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EXECUTIVE SUMMARY

Introduction

ARCADIS was commissioned to carry out a technical assessment with the purpose of establishing whether there is a potential infringement of EU law associated with the Derrybrien Wind Farm Project, County Galway, Republic of Ireland.

The operational Derrybrien Wind Farm Project is located in the northern part of the Slieve Aughty Mountains in County Galway, approximately 11km south of Loughrea, 13km north east of Gort and 24km west of Portumna.

The Project comprises 70 No. Vestas V52-850 kW wind turbines and substation, a grid connection comprising an overhead line (approximately 7.8km long) and Agannygal Substation connecting the wind farm to the National Grid and all associated developments. The owner and operator of the wind farm is Gort Windfarms Limited, a subsidiary of the Electricity Supply Board (ESB). Planning permissions were obtained between 1998 and 2002.

Construction of the wind farm commenced in June 2003 and continued to 2006. In October 2003 a peat slide occurred within the wind farm site boundary to the south of the site caused the disturbance and partial displacement of peat and forest debris. Displaced peat remobilised following a period of heavy rain. During the peat slide, debris passed down a stream valley and into an area of open flatter ground where it lost momentum and was deposited upstream of a minor road bridge. Some peat was transported further down the Owendalulleagh River with small amounts of peat deposited along the river banks. The estimated volume of peat in the peat slide area, based on the extent of the peat slide area was 450,000m^3 dispersed over a wide area.

The wind farm has been in continuous operation since 2006 and the operator envisages that it will operate until circa 2040, at which time it will be decommissioned.

In 2008, the Court of Justice of the European Union (CJEU) delivered a judgment against the State concluding that Ireland had failed in its obligations to assess environmental effects in accordance with European Directives prior to granting of the planning permissions for the Derrybrien wind farm. In 2019, there was a further CJEU judgment against the State for failure to comply with the 2008 judgment. Galway County Council has served a Notice under the Planning and Development Acts directing Gort Windfarms Limited (the owner and operator of the wind farm) to submit an application for Substitute Consent to An Bord Pleanála. The remedial EIA process started on 21 August 2020 when the developer submitted a substitute consent application to An Bord Pleanala. The Application includes environmental assessments which are intended to demonstrate compliance with the Environmental Impact Assessment and Habitats Directives, which will assist An Bord Pleanála carrying out a full environmental assessment of the Derrybrien Wind Farm Project. These assessments also address all the works that were undertaken in response to the peat slide in 2003. Concerns have however been raised by local complainants that the process is not adhering to the EIA Directive requirements and that key issues of concern are not being addressed.

Background to the Technical Assessment

This report comprises an analysis of the documentation and process supporting the Remedial Environmental Impact Assessment of Derrybrien Wind Farm and ancillary works. The documentation reviewed includes the Remedial Environmental Impact Assessment Report (rEIAR), Remedial Natura Impact Statement and information provided by third parties commenting on this process (which are publicly available) as well as documentation from complainants submitted to DG Environment.

The overall objective has been to assess if the EIA remedial process has fairly assessed the key impacts over time and addressed appropriately the need for remediation and compensation measures.

Due to the historic peat slide that occurred, peat stability has been a key focus of this assessment. Given the location of the wind farm on high ground with peat soils, the interaction between this development and the surrounding land uses, in particular, with regard to water runoff and possible downstream pollution and flooding

has also been considered as a key issue. Assessment of likely impacts of the development on protected habitats and species are also an important area of focus in the review.

Compliance with European Union and Irish Environmental Legislation and Process

The rEIAR correctly references Directive 2011/92/EU as amended by Directive 2014/52/EU. The relevant sections of this report give consideration to whether the requirements of Articles 2,3 and 5 have been met by the rEIAR, and in particular the requirements of Article 3 and Annex IV are considered in depth. It should however be noted that the rEIAR addresses the disposal and recovery of waste within the description of the project (in accordance with Annex IV Section 1) however there is no attempt to consider the likely significant effects of the project on the environment resulting from the disposal and recovery of waste (in accordance with Annex IV Section 5).

Article 5 (1) requires the developer to include a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment. This has been given very limited consideration, as set out in the section below.

Article 6 of the EIA Directive focuses on public consultation and under Article 8 of the EIA Directive 'the results of consultations and the information gathered pursuant to Articles 5 to 7 shall be duly taken into account in the development consent procedure.' A five-week participation window was provided for public consultation on the rEIAR. Whilst there has been an opportunity for public participation to take place, there is a question mark over the effectiveness of participation enabled by this opportunity, given the complex nature of the topic, the volume of application documents and the reasonableness of the timeframe for comments / inputs by members of the public. The rEIAR Non Technical Statement states "Gort Wind Farms Limited has engaged with the general public in relation to the Derrybrien Wind Farm Project throughout the development and operation of the Project." All of the complaints received by the EC contradict this claim and a complaint was made by a local resident that although there was a 30-day public consultation period starting on 21 August 2020, the documentation was not accessible until 27 August 2020.

Chapter 1: Introduction

Chapter 1: Introduction of the rEIAR gives a comprehensive account of the background to the project, an overview of the CJEU Judgements, the requirement for the rEIAR and the general methodology followed. The qualifications and number of years' experience of the main authors are reported, demonstrating that the rEIAR has been coordinated by competent experts, as required by the EIA Directive

No details are provided to document the extent to which the scope of the rEIAR has been discussed and agreed with the competent authority. It appears that no EIA Scoping exercise has been undertaken or Scoping Report prepared. The European Commission (EC) Guidance on Scoping (2017) notes that scoping is not mandatory under the EIA Directive, however the guidance states that it is good practice to undertake scoping even if it is not required by legislation (Section 1.4).

The overarching methodology is set out and appears comprehensive and the significance criteria proposed adequately cover the characteristics of the potential impact set out in Annex III (3) of the EIA Directive (e.g., extent of the impact, magnitude of impact, probability, duration, frequency and reversibility).

It should be noted that the rEIAR addresses the disposal and recovery of waste within the description of the project (in accordance with Annex IV Section 1) however there is no attempt to consider the likely significant effects of the project on the environment resulting from the disposal and recovery of waste (in accordance with Annex IV Section 5).

Details are set out demonstrating that the requirements of Article 6(2) of the EIA Directive have been met in terms of informing the public about the Substitute Consent Application and the EIA Process.

Chapter 2: Project Description

The rEIAR gives a comprehensive description of the project in line with the EIA Directive. No significant omissions were noted with regards to the information provided.

Chapter 3: Alternatives

Alternatives are considered for the Do-nothing; continued operation and later decommissioning; alternative renewable energy projects on site; and decommissioning and remediation alternatives for the wind farm site.

The assessment of the first three bullet points includes a comprehensive comparison of the environmental effects in line with the requirements of the EIA Directive. However it is questionable how likely the developer is to develop alternative energy projects on the site and therefore how far these constitute 'reasonable alternatives'. The aim of the alternatives assessment is to help embed environmental considerations into the evolution of the project, it is questioned the extent to which this part of the assessment adds to the quality of the rEIAR, and in particular in aiding the decision making process for the substitute application.

Very limited consideration has been given to alternatives for decommissioning and remediation options, or any alternatives given regarding amending the design/layout of the existing wind farm to potentially reduce the identified environmental impacts. The option of removal of one or more parts of the development has not been considered in any detail and the reasons for selecting the chosen option are also not dealt with in much detail.

Chapter 4 Population and Human Health

The chapter is broadly compliant with legislation and best practice, although further detail around population, recreation and amenity would enable a more robust assessment. A more detailed understanding of communities in the baseline would assist with later assessment of impacts, notably positive impacts relating to community benefits. There is no detail around farming (other than a brief reference to forestry and turbary) from a business / viability perspective, although negative effects have been identified in relation to farmland and farming activities. It is not clear whether consultation with stakeholders has taken place in relation to baseline data collection.

Conclusions made in relation to population impacts associated with the wind farm highlight the various positive social impacts resulting from employment and community benefits attributed to the project. The chapter also states that the project 'contributes significantly to the displacement of imported fossil fuel cost of economic benefit to the Irish economy and will continue to do so throughout the lifetime of the project' although no real detail / justification is presented in relation to this. No significant adverse impacts on population have been identified and these conclusions are considered reasonable.

The recent placement of a 'Hazard' sign at the entrance to the turbary stating that there is a risk of instability if peat cutting activities are undertaken has prevented local residents from obtaining a fuel supply for use next winter and does not accord with the 'slight positive economic benefit' in relation to turbary referred to in the chapter.

The assessment tables for human health covers a range of assessment periods (construction, impacts which occurred during the peat slide, operational phase 2006 to end 2020, operational impacts currently occurring, operational impacts likely to occur and decommissioning impacts). The assessments are high level in nature and do not provide sufficient detail to justify conclusions within this chapter. The human health section concludes that 'the distance between wind turbines and occupied buildings is always greater than that necessary to meet safety requirements. The turbines in use for Derrybrien Wind Farm have a proven record in terms of safety and reliability. In summary, the operation of the wind farm to date has not and future operation will not result in significant adverse impacts on human health'. This conclusion does not adequately reflect the assessment that has been made of human health effects throughout the chapter nor the potential issue around slope instability and potential for peat slide events.

Chapter 5 Noise and Vibration

Generally, the noise and vibration assessment is a robust and considered assessment based upon acceptable guidance and methodologies. In general, the conclusions of the Chapter seem reasonable and are accepted.

Key concerns relate to the issues raised relating the status of the property where adverse impacts are predicted to potentially occur during operation and decommissioning and are not controlled as the property is stated to be unoccupied. Assurances would be needed that this is the case for the lifespan of the wind farm and the decommissioning phase for the conclusions of the Chapter to be acceptable. Should this not be the case, and no assurances can be made that the property would remain unoccupied, then there is a potential for adverse

impacts which have not suitably been controlled within the works presented and additional mitigation may be necessary. These adverse impacts also include night-time operational impacts which would be a key concern for any resident.

Chapter 6 Shadow Flicker

There are a few minor inconsistencies within the methodology and scope of the chapter, but on the whole the approach follows the relevant guidance.

Only one receptor is considered to be within range to be affected by shadow flicker effects resulting from the project. This receptor is a currently uninhabited building (as described for noise above), but despite this, the rEIAR states that the property would not experience significant effects sufficient for mitigation to be considered. The rEIAR states that if a complaint from a future resident is received, mitigation measures which are outlined, will be utilised. It is recommended that there is a commitment to mitigation measures (as outlined above for noise) if the property becomes occupied.

Chapter 7 Biodiversity (Terrestrial Ecology)

The document is very difficult to follow, with large amounts of unbroken text. Greater structure and tabulation will help the reader navigate the assessment. There are additional legislation and guidance that should be included in an update of the rEIAR. The baseline is under described for amphibians and common lizard, badger, breeding and wintering birds other than Hen Harrier, roosting bats, otter, red squirrel and pine marten. Some of the surveys discussed are below best practice. It is also slightly confusing as to timing of the baseline as it is sometimes inconsistently described.

A table would be helpful with survey dates, guidance followed, and deviations from guidance clearly stated. An alternative means of assessment should be presented when survey data are not available. Clear scoping in and out with justification for each receptor should be presented, ideally in a tabular form. Clear limitations and precautionary assessment methods statements should also be listed per receptor. Given that this is a recreation of a baseline in the past, the CIEEM Guidance on Ecological Survey and Assessment in the UK During the COVID-19 Outbreak presents useful alternative methods of survey and data gathering and would be useful in this case.

Greater detail is required as to the justification of the value of the individuals with clearly stated data limitations and precautionary assessment. Structured guidance on evaluation for all receptors should be clearly stated along with an evaluation statement for each receptor. For example, if determining that a receptor is common and widespread national data should be evidenced, assessment at a global scale should also be employed for receptors that are globally scarce/rare.

Explanation as to the different assessment process applied for birds (have presumed Percival 2003) should be confirmed).

Tabulation of impacts and impact pathways scoped in and out, with justification would be helpful. Clearfelling of woodland to facilitate and enhance the development should be systematically assessed for all receptors. Habitat loss due to the development does not seem to have been assessed. Consistent structure throughout the document per receptor should be applied.

Operational effects are under assessed on habitats. Birds have been under assessed in general, and there is no assessment of the potential impacts from the potential increase in ease of access to the site. The number of bat mortalities may be undervalued. The effect of the felling to increase the wind farm's efficiency does not seem to have been fully assessed. A more structure cumulative effects section would be helpful with impacts and impact pathways clearly scoped in and out. Also, a more evidenced based assessment is required for cumulative effects. No mitigation is provided for the steep decline in Hen Harrier numbers.

Stakeholder concerns should be addressed within the chapter.

The potential impacts re decommissioning is not an unreasonable assessment however, additional survey effort and mitigation are required to ensure this result.

An overarching management and monitoring plan should be written, detailing the receptors, surveys, years of survey and management required over the years up to decommissioning, this should include but not be limited to:

- Consideration of the impact of greater access has had on turbary and other potential impacts such as hunting, recreation etc.
- There is no management or monitoring plan for habitats, it is recommended that habitats are managed to reach maximum positive condition and to plan for decommissioning to avoid degradation of the best habitats.
- There is no monitoring proposed for birds other than Hen Harrier, for which additional VPs should be added. Breeding and wintering bird surveys should also be undertaken.
- There is no monitoring proposed for amphibians or common lizard, it is recommended that some monitoring is undertaken to inform decommissioning.
- Bat monitoring using a suite of static detectors should be undertaken throughout the season to monitor the effect of the windfarm on bat foraging.
- Pre decommissioning otter surveys should be undertaken across the site and with appropriate buffers on the study area.

Additional mitigation or compensation should also be provided or considered for the following:

- Compensation for loss of habitat for red squirrel, pine marten, badger and nesting birds.
- No mitigation has been proposed for bats for the loss of coniferous forest as a roost and/or foraging resource, compensation should be provided. Two bat boxes for the potential loss of bridge roosting habitat do not seem sufficient. A minimum of three bat boxes should be erected either within each bridge or on suitable trees nearby.

Chapter 8 Aquatic Ecology and Fisheries

There is an extensive list of desk study data provided within section 8.1.3.2 however there is no listing of relevant legislation or policy. While some legislation is incorporated throughout the report a dedicated section should be provided. An assessment under the Water Framework Directive has not been undertaken nor one under the Eels Regulations. EPA guidelines (2017) are cited and followed; however it should also have included impact assessment guidance such as CIEEM guidelines 2019 (Ref 25). The NRA (2003) guidelines cited are not an appropriate assessment method.

The information is presented in a very academic way. Tabulation of each receptor baseline and valuation would help the reader navigate the large blocks of text. A separate survey methodology section separate from the baseline results would also help navigate the section.

Given the absence of any meaningful assessment of the freshwater systems prior to the start of construction, and given the admission in 'rEIAS, Section 8.1.4' that only limited data sources were identified by the current assessment for conditions preceding the peat slide of 2003, it is difficult to justify the concluding statement that despite constraints, it is considered that the data available, including the data collected during field surveys, is adequate.

The valuation of receptors is based on NRA guidelines from 2003, these were designed for roads and seem to refer largely to fisheries not to nature conservation status. These do not seem like an appropriate evaluation criterion, instead one should use impact assessment guidance such as CIEEM guidelines 2019

It would be appropriate to assess the faunal receptors fish and freshwater pearl mussel separately. There should be a section on the nature conservation status of each receptor and an appropriate evaluation of each one.

There are no stakeholder concerns presented within the document. Freshwater pearl mussel were a key stakeholder concern. These species appear to have been scoped out of the assessment but should be scoped out in a structured way with clear evidenced based reasoning.

The lack of any proposed monitoring is considered an omission in terms of proposed mitigation measures. Best practice guidance should be cited for mitigation. The formation of a management plan is welcome for the maintenance, this should also be overseen by an appointed pollution control officer. In addition to mitigation

for required maintenance, positive management and enhancement should be implemented. Yearly monitoring of the water courses should continue, annual monitoring of the site in general should be included to ensure that appropriate management is being undertaken. Method statements for the decommission should also be drawn up in advance. An assessment under the Water Framework Directive and under the Eels Regulations should be undertaken for the decommissioning even in the form of a pre-screening with recommendations for a detailed assessment to be undertaken prior to decommissioning.

The impacts may be underestimated, due to the lack of existing data. This is however difficult to judge and reliance on professional judgment is necessary. By incorporating the amendments and additions outlined in Sections 5.9.7. and 5.9.8 this would provide more confidence in the current and future impact predictions and in the success of mitigation.

Chapter 9 Landscape and Visual

The Landscape and Visual Assessment generally conforms to guidance and has been informed by several key guidance documents including Guidelines for Landscape and Visual Impact Assessment, 3rd Edition 2013 and Guide to Visual Representation of Wind Farms (Scottish Natural Heritage, 2017).

In principle, the assessment is appropriate and broadly follows the recommendations suggested in relevant Wind Farms guidance documents. However, the apparent absence of a scoping process and liaison with the competent authority departs from best practice as the scoping opinion represents the considered view of the competent authority and concerns of stakeholders on matters such as extent of study area, key receptors and viewpoints that would need to be assessed carefully.

Typically, as good practice the viewpoint locations would include a range of views to include various types of receptors such as residential, recreational, road users who would experience the landscape in different ways. In the assessment almost all views that have been selected are from roads which are transient in nature and even though the report mentions that there are a small number of rural houses on the fringes or outside of Derrybrien (to the south), Ballynakill (to the east) and along the local road to the south of the site, which do have views of the wind farm, these have not been included in the assessment.

There is also no mention of alternative siting/layouts considered and how/if landscape and visual issues have informed the layout and avoided visibility from certain locations.

The overall methodology is appropriate and while the guidance is not prescriptive there seems to introduction of an additional layer or effect which would make 'moderate effect' not significant. Moderate effects are generally significant and it is surprising that a very large wind far development of 70 turbines would not have a single significant effect.

No mitigation measures are proposed, and justification has been based on the absence of any significant effects. There is perhaps a missed opportunity to explore ways to assist the natural regeneration of the site following decommissioning given the fact that this is a very large wind farm development.

Chapter 10 Soils, Land and Geology

EU guidance in relation to the development of windfarms on peat-dominated landscapes is based on all-encompassing targets and does not therefore specify detailed processes by which these targets may be met. In the absence of specific guidance provided by the Irish authorities in relation to construction of windfarms on peat and the associated risk of slope failure, the rEIAR claims to use the detailed guidance provided by the Scottish Government – generally acknowledged as the best-practice guidance currently available and referred to here as SGG-2017. The rEIAR fails to follow this guidance in a number of key areas that are of critical importance given prevailing conditions at the Derrybrien windfarm site. The most evident failure to follow SGG-2017 is in the complete absence of any attempt to map the drainage pattern and the effect of this drainage on the afforested and formerly-forested peat body. Ample evidence, in some cases available for decades, exists to show that conifer plantations on peat bog systems causes substantial shrinkage of the peat, resulting in cracking and deformation of the peat matrix, particularly along the pattern of ploughing furrows. Evidence was presented in 2005 for the occurrence of this process at Derrybrien, and SGG-2017 specifically requires the mapping of such features. However, this mapping task, critical to the assessment of slope stability, has not been carried out either in the immediate post-slide surveys of 2004-5 or in the years since.

Furthermore, the site as a whole has not been subject to survey relevant to slope stability since 2005, so the 2020 slope stability assessment presented in the rEIAR is based on data which are at least 15 years old. The risk assessment, however, claims to show that conditions at the site have improved sufficiently by 2020 that areas identified as being at 'unacceptable risk' for the supposed 1998 'baseline' conditions are now at 'negligible risk'. This claim is not supported by any recent data. The claim is instead based on the generic idea that the drainage programme instigated in 2004 has increased the cohesive strength of the peat and thus reduced the risk of slope failure. Such a concept fails to recognise that, in peat, while drainage consolidates it also dislocates. Peat cracks are acknowledged by SGG-2017 and associated specialist literature as routes by which intense rainfall can be channelled to weak layers in the peat and thus trigger slope failure, but this is consistently ignored or not recognised within the rEIAR.

Indeed, the site mitigation strategy offered is simply one of continued drainage, worsening conditions in the long term, but claimed as the necessary means of preventing ponding of water on-site because such ponded water substantially increases the risk of slope failure. In a complete reversal of this strategy, however, the approach to decommissioning is that the drainage will no longer be maintained and will be allowed to choke up with vegetation resulting in ponded water, but the risk at this point is dismissed as being very slight.

Methods of survey used in 2004-5 for the site as a whole, and for the grid connection in 2017-19, do not conform to methods recommended in SGG-2017. This same failure to comply with the SGG-2017 guidance applies to the methodologies employed for constructing, analysing and presenting key aspects of the peat slide risk assessment.

The overall result of these failures to follow recognised guidance is that the rEIAR also fails to meet the relevant target requirements set out in the Checklist provided within the European Commission guidance for EIA (2017).

Chapter 11 Hydrology and Hydrogeology

Chapter 11 of the rEIAR provides a list of the legislation and best practice relevant to hydrology and the water environment. This list is comprehensive, however the assessment would benefit from a table summarising how the project achieves compliance with the key requirements of these laws and policies.

The rEIAR largely ignores the forested and formerly-forested blocks within the site in terms of hydrological mapping. Indeed, at a more general level, the rEIAR does not consider the issue of peat shrinkage due to drainage at all. As such, the rEIAR cannot be said to have followed the guidance (and associated specialist literature) which the rEIAR itself claims to be following.

There is no mapping of ploughing furrows, no mapping of peat cracks associated with such furrows, and very little attempt to map possible sub-surface piping associated with the forested ground – which represents a large proportion of the site. Given that the whole site, apart from the area of turbary, was afforested prior to windfarm development, failure to map diligently the hydrological effects and legacy of the forestry represents a major gap in the required set of baseline information.

The assessment methodology is suitably described and the significance criteria and adopted approach are consistent with what is documented in Chapter 1. However, the assessment would benefit from a table to summarise key receptors and their attributes, the value assigned to each and the rationale behind the values assigned.

The Chapter does not provide any details with regard to stakeholder engagement and no reporting of any concerns raised by stakeholders is included. The South Galway Flood Relief Committee submitted a complaint to the EC detailing how they attempted to contribute to the rEIAR but were ignored by the developer. The only communication they received in response to the letter sent to the developer in April 2017 was in a notice on 2 September stating that a rEIAR has been submitted to An Bord Pleanala.

The Chapter includes an assessment of the effects of decommissioning the wind farm. The assessment records which elements of the windfarm infrastructure would be removed, and which would be left in-situ. A key element for consideration is the land drainage system installed to prevent ponding on site during operation of the windfarm, with the proposal to leave this system in place with no future maintenance. The assessment acknowledges that over time, drainage channels would be expected to reduce in capacity due to vegetation growth and silting and effects on the hydrological regime and are stated as the temporary, localised and minor negative.

There is apparent conflict between the mitigation approaches applied during operation, when a drainage system is actively maintained to move rainfall runoff off site and prevent surface water ponding, and during decommissioning, when this drainage system would be allowed to degrade, without any ongoing maintenance.

Given that the proposed mitigating measures have the potential to increase risk over time, a Contingency Plan and physical measures to limit impact would appear to merit priority action. A record of stakeholder engagement should be provided and responses to the issues raised by the South Galway Flood Relief Committee should be provided.

Considering the issues raised by the South Galway Flood Relief Committee, and the concerns reported in Soils, Land and Geology review with regard to the conclusions of the assessments linked to the peat hydrology of the site, without further evidence, some conclusions of the hydrology and hydrogeology assessment cannot be considered reasonable. In particular, there is need for further justification of the assessed local and minor effects of windfarm decommissioning on the catchments hydrological regime.

Chapter 12 Air and Climate

The air quality assessment confirms to the most appropriate guidance for the assessment of this type of project. The conclusions of the chapter are reasonable and the impacts on local air quality reported as not significant are accepted. The mitigation measures included in the chapter in relation to the control of construction activities are in line with best practice.

In terms of the assessed balance of carbon emissions for the lifetime of the windfarm (and beyond) the rEIAR uses the Scottish Government Carbon Calculator for windfarm developments on peat, but only provides total net carbon values for each entire module within the calculator. The absence of individual values fed into each question within the Carbon Calculator makes it impossible to judge the validity of the overall values presented. A full set of input values should have been provided, together with an explanation of each value used. These input values and their justification could have been provided within an Appendix.

Chapter 13 Material Assets

The term 'material assets' has a broad scope, which may include assets of human or natural origin, valued for socio-economic or heritage reasons. Chapter 13 sets out the justification for material assets not considered in detail but it is not clear whether any consultation has been undertaken as part of this scoping out process. Although there are omissions in terms of defining the study area and sources of data, the baseline information is appropriate, taking into consideration the extent of cross-referencing in the Chapter.

The Chapter does not provide information to inform the description of effects where this would have been expected. For example, during construction the Chapter states that large areas of forest plantation have been felled to accommodate the wind farm and grid connection but the areas affected are not given until the mitigation section. It should also be noted that throughout the rEIAR different figures are stated with respect to the area of forestry felled.

The assessment methodology broadly follows the criteria set out in the EPA Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017), although it is unclear how the classification of significance set out has been applied. The conclusions however seem on the whole reasonable, although the conclusion that felling of forestry on the wind farm site prior to construction is a neutral effect is questionable. Notwithstanding the above, it is considered unlikely that any remedial works for the existing operation of the wind farm would be required. Confirmation that replacement planting for forestry felled was undertaken should be sought. Consultation with Coillte regarding their felling plans in the future is also recommended. In addition to mitigation measures proposed, during decommissioning the contractor could be required to be obliged to put measures in place to ensure that there are no interruptions to existing utilities and services unless this has been agreed in advance with the relevant service provider.

Chapter 14 Traffic and Transport

Chapter 14 examines the impact of the development with respect to Traffic and Transport. It is not made clear how the study area or method of the Chapter have been derived. No scoping appears to have been undertaken with the competent authority or its consultees. The environmental sensitivity of geographical areas within the study area has not been defined.

Baseline information, namely traffic flows, is not given for several roads within the study area. The EIA Directive requires that a description is given of the current state of the environment. With regards to traffic and transport, the existing environment is a direct function of existing traffic flows and therefore the magnitude of impacts should be calculated from the relative change compared with the quantified baseline.

The Chapter does not set out the method for establishing the existing environmental sensitivity of geographical areas within the study area, nor does it set out a transparent method for establishing the magnitude of impacts. In the absence of either, it is not possible to validate the assessment of the significance of effects.

During decommissioning, mitigation is proposed in the form of moving abnormal loads at night and implementing a Traffic Management Plan. Given that the findings of the significance effects cannot be corroborated, the appropriateness and effectiveness of the proposed mitigation measures cannot be commented upon.

Additional information and evidence is required to understand whether there would be any significant traffic and transport effects resulting from the decommissioning of the project. Given the deficiencies in the assessment, it cannot be considered that the conclusions of the Chapter are reasonable, and it cannot be concluded that any residual effects would be Not Significant.

Chapter 15 Cultural Heritage

The Chapter generally conforms to guidance however there are some areas where the assessment could have been more comprehensive. Although archaeological monitoring of ground works was carried out during the first phase of construction of the wind farm, the report on these works could not be sourced. The authors sought to resolve this through obtaining written confirmation from the archaeologist that conducted the investigations that nothing of archaeological significance was revealed in any area of the site. Overall the desk-based sources consulted are comprehensive and appropriate. The lack of a report detailing monitoring does represent a gap in the record.

The windfarm site is located in an area of upland peat bog. Peat and peat bogs are well known to provide excellent preservation of organic remains and can be a fantastic source of paleo-environmental evidence. The chapter does not acknowledge this potential.

The Chapter focuses on the lack of known cultural heritage assets within the areas of proposed activity. It is silent on the prospect of previously unrecorded assets being impacted by decommissioning activities (in particular the land regrading) and does not consider the possibility of decommissioning activities presenting an opportunity to carry out investigations into the potential for archaeological preservation within the peat deposits.

Some mitigation measures in the form of archaeological monitoring are being proposed. The effectiveness of these measures will depend on their exact scope and nature – assessment and monitoring that acknowledges and accounts for the potential for as yet unrecorded remains to be present, particularly within the peat deposits, will be more effective than assessment and monitoring that focuses solely on known heritage assets. It would also be helpful for the scope of the proposed archaeological assessment and monitoring to be clarified and for that scope to appropriately consider the archaeological potential of the peat.

Chapter 16 Major Accidents and Disasters

The Chapter provides a description of the social, natural hazards, infrastructure and hazardous sites and provides a detailed account of the 2003 peat slide. References is made to investigations undertaken to identify the cause of the land slide. The baseline however lacks a detailed review of the baseline conditions prior to the land slide.

Although the methodology clearly sets out how risks have been evaluated using an Emergency Risk Rating Matrix, no link is made between the risk ratings and 'Significance of Effect' in terms of the EIA Directive.

There is no evidence within the Chapter of any response to stakeholder concerns. This is a major omission given the significant concerns stakeholders have following the peat slide in 2003 where public roads and bridges were inaccessible for long periods of time and watercourses were blocked with peat. Recently the developer has placed a Hazard sign at the entrance to the turbary stating that there is a risk of instability if peat cutting activities are undertaken. This prevents the local residents from obtaining a fuel supply for use

next winter but has also heightened concerns about site stability, despite continued assurances from the developer (and repeated in the rEIAR) that mitigation measures have rendered the site safe.

No evidence is presented to demonstrate that the decommissioning phase would not increase the risk of a further peat slide. The rEIAR simply states that operation phase will continue to reduce the risk due to the drainage improvement and sustained loading of the peat from the constructed infrastructure. However, the rEIAR states that the drainage structures would not be maintained following decommissioning and would likely become obstructed by debris. It is incongruous to state on one hand state that maintenance of a robust drainage system is vital for site stability but that following decommissioning maintenance will stop and permit the drainage system to fail having undertaken no mitigating management to stabilise such a future scenario. There is also no consideration of projected impacts of climate change and the implications this may have for peat stability resulting from periods of drought and/or heavy rainfall.

The likelihood of a peat slide during decommissioning is considered to be very unlikely in the rEIAR. Without sufficient evidence to substantiate this claim, this conclusion is unreasonable. Further evidence is required to demonstrate that following decommissioning the risk of a peat slide will not increase. Either a long term maintenance plan following decommissioning should also be implemented or works to restore the peat to a point where long term maintenance is not required should be considered.

