the effect of land-uses other than forestry; ➤ Where possible, downstream locations should be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no effect through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and, ➤ The above sampling strategy will be undertaken for all on-site sub-catchments streams where permanent tree felling is proposed. 			
MX5	Chapter 16, Appendix 8-1	<p>Where excessive movement is observed, the following measures will be taken:</p> <ul style="list-style-type: none"> ➤ All works will be suspended in the area, ➤ A competent Geotechnical Engineer will carry out an assessment of the peat instability including drainage. The competent Geotechnical Engineer will compile a report outlining the surveys undertaken, the potential cause of the instability, assessment of any increased risk caused by the instability, and the further measures required to manage this risk, ➤ An increased monitoring regime will be specified including increase in number of monitoring post lines, decrease on monitoring post spacing and an increase in the frequency of monitoring post observations, 	When Excessive Movement Noted	As Required	Geotechnical Engineer

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		<ul style="list-style-type: none"> ➤ Should no further movement be detected, activities will be recommenced while maintaining the increased monitoring regime, ➤ Should further excessive movement be detected, the geotechnical engineer will need to be informed and the design of further reinstatement works will be required such as excavation of the disturbed material, installation of a granular berms or similar. <p>Emergency Response to a Landslide Event</p> <p>Due to the high factors of safety and negligible risk of peat landslides identified on site, it is not anticipated that peat failure will occur on site, However, in the event of peat failure (e.g. tension cracking, surface rippling, sliding), the following measures will be implemented by the contractor:</p> <ul style="list-style-type: none"> ➤ All members of the project team will be alerted immediately or as it is safe to do so; ➤ All habitat enhancement works will be ceased with immediate effect, and all available resources will be used for the management and mitigation of the risks posed by the event; ➤ Localised peat slides that do not present a risk to watercourses will be assessed by competent engineers, and will be stabilised by rock infill and granular material where necessary; ➤ The key initial activity will be to prevent displaced materials from reaching any watercourses or sensitive environments. Given the terrain of the Proposed Offsetting Lands, the key risk is the development of a propagation landslide or slip within topographic valleys and watercourses. Where possible, catch ditches will be constructed to aid prevent further run out of the disturbed peat material. These catch ditches may slow or halt runout, although it is preferable that they are cut in non-peat material. Simple 			

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		earthwork ditches can form a useful low-cost defence. Paired ditches and barrages have been observed (Tobin, 2003) to slow peat landslide runout at failure sites.			

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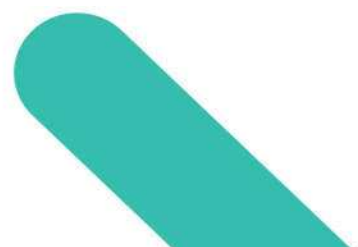
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Taurbeg Wind Farm
Extension of Operational
Life

Volume 1

Non-Technical Summary
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Prepared By: **MKO
Tuam Road
Galway
Ireland
H91 VW84**



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