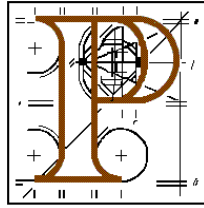


An Bord Pleanála



Inspector's Report

Development: 10-year permission to construct a wind farm at Carrigarierk, Dunmanway, of up to 5 no. turbines with maximum height of 140m, access roads, wind monitoring mast (90m), 2 no. borrow pits, underground electricity cabling, sub-station, all ancillary works, and underground grid connection at the townlands of Gurteen, Clogher, Derryleigh, Gortatanavally, Carrigdangan, Inchincurka, Johnstown, Haremout, Gorteenadrolane, Teeranassig, Clonmmoyle, Dromleigh, Coolaclevane, Carrigboy, Cooldorragha, Deshure, Teerelton, Lisnacuddy, Reanacaheragh, Barnadivane, Barnadivane (Kneeves) and Garranereagh, Co. Cork.

Planning Application

Planning Authority : Cork County Council
Planning Authority Register Ref. : 15/730
Applicant : Keel Energy Ltd.
Type of Application : Permission
Planning Authority Decision : Refuse permission

Planning Appeal

Appellant(s) : Karin Kempf
: Nigel de Haas
: Keel Energy Ltd.
: Sarah Hodgkinson & Others

Type of Appeal : 1st & 3rd Parties v Refusal

Observer(s) : A.G. Lacey-Porter
: Anthony Cohu
: Pam Brennan de Haas
: Maurice & Siobhán Murphy and Others
: Paul Screech
: Ian Collins
: Carlien Croonenberg
: Anton Floyd
: Anne O'Callaghan
: Wendy Miles
: Diana Kuehnel
: Sinéad McSherry and Brendan Daly
: Mick & Julia O'Connell
: John & Kitty Carroll and Others
: Joseph Pittam and Marika Jylhasalo
: Tony Miller
: Louise Munday
: Francis, Eileen, Aidan & Aoibhín Kelly
: Board of Management – Dromleigh NS
: Stephanie Larkin
: Nic Pease
: Justine Richards & Con Kelleher
: James & Kay Cronin

Date of Site Inspection : 3rd August & 7th September 2016

Inspector : **Michael Dillon**

1.0 Site Location & Description

- 1.1 The wind farm site, with a stated area of 68.2ha (the permanent footprint being approximately 5.4ha), is located some 9km north of the village of Dunmanway, in Co. Cork. The site straddles Carrigarierk Hill (343m) with turbine bases located at heights between 233m and 329m OD. The hill forms part of a range of hills, with the Lee River valley to the north and northeast and the Bandon River valley to the south and southeast, and is characterised as the eastern foothills of the Shehy Mountains. Approximately three quarters of the site comprises coniferous plantation – the remainder being rough grazing land and grassland. Some forestry on the northern slopes of the hill has recently been clear-felled and replanted. All elements of the wind farm, apart from T5 and the sub-station, are within coniferous plantation.
- 1.2 Access to the proposed development is via a Coillte forestry entrance from a county road to the south (L8535). The road is approximately 4m wide. The 80kph speed restriction applies in this area. There are no public footpaths and no public lighting in the area. The site entrance is approximately 2.4km from the R585 Regional Road to the south.
- 1.3 There are fine views into the site from all directions due to its elevation. There are wind farm developments visible away to the east and south. There are no wind farm developments within a 10km radius of the site, although planning permission has been granted for one approximately 9km to the south and another 9km to the northwest, and permissions sought for others to the west and north (within a radius of 10km). These permissions and applications are indicated on Figure 2.4 of the EIS.
- 1.4 Neither the site nor the grid connection route is located within a Gaeltacht area.