Chapter 17 Interaction of Impacts

Effects and their significance are described sporadically throughout the chapter without consistent use of the impact characteristics and the degree / nature of the effect. The assessments are high level and do not provide sufficient detail to justify conclusions, although it is noted that reference is made to other chapters where further information is provided.

In terms of intra project cumulative impacts, the report states that these are considered in the technical chapters. However, a methodology for identifying other projects with the potential for cumulative effects and a list of these other committed developments is not provided. The assessment methodology would benefit from a description of how individual effects are combined to determine a resulting effect significance. The assessment presents effects identified in the technical chapters with the potential cumulative effects but does not include an assessment to properly consider how these effects may interact to result in a potentially more significant residual effect.

No mitigation measures are proposed. For the most part this is acceptable as the assessment does not report any significant cumulative effects that require mitigation. However the rEIAR identifies minor, negative temporary impacts that rely on the road widening activities being 'properly planned and supervised'. Further details should be provided.

The assessment excludes cumulative tree felling impacts stating that "*only the impact of felling associated with the wind farm project was considered and any other felling carried out in the area during construction and following commissioning is beyond the study scope*". Given that the project involved the felling of some 222ha of forest, this is considered to be a major omission from the assessment.

The South Galway Flood Relief Committee have raised concern that the cumulative effects of forestry felling and operations have not been considered in the rEIAR. An assessment of the cumulative tree felling at the site and in the surrounding area should be undertaken.

18 Summary of Remedial Measures

The chapter provides a useful summary of all the remedial measures identified in the technical chapters setting out their duration, stage of impact and status. The presentation of the measures is comprehensive. Comments on measures proposed are set out in each of the relevant topic chapters of this report.

Conclusions

In terms of scope, the rEIAR satisfies most of the content requirements of the EIA Directive as set out in Articles 3 and 5. The exception is the requirement to estimate quantities and types of waste (Annex IV). The rEIAR only provides a short passage of text setting out that all demolition waste will be removed from site and reused

/ recycled where possible. Considering the scale of the decommissioning activities (i.e., removal of 70 turbines), this is a major omission and renders the rEIAR non-compliant with the EIA Directive.

In accordance with the EIA Directive, a five-week participation window was provided for public consultation. While this meets the minimum requirements of the EIA Directive, there is a question mark over the effectiveness of participation enabled by this opportunity, given the complex nature of the topic and the volume of application documents. The rEIAR states that the public have been engaged throughout the process, but this is contradicted by all of the complaints received by the EC.

The assessment methodology for the rEIAR is clearly set out in the introductory chapters and supplemented by chapter specific methodologies and effect significance criteria. However, inadequacies have been identified in the methodologies for the Population and Human Health; Terrestrial Biodiversity; Landscape and Visual; Traffic and Transport; Soils, Land and Geology; Material Assets and Interaction of Impacts. Inadequacies include invalid survey methods and not applying the stated significance criteria within the assessments. These inadequacies invalidate the conclusions of some assessments, and the appropriateness and effectiveness of the proposed mitigation measures cannot subsequently always be determined.

Aside from the issues with the assessment methodology, the most fundamental inadequacy of the assessment is the handling of the risk of further peat slides following decommissioning. The operational assessment relies heavily on the continued functioning of the drainage system during operation to mitigate the risk. However, the report makes clear that following decommissioning there will be no further action even though the drainage system will become blocked and lead to pooling on the peat thereby increasing the risk of another peat slide.

It is recommended that further information is provided before the consenting authority can make an informed decision on this application. Inadequacies have been identified within the assessments which lead to uncertainty around the validity of the conclusions and the suitability and effectiveness of proposed mitigation. Most importantly, more evidence is required to demonstrate that following decommissioning the site will be returned to a state in which there is not an unacceptable risk of further peat slides with associated adverse effects on hydrology, ecology, and human health.

1 Introduction

1.1 Background

In the context of a global framework contract for carrying out technical assessments with regard to potential infringements of the EU environmental legislation, ARCADIS was commissioned to carry out a technical assessment with the purpose of establishing whether there is a potential infringement of EU law associated with the Derrybrien Wind Farm Project, County Galway, Republic of Ireland.

1.2 Background to Derrybrien Wind Farm

The operational Derrybrien Wind Farm Project is located in the northern part of the Slieve Aughty Mountains in County Galway, approximately 11km south of Loughrea, 13km north east of Gort and 24km west of Portumna.

The Project comprises 70 No. Vestas V52-850 kW wind turbines and substation, a grid connection comprising an overhead line (approximately 7.8km long) and Agannygal Substation connecting the wind farm to the National Grid and all associated developments. The owner and operator of the wind farm is Gort Windfarms Limited, a subsidiary of the Electricity Supply Board (ESB).

Derrybrien Wind Farm was acquired by Gort Windfarms Ltd. from a private developer (Saorgus Energy Ltd.) in 2003. At the time of acquisition, the majority of the project site was in use as commercial forestry with some turf cutting undertaken in non-forested areas located to the north and east of the site. Development consents were in place in the form of a number of planning permissions obtained between 1998 and 2002, permitting the development of a 71 No. turbine wind farm which would be connected to the national grid by means of an overhead line. The planning applications were originally made to Galway County Council and the three planning applications associated with the wind farm were granted on appeal by An Bórd Pleanála.

Although the development consent was for 71 No. turbines, the access track between T15 and T17, which provided access to the proposed Turbine 16, was abandoned as being incapable of stabilising satisfactorily (few details are provided about this decision). With no access to the location of Turbine 16 there was no way it could be constructed, although an un-made track is evident on satellite imagery.

Construction of the wind farm commenced in June 2003 and continued to 2006. In October 2003, during the excavation work for turbine base T68, a peat slide occurred immediately south of the turbine foundation location. The slide which was within the wind farm site boundary to the south of the site caused the disturbance and partial displacement of peat and forest debris mainly onto land between the wind farm site and Flaggy Bridge on the R353. Displaced peat remobilised following a period of heavy rain. During the peat slide, debris passed down a stream valley and into an area of open flatter ground where it lost momentum and was deposited upstream of a minor road bridge (the Black Road Bridge). Some peat was transported further down the Owendalulleagh River with small amounts of peat deposited along the river banks. The estimated volume of peat in the peat slide area, based on the extent of the peat slide area was 450,000m^3 dispersed over a wide area.

The following year (2004), construction of the wind farm resumed. All phases of the project were constructed in parallel. Construction of the Project was completed in 2006. The wind farm has been in continuous operation since 2006 and the operator envisages that it will operate until circa 2040, at which time it will be decommissioned.

In 2008, the Court of Justice of the European Union (CJEU) delivered a judgment against the State concluding that Ireland had failed in its obligations to assess environmental effects in accordance with European Directives prior to granting of the planning permissions for the Derrybrien wind farm.

In 2019, there was a further CJEU judgment against the State for failure to comply with the 2008 judgment.

In order to facilitate compliance by the State with the CJEU judgments, Galway County Council has served a Notice under the Planning and Development Acts directing Gort Windfarms Limited to submit an application for Substitute Consent to An Bord Pleanála. The remedial Environmental Impact

Assessment (EIA) process started on 21 August 2020 when the developer submitted a substitute consent application to An Bord Pleanala. The Application includes environmental assessments which are intended to demonstrate compliance with the EIA Directive (Ref 1) and Habitats Directive (Ref 2), which will assist An Bord Pleanála carrying out a full environmental assessment of the Derrybrien Wind Farm Project throughout the construction, operational and decommissioning stages. These assessments also address all the works that were undertaken in response to the peat slide in 2003.

Concerns have however been raised by local complainants that the process is not adhering to the EIA Directive requirements and that key issues of concern are not being addressed.

1.3 Derrybrien Wind Farm Project Description

The remedial EIA Report (rEIAR) states that the closest settlement to the wind farm is the village of Derrybrien some 2km to the south. The village of Peterswell is approximately 7.5km to the west. The nearest occupied houses are located approximately 2km from the boundary of the site. A derelict house is located some 1.3km from the boundary of the site. It is understood that this has not been occupied since before the peat slide.

The wind farm occupies a relatively small portion of a larger Coillte site. The site is covered by forestry plantation and blanket peat. Coillte manage commercial forestry operations over the broader site. Some turbary activity takes place in the area.

The key elements of the Derrybrien Wind Farm comprise:

- Turbines and associated development - 70 No. Vestas V52-850 kW turbines and associated ancillary development.
- Underground cables – from each turbine, buried at shallow depth, to electrical transformers in Derrybrien Substation where the electricity is transformed to a higher voltage for supply to the national electricity network via the Derrybrien – Agannygal Overhead Line (OHL).
- Anemometer masts – two lattice masts.
- Access roads – Access to the wind farm site was facilitated by the upgrading of an existing Coillte forestry road which connected to the Black Road to the east of the site. There is a network of wind farm access tracks across the site. These comprise sections of pre-existing forestry tracks, and roads specifically developed during the construction of the wind farm.
- Borrow pits - Borrow pits were excavated on the site – with the extracted material used for the construction of access tracks and hard standing areas.
- Peat excavation and storage - To facilitate the development of the wind farm, peat was excavated from locations including the turbine foundations, hardstanding areas and the footprint of the substation.
- On-site storage - Spare turbine parts are stored in a number of modular storage containers located on the wind farm site.
- On-site drainage - Across the site there is a network of drainage channels. These comprise a mixture of pre-existing and constructed channels which facilitate the discharge of surface waters to watercourses.
- Electrical Substations and the grid connection - Underground cables from across the site converge at Derrybrien Substation where the electricity is transformed from 20kV to 110kV. The electricity is exported via an overhead line extending from the wind farm to Agannygal Substation from where it is exported to the national grid via a pre-existing overhead line.
- Tree felling – Commercial forestry was felled to facilitate the construction of the wind farm. Operational requirements of the wind farm necessitate the licensed felling of trees. Approximately 220 Ha of forestry were felled to facilitate the construction of the wind farm.
- Operational requirements necessitated the licensed felling of an additional c.47 Ha of forestry between 2016 and 2018
- Improvements on the local road network – sections of local roads and carriageways (include bridges on the Black Road) were upgraded.

- Engineering works associated with the historic peat slide - The peat slide that occurred during construction caused the disturbance and partial displacement of peat and forest debris onto land south of the wind farm site. Displaced peat remobilised following a period of heavy rain. Following the peat slide, emergency measures were implemented. Stabilisation and containment works were installed both inside and outside the wind farm site and other works were carried out to prevent further propagation of the peat slide and to prevent further release of debris into watercourses downstream (installation of earthen and boulder barrages to minimise effects on receiving watercourses, roads and lands). Some of these features were temporary and some – including barrages and repositories, remain today. Further works associated with the peat slide were undertaken in 2004- 2005 which comprised the creation of offsite peat repository areas for the storage of displaced peat. The location of works associated with the peat slide are mainly located within the townland of Derrybrien North. The affected lands are principally owned by Coillte with some private landowners also affected.

2 Description of the Case

In July 2008, the Court of Justice of the European Union (CJEU) delivered a judgment against the Irish State in Commission v Ireland (C-215/06, EU:C:2008:380) referencing Derrybrien Wind Farm (Ref 3).

In its judgment of 3 July 2008, the Court held that, by failing to adopt all measures necessary to ensure that:

- projects which are within the scope of Directive 85/337 (Ref 4), either before or after amendment by Directive 97/11 (Ref 5) are, before they are executed in whole or in part, first, considered with regard to the need for an environmental impact assessment and, secondly, where those projects are likely to have significant effects on the environment by virtue of their nature, size or location, that they are made subject to an assessment with regard to their effects in accordance with Articles 5 to 10 of Directive 85/337, and
- the development consents given for, and the execution of, wind farm developments and associated works at Derrybrien, County Galway (Ireland), were preceded by an assessment with regard to their environmental effects, in accordance with Articles 5 to 10 of that directive,

Ireland failed to fulfil its obligations under Articles 2, 4 and 5 to 10 of Directive 85/337.

The scope of works referenced in that Judgement comprised the wind farm and ancillary aspects of the project including inter alia road construction, felling of forestry, peat extraction, quarrying and electricity transmission.

A further judgment of the Court of Justice of the European Union (CJEU) in Case C-261/18 on 12 November 2019 (Ref 6), found that the Irish State had failed to take measures necessary to comply with Case C-215/06 and to fulfil a number of obligations arising from the EIA Directive (at the time Directive 85/337 as amended by Directive 97/11). The judgement issued under Case C-261/18 requires the State to take measures to comply with the earlier judgement i.e., to take steps to ensure that projects are subject of robust EIA.

The CJEU judgements have determined that the permission(s) which enabled the development of this Project were in breach of law, invalid or otherwise defective because though the EIA report (the EIS) complied with Irish legislation at that time, it was inadequate because the Irish State had failed to fulfil a number of obligations arising from the EIA Directive.

As a result of the November 2019 judgement, Galway County Council initiated the Substitute Consent process under the Planning and Development Act, 2000 (as amended) (referred hereafter as the PDA) (Ref 7).

Section 177B (1) of Part XA of the PDA requires that where a planning permission for a project requiring an EIA has been found defective in a material respect by a court of competent jurisdiction in the State or the European Court of Justice, the planning authority must give notice in writing to the developer or other appropriate person directing that an application for substitute consent be made to An Bórd Pleanála (the Board) no later than 12 weeks from the date of the notice and that the application for substitute consent is to be accompanied by a rEIAR or remedial Natura Impact Statement (rNIS) or both as the case may be.

On 9 June 2020, the Planning Authority - Galway County Council, issued a notice to Gort Windfarms Ltd. pursuant to Section 177B of the PDA. That Notice stated that:

- the Planning Authority has become aware in relation to development within the Council's administrative area for which several permissions were granted by the Council and / or An Bord Pleanála and for which an EIA was required;
- a final judgement of the Court of Justice of the European Union in the case of Commission of the European Communities -v- Ireland (case C-215/06) had been made on the 3 July 2008 and that permissions listed, 'or certain of same', were in breach of law, invalid and/or otherwise defective for the reasons set out in the said Judgement and in particular were in

breach of the provisions of European Directive 85/337/EEC (and as amended by European Directive 97/11) by reason of the omission from the application for permission of an Environmental Impact Statement in respect of those parts of the development for which permission was granted without an Environmental Impact Statement having been submitted;

- Gort Windfarms Limited was the person who carried out the development and/or the owner and occupier of the land on which the development is situated.

The Notice directed Gort Windfarms Limited to apply to The Board for substitute consent, within the meaning assigned by the PDA, as amended, in respect of 'the Development', no later than 12 weeks from the date of the Notice. It further directed Gort Windfarms Limited to furnish with that application, a rEIAR) and - if required, a rNIS.

The Notice, per Schedule 1, described 'the Development' as 'the development of a windfarm, including ancillary development which includes service roadways, control house, transformer compounds and anemometer mast at Derrybrien West, Derrybrien East, Derrybrien North, Toormacnevin, Bohaboy, Caheranearl and Boleyneendorrish, in the County of Galway'.

The Notice issued was confirmed by Galway County Council on 23 July 2020.

The Commission was informed that the remedial EIA process had commenced on 21 August 2020 when the developer submitted a substitute consent application to An Bord Pleanala. The application comprised a number of documents including a rEIAR and rNIS. A provisional date of 4 January 2021 for the determination was targeted. Concerns have however been raised by local complainants that the process is not adhering to the EIA Directive requirements and that key issues of concern are not being addressed.

Furthermore, the legal delivery vehicle for this remedial EIA in Irish law, the substitute consent process, has been called into question by the Irish Supreme Court in a recent judgment of 1 July 2020 in An Taisce v. An Bord Pleanala (Ref 8).

New legislation has now been adopted in Ireland to respond to the concerns raised by the Supreme Court. The Commission has been informed by the Irish authorities that the developer will not need to resubmit the application, but the original decision deadline of 4 January 2021 will now be extended.

2.1 Background to the Technical Assessment

This report comprises an analysis of the documentation and process supporting the rEIAR of Derrybrien Wind Farm and ancillary works. The documentation reviewed includes the rEIAR, rNIS and information provided by third parties commenting on this process (which are publicly available) as well as documentation from complainants submitted to DG Environment (see Appendix B for a full list of the complaints and documents reviewed).

The objective has been to identify whether the remedial EIA process being undertaken is thorough, complete and in line with EU law. This report therefore comprises technical assessment of the information submitted and also assess the documentation provided as the basis for the remedial EIA process, as well as the process itself inter alia, in terms of public participation.

The overall objective has been to assess if the EIA remedial process has fairly assessed the key impacts over time and addressed appropriately the need for remediation and compensation measures.

Account has been taken not only of the situation as it was when the Project was originally consented, but also the impacts of the Project whilst being built, the impacts during its lifetime as well as the impacts when the Project is decommissioned.

The focus of this report is on the main impacts of concern related to this Project from its construction, operation to decommissioning. Due to the historic peat slide that occurred, peat stability has been a key focus of this assessment. Given the location of the wind farm on high ground with peat soils, the interaction between this development and the surrounding land uses, in particular, with regard to water runoff and possible downstream pollution and flooding has also been considered as a key issue. Assessment of likely impacts of the development on protected habitats and species are also an important area of focus in the review.

The reasonableness of the conclusions reached by the developer's rEIAR (and accompanying documentation) and the final decision maker, have been assessed, in particular with regard to the need for possible remediation works.

This report considers if all possible remediation options have been assessed, including where necessary the removal of one or more parts of the development. This assessment also considers whether any additional information may need to be provided in the process e.g. on the request of the decision maker within the overall EIA process. The assessment is then measured against the final decision of An Bord Pleanala.

The structure of this report is as follows:

Section 2	Description of the Case
Section 3	Methodology for the Technical Assessment
Section 4	Compliance with European Union Environmental Legislation
Section 5	Remedial Environmental Impact Assessment Report Review
Section 6	Conclusions
Section 7	List of Sources Consulted

3 Methodology for the Technical Assessment

3.1 Team of Experts

The team consists of a set of experts, covering the different environmental disciplines of an EIA. The core team includes technical experts in relation to peat/ soil stability, hydrology and flood risk and protected habitats and species. The core team consists of:

- [redacted]: senior EIA expert (Arcadis)
- [redacted]: senior biodiversity expert (Arcadis)
- [redacted]: senior peatland expert (sub-consultant)
- [redacted]: senior hydrologist and flood risk expert (Arcadis)

3.2 Methodology and Approach

The following information from the dossier was provided by the Commission:

- Derrybrien Wind Farm Project rEIAR
- Derrybrien Wind Farm Project rNIS
- Documentation in relation to complaints and concerns raised by stakeholders in response to the rEIAR (See Appendix B for a list of complaints)

The review has comprised technical review of the documentation by experts. In conducting the review, every effort has been made to remain independent, objective and systematic.

The available information has been assessed from a mainly technical point of view. The documents provided by the EC were analysed taking into consideration the requirements of the relevant EU legislation and the ECJ judgements. However, it should be stressed that this assessment is mainly of technical nature and does not provide for an exhaustive legal assessment taking into account all relevant EU legislation and judgements of the ECJ.

A detailed chapter-by-chapter review of the rEIAR and information provided as stated above has been undertaken. The review has included:

- Assessment of compliance of ES with relevant legislation and best practice;
- Consideration of the adequacy of baseline information
- Consideration of the appropriateness of the assessment methodology and significance criteria, and whether these has been applied correctly;
- Consideration if stakeholder concerns have been addressed;
- Effect of Decommissioning
- Consideration of the likely effectiveness of the proposed mitigation measures;
- Recommendations for any further mitigation measures that could be necessary; and
- Identifying if additional information or evidence should be requested from the applicant.
- Reasonableness of Conclusions and Need for Possible Remedial Works

Each technical assessment considers whether the national competent authorities, when issuing the decisions authorizing the project had ensured the proper application of the EIA and HRA Directives.

The review has followed the Guidance on EIA: EIS Review, EC / Environmental Resources Management (Ref 9). Although this guidance was designed primarily for use by competent authorities in assessing the adequacy of an ES, the EC Review Checklist is a systematic method for reviewing the adequacy of the ES in terms of compliance with the requirements of the Directive and accepted good practice in EIA. The completed EC Review Checklist is included in Appendix A.

4 Compliance with European Union and Irish Environmental Legislation and Process

4.1 EIA Directive

The current EIA Directive is Directive 2011/92/EU as amended by Directive 2014/52/EU. The rEIAR correctly references this version of the EIA Directive. The following Articles of the EIA Directive are considered to be of relevance to this technical assessment. These requirements have been incorporated into the ES Review Checklist contained in Appendix 1 of this report, which has been used to aid this technical assessment.

Article 2 of the EIA Directive requires Member States to adopt 'all measures necessary to ensure that, before development consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects on the environment. These projects are defined in Article 4'.

Article 3 of the Directive provides that:

1. 'The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:
   a. population and human health;
   b. biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
   c. land, soil, water, air and climate;
   d. material assets, cultural heritage and the landscape;
   e. the interaction between the factors referred to in points (a) to (d).
2. The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned.'

These factors are included in the rEIAR (as shown in Table 5-1 below). The adequacy of the assessments are considered further in Sections 5.2 – 5.19 of this report.

Article 5 (1) states that 'Where an environmental impact assessment is required, the developer shall prepare and submit an environmental impact assessment report. The information to be provided by the developer shall include at least:

f. a description of the project comprising information on the site, design, size and other relevant features of the project;
g. a description of the likely significant effects of the project on the environment;
h. a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
i. a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;
j. a non-technical summary of the information referred to in points (a) to (d); and
k. any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.

Annex IV provides more detailed requirements for the required content of the rEIAR. These requirements have been considered in assessing compliance of the rEIAR against the EIA Directive.

Table 4-1 Annex IV Information referred to in Article 5(1)

Section	Information for the Impact Assessment Report
1	Description of the project, including in particular: a. a description of the location of the project b. a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases; c. a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used d. an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.
2	A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.
3	A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.
4	A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.
5	A description of the likely significant effects of the project on the environment resulting from, inter alia: a. the construction and existence of the project, including, where relevant, demolition works; b. the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources; c. the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste; d. the risks to human health, cultural heritage or the environment (for example due to accidents or disasters); e. the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; f. the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; g. the technologies and the substances used The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project.

Section	Information for the Impact Assessment Report
6	A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.
7	A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.
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.
9	A non-technical summary of the information provided under points 1 to 8.
10	A reference list detailing the sources used for the descriptions and assessments included in the report.

Consideration is given to whether the requirements of Annex IV are met in Sections 5.2 – 5.19 of this report. This follows the format of the rEIAR. It should however be noted that the rEIAR addresses the disposal and recovery of waste within the description of the project (in accordance with Annex IV Section 1) however the types and quantities of waste are not detailed and there is no attempt to consider the likely significant effects of the project on the environment resulting from the disposal and recovery of waste (in accordance with Annex IV, Section 5).

4.2 Scoping

With regards to EIA Scoping, Article 5 states that 'where an opinion is issued pursuant to paragraph 2, the environmental impact assessment report shall be based on that opinion, and include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. The developer shall, with a view to avoiding duplication of assessments, take into account the available results of other relevant assessments under Union or national legislation, in preparing the environmental impact assessment report'.

No EIA Scoping has been undertaken to inform the rEIAR. This is considered further in Section 5.2 of this report.

4.3 Competent Experts

Article 5(3) of the EIA Directive requires that in order to ensure the completeness and quality of the environmental impact assessment report '*the developer shall ensure that the environmental impact assessment report is prepared by competent experts*'.

Compliance against Article 5(3) is considered in Section 5.2 of this report.

4.4 Public Consultation

Article 6 of the EIA Directive focuses on public consultation, in particular:

1. Member States shall take the measures necessary to ensure that the authorities likely to be concerned by the project by reason of their specific environmental responsibilities or local and regional competences are given an opportunity to express their opinion on the information supplied by the developer and on the request for development consent, taking into account, where appropriate, the cases referred to in Article 8a(3). To that end, Member States shall designate the authorities to be consulted, either in general terms or on a case-by-case basis. The information gathered pursuant to Article 5 shall be forwarded to those authorities. Detailed arrangements for consultation shall be laid down by the Member States.
2. In order to ensure the effective participation of the public concerned in the decision-making procedures, the public shall be informed electronically and by public notices or by other appropriate means, of the following matters early in the environmental decision making procedures referred to in Article 2(2) and, at the latest, as soon as information can reasonably be provided:
   a. the request for development consent;
   b. the fact that the project is subject to an environmental impact assessment procedure and, where relevant, the fact that Article 7 applies;
   c. details of the competent authorities responsible for taking the decision, those from which relevant information can be obtained, those to which comments or questions can be submitted, and details of the time schedule for transmitting comments or questions;
   d. the nature of possible decisions or, where there is one, the draft decision;
   e. an indication of the availability of the information gathered pursuant to Article 5;
   f. an indication of the times and places at which, and the means by which, the relevant information will be made available;
   g. details of the arrangements for public participation made pursuant to paragraph 5 of this Article.
3. Member States shall ensure that, within reasonable time-frames, the following is made available to the public concerned:
   a. any information gathered pursuant to Article 5;
   b. in accordance with national legislation, the main reports and advice issued to the competent authority or authorities at the time when the public concerned is informed in accordance with paragraph 2 of this Article;
   c. in accordance with the provisions of Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information (1), information other than that referred to in paragraph 2 of this Article which is relevant for the decision in accordance with Article 8 of this Directive and which only becomes available after the time the public concerned was informed in accordance with paragraph 2 of this Article.
4. The public concerned shall be given early and effective opportunities to participate in the environmental decision-making procedures referred to in Article 2(2) and shall, for that purpose, be entitled to express comments and opinions when all options are open to the competent authority or authorities before the decision on the request for development consent is taken.
5. The detailed arrangements for informing the public, for example by bill posting within a certain radius or publication in local newspapers, and for consulting the public concerned, for example by written submissions or by way of a public inquiry, shall be determined by the Member States. Member States shall take the necessary measures to ensure that the relevant information is electronically accessible to the public, through at least a central portal or easily accessible points of access, at the appropriate administrative level.
6. Reasonable time-frames for the different phases shall be provided for, allowing sufficient time for:
   a. informing the authorities referred to in paragraph 1 and the public; and

b. the authorities referred to in paragraph 1 and the public concerned to prepare and participate effectively in the environmental decision making, subject to the provisions of this Article.

7. The time-frames for consulting the public concerned on the environmental impact assessment report referred to in Article 5(1) shall not be shorter than 30 days'.

Under Article 8 of the EIA Directive 'the results of consultations and the information gathered pursuant to Articles 5 to 7 shall be duly taken into account in the development consent procedure.'

The Supreme Court Ruling Record 1st July 2020 between An Taisce and An Bord Pleanála considers public participation rights under EU Law and refers to Article 6(4) of the EIA Directive around *'early and effective opportunities to participate in the environmental decision-making procedures referred to in Article 2(2)'*. The ruling record notes the following from the EIA Directive (2011/92/EU) – *'effective public participation in the taking of decisions enables the public to express, and the decision-maker to take account of, opinions and concerns which may be relevant to those decisions, thereby increasing the accountability and transparency of the decision-making process and contributing to public awareness of environmental issues and support for the decisions taken'*. Conclusions from the Supreme Court states that *'given the structure of s. 177, the failure to make provision for public participation at the leave application stage for substitute consent is inconsistent with the public participation rights conferred by and outlined in the EIA Directive.'* In not enabling public engagement at a stage when effective participation can take place, there is reduced potential for the detail within the application to be informed by local information.

A five-week participation window was provided for public consultation on the rEIAR. Whilst there has been an opportunity for public participation to take place, there is a question mark over the effectiveness of participation enabled by this opportunity, given the complex nature of the topic, the volume of application documents and the reasonableness of the timeframe for comments / inputs by members of the public.

Section 1.5.5. of the NTS states "Gort Wind Farms Limited has engaged with the general public in relation to the Derrybrien Wind Farm Project throughout the development and operation of the Project." All of the complaints received by the EC contradict this claim.

A complaint was made by a local resident that although there was a 30-day public consultation period starting on 21 August 2020, the documentation was not accessible until 27 August 2020.

4.5 Planning and Development Act, 2000

The requirements of the EIA Directive are transposed into Irish legislation by means of Part X of the PDA. The rEIAR refers to this legislation in Section 1.1.4. This legislation sets out when the requirement for EIA arises; provides a definition of terms; states the requirements of the EIAR itself; and the process by which assessment process is completed and decisions are made.

As a result of the retrospective element of the assessment, the rEIAR differs from a normal EIAR in that it is required to identify significant environmental impacts which have already occurred together with ongoing impacts as well as future likely impacts as would be required in an EIAR. Specifically, as set out in section 177F(1) of the PDA 2000 (as amended) the rEIAR is required to provide the following:

a. a statement of the significant effects, if any, on the environment, which have occurred or which are occurring or which can reasonably be expected to occur because of the development the subject of the application for substitute consent was carried out;

b. details of—

i. any appropriate remedial measures undertaken or proposed to be undertaken by the applicant for substitute consent to remedy any significant adverse effects on the environment;

ii. the period of time within which any proposed remedial measures shall be carried out by or on behalf of the applicant;

c. such information as may be prescribed under section 177N.'

These requirements of section 177F(1) of the PDA 2000 (as amended) have been considered during this technical assessment.

Section 1.2 of the rEIAR states that the rEIAR has been prepared having regard to the Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, August 2017). These Guidelines have been drafted with a view to facilitating compliance with EIA Directive (2014/52/EU).

5 Remedial Environmental Impact Assessment Report Review

5.1 Background

This technical assessment is set out following the order of the rEIAR which is structured as follows:

- Chapter 1 - provides an introduction to the remedial EIAR, describing the background to requirement for rEIAR, the scope of assessment, method of preparation and identifying those responsible
- Chapter 2 - provides a description of the Derrybrien Wind Farm Project in terms of the site location and the construction, operation and decommissioning of the Project
- Chapters 3-16 - identify and describe the environmental impact of the Project
- Chapter 16 - considers major accidents and disasters
- Chapter 17 - considers the possible interaction of impacts outlined in Chapters 3-15
- Chapter 17 - provides a summary of interaction of impacts
- Chapter 18 - provides a summary of mitigation and remedial measures

It should be noted that because of the retrospective nature of the assessment, the rEIAR differs from a typical EIAR in that it identifies significant environmental impacts which have already occurred together with ongoing impacts, as well as future likely impacts as would be required in an EIAR.

The correlation between Article 3 EIA factors, (requiring the identification, description and assessment in an appropriate manner of the direct and indirect significant effects of a project) and chapter topics is set out in the rEIAR as below (as referenced in the rEIAR).

