S. 37

File With _____

**SECTION 131 FORM**

**Appeal NO:** PL 04.248152 **Defer Re O/H** ☐

TO:SEO / For Board Direction

Having considered the contents of the submission dated/ received 16/11/A

from

Fehily Timoney & Company I recommend that section 131 of the Planning and Development Act, 2000 be/not be invoked at this stage for the following reason(s):_____

**E.O.:**_____ **Date:**_____

---

To EO:_____

Section 131 not to be invoked at this stage. ☐

Section 131 to be invoked – allow 2/4 weeks for reply. ☐

**S.E.O.:**_____ **Date:**_____

**S.A.O:**_____ **Date:**_____

---

**M** _____

**Please prepare BP** _____ **- Section 131 notice enclosing a copy of the attached submission**

**to:** _____

**Allow 2/3/4weeks – BP**_____

**EO:** _____ **Date:** _____

**AA:** _____ **Date:** _____

S. 37

File With _____

**CORRESPONDENCE FORM**

**Appeal No: PL** 04.248152

**M** S. Collins

**Please treat correspondence received on** 16/11/17 **as follows:**

| | |
|---|---|
| **1. Update database with new agent for Applicant/Appellant** _____ | |
| **2. Acknowledge with BP** 23 | **1. RETURN TO SENDER with BP** _____ |
| 3. Keep copy of Board's Letter ☐ | 2. Keep Envelope: ☐ |
| | 3. Keep Copy of Board's letter ☐ |

| |
|---|
| **Amendments/Comments** Response to S. 131 from Arran Windfarm Limited |
| |
| |
| |
| |

| | |
|---|---|
| **4. Attach to file** | |
| (a) R/S ☐ (d) Screening ☐ | **RETURN TO EO** ☑ |
| (b) GIS Processing ☐ (e) Inspectorate ☐ | |
| (c) Processing ☐ | |

| | |
|---|---|
| | Plans Date Stamped ☐ |
| | Date Stamped Filled in ☐ |
| **EO:** | **AA:** Ros |
| **Date:** 21/11/17 | **Date:** 21-11-17 |

**Jennifer Sherry**

**From:** procbordemail
**Sent:** Friday 17 November 2017 12:34
**To:** Jennifer Sherry
**Subject:** FW: PL04.248152-RESPONSE TO THIRD PARTY SUBMISSIONS
**Attachments:** P1339_Lett to ABP_Rpt 002_Ref PL04.248152.pdf; P1339_RPT_002.pdf

**From:** Bord
**Sent:** Thursday 16 November 2017 17:15
**To:** procbordemail <procbordemail@pleanala.ie>; Josephine Hayes <J.Hayes@pleanala.ie>
**Subject:** FW: PL04.248152-RESPONSE TO THIRD PARTY SUBMISSIONS

**From:** Silvia Garcia [mailto:silvia.garcia@ftco.ie]
**Sent:** 16 November 2017 16:50
**To:** Bord <bord@pleanala.ie>
**Cc:** Jim Hughes <jim.hughes@ftco.ie>; Deirdre Tobin <deirdre.tobin@ftco.ie>
**Subject:** PL04.248152-RESPONSE TO THIRD PARTY SUBMISSIONS

Dear Sir/Madam,

Find attached a submission to the ABP Planning Case Ref. PL04.248152.
It includes a letter and a response to 3rd party submissions report.

Regards,

**Silvia Garcia**
**Senior Project Scientist**
**Fehily Timoney & Company** | Core House | Pouladuff Road | Cork | T12 D773 | Ireland

Tel: +353 21 496 4133 Direct Dial: +353 21 496 9565
Fax: +353 21 496 4464
Mail to: silvia.garcia@ftco.ie | Web: www.fehilytimoney.ie

FEHILY TIMONEY & COMPANY

CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES

Our Ref: P1339/Lett/JH/MG

The Secretary
An Bord Pleanála
64, Marlborough Street
Dublin 1
D01V902

15 November 2017

**Re: Barnadivane Wind Farm, Co. Cork, (An Bord Pleanála Planning Ref. PL04.248152, Cork County Council Planning Ref. 14/557 – Response to Third Party Submissions made to An Board Pleanála**

Dear Sir/Madam,

Please find enclosed FTC's response to An Bord Pleanála's Planning Ref. PL04.248152, Cork County Council Planning Ref. 14/557.

If you should require any further information, please do not hesitate to contact the undersigned.

Yours sincerely,

Jim Hughes
for and on behalf of **Fehily Timoney & Company**

Encl.

ACEI
ENGINEERS IRELAND cpd

**CORE HOUSE, POULADUFF ROAD, CORK, IRELAND**
**T:** +353 21 4964133 **F:** + 353 21 4964464 **E:** info@ftco.ie **W:** www.fehilytimoney.ie
**Directors:** Eamon Timoney David McHugh Bernadette Guinan
**Company Secretary:** Sinead Timoney
Registered in Ireland, Fehily Timoney & Company Ltd. Number 180497
Registered Office: Core House, Pouladuff Road, Cork. VAT Registration Number: IE6580497D

# BARNADIVANE 110 KV SUBSTATION, TERELTON, CO. CORK, (AN BORD PLEANÁLA PLANNING REF. PL04.248152, CORK COUNTY COUNCIL PLANNING REF. 14/557) – RESPONSE TO THIRD PARTY SUBMISSIONS MADE TO AN BORD PLEANÁLA

## Arran Windfarm Limited

## NOVEMBER 2017

FEHILY TIMONEY & COMPANY

# BARNADIVANE 110 KV SUBSTATION, TERELTON, CO. CORK, (AN BORD PLEANALA PLANNING REF. PL04.248152, CORK COUNTY COUNCIL PLANNING REF. 14/557) – RESPONSE TO THIRD PARTY SUBMISSIONS MADE TO AN BORD PLEANÁLA

**User is Responsible for Checking the Revision Status of This Document**

| Rev. Nr. | Description of Changes | Prepared by: | Checked by: | Approved by: | Date: |
|---|---|---|---|---|---|
| 0 | Issue to ABP | DT/MG | JH | JH | 14.11.2017 |

**Client:** Arran Windfarm Limited

## TABLE OF CONTENTS



## LIST OF APPENDICES

## LIST OF FIGURES & TABLES

# 1 INTRODUCTION

## 1.1 Proposed Substation Development

On 26 September 2014, Arran Windfarm Ltd. submitted a planning application (planning ref 14/557) to Cork County Council for the development of a 110 kV substation at Barnadivane (Kneeves), Terelton, Co. Cork. This application was to replace a previously permitted 110 kV substation granted planning under An Bord Pleanála reference PL04.219620 (Cork Co. Co. reference 05/5907). A 10 year planning permission was sought for a development which consisted of:

> *The construction of an electricity substation compound, this application is intended to replace the substation already granted permission under PL04.219620 (05/5907) and subsequently extended under 11/6605. The electricity substation layout includes 3 no. control buildings, associated electrical plant and equipment, security fencing and ancillary works.*

Given that the proposed development comprises a 110 kV substation, the applicant engaged in pre-application consultations with An Bord Pleanála in 2014 (ref PL01.VC0074), as required under the Planning and Development Act, as amended. During this consultation process, the applicant outlined the key aspects of this proposed development to the Board. Following consideration of the issues, An Bord Pleanála determined that the development did not constitute Strategic Infrastructure Development, under the Act, and directed the applicant that the planning application should instead be made to Cork County Council.

The applicant also engaged in pre-application consultation with Cork County Council and other relevant stakeholders, in order to inform and scope the environmental assessment for the proposed development.

An EIA Screening Report was prepared and submitted to Cork County Council in advance of the planning application. This EIA Screening Report assessed the proposed development in terms of the relevant environmental and planning legislation and concluded that an EIS was not required for the development. Cork County Council also carried out its own EIA screening report and is included on file as "Senior Planners - EIA Screening" dated 6th November 2014). A copy of this report is included as Appendix 2. Cork County Council concludes in this report that "*an EIA is not necessary in this case and the proposal is sub-threshold*".

An Environmental Report and an Appropriate Assessment Screening Report were prepared, assessing the potential impacts of the proposed development on the surrounding environment and Natura 2000 sites respectively. These reports also assessed the potential cumulative impacts of the proposed development with the permitted wind farm and other relevant developments in the area, including the adjacent operational Garranereagh Wind Farm. The Environmental Report and the Appropriate Assessment Screening Report accompanied the planning application to Cork County Council.

On 13 January 2015, Cork County Council issued a Notification of a Decision to Grant Permission for the proposed development, subject to conditions, stating that:

*Having regard to the development plan objectives for the area and the pattern of development in this rural area, it is considered that subject to compliance with conditions attached in the Second Schedule, the proposed development would not seriously injure the amenities of the area and would not be prejudicial to public health and, therefore, would be in accordance with the proper planning and sustainable development of the area.*

## 1.2 3rd Party Appeals

A Third-Party appeal was lodged with An Bord Pleanála on the 9th February 2015 pursuant to ABP Ref. PL04.244439 and an Bord Pleanála issued an Order to consent development on the 11th July 2016. In making its decision ABP considered the concurrent and related appeal in respect of a proposed Barnadivane Wind Farm (Appeal No. PL04.245824). Consent was issued for the wind farm on the 8th of July 2016 and for the electricity substation compound on the 11th July 2016.

## 1.3 Judicial Review

However, following judicial review proceedings taken by a number of local residents (High Court Record Number 2016/614JR), the High Court ordered the quashing of the Board's decision relating to this appeal (PL04. 244439) and the associated appeal (PL04. 245824) relating to the Barnadivane Wind Farm. The court found that ABP failed to comply with fair procedures in not adhering to its own decision to circulate a submission made to it in January 2016 by Arran Windfarm Limited. The settlement provided that the matter be returned to the Board to be determined "in accordance with law". The High Court order was issued on the 1st of November 2016 and ABP quashed its decision relating to both appeals on the 27th of January 2017. The decision was quashed due to administrative errors by ABP in circulating appeal responses.

## 1.4 Re-activate 3rd Party Appeals

The appeal case relating to the Barnadivane Substation was re-activated by ABP on the 13th of March 2017 with a new case number (PL04.248152). The associated wind farm appeal case was also re-activated 2017 with a new case number (PL04.248153).

To adhere to the High Court finding ABP subsequently circulated the first party submission made to it in January 2016 by Arran Windfarm Limited to the third-party appellants.

Submissions were received by ABP in relation to this document from the following:

- Noonan Linehan Carroll Coffey, Solicitors (2nd August 2017).
- Stephanie Larkin & Michael O'Donovan (2nd August 2017)

This appeal response provides specific comment to the above referenced submissions.

# 2 BACKGROUND TO THE PROPOSED DEVELOPMENT

## 2.1 Background to the Proposed Development

The aim of this section is to provide the Board with a summary of the main elements of the proposed project.

## 2.2 Policy and Legislative Context

The proposed substation is considered to be in accordance with European, national and local policy and legislation as set out below. This was detailed in the Environmental Report which accompanied the planning application.

At EU level, the EU Directive on the Promotion of the Use of Energy from Renewable Sources (2009/28/EC)[i] sets a target of 20% of EU energy consumption from renewable sources by 2020 and a 20% cut in greenhouse gas emissions by 2020, the so-called 20:20:20 plan. As part of this Directive, Ireland's overall national target for the share of energy from renewable sources in gross final consumption of energy in 2020 is 16% (increased from 3.1% in 2005)[ii]. Ireland has set its own target in this respect, which is 40% of all electricity to come from renewable sources by 2020.

At national level, the National Spatial Strategy for Ireland (NSS) 2002-2020 states on page 36 that (emphasis added):

> *'National and international evidence also demonstrates that rural areas have a vital contribution to make to the achievement of balanced regional development. This involves utilising and developing the economic resources of rural areas, particularly in agriculture and food, marine, tourism, forestry,* ***renewable energy****, enterprise and local services, while at the same time capitalising on and drawing strength from vibrant neighbouring urban areas. In this way, rural and urban areas are seen as working in partnership, rather than competing with each other. This urban — rural partnership model is in line with the approach taken in the European Spatial Development Perspective (ESDP).'*

The White Paper 'Delivering a Sustainable Energy Future for Ireland'[iii] sets out the Government's Energy Policy Framework 2007 - 2020 to deliver a sustainable energy future for Ireland. It is set firmly in the global and European context which has put energy security and climate change among the most urgent international challenges. A number of key issues relating to renewable energy include the government's commitment to delivering a significant growth in renewable energy. The renewable target was increased to 40% of the electricity consumed in 2020 by the Minister for the Environment, Heritage and Local Government in his Second Carbon Budget in October 2008. It is estimated that wind energy will provide up to 90% of the energy required to meet this target.