2.0 The Proposed Development

- 2.1 A 10-year permission was sought on 22nd December 2015, for a wind farm development (15MW) as follows-
- 5 no. turbines – maximum blade tip height of 140m and rotor diameter of 113m. Colour to be matt-grey. Exact model not yet decided, but all will have three blades, will be geared, and all turbines will rotate in the same direction.
 - Wind anemometer mast of up to 90m in height – triangular lattice construction at 295m OD.
 - 38kV electricity sub-station (50m x 23m compound) and surrounded by 2.5m high palisade fencing. Single-storey control building (158m²) with pitched roof (6.1m high) within the compound.
 - 2 no. borrow pits – approximately 4m deep each.

- Underground cabling.
- Water supply harvested from roof rainwater.
- Foul effluent to be discharged to wastewater storage tank, and tankered off-site.
- Surface water disposal to ground.
- Upgrading of existing (0.63km) and provision of additional (4.17km) internal access tracks (6m in width).
- Construction access route from county road to the south (L8535 and L4607), which in turn link to the R585 Regional Road.
- Underground grid connection to proposed 110kV sub-station to serve proposed wind farm development at Barnadivane townland (some 12km due east of the proposed wind farm site), or else to the proposed sub-station, currently under appeal to the Board ref. PL 04.244439, to serve an amended proposal for the wind farm at Barnadivane – the two sub-station sites being different. The total length is 18km (all within public roads and forestry tracks), involving 15 no. water crossings.
- Junction accommodation works on proposed delivery route from the R585.
- Temporary construction compound (55m x 40m).
- Sign, measuring 1.8m x 2.4m high at site entrance.

2.1.1 The application is accompanied by the following-

- Environmental Impact Statement (EIS) – contained within two volumes. Volume 1 contains the Non-Technical Summary and the Main Document. Volume 2 contains a series of photographs and photomontages.
- Natura Impact Statement (NIS).
- Letters of consent from landowners to the making of the planning application.
- Cork County Council has given its consent to the use of public roads, within which to lay cables for the grid connection.

2.2 Unsolicited additional information was received from the applicant on 18th February 2016, being a rebuttal of objections received by the Council.

3.0 Development Plan & Other Guidance

3.1 National Policy

3.1.1 Guidelines for Planning Authorities on Wind Farm Development and Wind Energy Development 2006:

The Guidelines offer advice on planning for wind energy through the Development Plan process and in determining applications for planning permission, and are intended to ensure consistency of approach in the

identification of suitable locations for wind energy developments, and acknowledge that locational considerations are important. These considerations include ease of vehicular access and connection to the electricity grid. It is acknowledged that visual impact is amongst the more important issues when deciding a particular application. I would note that whilst there are proposed changes to these Guidelines – “Proposed Revisions to Wind Energy Development Guidelines 2006 – Targeted Review in relation to Noise, Proximity and Shadow Flicker” (December 2013) – no changes have been adopted to date, and the 2006 Guidelines remain in force.

3.1.2 Government Policy

Outlined in a number of government policy documents such as the National Climate Change Strategy 2007-2012, National Spatial Strategy 2002-2020, Towards 2016 – Ten Year Framework for Social Partnership Agreement 2006-2015, National Development Plan 2007-2013, Energy White Paper – “Delivering a Sustainable Energy Future for Ireland” (2007), National Energy Efficiency Action Plan; it is policy to promote the production of electricity from renewable resources such as wind power, in order to meet demand, reduce carbon emissions and meet commitments under the Kyoto Protocol. The White Paper – “Ireland’s Transition to a Low Carbon Energy Future 2015-2030”, issued by the Department of Communications Energy & Natural Resources, promotes the idea of a carbon-free energy sector by 2050.

3.2 **Regional Guidelines**

South West Regional Planning Guidelines 2010-2022:

Objective RTS-09: Energy and Renewable Energy, promotes the development of renewable energy resources in a sustainable manner. In particular, development of wind farms shall be subject to-

- The Wind Energy Planning Guidelines.
- Consistency with proper planning and sustainable development.
- Criteria such as design and landscape planning, natural heritage, environmental and amenity considerations.