Table 5-1 Correlation between Article 3 EIA Directive Factors and the rEIAR Chapters

Article 3 EIA Directive Factor	Chapter Title
Population and Human Health	Population and Human health (Ch. 4), Noise (Ch. 5); Shadow Flicker (Ch. 6), Roads and Traffic (Ch 14)
Biodiversity	Biodiversity – Terrestrial Ecology (Ch. 7); Aquatic Ecology and Water Quality (Ch. 8)
Landscape	Landscape and Visual (Ch. 9)
Soil	Soils, Geology and Land (Ch. 10)
Land	Soils, Geology and Land (Ch. 10); Material Assets (Ch. 13);
Water	Aquatic Ecology and Water Quality (Ch. 8); Hydrology & Hydrogeology (Ch. 11)
Air and Climate	Air and Climate (Ch. 12); Noise (Ch. 5); Shadow Flicker (Ch. 6)
Materials Assets	Materials Assets (Ch. 13); Soils, Geology and Land (Ch. 10)
Cultural Heritage	Cultural Heritage (Ch. 15)
Interaction between the Factors	Interaction of Impacts (Ch. 17)
Major Accidents and Disasters	Major Accidents and Disasters (Ch. 16)

5.2 Introduction

Chapter 1: Introduction of the rEIAR gives a comprehensive account of the background to the project, an overview of the CJEU Judgements, the requirement for the rEIAR and the general methodology followed in the assessments.

Article 5(3) of the EIA Directive requires that the rEIAR is prepared by competent experts. Table 1.5 lists the qualifications and number of years' experience of the main authors and contributors to the rEIAR. It is noted that for technical specialists, 'Statements of Authority' are provided in each technical chapter which provide further information on the relevant experience of assessors. The adequacy of this information and consideration of the competency of the technical specialists is included in the following sections. The information provided demonstrates that the rEIAR has been coordinated by competent experts, as required by the EIA Directive.

No details are provided within this Chapter to document the extent to which the scope of the rEIAR has been discussed and agreed with the competent authority. It appears that no EIA Scoping exercise has been undertaken or Scoping Report prepared. The European Commission (EC) Guidance on Scoping (Ref 9) notes that scoping is not mandatory under the EIA Directive, however the guidance states that it is good practice to undertake scoping even if it is not required by legislation (Section 1.4).

Section 1.3 sets out the overarching methodology that has been applied in the rEIAR. This appears comprehensive and clearly sets out the assessment scenarios that have been assessed and the method for determining significance. In particular the significance criteria proposed adequately covers the characteristics of the potential impact set out in Annex III (3) of the EIA Directive (e.g., extent of the impact, magnitude of impact, probability, duration, frequency and reversibility). However it is noted that technical topic chapters haven't necessarily followed the overarching assessment methodology set out in Section 1.3 of the rEIAR or relevant guidance with respect to significance criteria, and the adequacy of the methodology followed (including the method for determining significance) is considered in further detail in Sections 5.5 – 5.18 of this report.

Section 1.9 details the consultations undertaken to inform the rEIAR. It appears that the requirements of Article 6(2) of the EIA Directive have been met in terms of informing the public about the Substitute Consent Application and the EIA Process, however this matter has been considered further in Section 4.4 of this report.

5.3 Project Description

Chapter 2: Project Description of the rEIAR gives a comprehensive description of the project, including (as required by the EIA Directive):

- A description of the location of the project;
- A description of the project comprising information on the site, design, size and other relevant features of the project; and
- A description of the physical characteristics of the whole project, including the construction works undertaken, land use requirements during the construction and operation phases, and a description of the likely decommissioning works.

The written description is supported with a series of Figures which help the reader to visualise the site location and the project. When reviewed against the EC ES Review Criteria no significant omissions were noted with regards to the information provided in the Project Description.

5.4 Alternatives

Chapter 3: Alternatives describes the alternatives to the project that have been considered taking into account the key objectives of the project and how these would be met by alternative options. The EIA Directive requires that an EIA Report provides '*a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects*'.

Given the operational status of the development, the Chapter has considered the following types of alternative:

- Do-nothing;
- Continued operation and later decommissioning;
- Alternative Renewable Energy Projects on site;
- Decommissioning and remediation alternatives for the wind farm site.

The assessment of the first three bullet points includes a comprehensive comparison of the environmental effects in line with the requirements of the EIA Directive. However it is questionable how likely the developer is to develop alternative energy projects on the site and therefore how far these constitute 'reasonable alternatives'. The aim of the alternatives assessment is to help embed environmental considerations into the evolution of the project, it is questioned the extent to which this part of the assessment adds to the quality of the rEIAR, and in particular in aiding the decision making process for the substitute application.

Of more relevance and use to the decision-making process is the consideration of alternative decommissioning and remediation options as these comprise scenarios more likely to take place in the future. In comparison to the alternatives in the first three bullet points the decommissioning and remediation options are given very brief consideration, and the reasons for selecting the chosen option are not dealt with in much detail.

During construction the access track between T15 and T17 was abandoned as being incapable of stabilising satisfactorily and with no access to proposed Turbine 16 the turbine was not built. The removal of one or more parts of the development in areas where the risk of potential peat slide has been identified would be a reasonable alternative which should be considered. Neither changes to the current operational site nor alternatives during decommissioning have been considered. In conclusion, whilst it is considered that the consideration of Alternatives largely meets the requirements of the EIA Directive, its usefulness to decision makers is questionable and full consideration of reasonable alternatives (e.g. changes to the operational site and alternatives during decommissioning) have not be covered sufficiently.

5.5 Population and Human Health

5.5.1 Compliance with Legislation and Best Practice

Chapter 4 Population and Human Health contains reference to the draft Guidelines on the Information to be Contained in EIARs published by the Environmental Protection Agency (Ref 10), stating that this has been used to describe relevant effects and impacts where they occur in relation to the topic. Topics described in the guidance as applicable to Population and Human Health comprise employment, human health and amenity. This is not explicitly stated within the Chapter; although the first two of these topics are assessed, there is some ambiguity around how amenity has been considered. For example, the chapter cross-references with Chapter 13 Material Assets in relation to 'local amenity and tourism attractions' and only makes reference to amenity in relation to shadow flicker (when amenity is made up of several components of which the visual effects (shadow flicker) would be one, but equally noise and air quality impacts would also be relevant considerations).

The chapter makes reference to the 2014 EIA Directive, which introduced the requirement to consider human health within EIA. The chapter also correctly states that there is no specific guidance in relation to human health in the context of the EIA Directive and refers instead to the Commission's Strategic Environmental Assessment (SEA) Directive (Ref 11) in relation to human health (directly quoted from within the 2017 draft Guidelines). The draft Guidelines note that the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, under the environmental factors of air, water, soil and so on. This approach has been taken in the rEIAR.

The draft Guidelines require the consideration of 'interactions', thereby ensuring that effects are cross-referenced between topics. The rEIAR makes appropriate cross-reference to Chapters 5, 6, 8, 11, 12 and 14, which deal with Noise, Shadow Flicker, Aquatic Ecology, Hydrology and Hydrogeology, Air

and Climate and Traffic and Transport. More useful cross-reference could be made to Chapter 13 Material Assets with which there is related content.

5.5.2 Baseline Information

The baseline has been identified using desk-top data sources as appropriate to the topic. No study *area has been defined for the collection of baseline data. Electoral Divisions (EDs) have been used* to present population and employment data and these are illustrated in Figure 4.1. It would appear that baseline data has been collated for those EDs within which elements of the project reside (including the windfarm itself and the overhead line), although this is not directly articulated within the chapter. Equally there is no explanation as to the significance of the buffer zones identified on Figure 4.1 and the role these may play in identifying impacts. Equally, the Community Benefits text within Chapter 4 references a 10km radius from the project, but this is not referred to in the baseline and no data is provided.

Appropriate information sources have been used to identify baseline data (e.g. Central Statistics Office (CSO) Census data and associated reports). Population data provided has been taken from the 1996 Census, as most recent available data to the formal commencement of the baseline period in 1998.

The rEIAR refers to the low population numbers in the vicinity of the Derrybrien wind farm site as demonstrated by the data shown for individual EDs. There is no age profile provided; whilst the draft Guidelines do note that detailed socio-economic analysis is not generally required as part of an EIAR, age profiles of an area do help to provide context and to identify if there are particular vulnerabilities within a population (for example if there is a higher proportion of older or younger people within an area for whom environmental effects may differ).

There is no real description in the baseline as to who the 'windfarm communities' really are, with the exception of Derrybrien itself. This makes it difficult to fully understand the adequacy of the Community Benefits described later in the chapter.

An overview of tourism and employment has been provided in Appendix 4.1. The tourism data is at a very high spatial level, which may be attributed to a lack of detailed local information. However there are broad assumptions made – for example, in the jump from data relating to national visitor numbers to the statement that 'a significant portion of visitors would have been expected to have visited the West Region and this may have benefitted the general area of Gort to some extent'. The chapter refers to 'designated' recreational and amenity activities but does not present a picture of informal recreation activities (such as hillwalking) that may take place within the vicinity of the windfarm site or associated elements of the project such as the overhead line.

There is no understanding presented at baseline stage around farming from a business / viability perspective. Section 4.3.1.3 of the rEIAR (employment and socio-economics) identifies a negative effect relating to access to farmland and farming activities, however it is not clear what baseline this has been assessed against. Turbary within and immediately adjacent to the windfarm has been highlighted only from a cumulative perspective, highlighting positive cumulative economic benefits at the various stages of assessment; this does not appear to be in accordance with current activities onsite as noted earlier.

The human health baseline is presented in detail in Appendix 4.2 and covers appropriate topics such as mortality and self-reported health. However, the chapter references that different causes of mortality occur with age profile and that self-reported health also changes with gender, although there is no analysis as to what this might mean for local populations around the windfarm due to a lack of granularity in the baseline information.

It is not clear whether any consultation has been undertaken with stakeholders in relation to baseline data collection.

5.5.3 Appropriateness of Assessment Methodology and Significance Criteria

The methodology section within Chapter 4 makes general reference to the Draft Guidelines on the Information to be Contained in EIARs, stating that this has been used *'to describe effects and impacts where they occur'*. There is no reference within the chapter as to how significant effects have been

determined. It is assumed that use has been made of the table of significance provided in Chapter 1 (Table 1.2). Effects and their significance appear to have been described sporadically throughout the chapter without consistent use of the impact characteristics and the degree / nature of the effect. For example within Section 4.3.1.5 (Operational Impacts 2006-mid 2020), the chapter refers to locally significant effects (with no analysis / description as to what this might mean), and uses 'moderate', 'medium' and 'medium-term' to describe duration.

In relation to construction impacts, the level of detail provided is not considered to be sufficient or impacts appropriately justified. For example, no impacts are identified on population by use of the single metric 'population number' (i.e. no impacts are identified because there are no changes in population number as a result of the development). This element could have been set out more clearly within the scope for the chapter. Socio-economic effects associated with construction activities are high level in nature; it would normally be expected to quantify indirect effects using appropriate multipliers / methodologies, otherwise the scale of effect is hard to appreciate. In relation to tourism the rEIAR states that 'no impact would have occurred' but this does not appear to fit with the narrative provided in the baseline section which suggests there may have been a reasonable level of tourism activity.

In relation to operational impacts, the Community Benefits section identifies the effect of the Community Benefit Fund to date to be positive, locally significant and of medium term. As noted earlier, there is no baseline against which this judgement can be made.

The assessment tables for human health covers a range of assessment periods (construction, impacts which occurred during the peat slide, operational phase 2006 to end 2020, operational impacts currently occurring, operational impacts likely to occur and decommissioning impacts). The assessments are high level in nature and do not provide sufficient detail to justify conclusions within this chapter, although it is noted that reference is made to other chapters within the rEIAR where further information is provided. Examples include:

- Table 4-13 (construction effects on human health) – no reference to best practice / mitigation for construction activities relating to noise or dust emissions or consideration of potential effects on the construction workforce.
- Table 4-14 (operational impacts 2006 to 2020) – no assessment of the population who may benefit from the air quality impacts described as a result of a reduction in transboundary gas emissions (local area or wider area for example); no assessment of noise effects as they may relate to different groups within the population; no assessment or detail relating to the visual impacts described (which are categorised as moderate) in relation to a specific population.
- In relation to impacts which are occurring (set out in section 4.5.2 rather than in a table), this does not effectively set out the impacts on human health.
- Table 4-15 (operational impacts likely to occur) – no justification for how the moderately significant positive impact on health in relation to air quality has been reached.

5.5.4 Response to Stakeholder Concerns

No reference to stakeholder concerns or inputs from stakeholder concerns have been raised in the chapter.

The chapter refers to impacts on turbary cutting in the vicinity of the windfarm site, including cumulative impacts associated with such activities. The chapter concludes there to be 'an economic benefit to the turbary rights holders in the area' and refers to 'slight but positive economic effects' which are currently occurring. This appears to be in contradiction to recent warning signs posted at the site by Gort Windfarms Ltd stating "Warning! Risk of Peat Instability from Peat Harvesting on site". Further, a peat cutting contractor received documentation stating that that he would be held liable and responsible in the event of any peat slippage, resulting in the contractor refusing to undertake peat cutting with an associated social and economic disbenefit (e.g. the loss of peat used by members of the local community to heat their homes).

5.5.5 Effect of Decommissioning

The effects of decommissioning have been described in relation to population, employment / socio-economics, community benefit and human health. The assessment made within this section is considered to be reasonable, although the level of detail provided to support the assessment is high level.

5.5.6 Effectiveness of Proposed Mitigation Measures

For both population and human health, reference is made to other chapters of the rEIAR which may present mitigation of relevance (for example in relation to noise or air quality) and this is an acceptable approach.

The chapter does not identify any significant negative impacts relating to the population element of the chapter and therefore no remedial mitigation measures are presented. In relation to human health, the remedial mitigation section identifies that although significant negative impacts to the health of the population in the area have not occurred, there remains potential for their occurrence primarily from site instability in the absence of mitigation. Mitigation referred to here relates to measures associated with turbary cutting to ensure that peat instability on site does not arise. The Geology and Soils assessment notes that where updated risk assessment (based on survey and monitoring set out in 5.12.8 above) indicates moderate to high risk of slope failure, particularly in northern and western sectors of the site, those sections of the development should be abandoned, as was done for the area around Turbine 16, with specific remedial measures applied to those areas in order to reduce future loss of stability (i.e. removal of turbines and development of restoration approaches designed to enhance and ensure long-term stability of these areas). These conclusions do not appear to be presented in the assessment tables, which simply state there would be no impact.

5.5.7 Recommendations for Further Mitigation Measures

In line with other relevant chapters within this Technical Assessment of Derrybrien Windfarm and Ancillary Works (for example Noise and Vibration), the potential for additional mitigation has been raised in relation to Receptor 39 (R39) (the closest residential receptor to the site, although currently uninhabited) should it be reinstated as a residence. Human health effects here may result from noise, shadow flicker and changes to amenity. Further information relating to stabilising the site is also of relevance (as noted in sections 5.12.7 and 5.18.7 of this report in relation to Soils, Land and Geology and Major Accidents and Hazards respectively).

5.5.8 Additional Information or Evidence Required

No in-combination effects have been considered as part of the assessment, and this is an area which could be particularly important in relation to amenity effects (comprising effects from noise, air quality, visual impact and traffic and transport).

Impacts of the project on recreational activities and amenity in the vicinity of the project are not considered to be adequately dealt with.

The Major Accidents and Hazards section within this report notes that further evidence is required to demonstrate that following decommissioning, the risk of a peat slide will not increase and states that the conclusion of the rEIAR that a future peat slide is 'unlikely' is not reasonable; there are associated human health impacts associated with a potential future peat slide (refer to Section 5.18 of this report for further information).

5.5.9 Reasonableness of Conclusions and Need for Possible Remedial Works

Conclusions made in relation to population impacts associated with the wind farm highlight the various positive social impacts resulting from employment and community benefits attributed to the project. The chapter also states that the project 'contributes significantly to the displacement of imported fossil fuel cost of economic benefit to the Irish economy and will continue to do so throughout the lifetime of the project' although no real detail / justification is presented in relation to this. No significant adverse impacts on population have been identified and these conclusions are considered reasonable.

The human health section concludes that 'the distance between wind turbines and occupied buildings is always greater than that necessary to meet safety requirements. The turbines in use for Derrybrien Wind Farm have a proven record in terms of safety and reliability. In summary, the operation of the wind farm to date has not and future operation will not result in significant adverse impacts on human health'. This conclusion does not adequately reflect the assessment that has been made of human health effects throughout the chapter nor the potential issue around slope instability and potential for peat slide events highlighted earlier. Equally, it does not reflect wider impacts on human health associated with loss of / restrictions to turbary rights for local residents, which has recently happened at the site.

5.6 Noise and Vibration

5.6.1 Compliance with Legislation and Best Practice

Generally, Chapter 5 is considered as being a suitable assessment of construction, operational and decommissioning noise and vibration, based upon appropriate methodologies and assessment methods. However, we would note that the review extended to Chapter 5 and appropriate figures only, with the assumption made of professional competency and a basis of appropriate assumptions. No validation or review of acoustic modelling or calculations has been undertaken within the scope of this review.

Chapter 5 of the rEIAR discusses the impact of the development with respect to Noise and Vibration. It sets out the guidelines and methodologies which have been followed in the preparation of the assessment, covering aspects including construction, operation and decommissioning.

Section 5.2 outlines the main guidance and legislation used to consider impacts relating to noise which are appropriate for wind power development in Ireland. Generally referencing BS 5228: Pt1 2009 (+A1 2014) (Ref 12), ETSU R97 (Ref 13) and the Institute of Acoustics Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise as the main vehicles for assessment (Ref 14). Further detail of the pertinent guidance is provided in Section 5.4.

The study has been quantified within the document as implementing the appropriate prediction protocols for noise associated with construction/decommissioning and operational aspects of the study, including the proprietary software used for the purposes of the prediction of noise (Predictor Software).

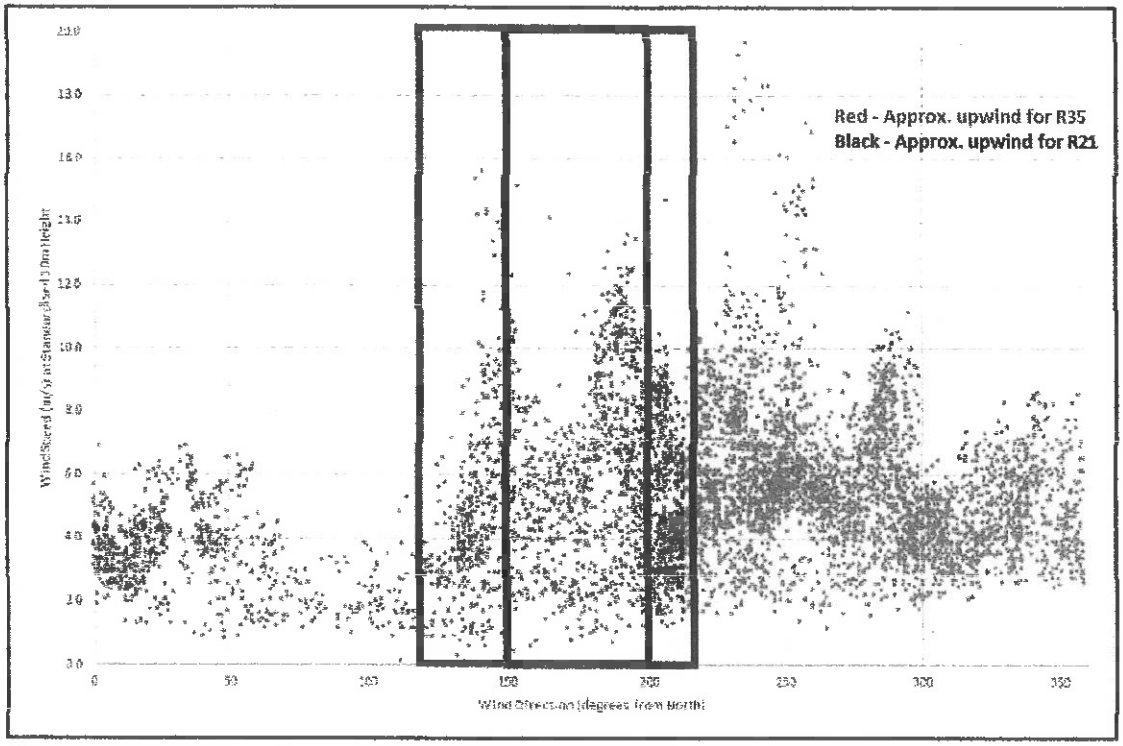
5.6.2 Baseline Information

The baseline information presented within Section 5.5, and approach taken to compiling this seems appropriate.

Within the report it is stated that surveys were undertaken between September and November 2018 at 2 locations, defined in an appropriate manner (relative to the predicted 35dB(A) operational noise contour).

No surveys were undertaken at R39 which is significantly closer to the development than any of the other receptors but as this is an unoccupied property, we accept that equipment security is a key concern that would preclude long term unattended surveys.

The data was then screened for wind direction (to account for upwind conditions to remove existing turbine noise contribution), rainfall and amenity hours such that a vast proportion of the dataset was removed from the baseline analysis. The figure below shows the data included based upon wind direction alone at each receptor, demonstrating the amount of data required to be discounted from the baseline analysis in the first instance.



This data was then further screened for rainfall and amenity hours meaning that the data set for use in the setting of the wind derived baseline was reduced still further.

Reference to Figures 5.8 to 5.11 demonstrate a vastly reduced dataset used to derive the baseline noise climates when wind direction and rainfall is accounted for along with amenity hours. Whilst each windspeed "bin (measured 1m/s wind speed bands)" on said figures does have a number of datapoints in, these are generally widely scattered around the best fit line. Can it be confirmed how many amenity hours datapoints were taken forward into the baseline analysis following the upwind and rainfall screening.

However, it is noted that it is likely that the baseline analysis is as robust as can be reasonably expected taking account of the fact that the site is fully operational and there is no feasible opportunity to shut the site down to undertake an alternative baseline survey without turbine noise.

Further justification for setting 37.5dB as the lower limit from the 35dB to 40dB range presented in guidance is required. Currently insufficient information is deemed to be presented to justify this stance, with the main context for the conclusion being drawn from a document relating to licenced waste management facilities, and not relevant to wind farms in rural settings.

5.6.3 Appropriateness of Assessment Methodology and Significance Criteria

The assessment methodology presented within Section 5.4 seems generally appropriate.

The study of noise references appropriate methodologies including BS 5228: Pt1 2009 (+A1 2014), ETSU R97 and the Institute of Acoustics Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise.

Construction vibration is limited to the consideration of damage criteria from both BS 7385: Pt2: 1993 and BS 5228: Pt2 2009 (+A1 2014). There is no mention of human perception criteria which is typically *much lower than that of damage criteria*.

Reference is made in the Chapter to the 2006 edition of the Wind Energy Development Guidelines (Ref 16). It is noted that a draft has been issued of a 2019 version of the guidance (Ref 17), but the Chapter presents and discusses this, outlining the concerns that have been raised within the acoustic

community to aspects of the document. There is a potential that the requirements of the 2019 version would require changes to the Chapter, however, as a result of the nature of the 2019 version (draft) and the concerns raised by the Institute of Acoustics (IOA) this has not been implemented. There is however discussion of aspects of the 2019 version presented within the document.

Section 5.6 considers significance criteria for construction activities based upon Environmental Protection Agency criteria for the description of effects, but this is not detailed within the Chapter as to the nature of the semantic scale used.

5.6.4 Response to Stakeholder Concerns

There are no stakeholder concerns referenced or detailed within the scope of the noise and vibration Chapter (Chapter 5).

5.6.5 Effect of Decommissioning

The assessment and consideration of decommissioning is sufficiently covered based around the premise that activities would be similar to that of construction, which is fully assessed and considered in Section 5.6 (5.6.1.1 to 5.6.1.3).

Concerns are raised about impacts and effects on R39 as detailed below.

However, it is noted that the consideration of the appropriateness of the study of both construction and decommissioning is based upon the information presented within the Chapter; no review of the detailed calculations informing the study, or the information provided relating to programme and plant compliments associated with the construction/decommissioning have been undertaken. Chapter 5 has been reviewed as presented, with the assumption made of professional competency and a basis of appropriate assumptions.

5.6.6 Effectiveness of Proposed Mitigation Measures

Construction and Decommissioning mitigation is based around the principles of BS 5228: 2009 (+A1: 2014) and the principles of Best Available Technique (BAT). This is standard practice for construction noise, especially as daytime impacts were concluded to be acceptable.

However, it is noted that within Sections 5.6.1.1 to 5.6.1.3 it is stated that predicted construction noise levels comply with appropriately defined significance thresholds for assessment periods where it is *not the case. The document defines activities such as Construction Haulage, Grid Connections/* Overhead Line, and Substation construction works as conforming with daytime, evening (and Weekend) and overnight significance thresholds where it is not the case. Generally, all construction and decommissioning activities comply with daytime BS 5228 Pt1: 2009 (+A1: 2014) limits, but Construction Haulage, Grid Connections/ Overhead Line, and Substation construction works would not comply with evening (weekend) or overnight thresholds in certain cases. This is likely to require additional mitigation especially during Decommissioning relative to weekend working, as construction has already occurred.

There is no specification of how decommissioning activities would be monitored to ensure compliance with appropriate thresholds. This is also the case for construction, but it is noted that construction works have already occurred.

Based upon the results of the operational modelling and assessments of noise as presented in the Chapter no additional mitigation is proposed for operational turbine noise within the site or turbine specifications. As to whether the calculations and data analysis underpinning this are correct it is noted that Chapter 5 has been reviewed as presented, with the assumption made of professional competency and on the basis of appropriate assumptions; no validation of calculations has been undertaken within the scope of this review.

5.6.7 Recommendations for Further Mitigation Measures

Whilst generally it is concluded that the assessment of operational noise is acceptable, subject to the assumption that all modelling and calculations were undertaken appropriately, there are concerns

relating to certain of the conclusions drawn, specifically relating to R39 which is a disused residential dwelling.

The conclusions for all other dwellings considered (totalling 41no.) based upon the information presented within the Chapter are considered acceptable.

During construction it is noted that the author believed the property to be entirely empty for the entire construction period; on this basis and as the construction works are completely finished (and the wind farm operational) there would have been no residents there to perceive any impacts and as such we concur with the conclusions.

With regard to decommissioning, which is yet to occur, there is a potential that additional mitigation may be necessary at R39 should it be reinstated as a residence and occupied. The assessments presented in the Chapter assume that it would be empty which cannot be guaranteed unless the operator owns the property (or has a legal agreement) and can ensure this is the case. Specifically, concern relates to decommissioning haulage, decommissioning of grid connections/ overhead lines, and decommissioning of the substations where the data presents predicted levels which could breach weekend thresholds (decommissioning hours stated as 07:00 to 19:00 Monday to Friday, and 07:00 – 14:00 Saturday). This would need to be specifically considered within any Environmental Management Plans or Codes of Practice necessary for the decommissioning works and would require detailed measures to be presented for control and monitoring of decommissioning activities under the principles of Best Available Technology (BAT), and complaints procedures for that period.

Similar concerns are raised with regard to the operational phase noise assessment for R39, which again is predicated on the basis that the property is empty which can only be guaranteed if the operator owns the property and land or has appropriate legal agreements.

5.6.8 Additional Information or Evidence Required

Based upon the conclusions drawn are generally accepted, with reservations relating to the property represented by R39.

Confirmation is required regarding how many amenity hours datapoints were taken forward into the baseline analysis following the upwind and rainfall screening.

Concerns relate to the fact that this is the only property adversely impacted by the development (construction, operation and decommissioning), with no mitigation proposed on the basis that it is not occupied.

For this control to be acceptable confirmation is necessary that the property is still unoccupied, that it will be unoccupied for the duration of the operational life of the wind farm and during decommissioning. However, we would assume that there are limited opportunities to ensure this unless the property is owned by the operator or the operator has legal agreements with the property owner to ensure it remains empty. In the absence of this there is the potential for adverse effects at this property which are not fully controlled during both operation and decommissioning.

Concern is also raised with regard to the justification for setting 37.5dB as the lower limit from the 35dB to 40dB range presented in guidance. Currently insufficient information is deemed to be presented to justify this stance, with the main context for the conclusion being drawn from a document relating to licenced waste management facilities, and not relevant to wind farms in quiet rural settings (Tables 5.11 to 5.14 show L_{A90} levels between 20 and 30dB). Further justification on this is necessary as should the threshold be set at 35dB the issues at R39 would be further exacerbated during operation at certain wind speeds. Albeit that it is accepted that the reduction in this lower limit to 35dB would only be an issue at R39 and subject to the confirmation of the status of the property may not be an issue.

5.6.9 Reasonableness of Conclusions and Need for Possible Remedial Works

Generally, Chapter 5 is a robust and considered assessment of the wind farm based upon acceptable guidance and methodologies. In general, the conclusions of the Chapter seem reasonable and are accepted.

Key concerns relate to the issues raised relating the status of the property at R39 where adverse impacts are predicted to potentially occur during operation and decommissioning and are not controlled as the property is stated to be unoccupied. Assurances would be needed that this is the case for the lifespan of the wind farm and the decommissioning phase for the conclusions of the Chapter to be acceptable. Should this not be the case, and no assurances can be made that the property would remain unoccupied, then there is a potential for adverse impacts which have not suitably been controlled within the works presented and additional mitigation may be necessary. These adverse impacts also include night-time operational impacts which would be a key concern for any resident.

It is further noted that the consideration of the information presented within Chapter 5 is reviewed on the basis as presented. No independent modelling or predictions have been undertaken within the scope of this review and professional competency has been assumed. Furthermore, within the scope of the review the base information, modelling or spreadsheet calculations informing the Chapter have not been reviewed, considering the results as presented.

5.7 Shadow Flicker

5.7.1 Compliance with Legislation and Best Practice

Chapter 6 defines the scope of the report, by way of detailing a list of recent studies and guidance documents, and standard constraints faced by this type of assessment, as well as technologies/software and approaches used. This is comprehensive, if a little long-winded in places, but adequately sets the scene for the approach to the assessment.

The following methodology section 6.1.3 again discusses relevant guidance documents and studies, and sets out the software (EMD WindPRO v3.3) and process utilised to undertake the assessment calculations. This seems appropriate for the type and scale of the assessment.

There is limited information evident regarding the type and accuracy of the digital terrain model used for the calculation. The report states that it was a 'Terrain elevation model - sourced from Ordnance Survey Ireland.'