The "All Island Grid Study" (2008), undertaken by the Department of Communications, Energy and Natural Resources, and the Northern Ireland Department of Enterprise, Trade and Investment, concluded that it was feasible to increase the share of electricity generated from renewable sources to 42% of total demand without incurring excess societal costs. The study concluded that the capacity of renewable plant required to deliver this contribution could include up to 6,000 MW of wind, 360 MW of base renewables such as biomass or biogas, and 285 MW of other variable renewables such as wave or tidal energy. Irish government targets are based on the results of this study.

According to the Irish Wind Energy Association the Republic of Ireland's total installed wind energy capacity is over 2,650 MW generated from over 211 wind energy developments in 26 counties[iv]. Other renewable energy developments have grid connection offers and are expected to be constructed within the next two to five years, including Barnadivane Wind Farm. The proposed substation is required to facilitate the connection of Barnadivane Wind Farm to the national grid.

The second National Climate Change Strategy, published in 2007, provides a framework for action to reduce Ireland's greenhouse gas emissions to comply with the target, set by the EU, to reduce greenhouse gas emissions by 20% on 1990 levels by 2020.

The strategy states that "*Electricity generation from renewable sources provides the most effective way of reducing the contribution of power generation to Ireland's greenhouse gas emissions. The Government has therefore established ambitious national targets for the contribution of renewables to power generation; 15% of electricity consumed will be from renewable sources by 2010 and 33% by 2020. These are above and beyond existing EU targets.*"

Directive 2009/28/EC requires each Member State to adopt a national renewable energy action plan and submit this to the European Commission. These plans are to set out Member States' national targets for the share of energy from renewable sources consumed in transport, electricity and heating and cooling in 2020, taking into account the effects of other policy measures relating to energy efficiency on final consumption of energy.

The National Renewable Energy Action Plan (NREAP)[v] sets out the Government's strategic approach and concrete measures to deliver on Ireland's 16% target under Directive 2009/28/EC.

The development of renewable energy is central to overall energy policy in Ireland. Renewable energy reduces dependence on fossil fuels, improves security of supply, and reduces greenhouse gas emissions creating environmental benefits while delivering green jobs to the economy, thus contributing to national competitiveness. The NREAP was submitted to the European Commission in July 2010.

The Strategy for Renewable Energy was published by the Department of Communications, Energy and Natural Resources in May 2012. The Strategy acknowledges that the Government is confident that Ireland has the capability to achieve its 2020 target for renewable electricity, primarily through onshore wind power. With relevance to Barnadivane Wind Farm (and its associated wind farm), the Strategy highlights the economic benefits the development of projects of this nature may have for the Irish economy.

> "*Further strategic deployment of onshore wind projects will develop a base of indigenous and foreign companies and create employment in the short-term in wind farm construction, possible turbine component manufacturing and servicing, the opportunity to capture international supply chain opportunities and the manufacture of niche onshore renewable energy generating equipment.*"

A key action of the Strategy is to "Support delivery of the 40% target for renewable electricity through the existing GATE processes."

The Green Paper on Energy Policy in Ireland (May 2014) states as its purpose 'to provide the regulatory and financial framework to deliver a national energy system that enables a sustainable quality of life.'[vi]

At a more local level then, the Regional Planning Guidelines for the South West Region were first adopted in 2004. It is acknowledged in the guidelines that "The south west has considerable potential for the generation of electricity from sustainable renewable resources such as wind and wave." Among the objectives (RTS-09) for the South West Region relating to Energy and Renewable Energy is the following:

- *It is an objective to facilitate the sustainable development of additional electricity generation capacity throughout the region and to support the sustainable expansion of the network.* ***National grid expansion is important in terms of ensuring adequacy of regional connectivity as well as facilitating the development and connectivity of sustainable renewable energy resources.***

When this application was lodged the site of the proposed development was located in an area designated as a "Strategic Search Area" on Figure 6.3 of the then County Development Plan. Since the decision issued the new Cork County Development Plan 2015 has come into effect (adopted on 8th December 2014 and therefore effective from the 15th of January 2015). Under the provisions of the current County Development plan the site is located in an area that has been designated as "Acceptable in Principle" for large scale commercial wind energy developments (Chapter 9 and Figure 9.3 of the Cork County Development Plan 2014 refers). Areas designated as "Acceptable in Principle" are described as being "*optimal locations for wind farm development without significant environmental impacts*" (Section 9.3.13 of the County Development Plan refers).

The proposed substation development is ideally located within the footprint of a permitted wind farm and in close proximity to an existing 110kV overhead transmission line which allows the energy generated at the wind farm to connect directly to the national grid, avoiding the need for additional overhead cables and minimising electrical losses.

In summary therefore, by virtue of the existing permission, the principle of this type of development has already been established in the vicinity. The substation is required to facilitate the connection of electrical energy generated at Barnadivane Wind Farm to the national grid.

It is considered that the proposed development is in keeping with relevant plans and policies for the region in terms of strategic search/acceptable in principle areas, the provision of renewable energy infrastructure and contribution to renewable energy targets.

## 2.3 Siting of the substation to be in proximity to the proposed wind farm

The substation has to be located in proximity to the proposed wind farm which is subject to a concurrent third party appeal. The site selection process for the substation has been fully informed through reviewing the EIS and EIA that was carried out pursuant to the proposed wind farm which is subject to concurrent third party appeal.

## 2.4 Proposed Development and Key Aspects of Site Design

The 110 kV substation compound will cover an area of approximately 108 m x 86 m on plan including a buffer area to the perimeter. There will be three single storey control buildings on the site. The control buildings will be of standard masonry construction, rendered externally with a pitched roof. Finishes will be in keeping with the surrounding buildings. The maximum floor area of each building will be 185m$^2$ and the maximum height of the buildings will be approximately 6.2 m above finished ground level. The control buildings and electrical equipment will be enclosed by a 2.4m high steel palisade fence painted green perimeter fence encompassing an area of approximately 76m x 97m. The substation compound will be connected to the public road via a short access track approximately 200m long.

The compound will contain assorted electrical equipment including transformers, switch gear including circuit breakers, metering transformers, busbars, post insulators, lightning protection masts, line gantries, etc., all in accordance with Eirgrid requirements.

Two steel lattice mast structures will be located approximately 10 m from the edge of the 110 kV compound and directly underneath the line of the existing 110 kV overhead line. They will have a maximum height of approximately 18 m.

Construction material for the fill and hardstanding areas at the substation and for the access track to the substation will be sourced from local quarries. It is likely that the total stone fill requirement will be in the order of 5,625 m$^3$.

However, much of this fill material will likely be sourced on site, as there is a surplus of cut material available, from the excavations for the compound and road.

The proposed drainage comprises swales and settlement ponds at the location of the proposed substation. Access track drainage will consist of swales with silt traps and diffuse discharge overland or to soakpits as required.

In terms of landscaping, it is intended to plant native hedgerow species along the public road at either side of the site entrance, as well as along the southern site boundary, as shown on the drawing. This planting will be undertaken on completion of the development, within 1 year of the completion of construction. A maintenance plan will be put in place to ensure any plants that do not thrive will be replaced during the next planting season. A detailed landscaping plan was submitted to Cork County Council in response to its request for further information, a copy of which is included for ease of reference, in Appendix 4.

Although not permanently staffed, maintenance personnel will visit the substation on average three to four times a week. Any general office waste will be regularly disposed of to a licensed facility.

[5]At present all SACs in Ireland are currently 'candidate' SACs, and referred to as cSACs. The relevant Statutory Instruments for the SACs in Ireland have not yet been put in place, though these sites must still be afforded protection in accordance with the EU Habitats Directive (92/43/EEC).

# 3 RESPONSE TO THIRD PARTY SUBMISSIONS

## 3.1 Introduction

ABP circulated the first party submission made to it in January 2016 by Arran Windfarm Limited to the third-party appellants. The following third-party submissions were made in relation to this document:

- Noonan Linehan Carroll Coffey, Solicitors (2nd August 2017)
- Stephanie Larkin & Michael O'Donovan (2nd August 2017)

The applicant herein addresses each item raised in the submissions. However, in the interest of clarity the items have been collated under a number of key headings (ref. Table 3.2). Where relevant, for ease of reference, the text of the submission is provided in italic text, with the applicant's response provided thereafter.

### Table 3-1: Summary of Submissions Collected

| Heading | Sub-Heading | Submitted by |
|---|---|---|
| Noise | Revised Wind Energy Guidelines | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| Noise | Local Noise Environment Change | Noonan Linehan Carroll Coffey, Solicitors (2nd August 2017) |
| Noise | Amplitude Modulation | Noonan Linehan Carroll Coffey, Solicitors (2nd August 2017) |
| Noise | Noise Sensitive Receptors | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| Noise | Critical Wind Speeds and Turbine Choice | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| Noise | Cumulative Noise & Residential Amenity | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| | | |
| | | |
| Planning | Project Splitting | Noonan Linehan Carroll Coffey, Solicitors (2nd August 2017) |
| | | |
| Planning | Aarhus Convention & Public Participation | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| **Heading** | **Sub-Heading** | **Submitted by** |
| Planning | Aarhus Convention & Public Participation | Sarah Hodkinson & Others (4th August 2017) |
| Planning | Lapsed Planning Permission | Noonan Linehan Carroll Coffey, Solicitors (6th - 9th October 2017) - Denis Buckley & Others |
| Planning | EIRGRID Compliance | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| | | |

| Heading | Sub-Heading | Submitted by |
|---|---|---|
| Landscape & Visual Impact & Recreational Amenity | Visual impact & residential amenity | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| Landscape & Visual Impact & Recreational Amenity | Recreational Activity | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| | | |
| Shadow Flicker | Modelling | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| | | |
| Human Environment | Impact on Property Valuation | Noonan Linehan Carroll Coffey, Solicitors (2nd August 2017) |
| Human Environment | Impact on Property Valuation | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| | | |
| Ecology | Wintering & Breeding Birds | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |
| Ecology | Planting Plan | Stephanie Larkin & Michael O'Donovan (2nd August 2017) |

## 3.2 Noise

Hayes McKenzie Consultants in Acoustics provide a detailed response to the Noise issues raised by the third parties, both in relation to the proposed Barnadivane Wind Farm application and the associated substation application. The Report dealing with the combined issues raised is included as Appendix 1 to this submission. Many of the noise concerns relate to the operation of the wind farm are comprehensively addressed in this report.

The issues raised within the submission are, in general, already considered within the documents submitted with the planning application and in response to a request for further information. As a consequence, we consider that the assessed noise impact is representative of the potential change associated with the proposed wind turbines and that the operation of the wind turbines will meet the intent of the current Wind Farm Planning Guidelines 2006.

Furthermore, we note the Planning Inspectors assessment of the information submitted with the planning application and EIS pursuant to Case Ref. PL04.245824 where the Inspector states that;

> *"Taken together, the information submitted by the applicant provides adequate information on the existing environment around the site with respect to noise. The prediction of the effects of the proposed development due to noise are based on reasonable assumptions and an accepted methodology laid down in a guidance document issued by a reputable technical institute. It takes proper account of the cumulative effects arising from the existing 4 turbines to the east of the site. Noise modelling is based on the physical characteristics of wind turbines and the environment in which they are placed, and so it has an empirical and scientific basis. It has not been shown to be unrealistic, as asserted by one of the appellants. The noise emissions from a development are capable of precise measurement, and can therefore be properly controlled by a condition on a permission that is readily enforceable by the procedures set out in part XIII of the planning act" (Page 20 of 39).*

## 3.3 Planning

### 3.1.1 Project Splitting

- Sarah Hodkinson & Others (4th August 2017)
- Noonan Linehan Carroll Coffey, Solicitors (2nd August 2017)

*The splitting of The Barnadivane Wind Farm Project into three applications has been solely to suit the applicant and has not been in the interest of fairness and justice. It does not facilitate proper public participation with the planning process.*

*Essentially the Board needs to be able to identify and describe on record just what "the project" is.*

In addition to the wind farm planning application, a separate application was submitted (under Arran Wind Farm Ltd. which forms part of a larger group of companies controlled by Enerco Energy Ltd.) seeking permission for a new grid connection substation to replace the consented substation, in order to meet current Eirgrid standards. A separate planning application was submitted for this proposed substation (planning ref. 14/557), (ABP Ref. PL 04.244439). Both the wind farm and the substation application decisions were quashed and remitted back to ABP for decision. The reason for the quashing of the decision by the Courts was due to an administrative error by ABP in circulating appeal responses by the applicant. As noted by ABP, both the wind farm application and the substation application were considered simultaneously by ABP, therefore allowing an EIA of the entire project.

Furthermore, a separate planning application was lodged by Barna Wind Energy (B.W.E.) Ltd. (and subsequently granted permission) for the development of a private roadway, approximately 150 metres long, from the R585 to the L6008, in Bengour West, Newcestown, Co. Cork (planning reference 14/06803). This development is to facilitate delivery of the turbine components to the wind farm site.