3.3 **Development Plan**

Cork County Development Plan 2014-2020:

- There is a Wind Energy Strategy contained within the Plan. The development is located within an area ‘Open to Consideration’ – indicated at Figure 2.7 of the Environmental Impact Statement (EIS) submitted with the application. The Plan states at Objective ED 3-5- “This area comprises almost 50% of the County area. Within these areas there are locations that may have the potential

for wind farm developments but there are also some environmental issues to be considered. This area has variable wind speeds and some access to the grid". Commercial wind energy development is open to consideration in these areas where the proposed development can avoid adverse impacts on:

- Residential amenity particularly in respect of noise, shadow flicker and visual amenity;
 - Urban areas and Metropolitan/Town Green Belts;
 - Natura 2000 Sites [SPA and SAC], Natural Heritage Areas [NHAs] or adjoining areas affecting their integrity;
 - Architectural and archaeological heritage;
 - Visual quality of the landscape and the degree to which impacts are highly visible over wider areas.
- Most of the site lies within Landscape Character Type 12(b) – Rolling Marginal Middleground. A portion, at the northern end of the site, lies within Landscape Character Type 15(a) – Ridged and Peaked Upland.
 - There are a number of Scenic Routes in the vicinity of the site – indicated at Chapter 5 of Volume 2. Of note is Scenic Route S32 which comprises the county road (L85367) running from southwest to northeast, to the northwest of the proposed site. Other Scenic Routes in the area are S33 & S34, with S29 and S35 located further off. This section of the Plan notes that landscapes are living and changing and that it is not proposed that development be prohibited along these routes.

3.4 Local Area Plan

Skibbereen Electoral Area Local Area Plan 2011:

The LAP deals primarily with settlement issues.

4.0 Planning History

Ref. 05/1024: Permission refused for wind farm development of five turbines on site to the south of the current appeal site at Farrannahineeny. On appeal by the 1st Party to the Board (**PL 04.215968**), permission as refused in August 2006, on grounds of impact on the stone row National Monument at Farrannahineeny.

Ref. 05/5907: Permission granted for wind farm development of 18 no. turbines, including sub-station at Barnadivane. [This is the sub-station to which it is proposed to connect from the current appeal before the Board]. On appeal by 1st and 3rd parties, (**PL 04.219620**), permission was granted on 14th February 2007. No development has been undertaken to date.

Ref. 11/6605: Permission granted to extend wind farm permission ref. 05/5907. [This is the sub-station to which it is proposed to connect]. No development has been undertaken to date.

Ref. 14/6760: Permission granted for wind farm development of 6 no. turbines at Barnadivane (to replace permission ref. 11/6605). This decision was the subject of 3rd party appeals to the Board (**PL 04.245824**), with permission granted on 8th July 2016. This decision of the Board is subject to Judicial Review.

Ref. 14/557: Permission granted for sub-station to replace one previously granted under PL 04.219620 at Barnadivane. This decision was the subject of 3rd party appeals to the Board (**PL 04.244439**), with permission granted on 11th July 2016. This decision of the Board is subject to Judicial Review.

Ref. 13/551: Refers to a planning application for 12 wind turbines at Shehy More (some 3.0km to the west of the appeal site). Permission was granted, in May 2014, for 10 no. turbines. This decision was the subject of 1st and 3rd party appeals to the Board (**PL 04.243486**), with no decision to date.

Ref. 16/256: Permission granted on 22nd June 2016, to construct grid connection from proposed Shehy More wind farm (Ref. 13/551), currently the subject of appeal to the Board (PL 04.243486). The grid connection is to connect to the proposed sub-station at Barnadivane. The route is co-terminus with the grid connection route from Carrigarierk – from Teeranassig to Barnadivane. The decision was the subject of 3rd party appeals to the Board (**PL 88.246915**) with no decision to date.