5.7.2 Baseline Information

The baseline information presented within section 6.2 (and Appendix A, as well as Tables 6-1 and 6-2), and approach taken to compiling this seems appropriate.

5.7.3 Appropriateness of Assessment Methodology and Significance Criteria

Parameters for assessment, such as the extent of the assessment, and the threshold of significance of effects, are set out in wind energy planning guidance documents by the governments of England, Ireland, Northern Ireland and Scotland. Although these are broadly similar, the details/levels are different between the guidance documents. There are no standard methodologies. However, there are only three industry recognised modelling softwares used, which tends to standardise the modelling and calculation of assessment figures.

Section 6.1.3 (Methodology) of the rEIAR assessment correctly references the most current Irish Government Wind Energy Guidelines (Ref 18)). This document details assessment parameters and control measures but is quite broad in its provisions.

Section 6.1.1 (Chapter Scope) references the Review of Light and Shadow Effects from Wind Turbines in Scotland (LUC 2017) document (Ref 19), in particular quoting that Shadow Flicker may occur beyond a 10-rotor diameter threshold. This represents a worst-case scenario for an extent of assessment. Surprisingly, this document is not listed within the guidance documents used to inform the assessment.

5.7.4 Response to Stakeholder Concerns

There are no stakeholder concerns raised within the assessment, probably due to limited receptors being within range to be affected by shadow flicker effects (significant or otherwise).

5.7.5 Effect of Decommissioning

Not relevant for this assessment / Chapter.

5.7.6 Effectiveness of Proposed Mitigation Measures

Section 6.5.2 details that only one receptor (R01) is considered to be within range to be affected by *shadow flicker effects resulting from the project. This receptor is a currently uninhabited building, but* despite this, the section states that the property would not experience significant effects sufficient for mitigation to be considered.

The section goes onto to outline that if a complaint from a future resident is received, mitigation measures which are outlined, will be utilised.

However, this is slightly different from the approach advocated to mitigation in the Irish Government Wind Energy Guidelines. This states that if a "*shadow flicker prediction model indicates that there is potential for shadow flicker to occur at any particular dwelling or other potentially affected property, then a review of site design involving the possible relocation of one or more turbines to explore the possibility of eliminating the occurrence of potential flicker is required.*"

5.7.7 Recommendations for Further Mitigation Measures

Not relevant for this assessment / Chapter.

5.7.8 Additional Information or Evidence Required

It is recommended that there is a commitment to mitigation measures (as outlined in section 6.5.2) if the property becomes occupied.

5.7.9 *Reasonableness of Conclusions and Need for Possible Remedial Works*

Given the limited nature of effects experienced within the study area, with only one receptor affected (and not to a significant level of effect), the conclusion text seems appropriate.

5.8 Biodiversity (Terrestrial Ecology)

5.8.1 Compliance with Legislation and Best Practice

Chapter 7 of the rEIAR provides a list of the legislation and other statutory policies and guidance relevant to Biodiversity in section 7.2.2 and 7.2.3.

This legislation provided is largely comprehensive, but the following should be included:

- The Flora (Protection) Order 2015 S.I. 356 (Ref 20)
- Project Ireland 2040 National Planning Framework (February 2018) (Ref 21)
- Galway County Heritage and Biodiversity Plan 2017-2022 (Ref 22)
- Relevant policies in Actions for Biodiversity 2011-2016, Ireland's 2nd National Biodiversity Plan produced by the Department of Arts, Heritage and the Gaeltacht in 2011 (now the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs) (Ref 23)

Some guidance could have been added or updated:

- Collins, J. (ed) (2016) Bat Surveys for the Professional Ecologists: Good Practice Guidelines (3rd edn.) by the Bat Conservation Trust (Ref 24) should have been cited in addition to the 2nd edition 2012 guidance.
- Similarly, CIEEM guidelines 2018, were updated as version 1.1 in September 2019 (Ref 25) and should have been cited as such.
- National guidance for planning authorities on Appropriate Assessment of plans and projects in Ireland was published by the Department of Environment, Heritage and Local Government (DEHLG) in 2009. It was updated in 2010 (Ref 26), by replacing the term "Statement for Appropriate Assessment" with "Natura Impact Statement" or "NIS and should have been cited as updated.

- Bird species of medium and high conservation concern listed in the publication Birds of Conservation Concern in Ireland (BoCCI) 2014 – 2019 (Ref 27) not referenced.
- Wray, S., Wells, D., Long, E. & Mitchell-Jones, T. (2010) Valuing bats in ecological impact assessment. In Practice, No 70, Institute of Ecology and Environmental Management would have been helpful for the bat assessment (Ref 28)
- Guidelines for Consideration of Bats in Wind Farm Projects (2014, Eurobats Series 6))Ref 29) would also have been helpful.
- Guidance on Ecological Survey and Assessment in the UK During the COVID-19 Outbreak Version 4 (CIEEM 2021) (Ref 30)

Using some of this guidance would be helpful to structure the assessment.

5.8.2 Baseline Information

Desk study

The decisions in relation to the planning applications and appeals for the wind farm and grid connection were made in the period 1998 – 2001. Therefore, for the purposes of this rEIAR the baseline date is circa 1998 – 2001 as stated in section 7.2.1. Sources used were:

- A desktop review of existing datasets and the original Environmental Impact Statements (EISs) prepared for the Project during the pre-planning stages.
- Aerial photography (historic and recent) was used to assist in determining the type and distribution of habitats within the project area prior to the commencement of the construction phase. The nature and distribution of habitats allowed certain assumptions to be made in relation to fauna species likely to have been present pre-construction.
- Ecological monitoring of the project began in 2003 during construction of the project. The monitoring has at various times included bird, bat, terrestrial habitats and aquatic ecology and fisheries field surveys. The results of these surveys have informed the impact assessment of the operational phase of the development and have also defined the existing receiving environment conditions against which the potential impacts associated with the decommissioning phase can be assessed.
- Section 7.2.4 lists the desk top study data sources which are extensive, missing from this list however is the Hen Harrier Project Annual Report which should have been cited.

Habitats

Section 7.2.6 outlines the Field Survey methodology, while numerous habitat surveys are stated as having been undertaken between 2004 and 2018 following Smith et al. 2011 "Detailed botanical and habitat descriptions were prepared for areas of ecological interest within the project area" it is not clear if this constituted a detailed botanical survey.

Breeding birds

For breeding birds, while targeted hen harrier surveys were undertaken, and methodology presented (Section 7.2.6.2). *"There are issues with the methodology, no regularity of hours, some had 9 hours,* some 7, some 8. There should be a standardised number of hours. Also, wintering harrier surveys were carried out for only 3 months, these should have been Nov-Mar at least. 2 Vantage Points were almost certainly not enough to cover this whole site. Four VPs would be a suggested minimum. Target species of only hen harrier and merlin. It's well known that other raptors are susceptible to collisions (even refenced in this document), so the target species should be broader.

Full breeding and wintering surveys should have been carried out. it was not clear what survey standards the breeding bird surveys were undertaken to. Any open areas should have had Brown and Shepperd carried out for breeding waders.

The wider area around the site, to approximately 5 km from the site boundary, was checked for breeding occupancy based largely on information available from previous surveys. This wider area is known as the hinterland or peripheral area. Surveys here were mainly in the early part of the season (March-May) when territorial birds are most active. However, later visits were made to occupied

territories to assess breeding success." Methods for wintering birds have not been provided. Guidance such as SNH recommended bird survey methods to inform impact assessment of onshore wind farms May 2014 (Ref 31) would have been appropriate.

The total population for the Slieve Aughty Mountains in the first National Hen Harrier Survey in 1998-2000 was 15-23 pairs (Ref 32). Since the start of the monitoring surveys for breeding territories in 2005, up to 14 breeding territories were identified within an approximate 5 km radius of the wind farm, 14 confirmed (Table 7.7) this has declined to a possible 5, (2 confirmed 3 possible) in 2018. There was an almost 50% decline in the wider Slieve Aughty Mountains. This decline hasn't adequately been assessed in subsequent sections.

Bats

A bat activity survey was undertaken on 5 November 2011 (Section 7.2.6.3.1) this is during the hibernation season and is therefore an invalid survey and should be stated as such in the baseline (it was not).

For the 2016 surveys, driven transect surveys were undertaken, the guidance cited is the 2nd edition of BCT guidelines 2012 (Ref 33), and that "Surveys started at sunset, as recommended in BCT (2012) guidance", however, the BCT guidance states a start 15 minutes before sunset. See excerpt Table 7.1 below. It should also be noted that driven transects "can be useful to supplement walked transects and provide additional survey data when surveying for proposed road widening schemes or on large sites" (BCT guidelines section 7.6.3) they should not be used as an alternative to walked transects.

Static surveys were undertaken in 2016 from April to August, and in 2019 from August to October. The SNH guidance stated as being followed requires "the minimum level of pre-application survey required using static detectors is 10 nights in each of: spring (April-May), summer (June-mid-August) and autumn (mid-August-October)". This method wasn't followed.

Table 7.1 Recommended timing for individual activity surveys. See Table 7.2 for automated surveys and for the recommended frequency of individual activity surveys (survey effort)

Survey objective	Dusk survey	Pre-dawn survey (if undertaken)
Bat activity away from roost (e.g. transects; all species)	START: ¼ hour before sunset[1] LENGTH: 2-3 hours[2]	LENGTH: 2 -1½ hours FINISH: sunrise[3]
Mating activity & swarming sites (all species)	START: approximately sunset LENGTH: 4+ hours after sunset	–

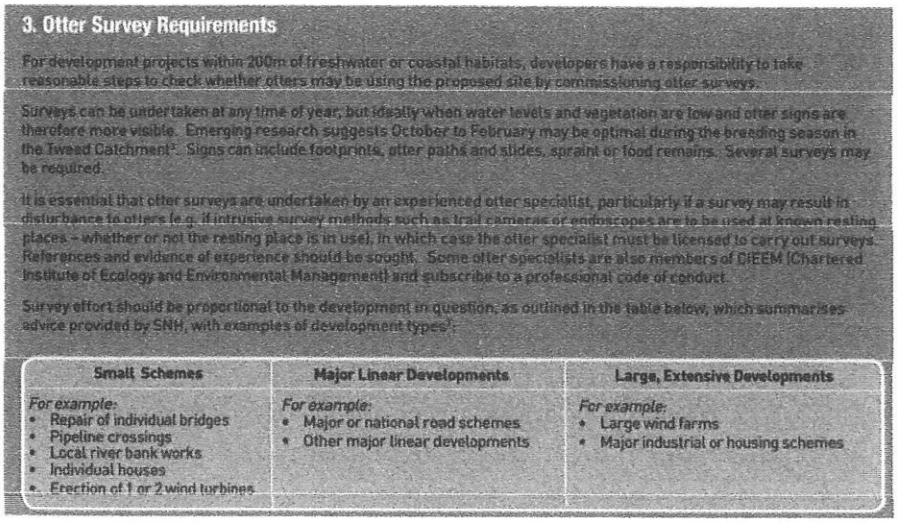
Notes
1 Some bat species emerge earlier; starting ½ an hour before sunset may be more appropriate (Dietz and Yalden 2009).
2 When the site is larger than 1ha, or at sites within 4 km of a greater horseshoe bat roost, 3 hours may be required.
3 Some bat species return to their roost whilst it is light and may require longer survey periods (Dietz and Yalden 2009).

No roost surveys are cited nor reported on. These should have been carried out for the trees that were removed from site.

Otter

No survey guidance for otter is cited in section 7.2.6.4 Mammals (other than bats) other than National Roads Authority (2006b) Guidelines for the Treatment of Otters prior to the Construction of National Roads Schemes. It is not clear whether appropriate baseline surveys were undertaken. The visual assessment undertaken in 2003 did not state whether surveys were undertaken of the bank from within the water course or from the bank. No methods are cited for the dedicated otter survey undertaken in July 2018, other otter results are from incidental observations. From the information presented it appears that that 1 day of otter surveying was undertaken post 2003 which would seem to be an under survey in terms of area, timing of survey and number of surveys. Guidance such as

SNH Technical Advice Note 2 for Otter Surveys (Ref 35) would be appropriate, see section 3 excerpt below.



3. Otter Survey Requirements

For development projects within 200m of freshwater or coastal habitats, developers have a responsibility to take reasonable steps to check whether otters may be using the proposed site by commissioning otter surveys.

Surveys can be undertaken at any time of year, but ideally when water levels and vegetation are low and other signs are therefore more visible. Emerging research suggests October to February may be optimal during the breeding season in the Tweed Catchment[1]. Signs can include footprints, otter paths and slides, spraint or food remains. Several surveys may be required.

It is essential that otter surveys are undertaken by an experienced otter specialist, particularly if a survey may result in disturbance to otters (e.g. if intrusive survey methods such as trail cameras or endoscopes are to be used at known resting places - whether or not the resting place is in use). In which case the otter specialist must be licensed to carry out surveys. References and evidence of experience should be sought. Some otter specialists are also members of CIEEM (Chartered Institute of Ecology and Environmental Management) and subscribe to a professional code of conduct.

Survey effort should be proportional to the development in question, as outlined in the table below, which summarises advice provided by SNH, with examples of development types[2]:

Small Schemes	Major Linear Developments	Large, Extensive Developments
For example: • Repair of individual bridges • Pipeline crossings • Local river bank works • Individual houses • Erection of 1 or 2 wind turbines	*For example:* • Major or national road schemes • Other major linear developments	*For example:* • Large wind farms • Major industrial or housing schemes

Other Mammals

No other mammal surveys were undertaken as the rEIAR states that "Based on an assessment of current habitat suitability for other large mammals within the wind farm site and along the OHL corridor, no other dedicated large mammal surveys were undertaken" yet the National Roads Authority (2006a) Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (Ref 36) was cited in the guidance section. It would have been helpful to cite the distribution records for badger in Ireland or describe the unsuitability of the habitats for scoping out this receptor.

All other fauna were scoped out of the terrestrial section without sufficient evidence.

This is a complex data set which may not accurately reflect the pre-construction baseline therefore precautionary assessment and a clear statement of limitations should be stated. These were not stated within the baseline section.

Baseline Summary

The baseline is under described for amphibians and common lizard, badger, breeding and wintering birds other than Hen Harrier, roosting bats, otter, red squirrel and pine marten. Some of the surveys discussed are below best practice. It is also slightly confusing as to timing of the baseline as it is sometimes inconsistently described.

A table would be helpful with surveys, guidance followed, deviations from guidance clearly stated, and dates of surveys listed. An alternative means of assessment should be presented when survey data are not available. Clear scoping in and out with justification for each receptor should be presented, ideally in a tabular form. Clear limitations and precautionary assessment methods statements should also be listed per receptor. Given that this is a recreation of a baseline in the past, the CIEEM Guidance on Ecological Survey and Assessment in the UK During the COVID-19 Outbreak presents useful alternative methods of survey and data gathering and would be useful in this case.

5.8.3 Appropriateness of Assessment Methodology and Significance Criteria

Onsite

Although the updated September 2019 CIEEM guidance is not referenced, this is not likely to be a material issue. Again, the CIEEM Guidance on Ecological Survey and Assessment in the UK During the COVID-19 Outbreak presents useful alternative methods of assessment and would be useful in this case.

There is no clear scoping assessment and due to the formatting and layout of the document it can be very difficult to follow the assessment.

Zone of Influence

Zone of Influence (ZOI) (section 7.2.5) was stated for:

- Natura sites, 15km;
- Bats, 10km;
- Birds, 10km; and
- Terrestrial habitats site boundary and immediately adjacent

No ZOI was stated for otter, although a single survey was undertaken within the site. No ZOI was stated for red squirrel, pine marten or badger.

Limitations

"Difficulties encountered" are reported in section 7.2.8. This section opens with "in general, no significant difficulties were encountered in carrying out the assessment of the impact of the Project on biodiversity". The section does proceed to discuss the issues with incidental, historical and third-party data sets. However, it proceeds to state that "it is considered that the data available is adequate to describe and assess the baseline terrestrial environment present within the Project area prior to development".

It would be expected that clear limitations would be presented per receptor with deviations from best practice guidance accompanied by detailed additional survey and its correspondence with best practice guidance and/or precautionary assessment procedures where this baseline data could not meet the required quality.

General Structure

The whole document would benefit enormously from tabulated sections detailing the Important Ecological Features, survey limitations and precautionary assessment.

Habitat evaluations within the site:

- Conifer plantation: is valued at local importance, lower value; however, the plantation *appears to have been planted on inappropriate habitats such as bog and heath and* therefore it may be appropriate to evaluate the underlying habitat separately. The future baseline and restoration potential for the habitat should also be considered.
- Cutover bog: degrades and evaluated as being of local importance, higher value; however, as a habitat of potentially high distinctiveness and global rarity the potential future baseline and restoration potential for the habitat could also be considered.
- Upland blanket bog: "The habitat corresponds with the Annex I habitat Active Blanket Bog and is deemed to be of high local importance." Given the global significance of this habitat it would be helpful to have this considered within the wider national and international context.
- Dystrophic lake: "the lake appeared to be in a relatively natural state. Natural dystrophic lakes and ponds are listed on Annex I of the EU Habitats Directive [habitat code 3160] and therefore the habitat is deemed to be of high local importance." This seems reasonable.

Habitats outside the windfarm site affected by the peat:

- Conifer plantation: Local importance low value
- Wet heath: Local importance higher value
- *Wet grassland: Local importance low value*

In general, these habitats seem to be valued at a local level as there is "plenty of this habitat around" however the global context and future restoration potential of the blanket bog and cutover bog has not been considered.

Bats

For bats, while in the assessment text it is acknowledged that for the bat survey results in 2011 "It was noted that the survey was carried out towards the end of the bat active season and that the results were likely to be an under-representation of bat activity at the site." the surveys were undertaken in November so would be completely invalid.

There is no acknowledgement of the potential under recording of brown long eared bats in the 2016 data, these often do not echolocate or echolocate at a volume that can be recorded and so are often underrepresented in survey data.

There were large differences in bat survey results between 2016 and 2019 as the surveys were not replicated temporally/seasonally it is not possible to know what caused these differences. For the most part the value of the site is assessed as being at site or local level, the justification for which is the wide availability of similar habitat in the surrounding area.

- Common and soprano pipistrelle: site value
- Nathusius' pipistrelle "Seven confirmed Nathusius' pipistrelle passes were recorded during the surveys. One pass was recorded at T33 in the middle of the night on 07 September 2019 and six passes 0.0 2.0 4.0 6.0 8.0 10.0 12.0 Bat passes per hour (P/h). The six passes all occurred within a two minute period." It is also acknowledged that Nathusius' is one of the rarest in Ireland however the site is considered to be of negligible value to this Important Ecological Feature (IEF).
- Leisler: site value
- Brown long-eared: site value (masonry bridges site value)
- *Natterer's: local value (masonry bridges site value)*
- Daubenton's: negligible value (masonry bridges site value)
- Whiskered: negligible value (masonry bridges site value)
- Lesser horseshoe: negligible, however this species was not recorded and habitat is suboptimal so could be scoped out.

Bats may have been undervalued. Greater detail as to the justification of the value of the individuals and assemblage would be welcome. A structured assessment methodology would be welcome such as Wray, S., Wells, D., Long, E. & Mitchell-Jones, T. (2010) Valuing bats in ecological impact assessment. *In Practice, No 70, Institute of Ecology and Environmental Management would have* been helpful for the bat assessment.

Birds

Birds are not valued within the assessment section to a geographic level as per the CIEEM guidelines that are cited.

Birds seem to have been assessed to a different mythology rather than CIEEM (i.e. not geographically valued or assessed). There should be clarification on whether the Percival method been used. Percival (2003) (Ref 37) details an assessment methodology to determine the significance of an impact based on the product of the sensitivity of the receptor and the magnitude of the effect. The sensitivity of a species is defined by Percival (2003) as its ecological importance and nature conservation interest at the site being assessed. Species which are of special conservation interest of a European site have the highest sensitivity rating. The significance of any one impact is a product of the sensitivity of the receptor, the magnitude of the impact and the probability of that impact occurring.

While the focus on hen harrier is welcome this seems to be to the reduction or exclusion of other species. Birds should be sectioned out as breeding assemblage, wintering assemblage and then particular species, such as hen harrier. Also, merlin is mentioned a few times, but not everywhere. If they are assessing merlin as a target species it should be assessed all the way through or scoped out. There is no standardisation.

Other Mammals

It is acknowledged that "preconstruction the 344.5 ha wind farm site had 265 ha of conifer plantation of which 222 ha was felled to facilitate construction of the wind farm" and that it would "have had the potential to support a number of mammal species". Incidentally, it should be noted that the areas cited are inconsistent through the rEIAR. Chapter 13 Material Assets for example reports that "the total area of the forestry felled was circa 150 ha, inclusive of roads, firebreaks, forest plantations and some open areas."

There were records of and incidental sightings of (pine martens) red squirrel, pine marten and badger however, no surveys were undertaken for nor have they been valued, they have been scoped out of the assessment. It is acknowledged in section 7.3.7.2 that "The surrounding coniferous plantations offer habitat suitable for breeding and foraging for all three mammal species, however, the habitats within the Project boundary only offer opportunities for foraging for badger and pine marten. Red squirrel is unlikely to occur regularly in the open habitats within the Project boundary." However, this should be a pre-construction baseline therefore these receptors should have been scoped in, evaluated and assessed on a precautionary basis.

Amphibians and Reptiles

Amphibians and lizard are mentioned in the assessment under other fauna section 7.3.8, no surveys are cited, there is an acknowledgement of a likely negative effect on amphibians, and a likely positive effect on common lizard. These species should be appropriately scoped in, evaluated and assessed.

5.8.4 Construction Assessment

Habitats:

The rNIS concluded:

- No significant effects on any European sites. The conservation objectives of Slieve Aughty are to "maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA" which are Hen Harrier and Merlin. However, the site is clearly failing its conservation objectives and neither the rNIS nor the rEIAR adequately assess the potential for operational disturbance alone or in combination. See the subsequent section on birds for detail. Mitigation should be proposed to restore the SPA to favourable conservation status
- *Other designated sites no effect*
- Conifer plantation minor permanent not significant which would seem sensible given the underlying habitat
- Habitat alteration from commercial forestry to open habitat is considered to be a positive long-term impact of moderate magnitude which is agreed
- Area around the artificial lake, the habitat alteration in this area is deemed a neutral permanent impact that, based on the low value of the original habitats, has led to no significant effect.
- *Cut over bog: However, these localised drainage effects are considered to have had a* minor negative long-term impact (no significant effect) on the cutover bog, given the subsequent peat slide and mid-term drainage effects this would seem to be under assessed. Also no consideration given to the potential future baseline should restoration be undertaken
- Habitat loss under hardstanding does not seem to have been assessed although Table 7.18 does present the habitat loss totalling 15.54ha.

Table 7.18: Summary of direct habitat loss in footprint of development.

Construction activity	Habitat(s) affected	Area Affected (ha) (Approximate)
Site access tracks	Felled conifer plantation (WS5) Cutover bog (PB4)	8.3
Turbine base and hardstanding areas	Felled conifer plantation (WS5) Cutover bog (PB4)	4.9
Derrybrien Substation	Felled conifer plantation (WS5)	0.4
Construction Compound	Access track (BL3) Conifer plantation (WD4)	0.29
Met masts	Felled conifer plantation (WS5) Cutover bog (PB4)	0.05
Agannygal Substation	Felled conifer plantation (WS5)	1.6

Birds

- Habitat loss regarding the removal of the conifer plantation is considered a positive impact of long-term duration resulting in a significant positive effect. However, the impact on some species in the short term for the negative (tree breeding species for example) isn't assessed.
- It's confusing as to what is the actual assessment. Loss of habitats is a good example (7-102 down). There are 5 separate assessments within this section. Tabulation would greatly help this section.
- Habitat loss of pre thicket rotation coniferous forest - while the loss of up to 11 ha of future pre-thicket second rotation forest is considered a negative impact, the effect on hen harrier is rated of slight significance and of medium-term duration (i.e. potentially available to harriers for up to 10 years before canopy closes).
- Habitat loss of cutover bog - overall, the loss of approximately 0.7 ha of cutover bog as a habitat for birds is considered a long-term negative impact however not resulting in a significant effect.
- Overall, the removal of the conifer plantation from along the OHL corridor and without replanting is considered a positive long-term impact as the conifer habitat is alien to the landscape and of low value for birds. This is considered to have been a significant positive effect for local bird populations. This loss has not been systematically assessed. The effect on nesting birds has not been assessed.
- Loss of nests considered not significant with the exception of snipe nests as a moderate negative impact considered to be a significant effect as the national population is in long term decline. Snipe are not however further mentioned in terms of residual effect or mitigation.
- Disturbance to hen harrier and snipe are specifically mentioned, such an effect is considered as significant but of temporary duration no mitigation is presented.
- The total population for the Slieve Aughty Mountains in the first National Hen Harrier Survey in 1998-2000 was 15-23 pairs (Ref 32). Since the start of the monitoring surveys for breeding territories in 2005, up to 14 breeding territories were identified within an approximate 5 km radius of the wind farm (Table 7.7). This declined to a possible 5 (2 confirmed, 3 possible) in 2018. There was an almost 50% decline in the wider Slieve Aughty Mountains. There are results from the 2020 monitoring[1] that show 6 pairs. This is a progressive decline from the 24-27 pairs in 2005, 15-23 pairs in 2010 and 8-14 pairs in 2015. This is a 75% decline if the lower range of 24 is used for 2005. Details for Merlin are not provided.

[1] http://www.henharrierproject.ie/HHP_HH_Monitoring_2020.pdf

- Reasons for potential decline have included windfarm developments including services lines and disturbance as well as undergrazing, maturation of conifer forest, egg predation and persecution. As no impact was assessed for the construction of the windfarm it would be inferred that this decline is due to operational effects? However, this is not progressed in that section to be discussed therefore there is no mitigation for this effect.
- *The rNIS is quite confusing in its layout. It is 288 pages long (137 pages up to references)* with a lot of wordy repetition so tabulation would help clarify the assessment. Access and recreation are noted as an impact pathway that causes harm. The SPA is failing its conservation objectives. Construction disturbance is acknowledged as likely to have occurred as a temporary impact and habitat loss is noted but again deemed insignificant. Disturbance caused by maintenance is deemed insignificant and disturbance caused by ease of access is not assessed as part of the operational phase. An adverse effect on breeding within 1km of the turbines is also deemed not significant. However, the decline of the population is worsening, and this assessment does not have the evidence to prove that *this project alone or in combination is not affecting the integrity of the site.* Additional mitigation should be provided with continued monitoring.

Bats

- There is no assessment of roosting resource loss within felled conifer plantations
- Lesser horseshoe bat, whiskered bat, and Daubenton's bat potential impacts are considered to be negligible not significant
- Brown long- eared temporary negative at site level, long term positive site level, overall not significant
- Natterers temporary negative at site level, long term positive site level, overall not significant
- Nathusius negligible not significant
- Common and soprano pipistrelle temporary negative at site level, long term positive site level, overall not significant
- Leisler's temporary negative at site level, long term positive site level, overall not significant
- These assessments cannot be justified given the lack of baseline information and valuation for these receptors.

Otter

- Overall, construction of the wind farm is considered to have had at most a slight, negative and short-term impact on any individuals which may have been using the site, and not believed to have had any significant effect on the local otter population in the area. However, this assessment cannot be justified given the lack of baseline information and valuation for otter.

Other mammals

- Pine marten slight negative and long term with no significant effect
- Red squirrel slight negative and long term with no significant effect
- Badger slight negative and long term with no significant effect

However, this assessment cannot be justified given the lack of baseline information and valuation for these species.

Offsite Peat Slide

Habitats

These seem under assessed, all impacts are not significant whether because of low value (such as conifer plantation) and/or because the habitats are widespread. While this is likely to be the case for the conifer plantation it would seem to be an under assessment for wet grassland.

Birds

Section 7.4.2.2.2 as the peat slide took place in October it is agreed that there is no nesting mortality and as a mobile species likely to have no mortality. However, the positive impact and no significant effect in the long term from habitat loss and significant positive effect of long-term duration considered due to habitat regeneration does not include and assessment of tree nesting birds or ground nesting birds due to the smothering of wet grassland.

Bats

Section 7.4.2.2.3 additional loss of 25 ha coniferous woodland is predicted to have no effect however conifer roosting potential is only considered for Natterers (permanent negative significant effect at the site level) this should be considered for all tree roosting species. This should also be applied to the original felling of confer plantation to facilitate the construction of the scheme. Henry Andrews Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals, 2018 (Ref 38) suggests that conifers that have roosting bat value. Also see Garry Mortimer Foraging, roosting and survival of Natterers bat in a commercial coniferous plantation (2016) (Ref 39).

Peat entered the upper reaches of the Owendalulleegh River and flowing along its length to Lough Cutra (approximately 22 km downstream). At the time of the event a visible plume was observed at the confluence of the Owendalulleegh River with Lough Cutra SAC. No impact on bats. However, the potential impact on foraging is not assessed.

Damage to three bridges considered to have potential for roosting for Daubentons and Brown long-eared, common and soprano pipistrelles. No effects were predicted on other bats.

There was no assessment of direct mortality from tree or bridge roosting loss.

It would be helpful to have some structure for assessment, for example "Valuing Bats in Ecological Impact Assessment Stephanie Wray CEnv FIEEM, David Wells CEnv MIEEM, Emma Long MIEEM and Tony Mitchell Jones MIEEM".

Otter

Section 7.4.2.2.4 predicted no effect of direct mortality as they are mobile, this assessment wasn't under any heading just in the introductory text. Reduction in food from fish kills assessed as being temporary to short-term and constituted a minor to moderate negative impact at the local population scale not likely to have had a significant effect. However, the fish kills from the peat slide were acknowledge so it is not sure how this assessment has been made.

Other mammals

In the same section pine marten and red squirrel are considered sufficiently mobile for there to be no direct mortality, slide occurred in October so impacts on young not considered likely, badger considered to have had the potential to be affected and setts lost but not considered to be there in high numbers (no badger surveys were carried out). The peat slide is therefore considered to have had a long-term negative impact, with no significant effect resulting on local mammal populations.

Assessment Summary

Greater detail is required as to the justification of the value of the individuals with clearly stated data limitations and precautionary assessment. Structured guidance on evaluation for all receptors should be clearly stated along with an evaluation statement for each receptor. For example, if determining that a receptor is common and widespread national data should be evidenced, assessment at a global scale should also be employed for receptors that are globally scared/rare.