As previously set out, the reasons for the separate planning applications, along with detailed information in respect of potential cumulative impacts associated with these developments and other potential developments in the vicinity, have all been discussed in detail in the wind farm planning application (14/06760), the response to the request for further information (RFI) from Cork County Council (May 2015) and the response to the clarification request (CFI) from Cork County Council (September 2015) and in the response to third party appeals made to An Bord Pleanála in respect of the quashed decisions. . The Board is therefore familiar with the significant detail provided therein, in this respect.

We note the Planning Inspectors assessment of the information submitted with the planning application and EIS pursuant to Case Ref. PL04.245824 where the Inspector states that;

> *Adequate information is before the board to allow an environmental impact assessment of the proposed windfarm together its connection to the national grid to be completed before a consent is granted for the proposed development. A grant of permission could therefore be made without contravening the law set down by the High Court in the Ó Grianna judgement or the requirement to assess the cumulative and indirect environmental effects of all integral parts of the proposed windfarm project (p 29 of 39).*

Two further planning applications are pending in proximity to the site. The Shehy More grid connection application and the Carrigarierk substation application were lodged subsequent to the making of the subject application. However, both the Shehy More and Carrigarierk applications considered the subject proposal cumulatively. Both applications are available for view and assessment on the local authority website and have been subject to their own EIS/EIAR and NIS. It is important to add that the Barnadivane wind farm planning application as presented to ABP can be built out and operated independently of the Shehy More grid connection and the Carrigarierk substation consents.

### 3.1.2 Aarhus Convention & Public Participation

- Stephanie Larkin & Michael O'Donovan (2nd August 2017)

*For the record, there are 259 submissions against this development…We do not feel that this citizens representation has been given due consideration and weight at any point of the process by either cork County Council or the Board.*

The planning application has gone through significant public consultation both voluntary and statutory. A public consultation event was held in the locality prior to the lodging of a planning application where feedback from the public was encouraged. Following this there were a number of statutory public participation opportunity, which the third-party objectors participated both at Planning Authority, An Bord Pleanála and the Judicial System level.

### 3.1.3 EIRGRID Compliance

- Stephanie Larkin & Michael O'Donovan (2nd August 2017)

*We believe that the unresolved issues with regard to the alleged revised Eirgrid substation layout, size, capacity and location. We have asked for direct confirmation or evidence to be provided from Eirgrid for the alleged need for a 60mW substation but this has failed to materialize. We also want to see evidence for and the nature of a grid connection at Barnadivane and evidence for and the nature of a grid connection at the newly proposed Carrigarierk to Dunmanway.*

The applicant addressed the rationale behind the substation layout, size, capacity and location change in the response to the RFI from Cork County Council in relation to the planning permission 14/557 and in the Response to Third Party Appeal to ABP (PL04.219620). Appendix 2 contains drawings of the (AIS) 110kV substation required layout from EirGrid. This layout has evolved from EirGrid's primary 2011 changes as identified in Arran Windfarm Ltd.'s planning submission.

In relation to these changes Wind Prospect have stated:

> *'As can be seen in the EirGrid drawings the requirements now include that the substation be suitable in its electrical plant layout and overall footprint size to allow for potential future expansion (this is identified in red in the EirGrid drawings). We also note the differences in building sizes and electrical plant configuration. EirGrid will operate the majority of the substation when the construction is completed; however, they will not take control of a substation that does not fulfil their current or at the least a very recent specification'.*

The planning application before the Board is as presented. For the purpose of responding to the third party, the link below is to a PDF on the Eirgrid website which confirms that Barra are contracted to Eirgrid to provide 60MW of electricity. http://www.eirgridgroup.com/site-files/library/EirGrid/Contracted-TSO-Wind-Farms-1-May-2017.pdf

## 3.4 Landscape & Visual Impact & Recreational Amenity

### 3.1.4 Visual Impact

- Stephanie Larkin & Michael O'Donovan (2nd August 2017)

*The proposed area for development is one of outstanding natural beauty. It is renowned for its views and five counties can be viewed from most points on the proposed wind farm. Six windmills with a proposed height of 131 meters in addition to a meteorological mast up to 90m would negatively and irreversibly. impact on the area from a visual perspective.*

*The visual impact of 2 wind farms in close proximity with turbines of differing heights, 105m at the existing site and 131m at the proposed will create an unharmonious and extremely visible industrial feature on the landscape. This in contravention of the Guidelines.... the large altitudinal differences between the Barnadivane proposed turbines which are located very close together and the Garranareigh wind farm nearby which is located on a plateau creates an extremely unbalanced unit.*

As outlined in the Cork County Development Plan 2015, this site is in an area designated as 'acceptable in principle' for wind energy development. Objective ED-4 is that commercial wind energy development is normally encouraged in these areas subject to protection of residential amenity particularly in respect of noise, shadow flicker, visual impact and the requirements of the Birds, Habitats, Flood and Water Framework Directives.

It should also be noted that the Planning Inspector in assessing the application prior to Judicial Review commented that the proposed development:

> *"would have a slight but perceptible effect on the wider landscape, as it would tend to reinforce an impression of an upland agricultural area where windfarms were present. However, the landscape in this area is not unusually sensitive or scenic and it is not designated as one of high value on the development plan".*

The cumulative visual impact of the proposed wind farm in conjunction with the Garranereagh Wind Farm is addressed in Section 8.3.1 of the EIS. This concludes that the additional cumulative impact represented by the proposed development is deemed to be low and, by default, is less than that which would result should the permitted Barnadivane Wind Farm be constructed.

Visual impact and residential amenity were addressed in section 3.2.4 of the Response to Third Party Appeal Made to An Bord Pleanála in January 2016. The relevant sections are included below:

Visual dominance is mentioned in respect of landscapes generally but not with specific respect to the effects on individual houses, notwithstanding this, the 500m separation distance is generally considered to satisfy issues of visual dominance / encroachment from turbine heights.

The DoECLG has indicated that they are undertaking a targeted revision of these guidelines for noise, shadow flicker and proximity, although no timeframe is available on when these will be formally issued. In the context of this planning application, the criterion for noise, shadow flicker and proximity as described in the 2006 guidelines are used.

In summary, there is no legal or planning definition of what determines residential amenity. It is considered to be an interaction of material impacts on residence in an area and is largely a matter of professional judgement by the competent authority. It is a statutory requirement for the Development Plan to include policies that protect amenity and also Local Authorities are obliged to have regard to statutory Section 28 Ministerial Guidelines. With regard to the class of development proposed, the most appropriate considerations relate to noise and shadow flicker which are set out in the Wind Energy Guidelines (2006).

Specifically, the Cork County Development Plan 2014 considers that with respect to on-shore wind energy developments, residential amenity should be considered in terms of noise, shadow flicker and visual impact,

*Objective ED3-5*
*Commercial wind energy development is open to consideration in these areas where proposals can avoid adverse impacts on:*

- *Residential amenity in respect of noise, shadow flicker and visual impact...*

Careful siting of turbines was used for the Barnadivane site to achieve the minimum separation distance for the protection of residential amenity. Various iterations of the layout were considered to arrive at the current proposed development. Separation distances between the turbines and the nearest non-involved and habituated houses have been maintained at a minimum of 500m. In addition, there are no hospitals, schools, hotels or guesthouses within 1 km of the site. This design response to residential amenity has a positive result on predicted noise and shadow flicker from the wind farm site. As described, the appraisal of noise and shadow flicker are directed by the guideline limits in place from the 2006 Wind Energy Development Guidelines.

Furthermore, we note the Planning Inspectors assessment of the information submitted with the planning application and EIS pursuant to Case Ref. PL04.245824 where the Inspector states that;

> *"The current guidelines provide the most useful and practical guide to assessing the impact on wind energy development on residential amenity. The 500m setback which it recommends is generally accepted as adequately dealing with issues of visual dominance. The proposed development maintains this separation distance from houses that are not involved in the scheme. It meets the noise and shadow flicker limits set down in the guidelines" (p12 of 39).*

### 3.1.5 Recreational Activity

- Stephanie Larkin & Michael O'Donovan (2nd August 2017)

*Local hunting groups like Kilmurray Harriers and those from further afield (Cork City) annually use this site for hunting both hares and foxes.*

*There is a signposted walk, which runs along part of a recognized scenic route along the south-western boundary of the site on the road which goes between T3 and T4 to the east. There are 2 local walking groups using these walks on a regular basis.*

No submissions were received from Kilmurray Harriers or other hunting groups in relation to this site being of important use for local hunting activities. Similarly, no submissions were received from local walking groups in relation to their use of the site. Figure 3.1 below indicates that the planning boundary is 885m from the closest scenic route. No recreational trails are in evidence in the vicinity of the site on the Irish Sports Council website www.irishtrails.ie. While there are tracks adjacent to the site (grey pecked lines), none of these are marked as waymarked walks in the Ordnance Survey Discovery Series mapping (red pecked lines). It is also important to note the road along the south western boundary is a public road which will not be negatively impacted from the wind farm. Furthermore, wind farms are recognized as sites which can enhance and encourage recreational amenity. In this regard, we note the success of the recreational trail at Mount Lucas Wind Farm Co. Offaly and also the trail being developed in Slieve Bawn Wind Farm in Co. Roscommon. www.sliabhbawnwindfarm.ie.

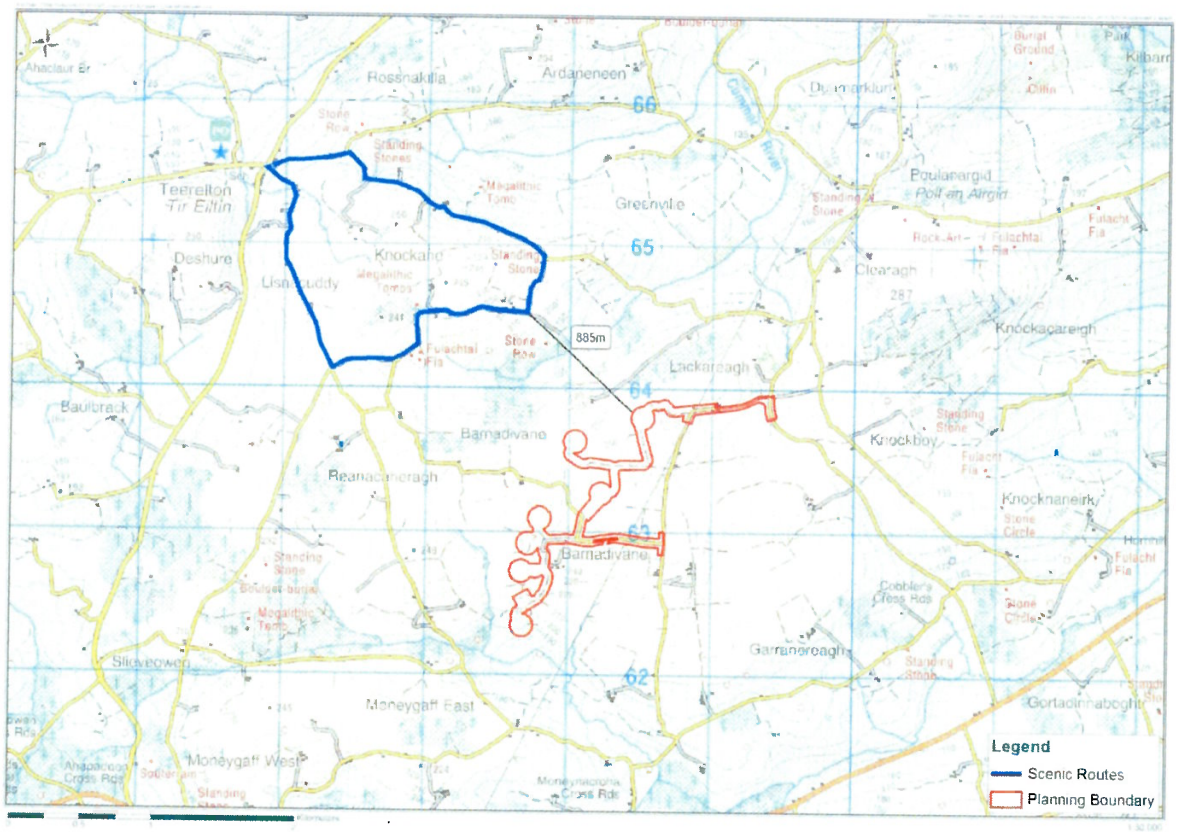



**Figure 3-1: Scenic Routes in Vicinity of the Development.**

## 3.5 Shadow Flicker

### 3.1.6 Height of Windows and Meteorological Data Correlation

- Stephanie Larkin & Michael O'Donovan (2nd August 2017)

*The inspector recommended that the effect of shadow flicker on 2 story houses, not just houses with windows at 2m high, should be modelled. We note Fehily Timoney failed to do this and request that they do so now so that the effect of shadow flicker is not underestimated.*

*We would also like to see the correlation of relevant meteorological data with the predicted shadow flicker results as I have been unable to find this information in the details provided by the applicant.*

There is no reference in either the current or the draft Guidelines to the height of dwelling being a determining factor in assessing shadow flicker. Should this be required it would necessitate additional surveying. Should this become a requirement in the revised Guidelines, and should they be implemented prior to the grant of permission, the applicant will implement them in full. It is important to note that the shadow flicker limits as per the current 2006 WEG's will need to be complied with. The applicant is committed to carrying out a shadow flicker compliance check within the first years of operation of the wind farm. If shadow flicker experienced exceeds the guideline limits mechanisms can be put in place to control the shadow flicker experienced by home owners.