5.0 The Planning Authority's Decision

By Order dated 22nd February 2016, Cork County Council issued a Notification of decision to refuse planning permission for one reason; that the development would materially contravene Objective ED 3-5 of the Plan, relating to impact on visual amenity and the precedent which a grant of planning permission would set for other similar-type developments.

6.0 Grounds of Appeal

The 1st Party has appealed against the decision to refuse permission. In addition, there are three 3rd Party appellants, as listed on the front page of this Inspector's Report. The documentation submitted is both extensive and comprehensive. Where possible, this Report attempts to avoid repetition.

6.1 1st Party Appeal

6.1.1 The response of McCarthy Keville O’Sullivan, agent on behalf of the 1st Party, Keel Energy Ltd, received by the Board on 21st March 2016, can be summarised in bullet point format as follows-

- The proposed turbines will not have an adverse impact on Scenic Routes. Additional photomontages have been submitted for S29, S32, S33, S34 & S35. On the portion of S32 closest to the site – the scenic views are away from the site towards the mountains/hills to the southwest, west, northwest and north. The closest turbine to this Scenic Route is 0.67km. A survey of vegetation screening on each Scenic Route was carried out in February 2016. Screening, which is not accounted for in the ZTV maps, considerably reduces the length of road from which views of turbines would be available: maps for S29, S32, S33 & S34 are produced.
- Residential amenity in terms of noise and shadow flicker has been considered in the design of the wind farm. The separation distance between any house and turbine is in excess of 707m. The Development is in accordance with the 2006 Guidelines, notwithstanding that Cork County Council seems to be dissatisfied with the said Guidelines.
- Topography and natural screening will ensure that the turbines will not be a dominant feature on the landscape. The impact arising would be long-term in duration, slight in significance and neutral in quality. The scale of the development is small, and appropriate for the location.
- The development has been sited to avoid impact on European sites and sites of nature conservation importance.
- Permission exists for a sub-station at Barnadivane – to which it is proposed to connect the wind farm at Carrigarierk to the national grid.
- Additional information in relation to a grid connection for the Shehy More wind farm has been submitted to the Board, and a decision is awaited on this appeal for 12 no. turbines some 3km to the west of the appeal site. Permission had been granted by Cork County Council for 10 turbines. The Shehy More development has been included in all photomontages. Permission was granted by Cork County Council for 6 no. turbines at Derragh to the northwest (subsequently the subject of the Ó Grianna judgement).
- The wind turbines will not have a detrimental impact on Farrannahineeny stone row due to setback distance of the closest turbine.
- References in Planning Reports to revisions to Wind Farm Guidelines and bills which were introduced and not passed, are not relevant considerations.
- The wind farm will not impact on views from Scenic Route 33.

- There are 16 no. houses within 1km of a turbine (excluding four houses whose owners have an interest in the proposal).
- House no. 43 is 755m from the closest turbine.
- Shadow flicker caused by the development can be controlled or mitigated in a variety of ways – clearly set out in the EIS.
- The grid connection route is the shortest underground option available. Whilst it is acknowledged that the Area Engineer for Cork County Council might wish to protect recent investment in road surfacing, trench works will ensure that the condition of the road will not be diminished. The development, if permitted, will be subject to a Road Opening Licence (controlled by Cork County Council).
- The drainage proposals were acceptable to the firm of consultants hired by Cork County Council, and will not result in any downstream flooding of roads.
- A bond would normally be required as a condition of permission, to ensure that roads are not damaged by construction traffic. In relation to the L4607 and L8535, the applicant would have no objection to the imposition of a bond condition.
- Permission has been granted for similar-type turbines in the vicinity – some of greater height.

6.1.2 The appeal is accompanied by the following documentation of note-

- Booklet of additional photomontages.
- Report on Archaeology.
- Technical Note on Noise.
- Habitat Rehabilitation Plan.
- Bat Fauna Assessment.
- Tree Felling & Nutrient Release Report.