Explanation as to the different assessment process applied for birds (have presumed Percival 2003 but this should be confirmed). Tabulation of impacts and impact pathways scoped in and out, assessed receptors with clear scoping in or out with justification would be helpful. Clearfelling of woodland to facilitate the development should be systematically assessed for all receptors. Habitat loss due to the development does not seem to have been assessed. Also, there should be a clear indication of assessment limitations and where precautionary assessments have been made.

5.8.5 Operation Assessment

Habitats

Occasional cutting back of re-growth of trees within the felled forestry areas prevents canopy closure occurring. As a result, the dominant heath / bog vegetation continues to occupy these areas. This is considered a minor positive impact of long-term duration as the habitat is of higher biodiversity value than a closed canopy conifer plantation that would otherwise have established in the area (significant positive effect). Conifer habitat adjacent felled to improve performance of wind farm but within the conifer felling cycle neutral impact and no significant effect.

No indirect effects are predicted from drainage. However, there is no assessment of vehicle movement, potential pollution via deposition, the effects that increasing the ease of access via access routes may cause such as degradation and disturbance due to recreation, increased hunting and or turbary.

Birds

- Birds section 7.4.2.3.2 reports that at the Derrybrien Wind Farm, there have been no documented collisions during the various surveys since 2006, though it is noted that carcass search was not part of the routine monitoring. However, in the absence of mitigation, the risk of collision with the overhead line is considered a potential negative impact which could be of significance. It is stated that "it can be demonstrated that hen harriers are at low risk of collision with wind turbines as a result of their typically low flight height" but it is not explicit in this section that there is no predicted impact from collision.
- Studies have shown hen harriers to still spend time foraging around the windfarm, it is considered that displacement of hen harriers from areas near turbines at Derrybrien has not been a significant impact and has not had a significant effect on the hen harrier population of the Slieve Aughty Mountains SPA. However, the large decline of Hen Harrier within this area was not mentioned in this section.
- Nesting – it is stated that there is no evidence to suggest that the wind farm has had any impacts on the reproductive output of the two regular hen harrier territories within a 1-2 km distance band.1 to 2km confirmed, none in 0 to 1km. Again, no mention of the decline in breeding pairs in this section and there is no assessment of potential disturbance for Hen Harrier or any other birds.
- Site not considered relevant to migrant birds.
- The replacement of non-native conifer plantation with an open sward is having a positive impact of long-term duration for birds including hen harrier, resulting in a significant positive effect for Hen Harrier.
- It considers that the maintenance of open habitats on site during the operation phase of the wind farm is likely to have had significant positive effect on breeding and summer bird species. Overall, it is considered that the removal of the trees is a positive impact of long-term duration for birds such as hen harrier which naturally forage over open habitats such as bog, heath and low scrub. However, only Hen Harrier and Merlin are considered other surveys have not been undertaken for operational monitoring, golden plover and red grouse are mentioned incidentally, along with "of particular importance is the frequency of meadow pipit, a Redlisted species, as well as skylark, mistle thrush, stonechat and linnet (all Amber-listed species)" a significant positive effect of the maintenance of open habitats is predicted on breeding birds, however, breeding and wintering birds should have been surveyed for and have been systematically assessed.

Bats

- Bats section 7.4.2.3.3 very low numbers of bat mortality quoted see table 7.20 below. However, the number of *Pipistrellus pipistrellus* killed annually in Britain in 2015 between mid-July and mid-October was estimated at 2,373 95% CI 513 to 4,233 and the number of P. pygmaeus at 3,082 95% CI 1,270 to 4,894. When compared to population estimates, the number of *Pipistrellus pygmaeus* killed was 57% higher than the number of *P.*

pipistrellus killed (0.19% of the population versus 0.43%, respectively). This may be due to *Pipistrellus pygmaeus* flying more often within the rotor sweep area compared to *P. pipistrellus* (Ref 41). Also, The National Bats & Wind Turbines Project (Ref 42) found casualty rates at wind farms in the UK to be variable, ranging from 0.00 to 5.25 bats per turbine per standard month, and from 0 to 77 bats per site per standard month. One soprano pipistrelle corpse was found during mortality surveys, confirming that bat mortality has occurred during the operation phase of the Derrybrien Wind Farm. However, "Searches were conducted on two consecutive mornings at 6 turbine locations (T11, T17, T18, T21, T27, and T71) on 31 August and 1 September 2016 to give an indication of bat mortality. During the survey the dogs were followed by the handler, who provided constant instruction. The dogs can effectively survey to 5 m either side of them when walking a transect." This would seem to be an under representation of monitoring compared to recommendations in Guidelines for Consideration of Bats in Wind Farm Projects.

Table 7.20: Summary of bat fatalities (high risk species) at wind turbines in the UK and Europe (total including UK figure).

Bat species	UK	Europe
Nathusius' pipstrelle	1	1564
Common pipistrelle	46	2362
Soprano pipistrelle	52	439
Leisler's bat	0	711

- For Nathusius', given the indicative size of the population in Ireland, a precautionary assessment is that the effect of mortality is likely to have a long term negative significant effect at the county level. However, the site was previously considered to be of negligible value to this IEF. These two statements do not seem congruous.
- The assessment concludes that it is likely that a long-term negative impact on common and soprano pipistrelle bats has occurred at site level between March 2006 and Mid 2020 and will continue.
- Also that Leisler's bat populations are likely to have a long term negative significant effect at the local level.

Otter

- Otter 7.4.2.3.4 suggested trout biomass would be restored from peat slide with no operational effect.

Other Mammals

- Offsite phased tree felling and replanting (approximately 46.2 ha in total) was undertaken immediately to the west of the wind farm site in 2016, 2017 and 2018 to optimise productivity of the wind farm. As previously these are considered to have had a short-term negative impact which would not have resulted in a significant effect on the local mammal population. However, these effects do not seem to have be systematically evidenced.

Long Term up to 2040

- Habitat maintenance no significant effect
- Birds no significant effect
- Bats same as previous
- Mammals including otter no significant effect

Summary

Operational effects are under assessed on habitats. Birds have been under assessed in general, and there is no assessment of the potential impacts from the potential increase in ease of access to the

site. The number of bat mortalities may be undervalued. The effect of the felling to increase the wind farm's efficiency does not seem to have been fully assessed.

Cumulative effects

Section 7.5.1 is titles cumulative impacts which have occurred but proceeds to consider everything *not significant.*

- Habitats - none however it acknowledges that turbary activities have increased it has not been assessed or discounted that the access tracks for the wind farm could have increased access to the area. It is recommended that this is further assessed.
- Birds - "While turf cutting by hand at the Derrybrien site has not resulted in a significant loss of habitat or a high level of disturbance, the recent mechanised cutting is of some significance in respect of both loss of foraging habitat and potential disturbance to foraging birds. It is concluded that mechanised peat cutting at Derrybrien, which is unrelated to the wind farm project, is contributing to an in-combination impact within the Slieve Aughty Mountains SPA." It goes on to say through that "However, it can be concluded that the operation of the Derrybrien Wind Farm project is not contributing to a negative in-combination effect when considered with turbary and peat extraction activities within the SPA." Increased ease of access has not been assessed.
- The Sonnagh Old Wind Farm is the only other wind farm within the Slieve Aughty Mountains SPA. This wind farm is located approximately 3.4 km to the northwest of Derrybrien. It is concluded that this has no cumulative effect, however, monitoring has not been requested at Sonnagh so this would seem not be a conclusion based on evidence. *Again, no mention of the large decline in Hen Harrier populations has been mentioned.*
- It is acknowledged that there is potential for OHL to have resulted in a cumulative impact in the absence of mitigation of moderate significance for Hen Harrier, other birds are not considered.
- Bats no effects from turbary, collision, or coniferous habitat loss, the damage and repair to three bridges is considered to be a permanent negative significant effect at the site level for common pipistrelle, soprano pipistrelle, Natterer's bats and Daubenton's bats but no cumulative effects predicted.
- Mammals slight temporary and localised negative impacts predicted, there is no impact predicted for otter despite the acknowledged fish kills and significant los of biomass for a number of years.

There is a further section titled Cumulative impacts which are likely to occur (section 7.5.2).

- Habitats - acknowledgement of turbary potentially causing destabilisation and that mitigation is in the Soils, Geology and Land section. The Chapter then goes on to say that "Turbary activities are removed from and do not impact on the intact areas of upland blanket bog within the wind farm site (highest quality peatland habitats) and therefore there *are no cumulative impacts on this habitat predicted.*"
- For birds it refers back to the previously discussed section saying the previous cumulative effects would persist but the previous sections assessed no cumulative effects, with the exception of moderate significant effect for Heh Harrier. This should be stated.
- Bats no cumulative effects on Lesser horseshoe bat, whiskered bat, Daubenton's, natterers and Brown long-eared.
- For common and soprano pipistrelle, Long term negative effects significant at the site level

A more structure cumulative effects section would be helpful with impacts and impact pathways clearly scoped *in and out. Also a more evidenced based assessment is required.*

5.8.6 Response to Stakeholder Concerns

There is no section on consultee responses in the Chapter. From the information provided the following comments were noted, the comments of Mr Collins were more extensive but these are the key concerns.

Consultee	Contact	Date	Comment
Duchas Heritage Service	Patrick White	1998	Insufficient information for the impacts due to peat impacts on Lough Cutra SPA CSAC Coole-Garryland Complex Effect on freshwater pearl mussel should be checked. More information on Hen Harriers More information on breeding versus migratory birds
Duchas Heritage Service	Joanna Modzcklewska	2001	Hen Harrier and Merlin identified but no breeding birds surveys caried out. Hen Harrier of particular importance re Slieve Aughties. Requested a complete survey for breeding birds using Hen Harrier Survey methods.
Member of the public	Martin Collins	2020	The fact that the 2015 National Survey of Hen Harrier in Ireland by the National Parks and Wildlife Service the population in the Slieve Aughties has shown a dramatic loss of almost 50% since 2005. Even more alarming is the fact that recently the Hen Harrier Project Annual Report Year 3; May 2019 – April 2020 stated that: "The Slieve Aughty Mountains straddles the Galway and Clare border and is the 2nd largest SPA in the network. This SPA supported 27 territorial pairs of breeding Hen Harrier in 2005, however since then the population has undergone catastrophic decline. There were just six confirmed territories recorded during surveys in 2019 and one possible territorial pair, which marks a 75% drop in numbers over the last 15 years. Four of the six confirmed pairs were successful in fledging a total of seven young. In spite of the continued decline in the number of breeding pairs the number of young birds fledged shows an increase over previous years."
Member of the public	*Martin Collins*	*2020*	The fact remain that No planning permission and No *EIA were produced for deforestation of 263 ha in* direct contravention of Irish and EU law.

5.8.7 Effect of Decommissioning

- Habitats temporary minor but no significant effect
- Bats minor negative effect due to localised disturbance, this doesn't seem in proportion to the previous assessments of no significant effect on bats due to much larger areas of habitat removal and disturbance due to the construction and peat slide.
- Otter, while intermittent localised disturbance may impact a small number of foraging male otters in the winter-spring period while foraging for frogs, this is expected to have at most a slight, negative and short-term impact with no significant effects.

- Other mammals activities on site are likely to cause localised disturbance to mammals such as pine marten and badger which may use the site for foraging purposes. This is expected to have at most a slight, negative and short-term impact with no significant effect.

5.8.8 Effectiveness of Proposed Mitigation Measures

There is little mitigation or monitoring proposed.

- Terrestrial habitats, none proposed following emergency peat slide mitigation, in the original ES avoidance of the most sensitive habitat and floating roads were used to avoid impacts, monitoring is not mentioned.
- For birds monitoring of Hen Harrier will continue at 3 year intervals and flight diverters will be erected on the OHL but no other bird monitoring is proposed. Pre decommissioning surveys for Hen harrier prior to works, other are birds not mentioned. More Vantage Points *(a minimum of 4) would be recommended to cover this area.*
- Bats 2 bat boxes erected to each of the three damaged bridges, there is no mention of potential loss of tree roosts. A curtailment scheme will be implemented to stop turbines when temperatures are above 11 degrees and wind speed is below 5m/s between dusk and dawn each night. Carcass searches will be undertaken for 3 years in spring, summer and autumn. No other bat monitoring is proposed. A suite of statics throughout the year to monitor how the operation of the windfarm affects bats would be helpful. It would also be helpful to monitor the success of additional roosting provision.
- No monitoring for mammals, pre decommissioning surveys for otter should be undertaken.

5.8.9 Recommendations for Further Mitigation Measures

An overarching management and monitoring plan should be written, detailing the receptors, surveys, years of survey and management required over the years up to decommissioning, this should include but not be limited to.

- Consideration of the impact of greater access has had on turbary and other potential impacts such as hunting, recreation etc.
- There is no management or monitoring plan for habitats, it is recommended that habitats are managed to reach maximum positive condition and to plan for decommissioning to avoid degradation of the best habitats.
- There is no monitoring proposed for birds other than Hen Harrier, for which additional VPs should be added. Merlin are under reported. Breeding and wintering bird surveys should also be undertaken.
- The SPA is clearly failing in its conservation objectives, further interventions of positive management for Hen Harrier and Merlin should be produced to link in with the overall habitat management plan suggested above.
- There is no monitoring proposed for amphibians or common lizard, it is recommended that *some monitoring is undertaken to inform decommissioning.*
- Bat monitoring using a suite of static detectors should be undertaken throughout the season to monitor the effect of the windfarm on bat foraging.
- Pre decommissioning otter surveys should be undertaken across the site and with appropriate buffers on the study area.
- Additional mitigation or compensation should be provided or considered for the following:
- Compensation for loss of habitat for red squirrel, pine marten, badger and nesting birds should be considered.
- *No mitigation has been proposed for bats for the loss of coniferous forest as a roost and/or* foraging resource, compensation should be provided. Two bat boxes for the potential loss of bridge roosting habitat do not seem sufficient. A minimum of three bat boxes should be erected either within each bridge or on suitable trees nearby.

5.8.10 Additional Information or Evidence Required

The rEIAR is incredibly difficult to follow and the difficulty in reading and interpreting the assessment may give greater doubt as to its veracity. It would benefit from greater structure use of tables and clarity of the assessment process. Greater evidence is required for all receptors. Additional survey data should be captured for breeding and wintering birds and foraging bats. Limitations from best practice should be clearly stated per receptor. Alternative methods of assessment should be cited to address limitations where historic data is not available.

There are instances where results, impacts and mitigation are mixed. Tabulated surveys and survey effort, a clear preconstruction baseline, a list of impact pathways and receptors scoped in and out, evaluation and impact assessment tables would be helpful.

Clear scoping of receptors and impacts/impact pathways should be stated.

Habitat loss does not seem to have been assessed. Some receptors seem to have been undervalued and impacts also undervalued. Assessment of the increased access the new road system may have on disturbance and degradation due to recreational impacts, increased hunting, increased turbary and potential pollution via atmospheric deposition have not been assessed.

Other birds other than Hen Harrier are under assessed.

The effects of clearfelling large areas of conifer have not adequately been assessed on roosting bats, red squirrel, badger, pine marten or nesting birds.

Cumulative effects assessment has not been clearly evidenced.

There is no section on consultee responses, there should be a summary table detailing how concerns have been addressed.

Additional mitigation and monitoring should be proposed as set out in section 5.8.9 recommendations for further mitigation measures.

5.8.11 Reasonableness of Conclusions and Need for Possible Remedial Works

The rEIAR is incredibly difficult to follow and the difficulty in reading and interpreting the assessment may give greater doubt as to its veracity. More evidence is required to justify the conclusions. Additional information should be gathered and an assessment undertaken that is clearly structure as set out in section 5.8.10. Additional mitigation and monitoring should be provided as presented in section 5.8.9.

5.9 Aquatic Ecology and Fisheries

5.9.1 Compliance with Legislation and Best Practice

There is an extensive list of desk study data provided within section 8.1.3.2 however there is no listing of relevant legislation or policy. While some legislation is incorporated throughout the report a dedicated section would be helpful.

An assessment under the Water Framework Directive has not been undertaken nor one under the Eels Regulations.

EPA guidelines (2017) are cited and followed, however it should also have included impact assessment guidance such as CIEEM guidelines 2019 (Ref 25). The NRA (2003) guidelines cited are not an appropriate assessment method.

Other guidelines are peppered throughout the document it would be useful to have these listed in the method section.

There is no scoping process which makes the document difficult to follow. There is limited liaison with the with the competent authority.

5.9.2 Baseline Information

The baseline includes river catchments, geology and soils, sub catchments and landuse, biological quality, water chemistry and Fisheries. Freshwater pearl mussel are mentioned within the baseline within section 8.2.1 River Catchments. "The Graney River has a historic record of the freshwater pearl mussel (*Margaritifera margaritifera*) from the 1920's. However, that record was from the lower reaches of the river i.e. downstream of both Lough Graney and Lough Atorick and there have been no records since." This species should have been presented as an individual receptor.

The information is presented in a very academic way. Tabulation of each receptor baseline and valuation would help the reader navigate the large blocks of text.

There is impact assessment within the baseline for example within section 8.2.4 Biological Water Quality "The data selected begins in 1996 several years before commencement of the wind farm construction and continues until 2019. It also includes the data for 2003, which was surveyed within one month of the peat slide. Throughout this period of 23 years, all of the main channel sites have returned High Status results of Q4-5 or Q5. The only exception was in 2003 when sampling was undertaken exactly one month after the peat slide at the wind farm and where the previously High Status dropped to Bad (Q2) at the site closest the slide (5 km d/s) i.e. EPA O5, improving gradually in a downstream direction through Moderate Status (Q3-4) at EPA O4 to Good Status (Q4) at sites EPA O3 to O1, as the amount of peat silt in the channel diminished in a downstream direction (Clabby et al., 2004). In the next round of sampling in 2006 there was no evidence of an impact from the 2003 peat slide, at four out of five of the survey sites (EPA O2 to O5) which were all High Status. The exception was EPA O1 at Killafeen Bridge which is the farthest site downstream from the wind farm where Good Status (Q4) was recorded. These data indicate that the impact of the 2003 peat slide on biological water quality on the main channel of the Owendalulleegh River was short-term, with pre-slide conditions resuming within 3 years (at most) and remaining essentially the same since."

This is useful information but should be in the impact assessment section of the document. These results of the water status should be tabulated in the desk study or results sections.

A separate survey methodology section separate from the baseline results would also help navigate the section.

It is worth noting the recorded absence by '*rEIAS, Section 8.2.6.3*' of fish species within the small tributaries feeding directly from the windfarm. Grieve & Gilvear (2008) (Ref 43) noted elevated levels of Dissolved Organic Carbon and markedly elevated levels of suspended sediment in streams associated with windfarm development on blanket bog. Meanwhile Waldron et al. (2009) (Ref 44) demonstrate increased aquatic loads from a windfarm constructed on partially-afforested blanket bog, which they suggest "*...may reflect continued disturbance propagating downstream with time...*" They go on to observe: "*The consequence of changing nutrient stoichiometry of receiving waters on riverine carbon efflux is an aspect that does not appear in environmental impact statements to be given consideration.*"

Under Section 8.1.4 Difficulties Encountered it is noted that "the main difficulty encountered was the lack of baseline macroinvertebrate, fisheries or water chemistry data for any of the many small streams which drain the Project area. In addition, except for triennial EPA data on Q-values at several sites on the main channel of the Owendalulleegh, Boleyneendorrish and Duniry Rivers, which have proven crucial in the current assessment, there was also a lack of baseline data for these main channels into which the minor streams draining the wind farm and much of the OHL corridor flow. There is a similar paucity of baseline fisheries, ecological and water chemistry data for Lough Cutra, into which the Owendalulleegh flows as its main inlet river, in the years immediately prior to, during and immediately after the peat slide. Moreover, there were very limited follow-up fisheries, water chemistry or macroinvertebrate surveys carried out in the years immediately following the commissioning of the wind farm, especially given the occurrence of a very large peat slide during the construction. This has made it difficult to assess the speed of recovery of the ecological status and fish populations in some watercourses impacted by the 2003 peat slide. During the original EISs for phase 1, 2, and 3 of the wind farm, water quality assessments of the nine small subcatchment streams draining the wind farm footprint were not carried out. Despite these constraints it is considered that the data available,

including the data collected during field surveys as part of the current study, is adequate to address this assessment."

Given the absence of any meaningful EIA of the freshwater systems prior to the start of construction, and given the admission in '*rEIAS, Section 8.1.4*' that only limited data sources were identified by the current assessment for conditions preceding the peat slide of 2003, it is difficult to justify the concluding statement of '*rEIAS, Section 8.1.4*': "Despite these constraints, it is considered that the data available, including the data collected during field surveys as part of the current study, is adequate to address this assessment."

Moreover, raising questions about the extent to which pre-peat slide information was sought, the Reference list for Chapter 8 does not, for example, include key papers about the brook lamprey *Lampetra planeri* (an Annex II species under the Habitats Directive) in Ireland by Kurz & Costello (1999) (Ref 45), Byrne et al. (2001) (Ref 46) or by Kelly & King (2001) (Ref 47), the latter reference, and the importance of brook lamprey *L. planeri* within the Owendalulleegh catchment and Lough Cutra, being highlighted by Lindsay & Bragg (2005) (Ref 48).

Brook lamprey *L. planeri* are non-migratory and thus would be slower to recolonise a damaged river system than the other two lamprey species, or highly migratory species such as the eel. Had the EIAs undertaken between 1998 and 2001 been of adequate quality they would have included an assessment of the fish populations in the river systems fed by streams arising within the orbit of the development. As it is, the absence of such pre-development data makes it difficult to judge the significance of lamprey data in the Owendalulleegh obtained between 2009 and 2019. The low number of lamprey recorded, however, particularly when contrasted with species such as eel and trout, could be cause for concern and merits a cautionary assessment. An explanation for low lamprey numbers, given in '*rEIAS, Section 8.2.7*', does not match well with the description of habitat preferences for the two stages of the brook lamprey life cycle given by Kurz & Costello (1999) - which is not referred to in '*rEIAS, Chapter 8*'.

5.9.3 Appropriateness of Assessment Methodology and Significance Criteria

The valuation of receptors is based on NRA guidelines from 2003, these were designed for roads and seem to refer largely to fisheries not to nature conservation status. These do not seem like an appropriate evaluation criterion, instead one should use impact assessment guidance such as CIEEM guidelines 2019 (Ref 25).

Section 8.2.7 on Ecological and Freshwater Value is very difficult to follow. The use of the NRA 2003 guidelines seems that the water bodies are assessed but not the faunal or floral species they support. However it seems to be a blend.

For example, the following is difficult to unpick

- "there is a healthy population of brown trout in the Owendalulleegh and the Boleyneendorrish main channels and some of their tributaries with excellent salmonid habitats and in this regard, they can be classed as C: High value locally important/County importance."
- Then for lamprey and eels "It is worth noting that both these species are more cryptic than trout so that their numbers in the three electrofishing surveys are probably slight underestimates at some sites because highly coloured water, deeper sites and, in the case of eel especially, very coarse substrate make them more difficult to capture. For these 2 species the Owendalulleegh can be classified as category D, Moderate value, locally important/Local importance (higher value)".

This would lead one to think the assessment was for individual fish receptors however the section goes on to say

- "The habitats are generally ideal for salmonid fish with riffle, glide and pool sequences in many parts of the system. This fact, coupled with the consistent High Status Q-ratings of the water quality as reported by the EPA along the main channel for in excess of 20 years, means that overall these habitats can be classed as of category C (High Value Locally Important/County Value). However, given that the number of High Status river water bodies

in Ireland has fallen by nearly a third (91 water bodies) since the baseline assessment in 2007-2009 (EPA, 2019) this highlights the importance of the main channels of both the Boleyneendorrish and the Owendalulleegh in a regional and national context. This assessment is further supported by the knowledge that the highest quality biological sites (Q5) show no sign of recovery nationally, having fallen from 13.4% of sites in 1987-1990 to only 0.7% of sites in (2016-2018). Indeed, the number of Q5 sites currently stands at 20 in the whole country (EPA, 2019). Of these, in 2018, 2 were present on the main channel of the Owendalulleegh and 1 on the main channel of the Boleyneendorrish, raising the ecological value of these channels to level B on the table namely to National/Regional importance."

So is the conclusion that the Boleyneendorrish and the Owendalulleegh are of National/Regional importance, if so which one? National or Regional? This is followed by:

- "Most of the larger tributaries draining the Derrybrien Wind Farm e.g. B2, B3 and B4, O5A O6A, O9A and D1 can be considered of High Value Local Importance (Category D) having *mainly Good or High Status water quality and good brown trout habitat. Smaller upper* tributaries including B1A, B4B, B4C, D1A, O1-O5, OHL 1 and OHL2 are of Moderate or Low ecological value by virtue of their generally smaller size, limited fisheries habitats or occasionally less than Good water quality falling somewhere between category D and E." This does not however cover all of the water courses sampled of which there are 19 in total. This would be better tabulated for clarity.

Then Lough Cutra and Lough Atorick are assessed as

- "Lough Cutra is classed as of international importance as a Special Area of Conservation (SAC) and Special Protection Area (SPA) but not for water based conservation objectives. Its status as a regionally important pike fishery, its eel population, combined with its size and generally Good Ecological status would suggest that it is of at least category C status i.e. High value, locally important/County importance.
- Lough Atorick which hasn't any WFD ecological status as yet assigned to it can be described as category D (Moderate value, locally important), as it is likely to hold a stock of small trout and have at least Good Ecological Status."

It would be appropriate to assess the faunal receptors fish and fresh water pearl mussel separately. There should be a section on the nature conservation status of each receptor and an appropriate evaluation of each one.

Suspended Solids – Impacts on Macroinvertebrates & Water Quality assessed "as being of moderate, negative but temporary to short-term impact on the water quality of the small streams draining from the wind farm" but this is not evidenced by Table 8.24 Predicted impacts which presents a decline in quality attributed by Q values on 14 out of the 26 values cited up to 2006, this does not evidence a return to previous water quality. Table 8.10 presents Q values from 2011 to 2019, these sample sites do not all appear analogous but show a continued decline for many sample sites.

Suspended Solids – Impacts on Fish "To conclude therefore, the impact which washout of mineral and organic solids from the wind farm construction had on fish in the receiving water courses (as opposed to invertebrates) is believed to have been at worst, slight, negative and temporary to short-term in duration." This is not evidenced.

Projected Changes in Water Quality due to the Construction Phase, this section suggests that the "The analysis has also taken into account the fact that the 2003 peat slide probably completely wiped out the macroinvertebrate communities all down through SC7(b) subcatchment (Site O4 and O5) and its downstream continuation, SC7(d) (Sites O6 and O6A), which would have completely masked any impact of clearfelling on the site or on the OHL corridor, as well as any wash-out of solids associated with on-site construction activities, all of which would have been expected to have been slight or moderate negative and temporary to short-term in duration."

"In conclusion, the impact on macroinvertebrates in the streams and rivers as listed in Table 8.24, outside of the SC7(b) and SC7(d) subcatchment (dealt with in Section 8.3.2.2), can be described as (i) no impact: O1, O2, B5 and D1, (ii) very slight negative and temporary: B1A, B2, D1A, OHL1 and

OHL 2, (iii) slight, negative, temporary to short-term: B4, O3, O8A, O9A, O9A1, O9A2, O9B, (iv) moderate, negative, temporary to short-term: O3A, B2A, B4B, B4C. Overall, the impacts of the construction phase of the wind farm site on fish can be categorised as a neutral to slightly negative, and temporary to short term in duration." From the information presented in Table 8.24 this isn't possible to evidence. Evidence from wind farm applications in the wider area would be helpful to support this assessment.

Under the OHL and Agannygal substation and associated works no significant impacts are predicted although Q values in Tables 8.10 and 8.24 show decreasing Q values.

Peat Slide

The assessment states that "In terms of Ecological Status and water quality these impacts indicate that the entire channel of subcatchment SC7(b) and SC7(d) were probably wiped out and that the first 1 km downstream from the confluence of SC7(d) with the main channel of the Owendalulleegh as far as EPA O5 was similarly impacted with a drop from High Status (Q4-5) down to Bad Status Q2 (Table 8.8) This can be described as a profound negative impact, of short-term duration. Over the following 5.7km downstream to EPA O4, the water quality dropped from High Status (Q5) to Moderate Status (Q3-4) which can be described as a very significant negative, short-term impact. In the next 7.2km downstream from EPA O4, to EPA O1 (1.5km upstream of Lough Cutra), the Q-rating fell from High Status (Q5 and Q4-5) to Good Status (Q4), which can be described as a significant to moderate negative impact, of short-term duration. As the EPA valued sites do not relate directly to the sites surveyed it is difficult to confirm this assessment particularly when comparisons between tables 8.24 and 8.10 show a long term decline in Q values for some sites that do not recover by 2019.

With regards to fish "There are no records of the fish density in the river prior to the peat slide and no systematic follow-up surveys were undertaken in the years immediately following the event, so that it isn't possible to know with any degree of accuracy the numbers of fish lost due to the peat slide nor the rate of recovery in the very early years after the event." The assessment then predicts very significant negative effects in the short term or medium term. The potential for habitat loss is discussed in terms of spawning capacity but is then dismissed as due to the naturally patchy nature of the suitable spawning habitat as therefore being a slight negative in the short to medium term. Given the lack of data and the numerous extrapolations and professional judgement taken on the assessment it would be useful to have a precautionary assessment with confidence in the assessment stated.

The section is very difficult to follow and would benefit from greater structure and a clear narrative per receptor.

Operation

"In April and May 2014 many parts of the floating road system on the wind farm needed to be repaired and upgraded due to wear and tear. These remedial works were assessed in detail in 2013 as part of an Appropriate Assessment screening process for the works and included recommendations for silt control mitigation on any of the drains likely to receive silt run-off from sections of the track ear-marked for repair. While no targeted follow-up assessments were undertaken after these works, the assessment at the time concluded that the silt control measures would have been sufficient, given the nature of the works and the gently sloping terrain, to prevent any downstream impacts on the ecology of the receiving waters caused by solids runoff." However, it is noted that a fall in Q values at sites O4 and O5 could have been attributed to maintenance activities but that "If this was the source of the impact it can be described as slight to moderate, negative and short-term on invertebrates, and slight, negative and short-term on fish in affected tributaries."