The meteorological data is used as an input into the model so correlation between the results of the model and the meteorological data is unnecessary. Annual sunshine and wind data are both used to calculate the annual correction as explained in the EIS.

Furthermore, we note the Planning Inspectors assessment of the information submitted with the planning application and EIS pursuant to Case Ref. PL04.245824 where the Inspector states that;

> *The EIS describes measures to be agreed with a resident that might be effected, including screen planting. However, if no agreement is reached then an automated system would be installed to switch off turbines when the limit is reached. Such a measure is practicable and is likely to be effective. Subject to its implementation, the proposed development is not likely to give rise to a significant negative impact due to shadow flicker (p21 of 39).*

## 3.6 Human Environment

### 3.1.7 Property Valuation

- Stephanie Larkin & Michael O'Donovan (2nd August 2017)
- Noonan Linehan Carroll Coffey, Solicitors (2nd August 2017)

A. *A number of submissions related to the impact of the proposed wind farm on property prices in the area.*

B. *Noonan Linehan Carroll Coffey, Solicitors (2nd August 2017) include an Institute for Future Energy Consumer needs and Behaviour (FCN) Working Paper No 3/2012 on the "Impact of Wind Farms on Property Values: a Geographically Weighted Hedonic Pricing Model", (Sunak, Y. Reinhard, M.). Stephanie Larkin et al questions the property valuation studies quoted by Fehily Timoney's as the settlement patterns in the UK and US, in which they are based, significantly less dispersed than in rural Ireland.*

Section 3.2.6 of the Response to Third Party Appeal Made to An Bord Pleanála by Arran Windfarm Limited in January 2016 addresses the possible impact of the wind turbines on neighboring property values as raised in an earlier submission. The key points are included below.

In relation to residential property values, in general, studies and property valuation information which has been published and peer-reviewed is the most reliable when reviewing available literature on property devaluation as a result of wind farm developments.

The published reports to date suggest that the presence of wind farms does not devalue residential property.

For instance, a study was carried out by Renewable UK on 'The effect of wind farms on house prices' (1) which looked at the effect of wind farms on the value of residential properties within a 5 km radius. This was done by comparing house price growth based on transactions completed within a 5 km radius of seven windfarm sites with prices in the wider county area between 1995 and mid-2013. The study also used econometric tests to assess whether or not windfarms had an impact on price growth. The analysis of the raw house price data for transactions completed within the vicinity of the wind farms (radius of 5 km) yielded no evidence that prices had been affected by either the announcement, construction or completion of the wind farms for six out of seven sites.

In a study by Hoen et al., 2009 (2) 'The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis', the potential impacts of wind power facilities on the sales prices of residential properties in proximity to and/or which have a view of the house to those wind facilities was investigated. A large quantity of residential transaction data was collected from communities surrounding a wide variety of wind power facilities.

Each of the homes included in this analysis was visited to clearly determine the degree to which the wind facility was visible at the time of home sale and to collect other essential data. To frame the analysis, three potentially distinct impacts of wind facilities on property values are considered: Area, Scenic Vista, and Nuisance Stigma.

To assess these potential impacts, the authors applied a base hedonic model, explored seven alternative hedonic models, conducted a repeat sales analysis, and evaluated possible impacts on sales volumes.

A. Noonan Linehan Carroll Coffey, Solicitors (2nd August 2017) include in their submission an Institute for Future Energy Consumer needs and Behaviour (FCN) Working Paper No 3/2012 on the "Impact of Wind Farms on Property Values: a Geographically Weighted Hedonic Pricing Model", *(Sunak, Y. Reinhard, M.)*.

   This is a working paper and as such was released to share ideas on a topic. It has not been through the peer-review process and as such is considered "grey literature"'. Notwithstanding that the paper itself undertakes a review of existing studies looking at look at the economic impact of wind farms on surrounding property values. Of the 5 studies, it considers it concluded that 3 found no significant impact, one found had "a fairly weak explanatory power" and one model (based in northern New York) found a significant result. The FCN working paper is based on a study in Germany. Because of data availability issues and privacy restrictions the model used land parcel prices as opposed to house prices which were used on the other studies. The results of this study are ambiguous, stating that "visibility had no significant impact on property values". It acknowledges that further investigation of wind farm proximity, and specifically visibility, is needed to derived general conclusions and reliable recommendations.

   Stephanie Larkin et al questions the property valuation studies quoted by Fehily Timoney's as the settlement patterns in the UK and US, in which they are based, significantly less dispersed than in rural Ireland. However, in the absence of Irish-based studies these peer-reviewed studies are the only reliable data upon which we can assess the impacts.

B. Keane Mahony Smith Auctioneers (KMS) (in a submission by Noonan Linehan Carroll Coffey, Solicitors ($6^{th}$ – $9^{th}$ October 2017)) included valuations between 255k - 400k for 3 properties. It is difficult to provide an accurate valuation on rural properties and the same principles cannot be applied to rural properties as to urban housing evaluation. KMS has not outlined their methodology employed and the basis of the valuation.

## 3.7 Ecology

### 3.7.1 Bat Survey

- Stephanie Larkin & Michael O'Donovan (2nd August 2017)

*If ABP does not ensure that a robust and reliable bat survey is carried out as part of the EIS with this application we intend to take the matter to the European Court*

In section 5 of the EIS it notes that records of bats previously recorded in the wider area were obtained from Bat Conservation Ireland (BCI) and states that a series of bat activity surveys were carried out at the development site and surrounding landscape on the nights of the 11/12 June 08/09 July and 26/27 August 2014. The field surveys confirmed the presence of six bat species and others are expected to occur on occasion. These surveys were carried out to assess the level of activity within the site for all bat species, roosting within the greater area, which would have included all know roost locations retrieved from BCI and other potential roosts. In the Response to Further Information Request (July 2015) it states that a total of 28 bat roosts are known to occur within 10 km of the proposed wind farm, including roosts of Common Pipistrelle, Soprano Pipistrelle, unidentified Pipistrelle (undetermined Common Pipistrelle or Soprano Pipistrelle), Brown Long-eared Bat, Leisler's Bat, Daubenton's Bat and the Lesser Horseshoe Bat. At the request of BCI, and due to the sensitive nature of detailing bat roost data, the locations/descriptions of these data are not provided here. The information on bat roosts known to occur within 10 km of the wind farm has been used to inform the Bat Impact Assessment.

The EIS concluded that the activity surveys at the proposed development site did not show any significant bat activity in the immediate vicinity of the proposed turbines, with the possible exception of proposed Turbine 6 and around the O'Sullivan Farmyard.

A number of Leisler's bat passes were recorded around the location of proposed Turbine 6, where common pipistrelle were also feeding. Leisler's bat, Common pipistrelle, Soprano pipistrelle and Natterer's bat were recorded around the trees surrounding this farmyard and the lanes leading from the farmyard. Lower bat activity was recorded in the vicinity of proposed Turbines 1, 2 and 3, with most activity in this area restricted to hedgerows along the lanes which provide sheltered conditions for insects and bats. In order to compensate for loss of potential roosting opportunities as a result of tree felling of mature trees and their replacement with immature trees, a minimum of 10 artificial bat roosts will be installed at suitable locations on mature trees on woodland edges or in hedgerows in the surrounding area. 'Schwegler' woodcrete boxes are long lasting and have been proven to be readily occupied by bats, including the species recorded in the study area.

The RFI for the proposed development also included a discussion on the potential impacts on bats, this is included below. The lack of bat activity recorded during field surveys is likely due to the high degree of wind exposure at the site. Bats were found to forage in the more sheltered hedgerows, earth banks and treelines at lower elevations in the surrounding landscape.

As mentioned above mitigation measures were proposed to reduce the negative impact of hedgerow removal on bats. For instance, the Natural England Technical Information Note TIN051 (7) was used to calculate a suitable buffer zone around each individual turbine in which vegetation clearance should take place. The removal of vegetation around turbines helps to ensure that bats are not drawn towards turbines, following vegetation corridors such as hedgerows, which could lead to collision impacts. Taking this measure into consideration the potential impacts on bats from the proposed 6 no. turbine development were not considered significant.

The study by Cryan et al. (5) involved monitoring bat behaviour at three wind turbines in Indiana in the United States in 2012 using thermal cameras and other methods. By looking at the way bats approached turbines it suggested behaviours that evolved at tall trees might be the reason why many bats die at wind turbines.

This study is not relevant to the current planning application as the habitats at the proposed site as well as the bats identified in and around the proposed site and the levels of bat activity are not comparable with the activity of the tree bat species surveyed in the study by Cryan et al. (5) Furthermore, in relation to bat collision, most of the research related to bat mortality at wind farms comes from research in mainland Europe and North America. Many of these overseas turbine/bat mortality studies are at wind farms, with significantly large numbers of turbines, sited along known bat migration routes where many hundreds or even thousands of bats commute seasonally resulting in numerous deaths and injuries.

There is currently no evidence that mortality of bats on the same scale occurs in Ireland. Although it is known that Nathusius' pipistrelle migrates from Scandinavia to Scotland and to the north of Ireland and back again (3), apart from this species, there is currently no evidence that internal or external bat migration routes of other bat species exist elsewhere in Ireland as no research has been undertaken.

### 3.7.2 Wintering & Breeding Birds

- Stephanie Larkin & Michael O'Donovan (2nd August 2017)

*This year as usual we have observed multiple breeding pairs of snipe on site, multiple pairs of grasshopper warbler, multiple wintering snipe and the usual solitary woodcock...these birds and many others do not appear in the EIS.*

The EIS states that all bird records were retrieved from the NPWS and the NBDC for a 10km grid square around the development site. No records for Woodcock or Grasshopper Warbler were found.

Two breeding bird transect surveys were carried out (11th June 2014 & 08th July 2014). A total of 21 species were recorded along the two transects at distances of between 0–25 m and 25–100m from the transects. Amongst these, no Woodcock or Grasshopper Warbler were recorded. A Snipe was seen on one such occasion in June 2014, with one also heard calling during a bat survey on the same date. As the wind farm development site has some habitats that can be used by snipe for foraging/roosting, the species are likely to use the site from time to time.

No Woodcock were recorded in the winter surveys. The recorded Winter season records for Snipe are summarised as follows:

- The records were collected as part of a 36-hour VP winter study completed as part of the EIS ecology assessment during November 2013 to March 2014 inclusive.
- Very few and sporadic observations were made overall. A Snipe was noted off-site (from VP2 location) on 27th February 2014 as part of a list of non-target bird species noted during VP watches.

  Despite the lack of activity noted for Snipe during the winter VP study, the wind farm development site has some habitats that can be used by this species for foraging/roosting (albeit not extensive); consequently, this species is likely to use the site from time to time.

The EIS reviews the potential impact on birds in Section 5.6.1 and Section 5.6.2. Potential mitigations were assessed in Section 5.7.4. A post-construction monitoring programme is discussed in Section 5.7.5.

In section 23.1 of the Response to Further Information Request (May 2015) the impact assessment of the development on Kestrel and Snipe is reviewed, this review is included below:

The EIS reviews the potential impact on birds in Section 5.6.1 and Section 5.6.2. Potential mitigations were assessed in Section 5.7.4. A post-construction monitoring programme is discussed in Section 5.7.5.

In section 23.1 of the Response to Further Information Request (May 2015) the impact assessment of the development on Kestrel and Snip is reviewed, this review is included below:

- As previously outlined ... an impact assessment has been developed for Ireland in relation to wind farms and birds (see Percival 2003). This assessment takes population loss and/or habitat loss into account, where these losses can arise through direct habitat loss, bird collision and/or bird disturbance displacement effects; elements which should be considered when examining wind farm significance on birds (see SNH 2006). If the Percival (2003) wind farm and bird impact assessment is applied to Kestrel and Snipe in the context of relatively low winter and summer activity overall and the presence of some suitable habitats, albeit not extensive – the same outcome of very low significance, as determined above for the winter period (see Table 20.4), applies all-year-round for both of these species regarding the development of a wind farm here. Therefore, taking the above into consideration, no revision to the outcome of the impact assessment completed for birds as part of the EIS is deemed necessary in this case.

This also means that no revision to the outcome of the cumulative impact assessment related to the nearby Garranereagh Wind Farm is required.