6.2 3rd Party Appeals

6.2.1 The 3rd Party Appeals were received from the following-

- ❖ Karin Kempf – 16th March 2016.
- ❖ Nigel de Haas – 16th March 2016.
- ❖ Noonan Linehan Carroll Coffey, Solicitors, agent on behalf of Sarah Hodkinson & Others – 21st March 2016.

6.2.2 The issues of note are summarised in bullet point format as follows-

- There are a number of other reasons which Cork County Council should have included in deciding to refuse permission for this development.
- Development will impact on well/spring water supply to private houses – particularly along the grid connection route.
- Welfare and wishes of community should have primacy over those of the developer.

- Residential property in the area will be devalued.
- Noise nuisance will result for residents of the area – particularly in combination with the Shehy More wind farm proposal. This can have a detrimental impact on health – particularly in relation to low frequency noise. Sleep patterns can be affected. There are a number of studies which show that wind farms have detrimental impacts on human health.
- The noise limit condition generally imposed by the Board is insufficient to protect residential amenity.
- It is not clear that the company/persons measuring noise in the area were suitably qualified. Insufficient noise monitoring locations were used. There is insufficient evidence on the file that noise monitoring equipment was appropriately calibrated and certified. The surveys were carried out in inappropriate weather conditions in terms of excessive rainfall and excessive wind and unrepresentative wind directions (during Storm Desmond). The loss of data from survey point D renders the study unrepresentative, as this was the only point north of the Carrigarierk ridge line.
- Wind turbines can negatively affect people with epilepsy.
- Turbines will be unsightly and will alter the landscape character. Photomontages underestimate the impact of the development. Some of the viewpoints chosen for the EIS are not representative. These turbines are on an elevated ridge and will entirely dominate the landscape. The site is not located in ‘Moorland mountain’ landscape type, as frequently stated in the EIS.
- Some of the measured distances between turbines and houses are incorrect.
- High voltage cables, even if underground, can impact negatively on peoples’ health.
- The Targeted Review of the Wind Energy Guidelines 2013, recommended stricter limits in relation to siting of turbines, noise and shadow flicker. No shadow flicker should be permitted to occur at nearby residences.
- Sediment entering watercourses will affect aquatic ecology – including the Freshwater pearl mussel. Drainage mitigation measures are not site-specific. Discharge to vegetation will not be suitable on steep ground during heavy rainfall where ground is already saturated. Monthly rainfall has been underestimated, and does not account for heavy rainfall events.
- Lubricants, cooling and hydraulic fluids could cause contamination of watercourses. As equipment ages on site, the possibility of leakages is greater. Fires can also result in leakages of such fluids. There is no evidence that turbines will be bunded for such leakages and spillages as may occur during the operational phase.

- The area is of importance for the Barn owl, and no night-time bird surveys would appear to have been carried out.
- Wind turbines have caused the deaths of White-tailed sea eagles at nearby Sillahertane in Co. Kerry.
- Bat species will be affected by turbines. Incomplete surveys of this species were carried out. Leisler's bat species will be particularly affected, as it is a 'high-flier'.
- Reasonable scientific doubt exists as to the effects of this development on European sites.
- Vantage point surveys for birds would seem to indicate that no counts were undertaken at point 2 of four. Weather conditions on the dates of some surveys have not been indicated.
- The development will compromise the archaeological heritage of the area. The site survey carried out for the EIS was limited to one day and did not include all areas – due to growth of vegetation. The failure to access the wedge tomb CO093-019 raises a question as to the thoroughness of the survey, as this monument is readily accessible. The impact of the development on Farrannahineeny stone row has been under-estimated. The turbines will overwhelm the monument.
- The developer has not engaged with the local community in any meaningful way. Not all households in the area were notified of the meeting in December 2015. Dunmanway is too far away from this local community: Inchigeelagh should have been used.
- The environmental impacts of this development and the Shehy More wind farm overlap. This application is an example of project-splitting by the same company making multiple applications for wind farms under different names. This proposed wind farm is even to share a grid connection with the proposed Shehy More wind farm. The full extent of this project has not been revealed by the applicant. Reference was made at pre-planning discussions to 11 no. turbines.
- Blades could fall off turbines, towers can collapse and nacelles go on fire. Ice throw is another safety concern. There have been a number of lightning strikes/fires/blade malfunction at turbines in Ireland. The 500m setback requirement is inadequate to protect the safety of nearby residents.
- The grid connection route is too close to three villages – Johnstown, Kilmichael and Teerelton. It is located too close to Dromleigh NS. People living close to the route or using it for recreation will be subjected to unacceptably high levels of electromagnetic radiation. There is no information regarding magnetic flux density over ground level for the proposed 38kV cable when operating at its maximum design level.
- The applicant does not have the permission of the relevant landowners to lay the grid connection – even where it is within a