On site drain cleaning "could generate suspended solids which could have a negative impact on fish spawning in the streams draining the site if silt were to accumulate in spawning beds during the spawning or hatching periods in winter and spring. Depending on the extent of such an effect the impact could range from slight to moderate, negative, temporary, in affected tributaries".

Tree growth cut back "These actions could potentially generate increased nutrients and suspended solids. However, their limited extent and dispersed nature strongly suggest that any impacts in

receiving waters will either be negligible or slight, negative and temporary and in most if not all cases unlikely to result in a change of ecological status in the receiving waters downstream."

Turbulence felling in SC9 is therefore thought to have given rise at worst to a slight, negative, temporary impact on macroinvertebrates. However, there were subsequent declines in Q values are thought possibly to be connected with clearfelling rather than the turbulence felling. Although "A water sample taken at the base of SC8 (O8A) in August 2019 returned the highest SRP (i.e. Soluble Reactive Phosphorous) value of any site sampled (0.214 mg/l) and it is considered unlikely that all of that was contributed by felling in the upper catchment. At around the same time a Q-rating of Q3-4 was recorded at the same site. However, it is doubtful that this can be attributed in its entirety to the clearfelling in the catchment carried out in 2017 and 2018. Overall therefore, it is believed that the 46.2 ha of turbulence felling undertaken between 2016 and 2018 across 4 subcatchments probably did give rise to an increase in nutrient runoff (as SRP primarily) but had at worst only slight negative and temporary impacts on ecological status at sites lower down in the subcatchments in question."

These sections are very difficult to follow, there are presented a number of confirmed impacts that are thought to be due to turbulence felling.

It would seem that more regular monitoring and consistent monitoring of sites is required to confirm the short term predicted duration of maintenance activities on the site.

5.9.4 Response to Stakeholder Concerns

There are no stakeholder concerns presented within the document. Freshwater pearl mussel were a key stakeholder concern. These species appear to have been scoped out of the assessment but should be scoped out in a structured way with clear evidenced based reasoning.

5.9.5 Effect of Decommissioning

The assessment for decommissioning assumes slight or moderate impacts even without mitigation. Given the previous peat slide incident this may be a potential under assessment of impact. Unforeseen incidents should also be assessed.

Track widening "Properly planned and supervised, these activities should have at most minor, negative and temporary impacts on downstream watercourses close to the wind farm boundary. The impacts would be confined mainly to aquatic invertebrates with the possibility of slight negative impacts on spawning success in the streams concerned, depending on the degree of siltation. This latter effect would not be expected to extend into the main channel of any of the 3 main channels draining the site."

Crossing of the Owendalulleegh by vehicles for the OHL and substation decommissioning "This was the same route used during the installation of these three structures. In terms of average density, we know that this crossing point holds about 0.3 trout and 0.1 stone loach per m2 which would suggest that about 5-6 trout and about 2 stone loach, on average, might be present in a 3.5m wide corridor at a point where the river is about 5m across and that number of fish could be killed at the crossing due to vehicular traffic. These figures could be higher however if there were frequent over-and-back trafficking. Were this to be the case the impact could be described as slight to moderate, negative and temporary."

"Where the ground falls more steeply toward channels at Black Road Bridge (Site O4) and Flaggy Bridge (Site O5). In fact, to some extent the latter could be an issue at any point along the route where very minor drains could allow contaminated surface run-off to reach one of the larger drainage channels along the route. These activities could lead to slight negative and temporary impacts in some of these watercourses, mainly in the form of changes to the relative abundance of some aquatic macroinvertebrate groups favouring less sensitive groups such as chironomids."

For the Removal of Barrages 3 and 4 "The proposal is to remove the boulders that form the main structure of the barrages and to also remove the finer material which has accumulated behind the structures. It is imperative that all the softer material is removed in its entirety before the boulders are removed because otherwise it could release suddenly under the weight of gravity and the force of the water upstream, potentially constituting a significant debris slide which in a worst-case scenario could

cause a fish kill downstream. Although such a fish kill, were it to occur, would only impact the first approximately 1 to 2 km downstream of the barrage sites, the potential impact would still be described as a moderate to significant negative, localised and short-term impact"

"If this is undertaken without mitigation, the downstream impact can be described as slight or moderate, negative, temporary, affecting the ecological status of the SC7(b) channel at Site O5, possibly dropping from Q4-5 or Q4 to Q3-4. There could also be a slight negative and temporary impact on spawning in the lower part of the subcatchment around Site O6A, depending on the amount of solids generated by the works, resulting in a slight reduction in trout fry recruitment at the site. Both these impacts would be localised within the SC7(b)/(d) subcatchment."

Cumulative effects

Of Turbery "the cumulative effect, had it occurred at all, could be described as slight to moderate, negative and temporary in terms of potential impacts on macroinvertebrates and slight, negative and temporary in terms of impacts on fish in the two affected channels.

Of Clearfelling "Had these occurred at the time they would have been slight to moderate, localised, and temporary to short-term in duration."

Of Planintg in lie of felling on wind farm site was considered to have no negative effect.

Ennis-Shannonbridge Over Head Line reinstatement "is likely to have a worst, a slight, negative and temporary impact on the water quality in small drains between the Agannygal Substation and Lough Atorick"

No other cumulative effects are predicted.

The overall assessment of cumulative effects is that "The assessment has already indicated that ongoing maintenance on the Project i.e. both on the wind farm site itself and along the OHL corridor until the end of the operational life, will give rise to intermittent, slight to moderate, negative, impacts, with these impacts confined to the minor streams draining the wind farm site, the OHL corridor and Agannygal Substation. On-going annual turbary activity on the wind farm site will contribute to these impacts as they occur but will not cause them to increase to a higher level of significance. The same can be said for the decommissioning phase of the Project including within the wind farm site, along the OHL corridor, Agannygal Substation and in connection with the removal off-site post slide remedial measures (Barrages 3 and 4) and therefore any cumulative impacts will not be significant."

5.9.6 Effectiveness of Proposed Mitigation Measures

There is a suite of proposed mitigation measures recommended for the decommissioning. These include pump over systems, work during dry weather, bog mats, silt control measures, fish rescue and protection, minimising and demarcating working areas, and the potential installation of a baily bridge. A pollution control officer should also be appointed for decommissioning.

For maintenance it is recommended that this is detailed in advance n an annual basis and sent for assessment to a trained aquatic ecologist for approval. Dry weather working is recommended with the use of bog mats. Removed material must be safely stored so that it does not enter the water course. Sillt fences should be erected for drain maintenance

However no guidance is cited. No monitoring is recommended.

5.9.7 Recommendations for Further Mitigation Measures

Best practice guidance should be cited for mitigation. The formation of a management plan is welcome for the maintenance, this should also be overseen by an appointed pollution control officer. In addition to mitigation for required maintenance, positive management and enhancement should be implemented. Yearly monitoring of the water courses should continue, annual monitoring of the site in general should be included to ensure that appropriate management is being undertaken. Method statements for the decommission should also be drawn up in advance. An assessment under the Water Framework Directive and under the Eels Regulations should be undertaken for the

decommissioning even in the form of a pre screening with recommendations for a detailed assessment to be undertaken prior to decommissioning.

5.9.8 Additional Information or Evidence Required

Compliance with legislation and policy should be cited. A list of guidance followed should be provided.

An assessment under the Water Framework Directive has not been undertaken nor one under the Eels Regulations. These should be undertaken for the decommissioning, even in the form of a pre screening with recommendations for a detailed assessment to be undertaken prior to decommissioning.

Key papers about the brook lamprey *Lampetra planeri* (an Annex II species under the Habitats Directive) in Ireland by Kurz & Costello (1999) (Ref 45), Byrne et al. (2001) (Ref 46) or by Kelly & King (2001) (Ref 47), the latter reference, and the importance of brook lamprey *L. planeri* within the Owendalulleegh catchment and Lough Cutra, being highlighted by Lindsay & Bragg (2005) (Ref 48) should be examined. In general a predicted baseline pre construction should be estimated and precautionary or extrapolated data clearly stated.

Each receptor should be systematically presented and the nature conservation status provided to form a valuation for each receptor. Each receptor should be systematically assessed and it should be clearly stated when professional judgement is used in the absence of data what the confidence in that data is. There should be a clear, structured narrative which presents the baseline per receptor, scoped receptors in/out of the assessment, predicts the impacts (with precautionary assessment or professional judgement with confidence levels stated). The valuation of receptors is based on NRA guidelines from 2003, these were designed for roads and seem to refer largely to fisheries not to nature conservation status. These do not seem like an appropriate evaluation criterion, instead one should use impact assessment guidance such as CIEEM guidelines 2019 (Ref 25).

Additional mitigation should be included as stated in Section 5.9.7.

5.9.9 Reasonableness of Conclusions and Need for Possible Remedial Works

The impacts may be underestimated, due to the lack of existing data. This is however difficult to judge and reliance on professional judgment is necessary. By incorporating the amendments and additions outlined in Sections 5.9.7. and 5.9.8 this would provide more confidence in the current and future impact predictions and in the success of mitigation.

5.10 Landscape and Visual

5.10.1 Compliance with Legislation and Best Practice

The standard list of guidance documents have been listed in chapter 9. These were all applicable and current in 2020. The Landscape and Visual Assessment generally conforms to LVIA guidance and has been informed by several key guidance documents including Guidelines for Landscape and Visual Impact Assessment (GLVIA), 3rd Edition 2013 and Guide to Visual Representation of Wind Farms (Scottish Natural Heritage, 2017).

However, the apparent absence of a scoping process and liaison with the competent authority on matters such as extent of study area, key receptors and viewpoints that would need to be assessed carefully as recommended by the GLVIA (Ref 49) departs from best practice.

5.10.2 Baseline Information

The LVIA establishes what the baseline was in 1998 and is appropriate and adequate for the assessment purposes. The viewpoint photos and maps provided as part of the baseline reporting is adequate.

5.10.3 Appropriateness of Assessment Methodology and Significance Criteria

The assessment methodology is standard and the significance criteria set out in Table 9-3 is generally appropriate. While it is acknowledged that LVIA guidance does not provide a prescriptive LVIA

methodology and relies on practitioners to develop their own specific methodologies based on the characteristics of the development proposal at hand and the landscape in which it is located, combined with professional judgement and experience, there seems to introduction of an additional layer or effect which would make 'moderate effect' not significant. Moderate effects are generally significant and it is surprising that a very large wind far development of 70 turbines would not have a single significant effect.

The proposed development is a very large wind farm and therefore likely to have some if not a complete absence of any significant effects. There is a slight lack of clarity with regard to visual effect significance and is evident in some form in the assessment section. For example, for viewpoint 14, which is of high sensitivity as it is acknowledged this is along a waymarked walking trail and has considerable scenic qualities and long distance views. However, the magnitude of change is considered to be low to medium even though it is recognised the turbines occupy a considerable proportion of the view. The visual effects are reported to be Slight to Moderate and surprisingly neutral visual effect. Similar assessment has been reported for Vp15 as well. The definition of 'Neutral' is defined as a scheme that complements the scale, landform and pattern of the landscape/view and maintains landscape quality. This is certainly not the case in the current landscape which has 70 large turbines.

Similarly, landscape significance seems to be allocated to effects above moderate effect rather than moderate and above which is more usual as stated before. The overall effect on Landscape from construction phases 1&2 is identified as a temporary "Moderate adverse", however this is deemed "not significant" in accordance with the methodology and table 9-3.

In addition, there seems to be no discussion of study area and the ZTV figure is limited to 25km which is not entirely unreasonable but one would expect the rationale for this limit to be set out. Viewpoint 12 – Terryglass harbour is just outside this limit however it is included as a viewpoint and there is no rationale for its inclusion. While it has been reported that 16 number of viewpoints have been carefully selected, there is no justification as to why these viewpoint locations have been selected and the category or group they represent.

Typically, as good practice the viewpoint locations would include a range of views to include various types of receptors such as residential, recreational, road users who would experience the landscape in different ways. In the assessment almost all views that have been selected are from roads which are transient in nature and therefore inherently significance of effects for such viewpoints would be lower. While it has been mentioned that there is relative lack of scenic amenity and recreational use in the Slieve Aughtys there could be other areas in the 25 km which could have been identified for viewpoint receptors. If this is not the case the assessment should clearly state these. The report mentions that there are a small number of rural houses on the fringes or outside of Derrybrien (to the south), Ballynakill (to the east) and along the local road to the south of the site, which do have views of the wind farm. However, these have not been included in the assessment.

There is also no mention of alternative siting/layouts considered and how/if landscape and visual issues have informed the layout and avoided visibility from certain locations. The turbines are tightly clustered and visual stacking does occur as it is a very large wind farm.

The ZTV sets out the visibility of the hub height rather than the blade tip height which is more usual. Even if the hub is below the skyline the appearance of a turning blade can still have a visual effect. It is best practice for two ZTVs to be produced for windfarm projects – one showing hub height ZTV and another showing blade tip height.

All above points are examples where there are instances of lack of clarity and conflicting professional judgement on the use of methodology.

5.10.4 Response to Stakeholder Concerns

There is no reference to stakeholder consultation at all. It is not apparent that a consultative scoping process has been undertaken and the apparent absence of a scoping process and liaison with the competent authority departs from best practice as the scoping opinion represents the considered view

of the competent authority and concerns of stakeholders on matters such as extent of study area, key receptors and viewpoints that would need to be carefully assessed.

There is also no mention of stakeholder input/agreement into methodology.

This appears to be a significant flaw in the LVIA.

5.10.5 Effect of Decommissioning

This is explored thoroughly.

5.10.6 Effectiveness of Proposed Mitigation Measures

No mitigation measures are proposed, and justification has been based on the absence of any significant effects.

5.10.7 Recommendations for Further Mitigation Measures

There is perhaps a missed opportunity to explore ways to assist the natural regeneration of the site following decommissioning given the fact that this is a very large wind farm development.

5.10.8 Additional Information or Evidence Required

There is no evidence of any liaison with stakeholders – particularly the Local Authority and other stakeholders/residents etc. This is an important part of to the process to consider their views and interests on a number of matters.

5.10.9 Reasonableness of Conclusions and Need for Possible Remedial Works

The conclusions appear reasonable however the apparent absence of any stakeholder involvement, the assessment methodology especially significance matrix is a concern.

5.11 Soils, Land and Geology

5.11.1 Compliance with Legislation and Best Practice

The EIA Directive and Guidance on the preparation of the EIA Report together with European Commission (1999) 'Guidance for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions' (Ref 50) set out broad targets which must be met rather than specifying how these targets (such as assessment of slope stability) should be met. The Directive and guidance therefore implicitly require that an EIA makes use of the best available guidance and best collective specialist understanding for any given topic. In the case of an EIA involving peat soils, particularly in the assessment of slope stability and associated impacts, little subject-specific guidance is provided by the Irish Authorities. A significant body of relevant scientific literature nevertheless exists, some of it dating back to the 1980s, with which to inform decision-making. This body of literature has recently been supplemented by specific guidance developed by the Scottish Government for use when undertaking an assessment of peat slide risk for windfarm development.

This Scottish Government guidance (SGG-2017) (Ref 51) is widely acknowledged as the best subject-specific guidance currently available, although the guidance itself highlights certain areas of continued uncertainty and the user of the guidance is referred to relevant scientific publications in order to give due consideration to these uncertainties.

The rEIAS states repeatedly that Chapter 10 Geology, Soils and Land uses SGG-2017 as the basis for its decision-making. Almost all the relevant field data used in the rEIAS were, however, obtained long before the SGG-2017 was published, so it cannot be the case that the process of gathering site data was shaped by SGG-2017. Furthermore, although the rEIAS risk assessment based on these old data was carried out in 2020 and claims to conform to SGG-2017 guidance, for several critical issues this is not the case, nor does the rEIAS take account of the significant body of available relevant specialist literature.

Although the survey data associated with the grid connection are more recent, they are limited and constrained in a number of ways which are entirely of the developer's own choosing, but as a result

the assessment of the grid connection cannot be said to be in compliance with the legislation, with acknowledged best practice, nor indeed with the guidance which the rEIAS claims to be following.

Section 2 of Appendix C provides an extended review of the SGG-2017 guidance, the body of relevant literature, and the approach adopted by the rEIAS.

5.11.2 *Baseline Information*

The first set of baseline information, submitted with the two EIS documents accompanying the original three planning applications, has already been ruled as inadequate by the ECJ ruling of C-215/06, EU:C:2008:380. Between 2003 and 2005, once construction had begun and following the peatslide event of 2003, a large body of post-hoc information was collected from the site. This information has been used to reconstruct the baseline condition of the site (usually referred to in the rEIAS as 'baseline conditions in 1998'). Of course this cannot be an accurate picture of the prevailing baseline conditions in 1998. By the time the 2003-2005 surveys were being undertaken a significant proportion of the windfarm roads had been constructed, drainage had been improved or installed, and blocks of forestry has started to be removed. The pre-construction survey of 2001 talks of the difficulties encountered while attempting to survey the pre-development site because: "The surface was waterlogged and very difficult to traverse." No such comments appear in the 2003-5 surveys.

Notwithstanding the belated nature of such survey effort, the methods used to obtain a picture of 'baseline' condition are valuable to an extent but limited in a number of important areas. In some cases, these limitations reflect the fact that survey pre-dates the SGG-2017 guidance by some 15 years, but in others there was already information available which, if used, would have shaped the nature of the survey methods employed. Unfortunately, such information was not used and so the information gathered misses key elements of what should have underpinned the baseline survey.

More significantly, during these intervening years the developer had the opportunity to undertake further survey informed by the SGG-2017 guidance and its earlier 2008 pre-cursor (given that the rEIAS already employs post-development survey data to develop a picture of the 'baseline'). No such survey has been undertaken, so the 2020 rEIAS is inevitably constrained by the survey methods employed immediately after the 2003 peatslide. The limitations resulting from the decision not to undertake further site-wide survey are explored in Appendix C , but a key issue is the fact that Lindsay & Bragg (2005) identified in their assessment of the 2003 peatslide that the area of forested peatland was riven with cracks which had formed along the forestry plough lines, and that these cracks had clearly played a major role in expanding the scale of the peatslide. The first edition of Lindsay & Bragg appeared in 2004, but even if the 2nd edition in 2005 is taken as the source of such information and thus did not feature in the instructions to the surveyors in 2003-2005, the developers have known about these cracks for more than 15 years and have had ample time to explore the implications for slope stability during this time. No such exploration has ever taken place. The cracks are not mentioned in the rEIAS 2020 peatslide risk assessment and do not feature in any form of geomorphological map (of the type required by SGG-2017, which specifically mentions the need to map cracks and fissures) nor in the map of drainage features presented as 'Figure 10-16' of the rEIAS.

That said, such cracking should have formed part of the survey requirements of the work undertaken between 2003 and 2005 because, as Lindsay & Bragg (2005) highlight, information about the scale of cracking beneath plantations on peat soils has been in the public domain since 1987 in publications such as Pyatt (1987) and Anderson (2001) (Ref 52). Slope stability is influenced to a considerable degree by cohesion of the peat, and cracks in peat represent areas of zero cohesion. The baseline condition of the site should therefore have recognised that linear features associated with zones often possessing zero cohesion dominated substantial parts of the site (given that most of it was afforested prior to windfarm construction). No such recognition has ever featured in any risk assessment, and plays no part in the 2020 risk assessment presented in the rEIAS. The further implications of this failure are explored in Section 6.1.4, of Appendix C.

Regarding the route of the Grid Connection, the range of field data gathered in 2018/2019 is even more limited than that obtained for the site as a whole in 2004/2005, despite claiming to follow the SGG-2017 guidance. As such, the baseline information obtained for the grid connection is

demonstrably inadequate both in terms of what type of data were gathered and over what area these data were obtained (see Section 5.3.2 of Appendix C).

5.11.3 Appropriateness of Assessment Methodology and Significance Criteria

An underpinning assumption of the EIA Directive and the associated guidance is that field survey will be undertaken and that a risk assessment will then be undertaken in a timely manner based on those field data in order to ensure that the data remain relevant to the risk assessment. In this case, the 2020 rEIAS risk assessment is being undertaken using site-condition data which were collected as much as 20 years ago, with even the most recent data for the site as a whole describing site conditions as they existed 15 years ago. The rEIAS itself states on numerous occasions that conditions have changed as a result of site management in the intervening years, thereby calling the utility of these old field data into question. Furthermore, although the rEIAS risk assessment asserts that site management activities have brought about improvements to stability in these intervening years, no more recent site-wide data are presented to support this assertion. The blindness of the assessment process to extensive cracking within the forested peatlands has been highlighted above, but the assessment also appears to be blind to the body of literature (including that referred to in SGG-2017) pointing to the role of such shrinkage cracks in the de-stabilisation of peat soils on slopes.

Indeed, the problem of failure to take heed of available specialist literature and guidance has implications for the risk assessment as a whole. The progressive improvement in site stability in the periods 1998–2003, 2004-2020, and 2020-2040 as presented in the sequence 'Figure 10-34, Figure 10-35 and Figure 10-36' of the rEIAS is based almost entirely on the single mitigating measure of peatland drainage. It is consistently assumed that drainage will stabilise the peat. While drainage will certainly increase the cohesion of the peat matrix, drainage also causes loss of water and consequent shrinkage of the peat (given that undrained peat consists of around 90% water by volume). Shrinkage within a volume of peat rarely occurs only in a vertically downward direction, although this will tend to be the dominant trend in peat under load, as is the case for peat beneath a 'floating' road. Peat not under load will tend to shrink in 3 dimensions, leading to cracks, fissures, deformation and creation of macropores (voids) which often occur in the shape of 'peat pipes'. As a result, while individual intact blocks of peat adjacent to infrastructure drainage, or in areas of existing or felled forestry, may display increased shear strength, the blocks themselves increasingly lose cohesion between each other because of cracking and deformation as shrinkage progresses. Peatland drainage consolidates but also dislocates. Loss of water can also make the blocks lighter and more buoyant, thereby making them more susceptible to uplift by an increase in hydrostatic pressure within sub-surface deformations such as peat pipes.

The result of maintaining 'a robust drainage system' across the site until 2040 is thus to establish a trend consisting of at least two opposing forces, only one of which is recognised within the rEIAS. While intact blocks of peat may indeed show increased cohesion, the peat body as a whole will shrink, distort and crack, reducing overall cohesion. The existing body of specialist literature and guidance points to the dangers associated with such a distorted and fractured peat system (see Appendix C), highlighting in particular the role of longer dry spells followed by intense convective storms - a weather pattern projected to become more frequent with climate change.

In terms of specific risk-assessment steps recommended by SGG-2017, the rEIAS does not explain the steps involved in arriving at the risk assessments set out in 'Figure 10-34, Figure 10-35 and Figure 10-36'. Details of the assessment are instead to be found in 'Sections 1, 2.5, 3.4 and 5.6, together with Tables 2-2, 3-5, 5-4 of Appendix B and Tables B1 to B5 of Appendix of Appendix B'. The critical factors in the initial baseline risk assessment are to be found in the last of these ('Tables B1 to B5 of Appendix of Appendix B') where site factors are categorised and thus assigned a score for the assessment process. No clear explanation is provided for the categorisation process and at least some decisions can be readily challenged (see Appendix C).

Notwithstanding the questions associated with the risk assessment for baseline conditions, the assessment does identify a substantial number of areas within the site which emerge from the assessment process as having an unacceptable degree of peatslide risk. The number so highlighted is smaller than might be achieved by an assessment which follows more closely the SGG-2017

guidance, but all forms of assessment highlight the risk posed by the northern sector of the site in particular, but also much of the western and south-western sector of the site (the slopes in this last sector, incidentally, inclined towards the village of Derrybrien).

The risk assessment then offers 'Tables 3-5, 5-4 of Appendix B' as the basis for subsequent conversion of those areas identified as having an 'unacceptable risk' to those ultimately having negligible risk by 2020. No explanation is given for the change in 'Hazard Likelihood' score in these tables. It seems that for the period 1998 to 2006, the values used for 1998 are simply and universally reduced by 2, then between 2006 and 2020 all values are universally reduced to a 'Hazard Likelihood' value of 1. No site data, no explanation and no justification are provided for this change in values, other than to state that site-wide drainage mitigation measures reduce risk.

Other concerns about the risk assessment process are explored in Section 6 of Appendix C.

5.11.4 Response to Stakeholder Concerns

There is no evidence within rEIAS Chapter 10 of any response to stakeholder concerns.

Recently the developer has placed a Hazard sign at the entrance to the turbary stating that there is a risk of instability if peat cutting activities are undertaken. This prevents the local residents from obtaining a fuel supply for use next winter but has also heightened concerns about site stability, despite continued assurances from the developer (and repeated in the rEIAS) that mitigation measures have rendered the site safe.

The likely basis of concern and the reason for the Hazard sign almost certainly originate from a series of factors which could have been anticipated by the developer had they undertaken adequate survey and had they taken account of the issues highlighted by Lindsay & Bragg (2005) on behalf of local stakeholders concerns which have been raised many times with the developers. The issues involved are explored in more detail in Appendix C.

5.11.5 Effect of Decommissioning

Decommissioning will involve removal of the turbines, associated buildings, and cabling, but will leave the roads, turbine bases and drainage in place. The rEIAS states that the drains will steadily choke up and cause ponding, providing conditions for re-development of a peat-forming vegetation.

The danger to site stability of ponded water and failing drainage runs as a constant theme through all reports contained within the rEIAS Appendices, from the initial post-slide AGEC (2004) (Ref 53) report to the 2020 reports by AGL and Fehily Timoney, as well as in the rEIAS itself. On decommissioning, however, it seems that the rEIAS considers it now acceptable to permit water to pond and the drainage to fail. It acknowledges that this will "reduce the effect on the stability of the peat to slightly significant" [p.10-337]. After almost 40 years of striving to prevent ponding and collapse of the drainage system it is difficult to see how the rEIAS comes to the conclusion that allowing precisely this to occur will amount to a 'slightly significant' effect. No explanation is provided.

As well as being founded on the false premise that all drains will inevitably infill with time, there is also no acknowledgement that excavated roads will continue to act as breaks in the peat mantle and therefore represent areas of weakness, while roads 'floated' over the peat will continue to subside into the peat. This is because 'floating' roads have generally been employed where the peat is particularly deep, and deep peat has considerable scope for long-term subsidence under such conditions. The breaks in the peat mantle and breaks in slope created by these roadways will continue to have an effect and represent lines of weakness long after the windfarm has been commissioned in 2040 but there is no acknowledgement of this in the rEIAS.

5.11.6 Effectiveness of Proposed Mitigation Measures

Mitigation measures comprise two types of action: firstly, monthly site walkovers by site staff looking for signs of instability, supplemented by an annual walkover by a qualified geoengineer; and secondly, continued drainage throughout the life of the windfarm but not beyond.

No other mitigation measures are offered by the rEIAS. There is currently no automated instrumental monitoring anywhere on the site and there are no plans to install any such instrumentation. A small

set of automated instrumentation was installed in 2006 but it was decommissioned in 2014 because it was no longer working, and it was not replaced. The only 'quantitative' monitoring devices now are seven 'sighting poles' placed in the area of the 2003 peatslide, designed to detect by eye whether there is any sign of peat movement. The remainder of the site has no monitoring devices. Consequently, there is no means of judging the effectiveness of the two systems of mitigation measures currently employed.

5.11.7 Recommendations for Further Mitigation Measures

There is a fundamental conflict between what the windfarm requires – effective drainage along roadways to maintain their trafficability and around turbine bases to minimise buoyancy effects – and what the best measures are to ensure stability of the peat mantle, which is best achieved by establishing a vigorous peat-forming vegetation across the site, thereby providing a strong fibrous surface layer.

As a minimum, however, tests should be started now to determine the best approach, or approaches, for stabilising the site into the long term once the windfarm is decommissioned. As an example of what might be tested, Peatland Action in Shetland has had some success in using old salmon-farm netting to stabilise eroding peat slopes and establishing new growth of peat-forming Sphagnum swards. Given the likely fractured nature of the peat across the forestry areas, tests might be undertaken to explore the potential of combining netting of the type used by peatland Action Shetland, or jute netting used by Moors for the Future in northern England, with the use of 'soil nails', which are commonly used by engineers in unstable soils.

Indeed, a great many methods have been tried and documented in the UK and Ireland for the restoration of drained, formerly-forested or eroded blanket bog. The recently-updated 'Conserving Bogs - The Management Handbook' (Ref 55) provides a great deal of valuable information (and see Section 7 of Appendix C). The important issue is that such testing and mitigation should be undertaken, and successful methods applied site-wide, *prior* to the end of the decommissioning phase in 2040.

5.11.8 Additional Information or Evidence Required

It is a point of some urgency that a re-survey of the whole site be undertaken, with particular reference to the areas of forested and formerly forested ground to determine the extent of fissuring and potential peat piping within these areas. Particular attention should also be devoted to a comprehensive survey of conditions in the northern and western sectors of the site, given the repeated identification of these areas as being at risk in the 'baseline' condition.

These investigations should follow the guidance provided in SGG-2017. Survey should therefore incorporate peat depths, slope angles, coring using a Russian corer to obtain realistic von Post values and Troels Smith categorisation, mapping of any evidence of surface or sub-surface seepage, identification and mapping where possible of peat piping, and mapping of all forestry drains, ploughing furrows and cracks within those furrows.

Shear vane testing should be undertaken using a shear vane diameter of at least 200 mm, but interpretation of shear vane readings should be used as indicative only and assumed to be over-estimates of peat shear strength.

A re-assessment of peat slide risk should then be undertaken using these new data, and be based on the assessment process set out in SGG-2017.

5.11.9 Reasonableness of Conclusions and Need for Possible Remedial Works

The conclusions set out in the rEIAS cannot be described as reasonable because these conclusions are based on a process that fails in several critical ways to follow its own chosen best-practice guidance:

- The data on which the assessment is based are, by the admission of the rEIAS itself, mostly at least 15 years out of date;

- The processes by which these (and even more recent data) were obtained fail to follow the procedures set out in the chosen best-practice guidance;
- Key aspects of the ground conditions are not measured, mapped or assessed at all;
- The risk assessment sequence fails to take into account the many caveats presented in the chosen best-practice guidance;
- The risk assessment process also fails to explain the claimed and predicted sequence of change to risk and hazard over the life of the windfarm and presents no data to support this predicted change;
- No systematic, instrumented monitoring system has ever been put in place across the site and there are no plans to do so. The only instrumentation installed was highly localised and was decommissioned (without replacement) in 2014;
- Best-practice guidance used by the rEIAS requires that measures be put in place to control the effects of any slope failure, while one of the earliest reports commissioned by the developers following the 2003 peatslide recommended that a Contingency Plan be drawn up to minimise any future slope failure or other similar event – but the rEIAS does not present any such Contingency Plan or any measures taken to control the effects of a future slope failure;
- The conditions acknowledged as likely to prevail after decommissioning represent those conditions repeatedly described by the rEIAS as being a hazard to stability, yet the rEIAS concludes that development of such conditions after decommissioning will be only 'slightly significant'.