The breeding and winter surveys did note low levels of Snipe activity. However, no observations were made in relation to Woodcock or Grasshopper Warbler. The bird sightings referred to in the submission cannot be included as no data was provided to support them.

It is important to note that the Heritage Officer of Cork County Council in recommending a grant of planning permission noted that the potential for significant effects on any cSAC or SPA can be screened out. The site does not have habitats or host species that are of significant ecological interest. No significant impacts on bird species is likely. Subject to the implementation of a CEMP agreed with the planning authority there is no objection to a grant of permission.

### 3.7.3 Planting Plan

- Stephanie Larkin & Michael O'Donovan (2nd August 2017)

*As a horticulturist...I wish to state that the planting plan lodged by the applicant is unworkable, inadequate and pointless.*

If required a more detailed plan will be submitted prior to construction. However, it is important to note the primary objective for this planting is to maintain connection between hedgerows for the purpose of Bat activity. ABP consider the existing plan adequate.

## 3.8 Conclusion

The applicant, Arran Windfarm Ltd. has applied for permission to develop a 110 kV substation at Barnadivane (Kneeves), near Terelton, Co. Cork.

In so doing, the applicant has followed all relevant policy, legislation and best practice in respect of such a planning application.

Pre-application consultations with An Bord Pleanála, Cork County Council and other relevant stakeholders were undertaken to establish the appropriate planning route and to scope the level of environmental assessment required for this development.

An EIA Screening exercise was undertaken to assess the need or otherwise for an EIS. The applicant prepared an EIS Screening Report, which was submitted to Cork County Council. The Council, as the competent authority, undertook an EIA screening assessment, which concluded that an EIS was not required for this proposal.

An Environmental Report, which assessed the potential impacts of the proposed development on the surrounding environment, was prepared to accompany the planning application. This Environmental Report also considered the potential cumulative impacts of the proposed development in combination with the permitted wind farm and any other relevant developments in the area.

An Appropriate Assessment Screening Report was also prepared, in accordance with all relevant legislation, to accompany the planning application. Cork County Council, as the competent authority, undertook an Appropriate Assessment Screening Assessment, which concluded that the development would not have adverse impacts on Natura 2000 sites in the vicinity of the proposal.

All of this demonstrates the robust nature of the proposal, which was borne out by the granting of permission for the development by Cork County Council.

The applicant has been very clear, throughout the planning documentation, that the proposed substation is to replace that previously permitted (under the permitted wind farm, planning reference 05/5907 and PL 04.219620, with an extension of duration granted under 11/6605). The applicant has also clearly stated that the proposed wind farm (planning reference 14/06760) would replace the permitted wind farm. The substation would therefore connect either the permitted wind farm or the proposed wind farm.

It is acknowledged that further applications have since been lodged in respect of a proposed wind farm (reference 14/06760) and minor road works to accommodate the delivery of oversized loads (reference 14/06803). The potential impacts of all three proposed developments (the wind farm, substation and private road) have been considered in full. This was done in the EIS and in the response to both the RFI and CFI which accompanied the wind farm planning application, which considered the potential cumulative impacts of the proposed wind farm, the proposed substation, the proposed turbine delivery route realignment and any other relevant developments within the area. Furthermore, ABP has and will again be considering the wind farm and the sub-station together therefore carrying out an EIA of the overall project.

All of this demonstrates the robust nature of the proposal, which was borne out by the granting of permission for the development by Cork County Council and by ABP initially. It is also important to note that since the making of the current application 2no. applications in the vicinity of the site has been brought to planning; the Shehy Moore wind farm grid connection EIS/EIAR and the Carrigarierk substation EIS/EIAR. Both application which are pending with the Local Authority considered the subject site cumulatively and the information is available on the local authority website.

# 4 BIBLIOGRAPHY

1. Renewable UK. *The effect of wind farms on house prices.* March 2014.
2. Hoen, B., Wiser, R., Cappers, P., Thayer, M. & Sethi, G. *The Impact of Wind Power Projects on the Residential Property Values in the United States: A Multi-Site Hedonic Analysis.* s.l. : Ernest Orlando Lawrence Berkeley National Laboratory, December 2009.
3. Hoen, B., Brown, J.P., Jackson, T., Wiser, R., Thayer, M. & Cappers, P. *A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States.* s.l. : Ernest Orlando Lawrence Berkeley National Laboratory, August 2013.
4. Natural England. Bats and onshore wind turbines Interim guidance. s.l. : Natural England Technical Information Note. Vol. TIN051.
5. *Behaviour of bats at wind turbines.* Cryan, P.M., Gorresen, P.M., Hein, C.D., Schirmacher, M.R., Diehl, R.H, Huso, M.M., Hayman, D.T.S., Fricker, P.D., Bonaccorso, F.J., Johnson, D.H., Heist, K. and Dalton, D.C. 42, s.l. : Proceedings of the National Academy of Sciences, 2014, Vol. 111. 15126-15131.
6. *The status of Nathusius' pipistrelle (Pipistrellus nathusii Keyserling & Blasius, 1839) in the British Isles.* Russ, J.M., Hutson, A.M., Montgomery, W.I., Racey, P.A. & Speakman, J.R. 91-100, s.l. : Journal of the Zoological Society of London, Vol. 254.
7. Hardy, J., Crick, H., Wernham, C., Riley, H., Etheridge, B., Thompson, D. Hen Harrier Circus cyaneus. *Raptors A Field Guide for Surveys and Monitoring.* s.l. : Scottish Natural Heritage, 2009.
8. Trust, Golden Eagle. goldeneagletrust.org. [Online]
9. Percival, S.M. *Birds and and farms in Ireland: a review of potential issues and impact assessment.* 2003.
10. *Birds of Conservation Concern in Ireland 2014-2019.* Colhoun, K. & Cummins, S. 523-544, s.l. : Irish Birds, 2013, Vol. 9.
11. Scottish Natural Heritage. *Recommended bird survey methods to inform impact assessment of onshore wind farms.* s.l. : Scottish Natural Heritage, 2014.
12. *Greater impacts of wind farms on bird populations during construction than subseqent operation: results of a multi-scale and multi-species analysis.* Pearce-Higgins, J.W., Stephen, L., Douse, A. & Langston, R.H.W. 386-394, s.l. : Journal of Applied Ecology, 2012, Vol. 49.
13. Fossitt, J.A. *A guide to habitats in Ireland* . s.l. : The Heritage Council, 2000.
*14.* Smith, G.F, O'Donoghue, P., O'Hora, K. & Delaney, E. *Best pratice guidance for habitat survey and mapping.* Kilkenny : The Heritage Council, 2011.

15. Percival, S.M. Predicting the effects of wind farms on birds in the UK: the development of an objective assessment method. . [book auth.] M., Ferrer, F.E., De Lucas, M. Janss. *Birds and Wind Farms, Risk Assessment and Mitigation.* s.l. : Madrid: Quercus.
16. Pearse-Higgins, J.W., Leigh, S., Langston, R.H.W., Bainbridge, I.P. & Bullman, R. *The distribution of breeding birds around upland wind farms.* s.l. : Journal of Applied Ecology, 46, 6, 2009.
17. Pearce-Higgins, J.W., Stephen, L., Langston, R.H.W., Bainbridge, I.P. and Bullman, R. *The distribution of breeding birds around upland wind farms.* s.l. : Journal of Applied Ecology, 2009. pp. 1323-1331.
18. *Birds of Conservation Concern in Ireland 2014-2019.* Colhoun, K., Cummins, S. s.l. : Irish Birds, 2013, Vol. 9, pp. 523-544.
19. European Council. *Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.* 2009.

---

[i] EU Directive on Promotion of the Use of Energy from Renewable Sources, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:EN:PDF

[ii] Directive of the European Parliament and of the Council on the Promotion of the Use of Energy from Renewable Sources, 2008/0016 (COD), Council of the European Union, Brussels, December 2008; http://www.ewea.org/fileadmin/ewea_documents/documents/00_POLICY_document/RES-directive_consolidated.pdf

[iii] White Paper 'Delivering a Sustainable Energy Future for Ireland' http://www.dcenr.gov.ie/NR/rdonlyres/54C78A1E-4E96-4E28-A77A-3226220DF2FC/27356/EnergyWhitePaper12March2007.pdf

[iv] http://www.iwea.com/index.cfm?page=bycounty&county=cork; last updated: August 2014

[v] http://www.dcenr.gov.ie/NR/rdonlyres/C71495BB-DB3C-4FE9-A725-0C094FE19BCA/0/2010NREAP.pdf

[vi] Green Paper on Energy Policy in Ireland, May 2014, http://www.dcenr.gov.ie/NR/rdonlyres/ED7DCC31-9F0A-4350-8E2D-979DBEAE4034/0/DCENRSummaryofGreenPaperonEnergyIreland.pdf

# Appendix 1

## Response to Noise Submissions

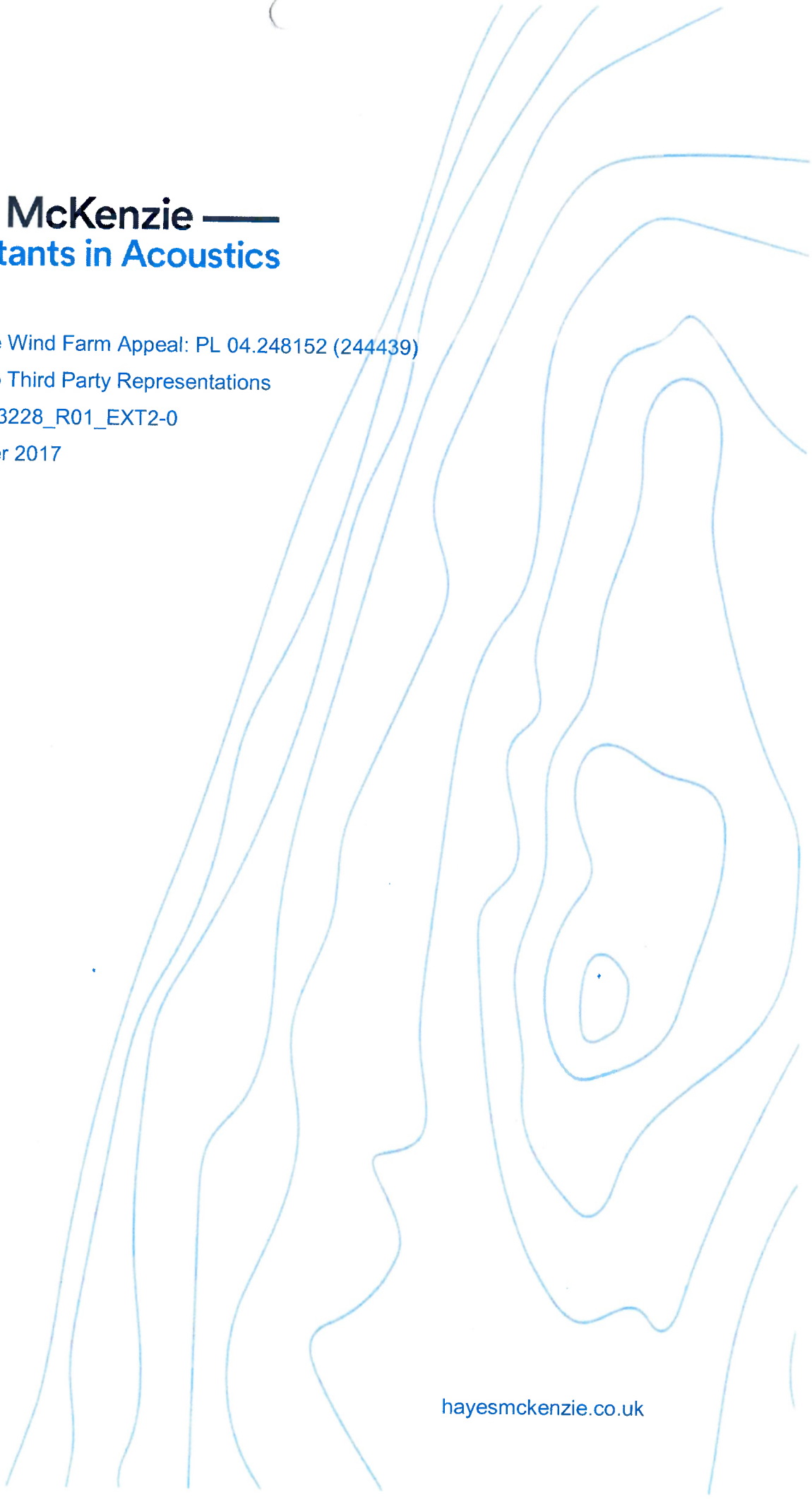
Hayes McKenzie
Consultants in Acoustics

# Barnadivane Wind Farm Appeal: PL 04.248152 (244439)

## Response to Third Party Representations

Report HM: 3228_R01_EXT2-0

16 November 2017



hayesmckenzie.co.uk

Barnadivane Wind Farm Appeal: PL 04.248152 (244439)
Response to Third Party Representations
Report HM: 3228_R01_EXT2-0,
16 November 2017

Prepared for: BARNA WIND ENERGY (B.W.E.) LTD.