public road. If rock is encountered within roads, cables will likely be laid at shallower depths.

- The narrow roads in the area will not be able to accommodate the proposed junction bays on the grid connection route.
- Cable laying will be disruptive to local traffic.
- Cable laying may negatively impact on other services already located within the road.
- The cable route will prejudice future development and will place restrictions on what can be developed.
- Japanese knotweed will be spread along the grid connection route as a result of works.
- The Coillte forest at Carrigarierk is the site of a confirmed outbreak of the fungal pathogen *Phytophthora ramorum*. The construction activities at this site are sure to result in the spread of this plant pathogen.
- The number of existing, permitted and proposed wind farms in the area undermine the tourism potential of the area.
- County Cork is providing more than its fair share of renewable energy within the country.
- The area is zoned for agricultural use – and industrial wind farms are not considered an appropriate use within this zoning.
- The development contravenes a number of Development Plan policies in relation to protection of rural communities, recreational facilities, business development in rural areas, tourism, and protection of the natural and built environment.
- The wider landscape belongs to the community, and inspires poets, writers and artists. People have an emotional response to the landscape. Turbines are not sculptural objects in the landscape, as claimed in the EIS.
- Documentation on this file was not available for consultation by the public until the second week of January 2016 – although the application had been received by Cork County Council on 22nd December 2015.

6.2.3 The appeals are accompanied by the following documents of note-

- Extracts from documentation of the Companies Registration Office.
- Safety manuals for operators & technicians on particular wind turbine models.
- Weather reports from November 2015.
- Research Paper relating to low frequency noise and infrasound as they relate to wind farms.
- Signed petitions – objecting to the proposed development.
- Research Paper relating to noise and wind farms.
- Conference Presentation relating to physical and mental health and noise from wind farms.

- Research Paper relating to medical, psychological and genetic aspects of noise.
- Research Paper relating to the impact of wind farms on property values.
- Copy of 'Acoustics Today' Journal – Winter 2014.
- Kelly Judgement of the High Court – No. 802 of 2013.
- Balz & Heubach Judgement of the High Court – No. 450 of 2013.
- Photographic examples of accidents at wind farms in Ireland.
- Research Paper on ETSU-R-97 and why it's use as a standard for noise is wrong.
- Research Paper on Wind Turbine Noise – Audible Amplitude Modulation.
- Research Paper on noise-compliant wind farms which cause nuisance to neighbours.
- Research Paper on community noise-monitoring project.
- Report of Gerard P. Moynihan, Consulting Engineer, in relation to structural stability of premises – Cill Éanna Bar, Johnstown, Kilmichael. Grid connection trench is located too close to the gable wall of the bar. (2 no. colour photographs included).

6.3 Request for Oral Hearing

A request by one of the 3rd parties that an Oral Hearing be held was turned down by the Board; by Order dated 19th May 2016.