In addition to the actions listed in 5.12.8 above, further remedial works should comprise:

- Production of a Contingency Plan for all possible routes for material arising from future slope failure;
- Installation of appropriate, environmentally sensitive control measures on all possible routes for material arising from future slope failure;
- Where updated risk assessment (based on survey and monitoring set out in 5.12.8 above) indicates moderate to high risk of slope failure, particularly in northern and western sectors of the site, those sections of the development should be abandoned, as was done for the area around Turbine 16, with specific remedial measures applied to those areas in order to reduce future loss of stability (i.e. removal of turbines and development of restoration approaches designed to enhance and ensure long-term stability of these areas).

5.12 Hydrology and Hydrogeology

5.12.1 Compliance with Legislation and Best Practice

Chapter 11 of the rEIAR provides a list of the legislation and best practice relevant to hydrology and the water environment. It is noted that aspects linked to water quality are covered in Chapter 8: Biodiversity – Aquatic Ecology. This list is comprehensive, however the assessment would benefit from a table summarising how the project achieves compliance with the key requirements of these laws and policies.

The relationship between peat soils, hydrology and stability is, however, identified in the rEIAR as being guided by Scottish Government (2017) 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Projects' referred to as 'SGG-2017 in Section 5.12 above. This guidance, widely accepted as the best currently available, sets out a range of factors that should form part of any risk assessment.

Both SGG-2017 and the rEIAR emphasise the key role played by water and hydrological management in the assessment of potential slope-failure hazard. SGG-2017 highlights the need to identify all features which represent disruptions to the hydrological integrity of the peat body. As well as drains, roads and infrastructure, SGG-2017 identifies as features to map and investigate all fissures, peat

pipes and other forms of distortion resulting from shrinkage of the peat as a result of drainage impacts. SGG-2017 acknowledges the difficulty of doing so when a site has been afforested but emphasises that such mapping must be undertaken despite the difficulties. Only by creating a map of all factors influencing the hydrology of the peat body can a true estimate of risk and hazard be obtained.

The rEIAR largely ignores the forested and formerly-forested blocks within the site in terms of hydrological mapping. Indeed, at a more general level, the rEIAR does not consider the issue of peat shrinkage due to drainage at all. As such, the rEIAR cannot be said to have followed the guidance (and associated specialist literature) which the rEIAR itself claims to be following.

5.12.2 Baseline Information

Baseline information has been collected through desk study and a range of field surveys. The baseline circa 1998 is described and key changes to this baseline along the projects timeline to the time of assessment in 2020 have also been described. With the exception of peat soil hydrology (addressed below), the sources of desk study data referenced are considered generally appropriate and the field surveys undertaken are in line with expectations for defining the surface water environment. The description of the baseline is supported by suitable graphics and the descriptions cover physical landform and land use/cover, climate, hydrology, and groundwater, noting that surface water quality is described in detail in Chapter 8.

In terms of peat-soil hydrology and the impact of drainage-induced shrinkage (mainly driven by the forest plantations) Lindsay & Bragg (2005) specifically highlight and illustrate the extensive presence of linear cracking beneath the forested areas across the windfarm site, while Appendix C explores in considerable detail the significance of such features for any risk assessment. Not only do such fissures and sub-surface pipes represent sources of potential instability, they are also potentially major contributors to the overall hydrological pattern of water movement through, and from, a site thus affected. Such cracks, fissures and piping are commonly associated with the forestry ploughing furrows, which themselves represent a major influencer on surface water flow – indeed this is one of the key purposes of such ploughing furrows. Consequently, the influence of forestry on both the surface and sub-surface hydrology of a blanket bog landscape can be profound.

There is no mapping of ploughing furrows, no mapping of peat cracks associated with such furrows, and very little attempt to map possible sub-surface piping associated with the forested ground – which represents a large proportion of the site. Given that the whole site, apart from the area of turbary, was afforested prior to windfarm development, failure to map diligently the hydrological effects and legacy of the forestry represents a major gap in the required set of baseline information.

5.12.3 Appropriateness of Assessment Methodology and Significance Criteria

The assessment methodology is suitably described and the significance criteria and adopted approach are consistent with what is documented in Chapter 1.

The assessment would benefit from a table to summarise key receptors and their attributes, the value assigned to each and the rationale behind the values assigned.

The assessment is also supported by a stand-alone Flood Risk Assessment.

5.12.4 Response to Stakeholder Concerns

The Chapter does not provide any details with regard to stakeholder engagement and no reporting of any concerns raised by stakeholders is included.

The South Galway Flood Relief Committee submitted a complaint to the EC detailing how they attempted to contribute to the rEIAR but were ignored by the developer. The only communication they received in response to the letter sent to the developer in April 2017 was in a notice on 2 September stating that a rEIAR has been submitted to An Bord Pleanala.

Key points raised by the complainant include the concerns that flood peaks and the frequency of flooding events are increasing and impacting on residential areas downstream in the catchment. The removal of the forestry is cited as a causative factor, based on established research evidence. This evidence is cited by the stakeholders in the form of research results obtained by the UK Centre for

Ecology & Hydrology, which demonstrate a quantitative relationship between increased water flows from areas as forestry plantations are felled. Such effects could be mitigated by re-establishing a Sphagnum-rich peat-forming community across the felled areas because such a community provides 'surface roughness' that slows peak water flows in two ways. Firstly, the semi-porous nature of a Sphagnum-rich carpet acts to slow lateral water movement, and secondly, the natural growth form of different Sphagnum species into 'hummock-hollow' structures creates physical undulations in the Sphagnum carpet which further impede water movement as it moves across the land surface (Ref 56). However, development of a Sphagnum-rich community with its permanently high water-table poses challenges for the developer seeking to keep the site as well-drained as possible in order to minimise peat slide risk and turbine instability.

The prime purpose of drains is to remove surface water as rapidly as possible from an area. It is inevitable, therefore, that a robustly drained hill with a mantle of blanket peat will shed water much more rapidly than a similar hill covered by a mantle of healthy blanket bog vegetation rich in Sphagnum. While establishment of the conifer plantations largely destroyed the natural bog vegetation, the trees themselves will have taken up much of the precipitation inputs to the hill summit. Once these plantations are removed there is neither the tree cover nor the original functioning bog surface to slow water flow from the hill. It is consequently inevitable that flood peak flows will increase now that the plantations have been removed, no peatland restoration has been undertaken, and the drainage system is maintained in a free-flowing condition. This combination of factors is well described in the scientific literature and has been for some years. The consequences should have formed a clear part of the rEIAR in response to stakeholder concerns, as should a set of mitigating measures to address these issues - the best of which would have been to begin trials for the restoration of an actively peat-forming vegetation in a safe and stable manner, exploring methods used by experienced restoration teams such as those highlighted in Appendix C. The onus would lie with the developer to demonstrate to stakeholders how these two conflicting demands could be met – on the one hand, stability and trafficability for roads and turbines, versus, on the other hand, potential re-development of a functioning Sphagnum-rich vegetation providing nature-based solutions to intense rainfall events and flood peaks, or some equally effective mitigation measure.

The complainant also raises issues with the data used to describe historical flooding within the Flood Risk Assessment. The report cites floodinfo.ie as a data source and describes the closest downstream areas affected by significant flooding as more than 20km downstream of the windfarm. The compliant highlights the inaccuracy of this, with settlements located 10km and 12km downstream suffering from extensive flooding.

A robust consultation with key stakeholders would be expected to form part of an ES chapter, together with details of how any concerns raised have been addressed, thereby giving confidence in the robustness of the assessment and the proposed mitigation methods.

5.12.5 Effect of Decommissioning

The Chapter includes an assessment of the effects of decommissioning the wind farm. The assessment records which elements of the windfarm infrastructure would be removed, and which would be left in-situ. A key element for consideration is the land drainage system installed to prevent ponding on site during operation of the windfarm, with the proposal to leave this system in place with no future maintenance. The assessment acknowledges that over time, drainage channels would be expected to reduce in capacity due to vegetation growth and silting and effects on the hydrological regime and are stated as the temporary, localised and minor negative. .

As described in Section 5.11, the justification for the assessment of only minor and localised effects is not considered to reflect the potential implications on the peat-hydrology and land stability regimes, and it is considered that the magnitude of effects may be understated.

5.12.6 Effectiveness of Proposed Mitigation Measures

The report contains detailed information about the measures put in place to reduce the effects of the development during its construction. Measures to mitigate impacts during construction are in line with best practice and are typical for a wind farm project.

It also describes the measures included in the design to mitigate the effects of operation and decommissioning of the wind farm.

The regime of site inspections and maintenance during operation is described, along a timeline the types and frequency of activities that are undertaken, for example, clearing of blocked land drains, measures to manage scour/erosion and repairs to the floating access road network. The additional mitigation measures put in place following the peat slide, for example, provision of silt traps, barrages to prevent further downslope movement of materials and provision of alternative and additional surface water drainage routes, are also described.

The assessment concludes the mitigation measures to have been robust in preventing changes to the hydrological regime and to water quality during construction and operation, noting that the drainage network has to date demonstrated sufficient capacity to convey site runoff during a range of storm events, without causing excessive flooding onsite nor downstream

There is apparent conflict between the mitigation approaches applied during operation, when a drainage system is actively maintained to move rainfall runoff off site and prevent surface water ponding, and during decommissioning, when this drainage system would be allowed to degrade, without any ongoing maintenance. The limitations of the effectiveness of these proposed mitigation strategies on the peat hydrology and slope stability regimes of the site are described in Section 5.11.

5.12.7 Recommendations for Further Mitigation Measures

Recommendations for further mitigation are made in Section 5.11, which would also reduce long term effects on peat-hydrology and the land drainage regime.

The 2003 peat slide illustrated the potential scale of hydrological impact resulting from a single large event such as this. The inadequacy of the peat slide risk assessment discussed in Section 5.12 above and Appendix C raises significant questions and concerns about the treatment of such a possibility within the rEIAR. As far back as 2004, AGEC ('rEIAR, Appendix A') recommended that contingency plans be draw up for all areas potentially affected by a similar event, and it is a requirement of SGG-17 that 'Engineering mitigation measures to control landslide impacts' be put in place, but there is little evidence of either a Contingency Plan or physical measures to control potential impacts – other than down the existing 2003 slide zone. This is despite the rEIAR itself identifying a substantial number of other areas across the site having significant potential risk in the absence of mitigating measures. Given that the proposed mitigating measures have the potential to increase risk over time, a Contingency Plan and physical measures to limit impact would appear to merit priority action.

5.12.8 Additional Information or Evidence Required

A record of stakeholder engagement should be provided and responses to the issues raised by the South Galway Flood Relief Committee should be provided.

5.12.9 Reasonableness of Conclusions and Need for Possible Remedial Works

Table 11-12 provides a clear and concise summary of the assessment. Other than the *recommendation to continue the current operational inspection and maintenance regimes, no remedial* works are identified to be necessary.

Considering the issues raised by the South Galway Flood Relief Committee, and the concerns reported in Section 5.11 with regard to the conclusions of the assessments linked to the peat hydrology of the site, without further evidence, some conclusions of the hydrology and hydrogeology assessment cannot be considered reasonable. In particular, there is need for further justification of the assessed local and minor effects of windfarm decommissioning on the catchments hydrological regime.

5.13 Air and Climate

5.13.1 Compliance with Legislation and Best Practice

Chapter 12 provides a list of the legislation and other statutory policies and guidance relevant to Air Quality. The list of legislation is comprehensive, although it should be noted that not all the referenced legislation and pollutants are relevant to this assessment.

The assessment would therefore have benefitted from focusing on the parts of the legislation and pollutants that are relevant to this assessment.

The air quality assessment has been undertaken in accordance with the Institute of air quality management (IAQM) guidance which is an appropriate document to follow for the construction and operational impact on local air quality for this assessment.

In terms of carbon emissions from the blanket peat soil, which is the predominant soil type across both the wind farm and the grid connector, the rEIAS uses the Scottish Government Carbon Calculator (Ref 57). This is widely accepted as the best available tool for assessing carbon emissions form windfarm developments on peat, although there are acknowledged weaknesses in the model.

5.13.2 Baseline Information

The baseline information is provided in the assessment and demonstrates that air quality is good in the area of the proposed development.

The Scottish Government Carbon Calculator consists of several interlocking modules which together arrive at a final integrated calculation of net carbon balance. These modules consist of, for example, construction emissions, transport emissions, reductions in fossil fuel emissions, and a number of other carbon-related factors. Several of these modules are associated with significant uncertainties and some of these uncertainties, or the figures fed into them, can have a substantial impact on the final outcome.

The baseline data used to populate the Carbon Calculator are not presented. Instead, summarised results for various modules are presented in '*rEIAS, Section 12.4.6.1, 6.4.6.2 and Appendix 12.1 and Appendix 12.2*' but it is impossible to judge the merit of these because the individual data inputs used (such as average depth of water table, or volume of concrete used) are not listed. Rather than present the summary output tables in '*Appendix 12.1 and 12.2*', a table of all data inputs should have been presented. Without this, no meaningful assessment can be made of the baseline information used to generate the carbon payback periods given in '*rEIAS, Table 12-14*'.

5.13.3 Appropriateness of Assessment Methodology and Significance Criteria

The air quality assessment has been undertaken in accordance with the Institute of air quality management guidance which is an appropriate document to follow for the construction and operational impact on local air quality for this assessment. Based on the evidence presented in the report and distance to nearby receptors the conclusion of negligible and no significant impact in relation to construction is in accordance with the guidance.

During operation the report states that the project would not give rise to significant emissions to atmosphere and therefore the impacts are not significant, this would be expected given the nature of the development.

While the input data necessary to make a judgement about the proposed carbon payback period are not presented, it is necessary to highlight the fact that '*rEIAS, Table 12-14*' offers only the 'Expected' payback time from the Carbon Calculator, whereas 'Appendix 12.1' shows that uncertainties within the Calculator and input values can double payback times to an estimated maximum of 14 years if the carbon from the 2003 peat slide event is included. Were another peat slide of the same or larger magnitude to occur, this could have a major impact on the total carbon payback, but neither the current acknowledged potential maximum payback period, nor the potential implications of further peat slide events, are considered.

5.13.4 Response to Stakeholder Concerns

No specific concerns on local air quality.

The local community has questioned the Carbon Calculator payback times presented by the developer, but the details of how these figures have been arrived at are not presented in the rEIAS.

5.13.5 Effect of Decommissioning

The effect of decommissioning has been included in the assessment and based on the guidance that has been followed and the nature of the conclusions of the assessment are in line with the IAQM guidance.

Decommissioning carbon costs are included within the Carbon Calculator.

5.13.6 Effectiveness of Proposed Mitigation Measures

Mitigation has been proposed for decommissioning this includes dampening of stockpiles, given the distances to nearby receptors the mitigation is appropriate.

No specific mitigation measures aimed at reducing carbon emissions from the peat are offered.

5.13.7 Recommendations for Further Mitigation Measures

The Carbon Calculator provides for carbon gains made by restoring a windfarm site to a condition whereby it returns to active peat formation. The rEIAS at present makes no commitment towards restoring blanker bog habitat (with its natural capacity for carbon-capture) following decommissioning. Currently, the rEIAS simply states that bog vegetation may naturally re-develop over time following decommissioning because drains will steadily choke with natural vegetation. Appendix C explains why this may not happen for some drains, and also highlights the potential for long-term instability without active intervention to create a stable peat-forming vegetation before the developer leaves the site. Recommendations are made under 'Geology, Soils and Land' above and in Appendix C for actions that the developer might take to bring this about, not least as a means of providing better prospects for ensuring long-term slope stability across the site.

5.13.8 *Additional Information or Evidence Required*

All input data used in populating the various modules of the Carbon Calculator are required.

5.13.9 Reasonableness of Conclusions and Need for Possible Remedial Works

The conclusions are reasonable based on the information in the report and the type of project, no remedial works are recommended for local air quality.

The proffered conclusions with respect to carbon balance depend entirely on the data used to calculate this balance. Without seeing the input data it is not possible to judge how reasonable the conclusions as presented might be.

5.14 Material Assets

5.14.1 Compliance with Legislation and Best Practice

Article 3 of the EIA Directive provides that the environmental impact assessment shall identify and describe and assess in an appropriate manner the direct and indirect significant effects of a project on 'material assets, cultural heritage and the landscape'.

The term 'material assets' has a broad scope, which may include assets of human or natural origin, valued for socio-economic or heritage reasons.

The draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017) published by the Environmental Protection Agency recognises that the meaning of this factor is less clear than others and goes on to state that Material Assets can now be taken to mean built services and infrastructure (built service, roads and traffic and waste management). Material assets are in practice usually considered across a range of topic areas within an ES, in particular historic environment and socio-economics. This is the approach taken by the rEIAR.

Chapter 13 of the rEIAR references the EPA Advice Notes for Preparing Environmental Impact Statements (Draft 2015) and the EPA Draft Guidelines on the Information to be Contained in EAIRs (2017). No other reference is made to policies or legislation.

Socio-economic, community and recreation effects are assessed within Chapter 4 Population and Human Health, while effects relating to historic environment are assessed within Chapter 15. Traffic and transport assets are considered in Chapter 14 of the rEIAR. Land use has been assessed in more detail in Chapter 10 Land Soils and Geology in addition to Chapter 13. Other Chapters relevant to the assessment are also noted.

Chapter 13 Material Assets sets out the impact of the development with respect to Material Assets not covered in the Chapters identified above. Chapter 13 of the rEIAR identifies the relevant built services and natural resources identified for the purpose of material assets assessment as:

- Water supply
- Sewerage Schemes and Wastewater Infrastructure
- Energy Infrastructure
- Telecommunications
- Tourism & Recreational Infrastructure
- Land use

Chapter 13 sets out the justification for material assets not considered in detail in the Chapter as they are not considered to be associated with any potential significant effects as a result of the Project. This includes airports and navigation, cities, towns, villages and settlements, agronomy and commercial and industrial development. It is not clear whether any consultation has been undertaken as part of this scoping out process.

5.14.2 Baseline Information

A site visit was undertaken on 5 November 2019 by the author of Chapter 13. Although not specifically referenced as such, a desk top study was also undertaken. The baseline represents the position prior to the commencement of development. Reference is made to other Chapters of the rEIAR where relevant. No study area is defined for collection of baseline data, although reference is made to distances to some of the assets identified (e.g. telecommunication masts and key amenity features). The baseline information refers back to historical sources (e.g. Ordnance Survey historic aerial views) where appropriate and also references changes to the baseline which have occurred during construction (e.g. telecommunications mast installed on site in 2005). Data sources are referenced for some assets (e.g. tourism assets) but it is not clear where information has been obtained from for all assets discussed or whether any consultation has been undertaken with stakeholders.

Although there are omissions in terms of defining the study area and sources of data, the baseline information is appropriate, taking into consideration the extent of cross-referencing in the Chapter.

5.14.3 Appropriateness of Assessment Methodology and Significance Criteria

Chapter 13 makes reference to Table 3.3 Description of Effects in the EPA Draft Guidelines on the Information to be Contained in EIARs (2017) and the terminology used, although the classification of significance varies from Figure 3.5 of the Draft Guidance. The Chapter states that for the purpose of the assessment 'significant effect' is an effect that either supports or undermines the integrity of the material assets (both man-made and natural) but it isn't clear which significance levels this applies to (for example if this would only apply for profound, major and moderate effects). The assessment terminology is largely consistent with Table 3.3 Description of Effects in the EPA Draft Guidelines on the Information to be Contained in EAIRs (2017) but as the table is not provided in the rEIAR this is difficult to follow. The significance criteria set out in Table 13-1 of the rEIAR do not however appear to have been applied in the assessment.

The Chapter does not provide information to inform the description of effects where this would have been expected. For example, during construction the Chapter states that large areas of forest plantation have been felled to accommodate the wind farm and grid connection. No information is provided in terms of the size of the area felled (although the area is given in the mitigation section of the Chapter).

It should also be noted that the areas cited in the report are inconsistent. The Ecology Chapter states that "preconstruction the 344.5 ha wind farm site had 265 ha of conifer plantation of which 222 ha was felled to facilitate construction of the wind farm".

Felling is also described as a neutral effect, which according to Table 3.3 Description of Effects in the EPA Draft Guidelines on the Information to be Contained in EIARs (2017) implies that there are no effects or effects are not imperceptible, which is questionable given the scale of the change in land use. Similarly, the temporary road closures during the peat slide are reported as imperceptible, whereas a non-significant impact or perhaps slight effects would seem more appropriate, although it is noted the Chapter refers to Chapter 14 of the rEIAR regarding effects to the road network.

5.14.4 Response to Stakeholder Concerns

The rEIAR makes no reference to concerns from stakeholders.

5.14.5 Effect of Decommissioning

The Chapter notes that potential impacts on material assets as a result of decommissioning activities are likely to be similar to those experienced during the construction of the project, which is a reasonable assumption.

The Chapter notes that based on the age profile much of the forestry estate surrounding the wind farm may be subject to felling in the coming decade but that these activities are not expected to coincide with the anticipated project decommissioning date of circa. 2040 and therefore no significant cumulative impacts are anticipated in that regard. No information is provided regarding the source of information or whether consultations have been undertaken with Coillte regarding forestry felling plans to substantiate this.

5.14.6 Effectiveness of Proposed Mitigation Measures

The mitigation section of the Chapter states that the total area of the forestry felled was circa 150 ha, inclusive of roads, firebreaks, forest plantations and some open areas and that the replanting requirement was 119.3ha of forest plantation comprising a mixture of Sitka Spruce, Lodgepole pine and Broadleaves, which appears to have been proposed at locations remote from the wind farm. No information is included on how the area replanted was agreed with statutory bodies. No information is provided to confirm this mitigation was undertaken.

No remedial mitigation measures or monitoring is in relation to Material Assets are proposed.

5.14.7 Recommendations for Further Mitigation Measures

Although felling of the forestry surrounding the wind farm is not anticipated to be undertaken at the same time as decommissioning, consultation with Coillte should be undertaken and their felling plans reviewed.

During decommissioning the contractor could be required to be obliged to put measures in place to ensure that there are no interruptions to existing utilities and services unless this has been agreed in *advance with the relevant service provider.*

5.14.8 Additional Information or Evidence Required

There is no evidence provided to confirm the replacement planting proposed was undertaken. Information could be provided on the location of the planting sites, areas planted and whether the establishment was successful.

5.14.9 Reasonableness of Conclusions and Need for Possible Remedial Works

The assessment methodology broadly follows the criteria set out in Table 3.3 Description of Effects in *the EPA Draft Guidelines, although it is unclear how Table 13-1 Classification of Significance set out* within the rEIAR has been applied. The conclusions however seem on the whole reasonable, although the conclusion that felling of forestry on the wind farm site prior to construction is a neutral effect is questionable.

Notwithstanding the above, it is considered unlikely that any remedial works for the existing operation of the wind farm would be required for material assets. Confirmation that replacement planting for forestry felled was undertaken should be sought. Consultation with Coillte regarding their felling plans in the future is also recommended.

5.15 Traffic and Transport

5.15.1 Compliance with Legislation and Best Practice

Chapter 14 discusses the impact of the development with respect to Traffic and Transport. It sets out the guidelines which have been followed in the preparation of the assessment, namely the Traffic and Transport Guidelines (2014) published by Transport Infrastructure Ireland, and the draft Guidelines on the Information to be Contained in EIARs.

Whilst the wider rEIAR has been prepared in accordance with the EIA Directive, it is not made clear which specific legislation the Traffic and Transport Chapter accords with.

It is not made clear how the study area or method of the Chapter have been derived. EC Guidance on Scoping (2017) notes that scoping is not mandatory under the EIA Directive, the guidance states that it is good practice to undertake scoping even if it is not required by legislation (Section 1.4). In the absence of scoping, it is not known whether the developer has fixed the study area and method with the agreement of the competent authority or its consultees, such as Galway County Council.

The Directive stipulates, at Annex II.A, that a description of the location of the project, with particular regard to the environmental sensitivity of geographical areas likely to be affected, must be provided. It is noted that Figure 14.1 does not illustrate the full extents of the study area, omitting key roads such as R458 and the M18.

The environmental sensitivity of geographical areas within the study area has not been defined. For example, populated areas such as Gort, which lies on the R380 between Derrybrien and the M18, have not been explicitly considered.

In accordance with Article 5(3) of the EIA Directive, the author of the Chapter, and their experience and qualifications, has been given.

The Chapter does not set out any transport policy against which the development should be assessed. The EC Guidance on the Preparation of the EIARs (2017) notes that the significance of effects should be clearly explained with reference to legal or policy requirements or other standards.

5.15.2 Baseline Information

The Chapter advises that, in the absence of baseline traffic data prior to construction of the wind farm, the assessment has been undertaken on a qualitative basis.

No baseline traffic flows are given for Black Road nor the R353 nor the R458 (in Gort), all of which are public roads with existing environments of varying sensitivity. For example, R458 passes through the town centre of Gort, and therefore would likely have medium or high sensitivity.

The EIA Directive states, at Annex IV, that the Environmental Impact Assessment Report should include:

"A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge."

The criteria included within the EIA Directive is therefore equivocal as to the necessity of describing baselines on a quantitative basis. However, a reasonable interpretation of the criteria in the context of transport planning would be that 'information' means traffic data, and traffic data is quantitative by its very nature. In addition, it would not constitute 'unreasonable effort' on the part of a developer to attempt to quantity traffic flows, even retrospectively. Based on this interpretation, the failure of the developer to set a baseline in quantitative terms does not meet the requirements of the EIA Directive.

This point is relevant for all stages of assessment with respect to significance of effects, as described below.

The EC Guidance on the Preparation of the EIAR elaborates on assessment method, at Section 1.4.2, stating that *significance determinations should not be the exclusive prerogative of 'experts' or 'specialists': significance should be defined in a way that reflects what is valued in the environment by regulators and by public and private stakeholders.* The assessment of a baseline in qualitative terms equates to a prerogative of experts. On the basis of this interpretation, the failure of the developer to set a baseline in quantitative terms does not comply with the EC Guidance.

With regards to traffic and transport, the value of the existing environment is a direct function of existing traffic flows. On this basis, the magnitude of impacts should be calculated from the relative change compared to the baseline.

This is of particular relevance for assessing the effects of decommissioning, for which existing traffic data could be used to form a future baseline. Whilst the EC Guidance on the Preparation of the Environmental Impact Assessment Report acknowledges that data can be difficult to find, it suggests that proxy indicators can be used to understand the environmental situation (Section 1.2.2). The Chapter neither presents traffic survey data nor proxy indicators and therefore does not comply with the EC Guidance.

5.15.3 Appropriateness of Assessment Methodology and Significance Criteria

The Chapter has been prepared with regard to Traffic and Transport Guidelines (2014) published by Transport Infrastructure Ireland (Ref 58), and the draft Guidelines on the Information to be Contained in EIARs (2017) published by the Environmental Protection Agency. It is noted that the Chapter should also have been prepared in accordance with the EC Guidance on the Preparation of the Environmental Impact Assessment Report.

Figure 3.5 of the draft Guidelines sets out that the significance of effects should be derived from the sensitivity and significance of the existing environment combined with the magnitude and duration of the impact. The Chapter defines a significant effect as one that "*supports or undermines the operation of the roads and transport environment and the traffic experienced in that environment*" (Section 14.1.3.1).

The EC Guidance on the Preparation of the EIAR states that (Section 1.4.2), when those preparing the EIA report have to determine the significance of effects, the assessment of significance should be based on clear and unambiguous criteria:

Significance criteria take both the characteristics of an impact and the values associated with the environmental issues affected into account.

Significance is always context-specific and tailored criteria should, thus, be developed for each Project and its settings.

The Guidance elaborates that it is important that the assessors set out a transparent methodology that explains how they approach the assessment and that they then demonstrably apply that methodology in their assessment.

The Chapter does not set out the method for establishing the existing environmental sensitivity of geographical areas within the study area, nor does it set out a transparent method for establishing the magnitude of impacts. In the absence of either, it is not possible to validate the assessment of the significance of effects.

The sensitivity of the existing environment should consider all who interact with the transport network, ranging, for example, from long-distance hauliers to pedestrians crossing a road. It is not appropriate to only consider those travelling by motor vehicle as part of the existing environment.

Given the time that has passed since the construction of the wind farm, the Chapter acknowledges that difficulties were encountered in estimating trip generation during construction. Consequently, a conservative approach has been taken to the estimation of trip generation, which is considered appropriate.

5.15.4 Response to Stakeholder Concerns

Public comments regarding the rEIAR have been made in relation to traffic management and the improvement of existing roads. The rEIAR states that a Traffic Management Plan (TMP) will be agreed with Galway County Council prior to mitigation, however details of the measures that might be included within the TMP are not specific. The measures should be directly related to the likely significant effects, and be specific, measurable, and time bound. In this respect the rEIAR has not addressed stakeholder concerns.

5.15.5 Effect of Decommissioning

The Chapter considers the impacts of traffic generated by personnel travelling to and from the site during decommissioning. The Chapter has assumed a 100% mode share for travelling by car and an occupancy of 1.25 workers per vehicle. At the peak of decommissioning, this results in 128 vehicular trips (64 arrivals and 64 departures) per working day. It is not made clear how many working days per week are assumed, therefore it is not possible to determine whether assessment of effects should be undertaken for a weekday, weekend day, or average day.

Whilst the percentage change in traffic volumes is identified for the M18, it is not identified for Black Road, R353, R380, and R458. In the absence of this data, it is not possible to determine the magnitude of impacts on any of these roads and therefore the significance of effects cannot be established. The EIA Directive requires that the consideration of likely significant effects accounts for the magnitude and spatial extent of the impact, neither of which are given in the Chapter.

The Chapter states that "impacts on Black Road and the surrounding local road network will be more significant given the low baseline levels which exist on the local road network." However, the significance of effects has not been derived from the sensitivity of the existing environment, which is not specified, nor the magnitude of the impact. As raised prior, no baseline traffic flow data nor proxy data is provided.