Report prepared by: Malcolm Hayes BSc, MIOA
Director and Principal Acoustic Consultant

Checked by: Andy McKenzie PhD, BSc, FIOA
Director and Principal Acoustic Consultant

Approved by: Malcolm Hayes BSc, MIOA
Director and Principal Acoustic Consultant



Lodge Park, Tre'r Ddol, Machynlleth, Powys SY20 8PL, UK
+44 (0)1654 781400, machynlleth@hayesmckenzie.co.uk

## 1. INTRODUCTION

1.1 Submissions from Third Parties to the Appeal were submitted and received by An Bord Pleanála on the 2nd August 2017.

1.2 In a letter dated 20th October 2017 from An Bord Pleanála to Fehily Timoney & Company, it was indicated by An Bord Pleanála that "*you are requested to make any submissions or observations that you may have in relation to this enclosure on or before 16th November 2017*".

1.3 I have been requested to review the submissions on noise and provide comment, where I think appropriate, upon the issues which have been raised within the submission.

## 2. QUALIFICATIONS AND EXPERIENCE

2.1 I hold the degree of Bachelor of Science in Electronics and Communication Engineering from The Polytechnic of North London. I am a member of the Institute of Acoustics.

2.2 I have been employed as an acoustic consultant for 32 years. I held the posts of Assistant Engineer, Consultant Engineer, Senior Consultant Engineer and Associate Director within Hann Tucker Associates between 1985 and 1991. My experience during this time covered all aspects of noise and vibration control for industrial and residential development, the assessment of noise from industrial sources for litigation purposes, the development of performance and ride criteria for lifts and the assessment of vibration within building structures, in particular, relating to underground railways.

2.3 In May 1991, I moved to form The Hayes McKenzie Partnership. My personal involvement with wind farms has covered over 250 separate sites throughout Cornwall, Devon, Mid-Wales, Anglesey, Pembrokeshire, South Coast of England, Scotland, USA, Canada, Portugal, Spain, Holland, Germany, New Zealand and Australia. I have acted for developers and for Local Authorities at the planning stage of wind farm applications and as an expert witness at planning inquiries. I have presented evidence at 37 inquiries in the UK, two planning hearings and an appeal hearing in the State of Victoria, Australia and to the Environment Court in New Zealand for an appeal under the Resource Management Act.

2.4 The Partnership, now a limited company, has undertaken work on over 1000 wind farm/turbine developments since 1991. I have undertaken studies for the Department of Trade and Industry, through ETSU (Energy Technology Support Unit), dealing with the noise impact of wind farms including the study of the Mynydd y Cemmaes Wind Farm. I have also undertaken projects with turbine manufacturers for the reduction of emitted noise from wind turbines.

2.5 I was a member of the Working Group on Wind Turbine Noise which was sponsored by ETSU on behalf of the Department of Trade and Industry and that provided detailed guidance with respect to noise issues raised through wind farm development leading to the issue of the document ETSU-R-97.

2.6 The Partnership has also provided a representative to the joint working group formed by the Institute of Acoustics and Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment) to provide guidance on noise impact assessment.

2.7 I undertook a study of low frequency noise emissions associated with wind turbines at the three wind farms in the UK, the results of which were reported during August 2006. As a consequence of this work, the Noise Working Group on Wind Turbine Noise that authored ETSU-R-97 was reconvened to consider the findings and to review the report. The Group subsequently recommended that additional work be undertaken, under separate contract, to assess the potential for amplitude modulation of aerodynamic noise associated with the operation of wind turbines at neighbouring dwellings to UK wind farms. This work was undertaken during 2007 and reported in July 2007.

2.8 I was a member of the organising committee for the International Conferences on Wind Turbine Noise held in Berlin (2005), Lyon (2007), Aalborg (2009), Rome (2011), Denver (2013), Glasgow (2015), Rotterdam (2017) and Lisbon (2019). I have published and presented papers at conference dealing with the issues raised with the assessment of existing background noise levels within wind environments and the assessment of wind farm noise.

2.9 I provided technical support to Standards Australia in the drafting of an Australian Standard for the measurement and assessment of wind farm noise.

2.10 I am currently the acting Chair of the Institute of Acoustics (IoA) Working Group on Wind Turbine Noise and on the steering group for its sub-group on amplitude modulation. As part of the IoA group, I provided input to the Good Practice Guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise and the subsequent accompanying Supplementary Guidance Notes.

## 3. SUBMISSIONS

3.1 The submission received by An Bord Pleanála was prefaced by a covering letter from Noonan Linehan Carroll Coffey Solicitors. Section 4 of their letter raises the issue of noise associated with the operation of wind farms.

### Noonan Linehan Carroll Coffey Covering Letter

3.2 The first paragraph of Section 4 of the letter states that:

> *"In its Ardglass planning refusal (PL04.246824), the Board refused permission on the basis that the local noise environment would be significantly changed. In that case the predicted increase in ambient noise levels ranges from six to eleven times the present ambient levels. At least that level of increase would be seen at our clients' properties and in their environs."*

3.3 The above statement is at odds with the Inspectors' report which summarises his view as follows:

> *14.2.15 I acknowledge the report from the Environment Section of the Local Authority who recommends a refusal on the basis that noise emanating from the proposed development will be injurious to established residential amenities. The Environment Report essentially considers that the noise levels in the predicted noise model and illustrated in Table 5.15 of the EIS will in some cases be in excess of 5 dB and 10 dB of the established low background noise level. Whereas I would concur with the report from the Environment Section and acknowledge that in some cases the proposed development would amount to an increase of 10 dB which is significant in acoustic terms as this amounts to doubling of the loudness in a noise sensitive location. However I would not concur with the recommendation of refusal by the Environmental Section as I would consider that a refusal on this basis would go against the advice of the National Guidelines which I have referred to above and would essentially make wind energy developments unviable in a large proportion of rural areas where they might be otherwise considered suitable. I would be of the view to favour the advice offered in the Wind Energy Guidelines and also I would acknowledge the assertion in the guidelines that distances greater than 500m are unlikely to be a concern.*
>
> *14.2.16 The proposed mitigation measures include a noise survey to be completed by a qualified acoustic expert and based on the findings of a noise survey a set of measures will be drawn up in agreement with the Local Authority. I would consider, having regard to the proposed mitigation measures as outlined in Section 5.6.2 of*

*the EIS, that the overall noise implications from the proposed development would not adversely impact on the amenities of the area.*

3.4 The Notice of Refusal for the Ardglass Wind Farm proposal does not identify noise as a reason for refusal. Such a statement made by Noonan Linehan Carroll Coffey is wrong.

3.5 It is also incorrect to claim that the proposed development would result in 6 to 11 times increase of the present "*ambient levels*" at a property. A simple rule of thumb is that a 10 dB change in level will be perceived as a doubling or halving of the loudness of the sound. An increase of 6 to 11 times the ambient noise levels would be a change in level of between 25 and 35 dB which is not predicted for any location neighbouring the proposed site. Such a statement is also wrong.

3.6 The final paragraphs of the covering letter deal with the issue of amplitude modulation of the sound from a wind farm. It is suggested within the final paragraph that the Board should specifically address the issue in its conclusion on the noise issue "*in these cases*"[1]. It is suggested by Noonan Linehan Carroll Coffey that the Board should "*record its assessment of the impact of AM on nearby homes and farms and it must incorporate the result of that assessment in its decision*".

3.7 Reading through the submissions which have been attached and which are asserted as being "*current state of scientific knowledge*" it is clear that these papers do not provide a means by which any such assessment of likelihood of occurrence can be undertaken. As such, I consider that any such assertion should have been accompanied by such an analysis which is not attached to the submission from Noonan Linehan Carroll Coffey. I do not consider it appropriate for the Board to undertake such an analysis and thereby the request would appear to be outside the remit of the Board to provide.

3.8 Wind turbines, by the very nature of their operation, will result in some form of audible modulation of the aerodynamic noise. This is associated with the trailing edge of the wind turbine blade where a majority of the aerodynamic acoustic energy of a wind turbine is generated. ETSU-R-97 set out limits which allowed for the presence of this character but with the assumption that this would not normally exceed a level of 3 dB in a free-field noise environment. ETSU-R-97 also recognised that even when a free-field environment of 3 dB was achieved that in specific locations, i.e. court yards with multiple reflecting surfaces, that AM could achieve levels of 6 dB on occasion. This 3 dB Modulation Depth (MD) was been called "normal" AM.

[1] It is not clear whether this is a request to review all decisions where noise complaints have been received which would fall outside the remit of this Inquiry

3.9 Of particular concern has been the experience of OAM (Other Amplitude Modulation) where in a free-field environment it has been found that MD has exceeded the 3 dB criterion by, at times, a significant level. Work undertaken by RenewableUK and published in December 2013[2] identified that OAM may be the result of partial stall of the turbine blade such that increased noise levels occur during this brief period of stall, typically found when the blade was at its highest point, i.e. pointing vertically upwards. Following from this study the Institute of Acoustics formed a working group to consider the means by which such a character to wind turbine sound should be assessed.

3.10 The current position with regards to the assessment of AM for an operating wind farm in the UK is contained within a document issued by the Institute of Acoustics (IoA) "*Method for Rating Amplitude Modulation in Wind Turbine Noise*" issued on 9th August 2016[3]. This sets out a method for the assessment of AM within the sound incident at a receptor location. This method has been proposed for a number of assessment schemes for operational wind farms to allow determination of the level and occurrence of such a characteristic. It should be noted that this document does not set out how the determined level of MD should be applied to a planning condition in the form of any character correction that may be required.

3.11 With the use of this metric to allow determination of the level and occurrence of this characteristic to the sound, it is now possible to evaluate mitigation methods to reduce OAM at neighbouring receptor locations. Where such mitigation has been applied it has been found that OAM has been significantly reduced at neighbouring receptor locations[4].

3.12 Subsequent to the IoA Report, the Department of Business, Energy & Industrial Strategy (DBEIS) issued a summary of the worked commissioned by them relating to a review of the evidence on the response to amplitude modulation from wind turbines[5]. Within this document a tentative penalty scheme was proposed for the presence of OAM and a potential means by which this character may be assessed for the purpose of compliance measurements. The scheme has been subject to discussion and has yet to be adopted although DBEIS have stated:

> *While this research does not represent planning guidance, BEIS encourages developers and planning authorities in England to consider this research when determining if an AM condition would be appropriate.*

3.13 With the uncertainty which still exists with respect to the method by which any penalty

[2] http://www.renewableuk.com/page/IndustryStatementOAM
[3] http://ioa.org.uk/sites/default/files/AMWG%20Final%20Report-09-08-2016_0.pdf
[4] http://www.ewea.org/events/workshops/wp-content/uploads/2014/12/Tech14b5-2-Cand-Bullmore.pdf
[5] https://www.gov.uk/government/publications/review-of-the-evidence-on-the-response-to-amplitude-modulation-from-wind-turbines

scheme (if deemed appropriate) may be applied it is difficult to propose a simple Planning Condition which would deal with this issue. Therefore, if the Board were to consider inclusion of a means to control the potential of OAM then it might be best achieved through the requirement of a scheme to be agreed with the Local Planning Authority prior to undertaking any compliance measurements. Such Planning Conditions have taken the following form of words:

> *Within 4 weeks from receipt of a written request from the Planning Authority, following an amplitude modulation (AM) complaint to it from the occupant of a dwelling which lawfully exists or has planning permission at the date of this consent, the wind farm operator shall submit a scheme for the assessment and regulation of AM to the Planning Authority for its written approval. The scheme shall be in general accordance with:*

- *Any guidance endorsed in National Planning Policy or Guidance at the time of granting of consent, or in the absence of endorsed guidance,*
- *Suitable published methodology endorsed as good practice by the Institute of Acoustics at the time of granting of consent; or in the absence of such published methodology,*
- *The methodology published by RenewableUK on the 16th December 2013.*

*And implemented within 3 months of the written request of the Planning Authority unless otherwise extended in writing by the Planning Authority.*

## Stephanie Larkin & Michael O'Donovan (2nd August 2017)

3.14 The submission by Stephanie Larkin & Michael O'Donovan has raised a number of issues associated with noise. These are dealt with under various item headings and I will deal with them in the same order.

### *Noise Sensitive Receptor Locations*

3.15 Reference is made to a decision by An Bord Pleanála (Ref: PA0046) that relates to a 25 turbine development for North Meath Wind Farm Ltd. This was a Strategic Infrastructure Development with an installed capacity of likely more than 75MW.

3.16 The issue of noise was considered at Section 7.4. The issue of measurement locations is discussed at 7.4.6 – 7.4.15. Of note in this section are the following observations by the

Inspector:

> *7.4.12 The applicant's analysis of the baseline noise survey determined that the NML1, MNL3, MNL4 and MNL8 were most likely to have been influenced by local noise sources resulting in elevated noise levels (these are the same NMLs where I've noted the noise monitoring equipment was set up under trees). The application therefore justifiably excluded these results from consideration. As a consequent the determination of baseline noise characteristics for this extensive geographical area was based on only four NMLs (NML2, NML5, NML6 and NML7) which is exceedingly limited. That 50% of NMLs have had to be excluded reflects poorly on the overall approach to the baseline noise surveys. This is of increased concern given the possibility that much of the area may constitute a low noise environment where lower noise limits would apply under WEDG 2006. In my opinion, the failure to determine the presence and/ or extent of such areas within the study area is not acceptable and I would advise the Board that it would be appropriate to request the applicant to carry out and submit the results of an appropriately revised baseline noise assessment prior to making any decision to grant permission.*

3.17 The locations which were adopted to determine the noise environment at the current Appeal Site were selected to represent the ambient noise environments at those locations. However, the background noise survey was complicated by the presence of an existing wind farm which could influence the levels of noise at a receptor location. ETSU-R-97 advises that existing wind farms should not be included within the assessed background noise levels for a new neighbouring development. Without control of the neighbouring wind farm to allow the stopping of turbines, the solution adopted to determine the prevailing background noise levels for the noise sensitive receptors neighbouring the site was to adopt the lowest measured noise levels at any of the four locations for each wind speed bin and then apply a correction to the measured levels to take account of the possible influence of the existing wind farm upon the collected noise data. This analysis was presented in the "*Response to Additional RFI: 2: Items 1 to 4 – Noise and Vibration: Table 2*". As such this represents the lowest levels measured across the whole site and it was this level that was used when determining compliance with the guidance levels for acceptability of the wind farm. This is a very different analysis procedure to that detailed in the Inspectors report on PA 0046 above, where only four locations were used from an original 8 which covered a significantly larger area than this appeal site. Paragraph 7.4.14 of the Inspectors report also implies that the derived background noise level was determined for the site through averaging levels from all 4 measurement locations to determine a site background noise level. The paragraph states the following:

> *7.4.14 In table 6.4 the applicant sets out the average noise levels per standardised*

*10m wind speeds across all four NMLs and applies the relevant noise limit from WEDG 2006 based on same. A standard 45.0dBL90 daytime limit and 43.0dBL90 at night-time limit is applied as per WEDG 2000. Whilst an outdoor noise limit of 40dBAL90 10min is proposed under the WEDG 2006 Targeted Review (2013), this document has not been adopted at time of writing.*

3.18 Whilst recognising the concerns expressed by Stephanie Larkin & Michael O'Donovan, measurements at or near the tops of hills are often quieter than valley locations during the lower wind speed conditions since there is no noise associated with the flow of water in the near vicinity. Locations within or at the bottom of valleys often experience water flow noise and thereby higher background noise levels during low wind speed conditions. From measurements at many other sites in Ireland undertaken by Hayes McKenzie Partnership, I consider the levels which are presented within Table 2 to be indicative of the noise environment found in rural Ireland during the day time.

### *Critical Wind Speeds and Turbine Choice*

3.19 The assessment undertaken to determine the acceptability of the proposal does not limit itself to a single "*critical*" wind speed but considers the potential noise impact across standardised[6] 10 metre height wind speeds from 5 to 12 $m.s^{-1}$. Operational noise levels from the wind farm below 5 $m.s^{-1}$ will be lower than predicted for 5 $m.s^{-1}$ but no source noise data is available for the turbines since this wind speed is below that required for testing in accordance with *BS EN 61400-11: 2013: Wind Turbines: Part 11: Acoustic noise measurement techniques*, the standard for determining the source noise levels of wind turbines. For variable speed wind turbines, I would consider the critical wind speed to be between a standardised wind speed of 5 and 9 $m.s^{-1}$ as this is the region where the turbine will experience the greatest increase in source noise level with increasing wind speed whilst at a receptor location the existing noise environment may only be starting to increase due to wind effects. This is borne out from reference to the noise measurements undertaken for the Appeal site.

### *Wind Farm Noise – what is a reasonable limit in rural areas.*

3.20 The paper which is referenced considers issues found in Australia where the environment is very different to that found in Ireland. However, the issues which have been raised within the paper are generally addressed within the IoA GPG which has been followed when undertaking noise predictions for the site and when assessing the potential noise impact.

[6] wind speed measured at a height different than 10 m (generally measured at the turbine hub height) which is expressed to a reference height of 10 m using a roughness length of 0.05 for standardisation purpose (in accordance with the IEC 61400-11 standard)

For example, the separation of background noise data into day and night-time, allowance for wind turbine source noise uncertainty (i.e. increase source noise by a minimum of 1.3 dB over that expected for a standard Nordex N100 Wind Turbine) and inclusion of a correction for the valley effect, where it has been found to be required, have all been taken into account.

**Mr Patrick Manning: 3rd October 2017**

3.21 Mr Manning submission discusses the issue of noise associated with the wind farm and the predicted levels determined at two properties that he has an interest in, H54 and H55.

3.22 Mr Manning states that both his properties would be subject to cumulative level of noise associated with the Appeal site and the neighbouring Garranereagh Wind Farm. It may be seen from the predictions contained within the EIS and RFI responses that H54 falls outside the predicted 40 dB $L_{A90}$ noise contour and as such is not predicted to exceed the 43 dB $L_{A90}$ night-time noise limit.

3.23 H55 has been predicted to cumulatively exceed the 43 dB $L_{A90}$ noise limit by 0.1 dB and 0.2 dB at 8 $m.s^{-1}$ and for wind speeds ≥10 $m.s^{-1}$respectivley. This is detailed in Table 8 of Response to Additional RFI dated 9th September 2015 from AWNConsulting.

3.24 I have undertaken my own predictions for this location and agree with these potential predicted exceedances when only down wind conditions are considered. These predictions have been undertaken in accordance with the IoA Good Practice Guide requirements in terms of source sound power levels assumptions, barrier corrections and concave valley corrections.

3.25 An exceedance of 0.2 dB is a change in level which is not detectable within a laboratory environment for the presentation levels (< 45 dB $L_{Aeq}$) that will be experienced at the receptor, i.e. this potential exceedance is not noticeable. It should also be considered that the accuracy of a Type I Acoustic Calibrator is ± 0.2 dB, i.e. the appropriate measuring system for determination of compliance is unable to measure that accurately.

3.26 It should also be noted that H55 is located to the west of the Appeal site. This is upwind in the prevailing wind direction. Wind effects upon propagation will result in a reduction in received noise levels at the property for a majority of the time. Table 1 below details the calculated noise levels which take account of wind direction within the propagation algorithm, as set out in the IoA GPG.

| Table 1: H55 Predicted Directional Predicted Noise Levels: dB $L_{A90}$ | | | | | | |
|---|---|---|---|---|---|---|
| Wind Direction | Standardised Wind Speed: $m.s^{-1}$ | | | | | |
| | 5 | 6 | 7 | 8 | 9 | ≥10 |
| 0 | | 38.7 | 40.1 | 40.7 | 40.6 | 40.8 |
| 15 | | 39.2 | 40.6 | 41.2 | 41.1 | 41.3 |
| 30 | | 39.3 | 40.8 | 41.3 | 41.3 | 41.4 |
| 45 | | 40.4 | 41.8 | 42.4 | 42.3 | 42.5 |
| 60 | | 40.6 | 42.0 | 42.6 | 42.5 | 42.7 |
| 75 | | 41.0 | 42.4 | 43.0 | 42.9 | 43.1 |
| 90 | | 41.1 | 42.5 | 43.1 | 43.0 | 43.2 |
| 105 | | 41.1 | 42.5 | 43.1 | 43.0 | 43.2 |
| 120 | | 41.1 | 42.5 | 43.1 | 43.0 | 43.2 |
| 135 | | 41.1 | 42.5 | 43.1 | 43.0 | 43.2 |
| 150 | | 41.1 | 42.5 | 43.1 | 43.0 | 43.2 |
| 165 | | 40.7 | 42.1 | 42.7 | 42.6 | 42.8 |
| 180 | | 40.2 | 41.6 | 42.2 | 42.2 | 42.3 |
| 195 | | 40.0 | 41.4 | 42.0 | 41.9 | 42.1 |
| 210 | | 38.7 | 40.1 | 40.7 | 40.6 | 40.8 |
| 225 | | 38.8 | 40.2 | 40.8 | 40.7 | 40.9 |
| 240 | | 37.6 | 39.0 | 39.6 | 39.5 | 39.7 |
| 255 | | 36.7 | 38.1 | 38.7 | 38.6 | 38.8 |
| 270 | | 35.4 | 36.8 | 37.4 | 37.3 | 37.5 |
| 285 | | 34.6 | 36.0 | 36.6 | 36.5 | 36.7 |
| 300 | | 34.5 | 35.9 | 36.5 | 36.4 | 36.6 |
| 315 | | 35.0 | 36.4 | 37.0 | 36.9 | 37.1 |
| 330 | | 36.2 | 37.6 | 38.2 | 38.1 | 38.3 |
| 345 | | 37.0 | 38.4 | 39.0 | 38.9 | 39.1 |
| 360 | | 38.7 | 40.1 | 40.7 | 40.6 | 40.8 |

3.27 The predicted exceedance will therefore be restricted to limited periods of operation during the average year as the property is upwind of the Appeal site in the prevailing wind direction.

3.28 Mr Manning also states that his "investment" property is located within 400 metres of Turbine T4 whereas the letter from Mr Buckley (dated 6th October 2017) indicates that Mr Manning's residence is at 572 metres from the nearest turbine. My reading of the submission made by Mr Manning is that his residence is closer to the proposed Appeal site than his "investment" property, i.e. the "investment" property is further than 572 metres from

the nearest proposed wind turbine. It should be noted that Mr Manning has identified H38 within the first figure of his submission as the property at which he resides. However, H38 is considered to be a derelict property for the purpose of the EIS and therefore, following the wind farm planning guidance, has not been considered for noise assessment. It is our understanding that Mr. Manning resides in H55. Appendix 1 details the locations of H38 and H55 for ease of reference.

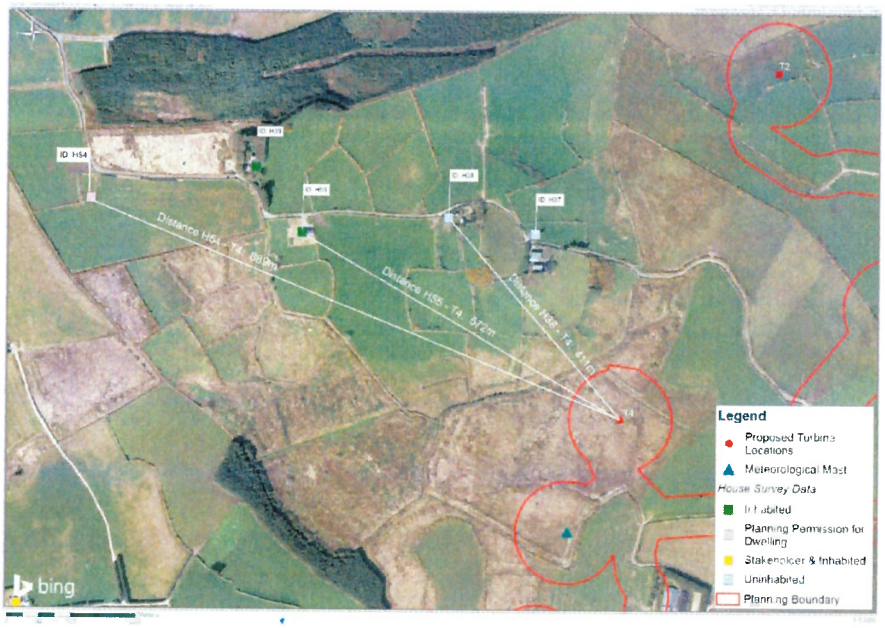
### Eleanor O'Leary Letter Dated 4th August 2017

3.29 I have reviewed the predictions of operational noise in the vicinity of 1km to the north of the existing wind turbines at Garranereagh Wind Farm as described within the letter from Mrs O'Leary. The predictions indicate that the Appeal site will result in noise levels around 3 dB below those predicted for the existing wind farm and would lead to an increase of around 1.5 dB in the cumulative noise levels. Such an increase does not result in levels exceeding a cumulative level of 37.7 dB $L_{A90}$ at a standardised wind speed of 10 $m.s^{-1}$.