It should be noted that changes in traffic flows appear to have been taken as the impacts on the transport network. Changes in traffic flows are not impacts in themselves, rather changes in traffic flows result in impacts such as delay, severance, or accidents. These impacts do not appear to have been considered by the Chapter.

The Chapter forecasts an average maximum of 10 HGV trips per day for material removal (5 arrivals and 5 departures) and 10 abnormal load trips per day (5 arrivals and 5 departures) for removal of components. As with the trips generated by personnel, the significance of the effects caused by HGV trips has not been related to the sensitivity of the existing environment and the magnitude of impacts.

5.15.6 Effectiveness of Proposed Mitigation Measures

To mitigate the movement of abnormal loads during decommissioning, it is proposed that these movements would generally occur at night. As the significance of the effects of abnormal load movements, such as delay, severance, and accidents, has not been determined, it is not possible to comment on the effectiveness of the proposed mitigation measures. It is however noted that the movement of abnormal loads at night should be considered in the context of other topics, such as noise and ecology.

During decommissioning, it is proposed that a TMP is implemented to minimise impacts on the surrounding transport network and its users. As the geographic scope and mitigation of impacts has not been defined, and the sensitivity of the existing environment has not been classified, it is not possible to comment on the effectiveness of a TMP in mitigating any likely significant effects.

In this respect, the Chapter does not comply with the EIA Directive.

5.15.7 Recommendations for Further Mitigation Measures

No mitigation is currently proposed for the effects of travel by personnel. Following further assessment to understand whether there would be any significant effects resulting from this travel, the need for mitigation should be revisited.

Further information should be given on the measures to be included in the TMP, including the geographic and temporal scope of these measures.

The effects of HGV trips may require further mitigation if any of the effects are found to be significant. This should be clarified when further assessment is undertaken.

5.15.8 Additional Information or Evidence Required

It is considered that the following additional information and evidence is required to understand whether there would be any significant traffic and transport effects resulting from the decommissioning of the project:

- Baseline traffic flow data for Black Road, R353, R380, and R458.
- Classification of the existing environmental sensitivity of geographical areas within the study area.
- Calculation of the magnitude of traffic and transport impacts, such as delay, severance, accidents etc. within the study area.
- Determination of the significance of traffic and transport effects based upon the above.

This additional information and evidence should be provided for the decommissioning of the project to understand the need for and effectiveness of mitigation measures.

5.15.9 Reasonableness of Conclusions and Need for Possible Remedial Works

Given the deficiencies in the assessment outlined prior, it cannot be considered that the conclusions are reasonable as it is not possible to validate the likely significant effects. Further information is required, and this may alter the conclusions of the Chapter.

Notwithstanding the above, it is considered unlikely that any remedial works for the existing operation of the wind farm would be required for traffic and transport reasons, however further mitigation may be needed for the decommissioning of the project.

5.16 Cultural Heritage

5.16.1 Compliance with Legislation and Best Practice

Section 15.2.1 of Chapter 15 provides a description of the legal and planning framework relevant to Cultural Heritage. The legislation and policy presented is comprehensive. The Galway County Heritage and Biodiversity Plan 2017-2022 could have been included.

No best practice guidance is listed. A reference to the Institute of Archaeologists of Ireland Code of Conduct could have been included. Given the need for tree clearance to facilitate the development reference to the Code of Practice between Coillte and the Minister for the Environment and Local Government could also have been included.

5.16.2 Baseline Information

Section 15.1.1 states that the study area applied in the assessment is 3km from the site boundary for *the windfarm and 100m either side of the Derrybrien-Agannygal 110kV Overhead line and Agannygal* substation. While this study area is not inappropriate a larger study area would have allowed for a greater understanding of potential significant effects on heritage assets of the highest value such as designated Record of Monuments and Places (RMP) sites.

A desk-top study was carried out to inform the rEIAR. Baseline data was collected from:

- The Sites and Monuments Record (SMR)
- The Record of Monuments and Places (RMP) for County Galway
- The Record of Protected Structures (RPS)
- The National Inventory of Architectural Heritage (NIAH)
- County Galway Development Plan
- Historic Environment Viewer

Information on previous archaeological assessments within the study area including those prepared for planning applications associated with this development. It is noted that no report on the archaeological monitoring of the first construction phase of the wind farm during 2003 was available.

- UNESCO World Heritage Sites and Tentative List
- National Inventory of Architectural Heritage (NIAH)
- Database of Irish Excavation Reports
- National Museum of Ireland (NMI) Topographical Files
- National Monuments Service (NMS) Archives
- Historical publications and cartographic sources
- Aerial Imagery
- Placenames Database of Ireland
- Irish National Folklore Collection

A site visit was carried out in August 2018 and October 2019.

Section 15.1.4 of the chapter states that archaeological monitoring of ground works was carried out during the first phase of construction of the wind farm but the report on these works could not be sourced. The authors of the chapter made contact with the archaeologist who carried out the work and obtained written confirmation that nothing of archaeological significance was revealed in any area of the site.

Overall the desk-based sources consulted are comprehensive and appropriate. The lack of a report detailing the archaeological monitoring carried out during the first phase of the construction of the windfarm is unfortunate.

The baseline section identified one archaeological asset within the site boundary – a levelled cashel. It is noted in the Chapter that this record was not included in the RMP for Co. Galway or the SMR until 2015. It is possible that below ground remains associated with this asset could have been present during the construction of the windfarm. Section 15.2.3.2 notes that the asset is located in an area of a borrow pit for the windfarm which was archaeologically monitored and no remains recorded. However, the lack of a report detailing this monitoring does represent a gap in the record.

The windfarm site is located in an area of upland peat bog. Peat and peat bogs are well known to provide excellent preservation of organic remains and can be a fantastic source of palaeoenvironmental evidence. The chapter does not acknowledge this potential.

5.16.3 Appropriateness of Assessment Methodology and Significance Criteria

The impact assessment methodology and significance criteria applied in the chapter is based on ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties 2011 (Ref 59). This is appropriate.

5.16.4 Response to Stakeholder Concerns

No specific stakeholder concerns in relation to cultural heritage are raised.

5.16.5 Effect of Decommissioning

Section 15.2.7.3 of the Chapter deals with decommissioning, noting that the removal of above ground elements and underground cables will take place in previously disturbed ground, while other elements of the wind farm will be left in situ. Some regrading of land will take place following the removal of barrages 3 and 4. The Chapter focuses on the lack of known cultural heritage assets within the areas of proposed activity. It is silent on the prospect of previously unrecorded assets being impacted by decommissioning activities (in particular the land regrading) and does not consider the possibility of decommissioning activities presenting an opportunity to carry out investigations into the potential for archaeological preservation within the peat deposits.

5.16.6 Effectiveness of Proposed Mitigation Measures

The Chapter does not propose any mitigation measures for significant or non-significant adverse cultural heritage effects. However, it does state that "*All detailed proposals for the decommissioning of the wind farm and overhead line will be subject to an archaeological assessment to determine if ground works will be required in undisturbed areas outside the footprint of the existing development that may have the potential to impact on any unrecorded, sub-surface archaeological features or artefacts that may exist within the subject areas. Any such works will be subject to archaeological monitoring carried out by a suitably qualified archaeologist operating under a licence issued by the NMS*". It is therefore considered that some mitigation measures in the form of archaeological monitoring are being proposed. The effectiveness of these measures will depend on their exact scope and nature – assessment and monitoring that acknowledges and accounts for the potential for as yet unrecorded remains to be present, particularly within the peat deposits, will be more effective than assessment and monitoring that focuses solely on known heritage assets.

5.16.7 Recommendations for Further Mitigation Measures

The need for further mitigation measures will be identified if and when the proposed scope and methodology for the proposed assessment and monitoring is made available.

5.16.8 Additional Information or Evidence Required

A statement regarding the archaeological potential of the peat would be helpful. It would also be helpful for the scope of the proposed archaeological assessment and monitoring to be clarified and for that scope to appropriately consider the archaeological potential of the peat.

5.16.9 Reasonableness of Conclusions and Need for Possible Remedial Works

On balance the conclusions are reasonable and they do recognise that archaeological monitoring was carried out during construction of the windfarm, in the peat slide area and during remedial works. There is a reliance on records of known heritage assets and there is a slight omission in considering the archaeological potential of peat deposits.

5.17 Major Accidents and Disasters

5.17.1 Compliance with Legislation and Best Practice

Chapter 16 of the rEIAR sets out the requirement to consider Major Accidents and Disasters as required by the EIA Directive. It correctly references Annex IV (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters); and 8 which states the following:

'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 (1) or Council Directive 2009/71/Euratom (2) 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'.

However, the Chapter notes that an assessment of major accidents was not required at the time the permission was granted.

The Chapter also sets out the wider United Nations and EU Policy content on natural and man-made disasters and how the topic was integrated into the EIA Directive. It goes on to set out the National, Regional and Local emergency management frameworks.

5.17.2 Baseline Information

Section 16.4 presents the baseline information (receiving environment) across five key aspects set out in the Framework for Major Emergency Management 2006 (MEM Framework) (Ref 60).

The Chapter provides a sufficient description of the social, natural hazards, infrastructure and hazardous sites and provides a detailed account of the Derrybrien peat slide that occurred in 2003. This detailed account makes reference to investigations undertaken to identify the cause of the land slide. However, the baseline lacks a detailed review of the baseline conditions of the peat at the site prior to the land slide.

5.17.3 Appropriateness of Assessment Methodology and Significance Criteria

The scope of the assessment is comprehensive considering the construction phases 2003 and 2003 - 2006, the peat slide which occurred in 2003, the operational phase from 2006 to circa 2040 and the decommissioning phase.

The methodology clearly sets out how risks have been evaluated using an Emergency Risk Rating Matrix that draws from the classification of likelihood and ranking of impact criteria derived from the 2010 guidance produced for Principal Response Agencies by the Department of Environment, Heritage and Local Government (DOEHLG) (Ref 61) in relation to emergency management. However, no link is made between the risk ratings and 'Significance of Effect' in terms of the EIA Directive. In order for the consenting authority to properly consider the effects of potential accidents/hazards it is necessary for the resulting significance of effects on receptors to be understood. The assessment methodology does not provide a framework to make these links.

5.17.4 Response to Stakeholder Concerns

There is no evidence within the Chapter of any response to stakeholder concerns. This is a major omission given the significant concerns stakeholders have following the peat slide in 2003 where public roads and bridges were inaccessible for long periods of time and watercourses were blocked with peat.

Recently the developer has placed a Hazard sign at the entrance to the turbary stating that there is a risk of instability if peat cutting activities are undertaken. This prevents the local residents from obtaining a fuel supply for use next winter but has also heightened concerns about site stability, despite continued assurances from the developer (and repeated in the rEIAS) that mitigation measures have rendered the site safe. See Section 5.11.4 and Appendix C for details.

5.17.5 Effect of Decommissioning

Section 16.5.4 covers the effects from decommissioning the project but provides no evidence to demonstrate that the decommissioning phase would not increase the risk of a further peat slide. It simply states that the operation phase will continue to reduce the risk due to the drainage improvement and sustained loading of the peat from the constructed infrastructure. However, in Chapter 10 the report states that the drainage structures would not be maintained following decommissioning and would likely become obstructed by debris. It is incongruous to state on one hand state that maintenance of a robust drainage system is vital for site stability but that following decommissioning maintenance will stop and permit the drainage system to fail having undertaken no mitigating management to stabilise such a future scenario.

5.17.6 Effectiveness of Proposed Mitigation Measures

Prior to the peat slide and in absence of mitigation measures the peat stability risk assessment determined that the risk of a peat slide was likely. Following the implementation of mitigation measures in the second phase of construction (after the peat slide occurred), the peat stability risk assessment found the risk to be reduced to very unlikely to unlikely

During operation no further mitigation measures are proposed and it is stated that it is anticipated that the likelihood of a peat slide will continue to reduce due to the drainage improvement and sustained loading of the peat from the constructed infrastructure and resulting increase in peat strength. This

does not take into account the projected impacts of climate change that may lead to peat slides resulting from periods of drought and/or heavy rainfall.

5.17.7 Recommendations for Further Mitigation Measures

Given the repeated evidence of slope failure both on the site itself, in the surrounding landscape, and *across Ireland as a whole, is that some form of suitable restoration intervention will be required on the* Derrybrien site prior to completion of decommissioning to ensure long-term stability of the area (See Section 5.11).

Either a long-term maintenance plan following decommissioning should be implemented or works to restore the peat to a point where long term maintenance is not required should be considered.

5.17.8 Additional Information or Evidence Required

The principal concern relating to Major Accidents and Hazards for this project is the risk of a further peat slide. The rEIAR provides an assessment that concludes that the continued operation of the windfarm will reduce the risk of further peat slides but provides little evidence to justify this. As outlined in section 5.18.5, further evidence is required to demonstrate that following decommissioning, the risk of a peat slide will not increase.

5.17.9 Reasonableness of Conclusions and Need for Possible Remedial Works

The assessment concluded that conditions on the windfarm site were suitable for the project with appropriate design and mitigation measures for working in peat based on The Landslide Susceptibility Map.

The report also concludes that wind farm activities for the decommissioning phase are not expected to result in any further peat slides. This is attributed to the current improved site conditions that will remain for the operation phase (until 2040) and it is stated that the likelihood of a peat slide will continue to reduce due to the drainage improvement and sustained loading of the peat from the constructed infrastructure and resulting increase in peat strength. The likelihood of a peat slide during decommissioning is considered to be very unlikely in the assessment. Without sufficient evidence to substantiate this claim, this conclusion is unreasonable. See Section 5.12 for details.

5.18 Interaction of Impacts

5.18.1 Compliance with Legislation and Best Practice

The Chapter sets out the requirement to consider interaction of impacts under Article 3.1 (e) of the EIA Directive and the EC guidance on the preparation of EIARs. This highlights Point (e) which sets out the need to consider the interaction between the different factors of the assessment.

5.18.2 Baseline Information

Baseline information is set out in each of the technical chapters. It is appropriate that it is not repeated in the Interaction of Impacts Chapter.

5.18.3 *Appropriateness of Assessment Methodology and Significance Criteria*

The Chapter states that the assessment methodology has followed the EPA Guidance Section 3.7 Interactions between Impacts of Different Factors. However, a description of the matrix (which underpins the EPA methodology) and how it works is not provided. Effects and their significance appear to have been described sporadically throughout the chapter without consistent use of the impact characteristics and the degree / nature of the effect.

The assessments are high level in nature and do not provide sufficient detail to justify conclusions within this chapter, although it is noted that reference is made to other chapters within the rEIAR where *further information is provided.*

In terms of intra project cumulative impacts, the report states that these are considered in the technical chapters. However, the methodology for identifying the other projects with the potential for cumulative effects set out in Section 2.5 is not provided.

5.18.4 Response to Stakeholder Concerns

The South Galway Flood Relief Committee raised that the cumulative effects of forestry felling and operations have not been considered in the rEIAR.

No response to stakeholder concerns is provided.

5.18.5 *Effect of Decommissioning*

The effects of decommissioning are set out across all the technical topics.

5.18.6 Effectiveness of Proposed Mitigation Measures

No mitigation measures are proposed to ameliorate cumulative effects. For the most part this is acceptable as the assessment does not report any significant cumulative effects that require mitigation. However, in Section 17.3.2.3 the assessment identifies minor, negative temporary impacts that rely on the road widening activities been 'properly planned and supervised'. Further details should be provided to expand on what this means.

5.18.7 Recommendations for Further Mitigation Measures

Please see the technical sections for recommendations for further mitigation measures.

5.18.8 Additional Information or Evidence Required

The assessment methodology would benefit from a description of how individual effects are combined to determine a resulting effect significance. For instance, does the combined effect significance default to the most significant individual effect; do multiple minor effects combine into a more significant effect; or is the assessment made on a qualitative basis.

The assessment should clearly set out how the conclusions on cumulative effects have been reached using a consistent methodology. A review of potential tree feeling cumulative effects on ecological features and hydrology should be considered as a minimum.

5.18.9 Reasonableness of Conclusions and Need for Possible Remedial Works

The assessment presents effects identified in the technical chapters with the potential cumulative effects but does not include an assessment to properly consider how these effects may interact to result in a potentially more significant residual effect.

The assessment also excludes cumulative tree felling impacts stating that "only the impact of felling associated with the wind farm project was considered and any other felling carried out in the area during construction and following commissioning is beyond the study scope". Given that the project involved the felling of 222ha of forest, this is considered to be a major omission from the assessment.

5.19 Summary of Remedial Measures

When setting out the scope of the Chapter reference is made to clause 177F. – (1) of the Planning and Development Act 2000 highlighting the requirement to set out any appropriate remedial measures undertaken or proposed to be undertaken by the applicant for substitute consent to remedy any significant adverse effects on the environment.

The chapter provides a useful summary of all the remedial measures identified in the technical chapters setting out their duration, stage of impact and status. The presentation of the measures is comprehensive and easy to follow.

Discussion of the effectiveness of the proposed remedial measures is presented in each of the technical chapter reviews (Sections 5.6-5.19).

6 Conclusions

In terms of scope, the rEIAR satisfies most of the content requirements of the EIA Directive as set out in Articles 3 and 5. The exception is the requirement to estimate quantities and types of waste as set out in Annex IV. The rEIAR only provides a short passage of text setting out that all demolition waste *will be removed from site and reused / recycled where possible. Considering the scale of the* decommissioning activities (i.e., removal of 70 turbines), this is a major omission and renders the rEIAR non-compliant with the EIA Directive.

Although the rEIAR references the most up to date best practice guidance, a scoping process was not undertaken which is considered to be a very important best practice activity to ensure that the assessment addresses all the key issues with agreement from statutory consultees. The lack of a scoping process is evident in the complaints from statutory consultees such as the South Galway Flood Relief Committee.

In accordance with the EIA Directive, a five-week participation window was provided for public consultation on the rEIAR following submission. Whilst there has been an opportunity for public participation to take place, there is a question mark over the effectiveness of participation enabled by this opportunity, given the complex nature of the topic, the volume of application documents and the reasonableness of the timeframe for comments / inputs by members of the public. The rEIAR Non-Technical Summary states "Gort Wind Farms Limited has engaged with the general public in relation to the Derrybrien Wind Farm Project throughout the development and operation of the Project." All of the complaints received by the EC contradict this claim and a complaint was made by a local resident that although there was a 30-day public consultation period starting on 21 August 2020, the documentation was not accessible until 27 August 2020.

In compliance with the EIA Directive the rEIAR considers alternatives, however, it is questionable how likely the developer is to develop alternative energy projects on the site and therefore how far these constitute reasonable alternatives. The most relevant reasonable alternatives are decommissioning and remediation options. In comparison to the other alternatives considered in the rEIAR, this alternative is given very brief consideration, and the reasons for selecting the chosen option are not dealt with in any detail. The removal of one or more parts of the development should be considered as a reasonable alternative. Neither changes to the current operational site nor alternatives during decommissioning have been considered. In conclusion, whilst it is considered that the consideration of alternatives largely meets the requirements of the EIA Directive, its usefulness to decision makers is questionable and full consideration of reasonable alternatives during decommissioning has not be covered sufficiently.

The assessment methodology for the rEIAR is clearly set out in the introductory chapters and supplemented by chapter specific methodologies and effect significance criteria. However, inadequacies have been identified in the methodologies for the Population and Human Health; Terrestrial Biodiversity; Landscape and Visual; Traffic and Transport; Soils, Land and Geology; Material Assets and Interaction of Impacts assessments. Inadequacies include invalid survey methods and not applying the stated significance criteria within the assessments. These inadequacies invalidate the conclusions of some assessments, and the appropriateness and effectiveness of the proposed mitigation measures cannot subsequently always be determined.

Given that construction is complete, decommissioning should be a key focus of the rEIAR. It is therefore welcomed that all the technical assessments include a section dedicated to the consideration of the effects of decommissioning. However, the conclusions that the assessments come to regarding adverse effects during and after decommissioning are not sufficiently evidenced.

The Soils, Land and Geology and the Major Hazards and Accidents chapters provide no evidence to demonstrate that the decommissioning phase would not increase the risk of a further peat slide. It simply states that the operation phase will continue to reduce the risk due to the drainage improvement and sustained loading of the peat from the constructed infrastructure. However, in Chapter 10 the report states that the drainage structures would not be maintained following decommissioning and would likely become obstructed by debris. It is incongruous to on one hand state that maintenance of

a robust drainage system is vital for peat stability but that after decommissioning maintenance will stop and permit the drainage system to fail having undertaken no mitigating management to stabilise such a future scenario.

The rEIAR adequately describes the emergency mitigation undertaken following the peat slide. However, the mitigation proposed during operation and decommissioning are in some cases inadequate and lack evidence to demonstrate their efficacy. The following points highlight the key concerns relating to the proposed mitigation or lack thereof.

- With regard to noise, additional mitigation especially during decommissioning relative to weekend working is required. There is no specification of how decommissioning activities would be monitored to ensure compliance with appropriate thresholds. This would need to be specifically considered within any Environmental Management Plans or Codes of Practice necessary for the decommissioning works and would require detailed measures to be presented for control and monitoring of decommissioning activities.
- With regard to Biodiversity, there appears to be significant lack of mitigation proposed during both operation and decommissioning. No mitigation is proposed for terrestrial habitats following the emergency peat slide mitigation and monitoring is not mentioned. Bird monitoring of Hen Harrier will continue at 3-year intervals and flight diverters will be erected on the OHL but no other bird monitoring is proposed. For bats, no monitoring is proposed to evaluate the success of additional roosting provision. There is also no monitoring for mammals proposed which is considered a significant omission. It is recommended that an overarching management and monitoring plan should be provided, detailing the receptors, surveys, years of survey and management required over the years up to decommissioning (see Section 6.8.10 for details).
- In terms of peat instability, monthly visual inspections supplemented by an annual walkover by a qualified geoengineer, and maintenance of the drainage system are proposed. No other mitigation measures are offered by the rEIAR. There is currently no automated instrumental monitoring anywhere on the site and there are no plans to install any such instrumentation. The only 'quantitative' monitoring devices now are seven 'sighting poles' designed to detect by eye whether there is any sign of peat movement. The remainder of the site has no monitoring devices. Consequently, there is no means of judging the effectiveness of the two systems of mitigation measures currently employed. Tests should be started now to determine the best approach, or approaches, for stabilising the site into the long term. For instance, there is case study evidence for the success in using old salmon-farm netting to stabilise eroding peat slopes and establishing new growth of peat-forming Sphagnum swards (see Section 5.11). Tests might be undertaken to explore the potential of combining netting, or jute netting with the use of 'soil nails'. Either a long-term maintenance plan following decommissioning should be implemented or works to restore the peat to a point where long-term maintenance is not required should be considered.

Based on the technical review of the rEIAR against the requirements of the EIA Directive, it is recommended that further information is provided before the consenting authority can make an informed decision on this application. With the exception of the omission of an assessment of the likely significant effects of the project on the environment resulting from the disposal of waste, the rEIAR is generally in accordance with the requirements of the EIA Directive. However, inadequacies have been identified within the assessments which lead to uncertainty around the validity of the conclusions and the suitability and effectiveness of proposed mitigation. In addition, omissions in the required mitigation have been identified, specifically relating to terrestrial ecology and peat stability. Specifically, more evidence is required to demonstrate that following decommissioning the site will be returned to a state in which there is not an unacceptable risk of further peat slides.

7 List of Consulted Sources

Table 7-1 List of Consulted Sources

Ref No.	Consulted Source
Ref 1	Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 on the assessment of the effects of certain public and private projects on the environment. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0052
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Ref 3	Commission v Ireland (C-215/06, EU:C:2008:380) Available at: https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:62006CJ0215
Ref 4	Directive 85/337/EEC of the European Parliament and of the Council of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A31985L0337
Ref 5	Directive 97/11/EC of the European Parliament and of the Council 3 March 1997 amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31997L0011
Ref 6	Commission v Ireland (C-261/18, EU:C:2019:955) Available at: https://curia.europa.eu/juris/liste.jsf?language=en&td=ALL&num=C-261/18
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Ref 10	Environmental Protection Agency, (2017), Guidelines on the Information to be Contained in EIARs (draft) Available at: https://www.epa.ie/pubs/advice/ea/EPA%20EIAR%20Guidelines.pdf
Ref 11	Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment Available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32001L0042
Ref 12	British Standards Institution (2014), Code of practice for noise and vibration control on construction and open sites. BS 5228-1:2009+A1:2014
Ref 13	ETSU-R-97:The Working Group on Noise from Wind Turbines (1996), The Assessment and Rating of Noise from Wind Farms (ETSU R97). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/49869/ETSU_Full_copy__Searchable_.pdf
Ref 14	*Institute of Acoustics (2013), Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating* of Wind Turbine Noise as the Main Vehicles for Assessment Available at: https://www.ioa.org.uk/sites/default/files/IOA%20Good%20Practice%20Guide%20on%20Wind%20Turbine%20Noise%20-%20May%202013.pdf

Ref No.	Consulted Source
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Ref 16	Department of Housing, Local Government and Heritage (2006), Wind Energy Development Guidelines Available at: https://www.gov.ie/en/publication/f449e-wind-energy-development-guidelines-2006/
Ref 17	Department of Housing, Planning and Local Government (2019), Wind Energy Development Guidelines (draft) Available at: https://www.gov.ie/en/publication/9d0f66-draft-revised-wind-energy-development-guidelines-december-2019/
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Ref 21	Department of Housing Planning and Local Government, (2018), Project Ireland 2040 National Planning Framework Available at: https://npf.ie/project-ireland-2040-national-planning-framework/
Ref 22	Galway County Council, (2018), Galway County Heritage and Biodiversity Plan 2017-2022, available at: https://dpdgay9x1sxad.cloudfront.net/wp-content/uploads/sites/6/2020/05/Galway-County-Heritage-and-Biodiversity-Plan-2017-2022.pdf
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Ref 24	Collins, J. (ed) (2016) Bat Surveys for the Professional Ecologists: Good Practice Guidelines (3rd edn.) Available at: https://cdn.bats.org.uk/pdf/Resources/Bat_Survey_Guidelines_2016_NON_PRINTABLE.pdf?mtime=20181115113931&focal=none
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Ref No.	Consulted Source
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Ref 30	Chartered Institute of Ecology and Environmental Management. (CIEEM) (2021), Guidance on Ecological Survey and Assessment in the UK During the COVID-19 Outbreak Version 4 https://cieem.net/wp-content/uploads/2020/06/CIEEM-Guidance-on-Alternative-Approaches-v4-FINAL.pdf
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Ref 32	Norriss, D.W., Marsh, J., McMahon, D. & Oliver, G.A. 2002. A national survey of breeding Hen Harriers Circus *cyaneus in Ireland 1998- 2000. Irish Birds 7: 1-10*
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Ref 38	Henry, A., 2018. Bat roosts in trees: A Guide to Identification and Assessment for Tree-Care and Ecology *Professionals, 1st ed. Exeter: Pelagic Publishing.*
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Ref 49	Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013), Guidelines for Landscape and Visual Impact Assessment (GIVIA). 3rd edition, Routledge
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Ref 60	Framework for Major Emergency Management 2006 (MEM Framework). Available at: http://mem.ie/wp-content/uploads/2015/05/A-Framework-For-Major-Emergency-Management.pdf
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APPENDIX A

ES Review Checklist

SECTION 1 DESCRIPTION OF THE PROJECT				
No.	Review Question	Relevant?	Adequately Addressed?	What further information is needed?
The Objectives and Physical Characteristics of the Project				
1.1	Are the need for and objectives of the project explained?	Yes	Yes	
1.2	Is the programme for implementation of the Project described, detailing the estimated length of time and start and Finnish dates for construction, operation and decommissioning? (this should include any phases of different activity within the main phases of the Project, for example extraction phases for mining operations)	Yes	Yes	
1.3	Are all the main components of the project described (for assistance see the Checklist of Project Activities in Part C of the Scoping Guide in this series)	Yes	Yes	
1.4	Is the location of each Project component identified, using maps, plans and diagrams asnecessary?	Yes	Yes	
1.5	Is the layout of the site (or sites) occupied bythe project described? (including ground levels, buildings, other physical structures, underground works, coastal works, storage facilities, water features, planting, access corridors, boundaries)	Yes	Yes	
1.6	For linear projects, are the route corridor, the vertical and horizontal alignment and any tunnelling and earthworks described?	Yes	No	The corridor used for the grid connection is not appropriate in its presented form, being constrained to a simple constant width (without justification or explanation) and all associated information being restricted to that width, whereas ground conditions should have been used to dictate the appropriate corridor width (and environmental impact

				information provided) for any given section of the grid connection route.
1.7	Are the activities involved in construction of *the project all described*?	Yes	Yes	
1.8	Are the activities involved in operation of the project all described?	Yes	Yes	
1.9	Are the activities involved in decommissioning the project all described? (e.g. closure, dismantling, demolition, clearance, site restoration, site re-use etc.)	Yes	No	No site restoration details are offered. Instead, the developer proposes simply to leave the site to the effects of natural processes (good and bad) after removal of above-ground infrastructure.
1.10	Are any additional services required for the project all described? (e.g. transport access, water, sewerage, waste disposal, electricity, telecoms) or developments (e.g. roads, harbours, powerlines, pipelines)	Yes	Yes	
1.11	Are any developments likely to occur as a consequence of the Project identified? (e.g. new housing, roads, water or sewerage infrastructure, aggregate extraction)	No	N/A	
1.12	Are any existing activities which will alter or cease as a consequence of the Project identified?	Yes	No	It appears that traditional use of turbary rights may no longer be possible as a result of the development, due to instability which, it is reasonable to suggest, may have been initiated by changed drainage patterns established by the development. Investigation of these potential impacts would thus be required. It may also be the case that downstream river management (e.g. siltation) and flood mitigation will be required as a result of more rapid drainage from the hill slopes, requiring regular monitoring of sediment loads and water flows.
1.13	Are any other existing or planned developments with which the Project could have cumulative effects identified?	Yes	Yes	
The Size of the Project				

1.14	Is the area of land occupied by each of the permanent project components quantified andshown on a scaled map? (including any associated access arrangements, *landscaping and ancillary facilities*)	Yes	No	Areas cited in the report are inconsistent. Ecology Chapter states that "preconstruction the 344.5 ha wind farm site had 265 ha of conifer plantation of which 222 ha was felled to facilitate construction of the wind farm". Material Assets Chapter states The mitigation section of the Chapter states that the total area of the forestry felled was circa 150 ha. Confirmation of areas felled is required.
1.15	Is the area of land required temporarily for construction quantified and mapped?	Yes	Yes	