## 4. CONCLUSIONS

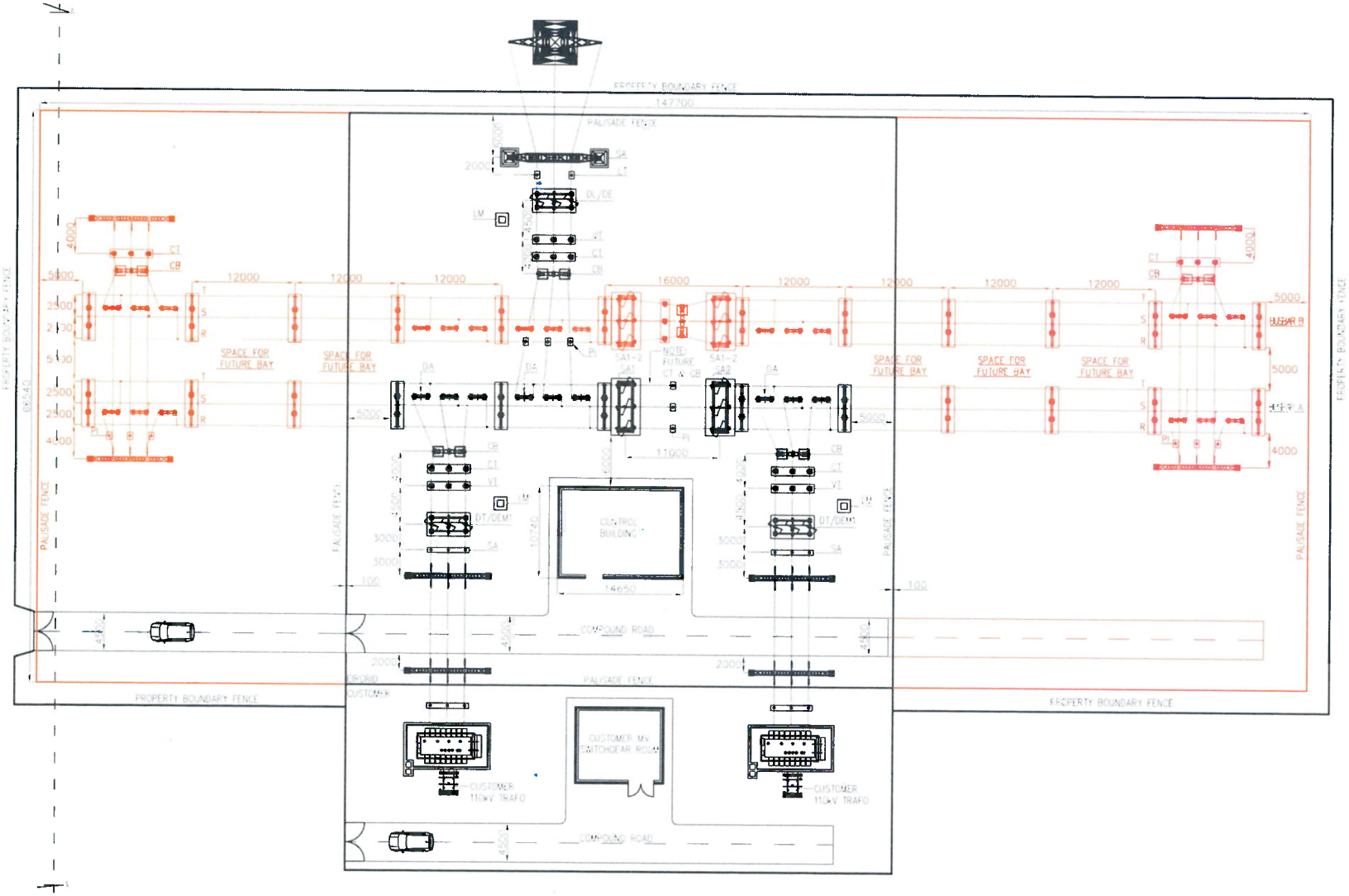
4.1 The issues raised within the submission are, in general, already considered within the documents submitted to the Planning Inquiry. As a consequence, I consider that the assessed noise impact is representative of the potential change associated with the proposed wind turbines and that the operation of the wind turbines will meet the intent of the current Wind Farm Planning Guidelines 2006.

# APPENDIX 1 – SITE PLAN: H38, H54 & H55 LOCATION IDENTIFICATION



# Appendix 2

## Eirgrid Substation Design




LEGEND

| | |
|---|---|
| LM | LIGHTNING MAST |
| Q1(DA) | BUSBAR DISCONNECT |
| SA | SURGE ARRESTER |
| VT | VOLTAGE TRANSFORMER |
| CT | CURRENT TRANSFORMER, SINGLE PHASE |
| Q0(CB) | CIRCUIT BREAKER |
| PI | POST INSULATOR |
| LT | LINE TRAP (TYPICALLY R, S, T PHASES) |
| Q9/Q91 (DL/DE) | LINE/EARTH DISCONNECT |
| Q9/Q91 (DT/DEMT) | TRAFO/EARTH DISCONNECT |
| Q11/Q12 (SA1-2 SA1/ SA1-2 SA2) | SECTIONALISER |

FUTURE RING STATION (SPACE ONLY)

NEW LOOP STATION

NOTE: THIS DRAWING IS PRODUCED FOR INFORMATION PURPOSE ONLY. ALL DIMENSIONS, REFERENCE GIVEN ARE INDICATIVE AND SHOULD NOT BE USED AS A PART OF A DETAILED DESIGN.

| REV | DESC | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|---|
| 03 | TRAFO & LINE EARTH SWITCHES UPDATED | JB | RB | PM | 09/09/2013 |
| 02 | PALISADE FENCE HEIGHT AMENDED | JB | RB | PM | 22/01/2013 |
| 01 | MINOR REVISIONS | JB | RB | PM | 11/12/2012 |
| 00 | FIRST ISSUE | JB | RB | PM | 03/11/2012 |

EirGrid plc
The Oval, 160 Shelbourne Road,
Ballsbridge Dublin 4, Ireland
Telephone: +353 1 677 1700
Fax: +353 1 661 5375
Email: info@eirgrid.com
Web: www.eirgrid.com

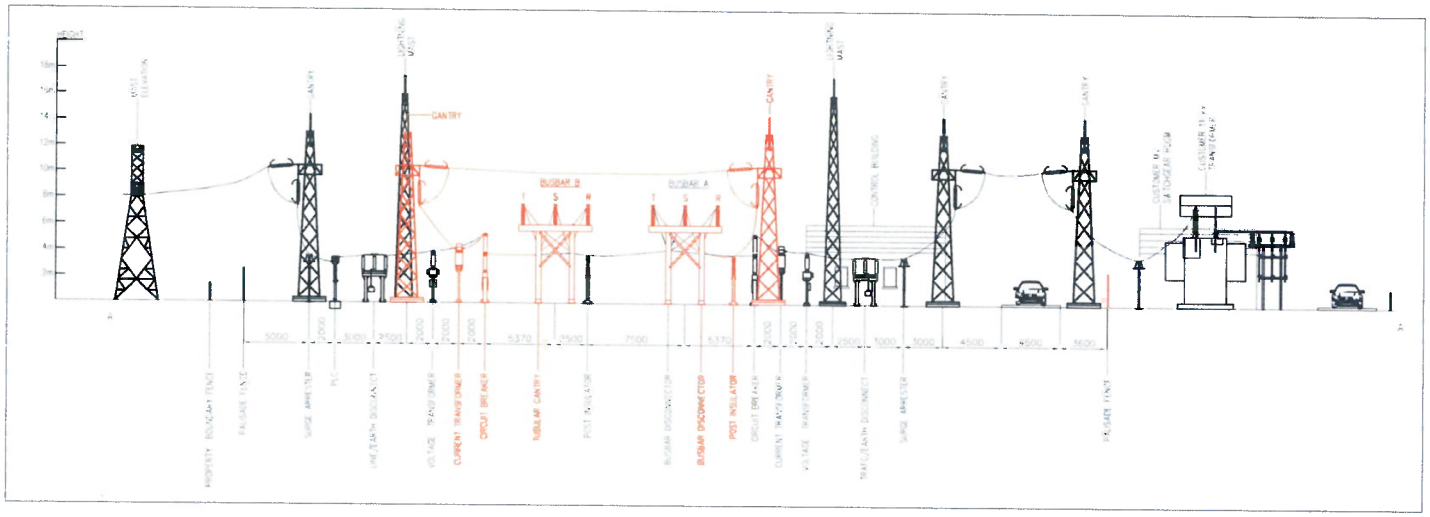


PROJECT
110kV STATION DESIGN STANDARD
AIS TAIL STATION

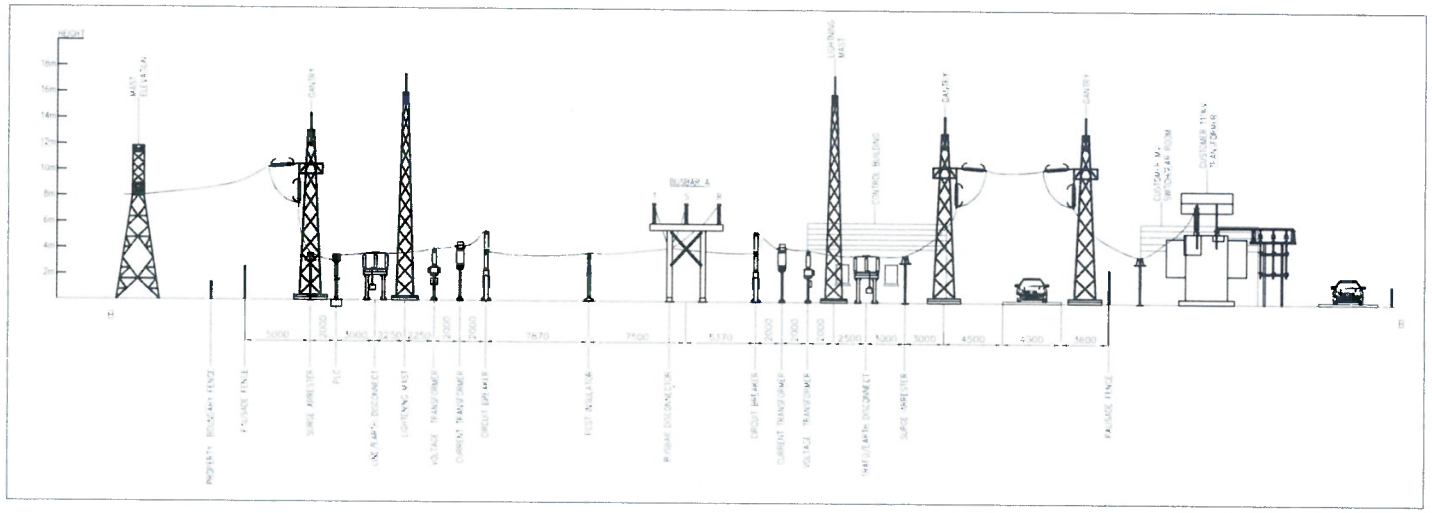
DRAWING TITLE
RING BUSBAR CONFIGURATION
1 LINE BAY & 2 TRAFO BAYS & SPACE
FOR 5 FUTURE BAYS & 2 WING COUPLERS

| No of Shts | SIZE | SCALE |
|---|---|---|
| 02 | A3 | 1:500 |

| DRAWING NUMBER | SHEET | REV |
|---|---|---|
| XDN-LAY-ELV-STND-H-002 | 001 | 03 |



ELEVATION SECTION A-A (FUTURE RING STATION ADDED)



ELEVATION SECTION A-A

FUTURE RING STATION

NEW TAIL STATION

NOTE: THIS DRAWING IS PRODUCED FOR INFORMATION PURPOSE ONLY. ALL DIMENSIONS, REFERENCE GIVEN ARE INDICATIVE AND SHOULD NOT BE USED AS A PART OF A DETAILED DESIGN.

| REV | DESC | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|---|
| 03 | TRAFO & LINE EARTH SWITCHES UPDATED | JB | RB | PM | 09/09/2013 |
| 02 | PALISADE FENCE HEIGHT AMENDED | JB | RB | PM | 22/01/2013 |
| 01 | MINOR REVISIONS | JB | RB | PM | 11/12/2012 |
| 00 | FIRST ISSUE | JB | RB | PM | 03/11/2012 |

EirGrid plc
The Oval 160 Shelbourne Road,
Ballsbridge, Dublin 4, Ireland
Telephone: +353 1 677 1700
Fax: +353 1 661 5375
Email: info@eirgrid.com
Web: www.eirgrid.com



PROJECT
110kV STATION DESIGN STANDARD
AIS TAIL STATION

DRAWING TITLE
RING BUSBAR CONFIGURATION
1 LINE BAY & 2 TRAFO BAYS & SPACE
FOR 5 FUTURE BAYS & 2 WING COUPLERS

| No of Sht | SIZE | SCALE |
|---|---|---|
| 02 | A3 | 1:400 |

| DRAWING NUMBER | SHEET | REV |
|---|---|---|
| XDN-LAY-ELV-STND-H-002 | 002 | 03 |