7.0 Observations

7.1 There are a total of 23 no. Observers to this appeal – listed on the front cover of this Inspector's Report. All are opposed to the proposed development. The issues raised, where in addition to those already raised by 3rd Parties, can be summarised in bullet point format as follows-

- Houses most affected by this development have been offered no compensation.
- Construction of turbines and wind farms generates more CO₂ than is saved in their operation.
- The EIS submitted is not impartial – and Cork County Council does not have the ability to carry out EIA on such a document.
- There is no justification for granting a 10-year permission. If applicants do not have an offer of connection to the national grid, then the application should be deemed premature.
- These turbines will have a disproportionately large swept area by blades – 113m diameter.
- Separation distances for house H17 from T5 has been under-represented, as has separation distance for H18 from T4.

- A grant of permission will result in people leaving this area – triggering a population loss and ultimate decline.
- The issue of flicker caused by the moon has not been addressed.
- This application is just part of a larger wind farm development which will ultimately include another six turbines on Pipe Hill. Pre-planning meetings with Cork County Council refer to 11 turbines.
- The EIS fails to acknowledge the village nucleus of Johnstown – the closest village to the wind farm.
- A-weighting noise measurement used in the 2006 Wind Farm Guidelines underestimates the sound pressure level of noise with low-frequency components, and the use of C-weighting would provide a better assessment of health impacts.
- Excavation for the grid connection will result in danger for children playing in the vicinity.
- There is a ring fort opposite the Cill Éanna Bar, and excavation within the road for the grid connection could result in damage to subsurface archaeology.
- The wind farm will result in the halting of work on animal and bird rehabilitation carried out at the property of Wendy Miles (house no. 43). T4 is located less than 500m from the house. A second dwelling-house is located next to Carrigarierk Rock and is not even marked on the maps submitted by the applicant. This second house is located 200-300 yards closer to T4. Other family members live in this second house (aerial photographs submitted).
- The EIS fails to give appropriate weight to a refusal of permission for a wind farm at Farrannahineeny stone row. The Development Applications Unit of the National Monuments Division opposed this application, which was ultimately refused permission by the Board (ref. 05/1024) for a reason relating to unacceptable impact on the astronomical alignment of the stones. The impact on this monument has been downplayed by the applicant.
- The wind farm will discourage hill-walkers from visiting the area.
- House H15 is most certainly occupied – even though not accessible to vehicular traffic.
- Lights on turbines will be visible at night-time, causing visual intrusion.
- Wind turbines will result in the countryside around being unavailable for film shoots of rural locations.
- Infrasound can have a deleterious impact on the well-being and behaviour of animals.
- The Pipe Hill Trail is promoted by nearby Dunmanway. There are lay-bys at the summit of this road (S32) to allow visitors to enjoy the panoramic vistas. Both the proposed wind farm and that at Shehy More will be particularly visible from this Scenic Route.
- Schoolchildren at Dromleigh NS will be exposed to unacceptably high levels of electromagnetic radiation.

- Pipe-laying will impact on otters in the Cooldorrihy River. Otter surveys were insufficient. No survey of Dippers was undertaken on this river.
- Surveys for Kerry Slug were insufficient.
- Television signals may be interfered with by rotating turbines.

- 7.2 Observations are accompanied by the following documents of note-
- Information leaflet on Shehy More wind farm underground grid connection.
 - Journal article on 'Barotrauma' and bat fatalities.
 - Review Article on Wind Turbine Syndrome.
 - Press Release in relation to Australian Government funding of research into impact of wind farms on human health.
 - Annotated black & white and colour photographs from the locality of the proposed wind farm.
 - Submission to Australian Senate Select Committee on Wind Turbines by Professor Alun Evans.
 - Annotated diagrammatic map of the area showing the position of houses relative to proposed wind turbines.
 - Signed petitions of objectors.

8.0 Response Submissions

In summarising response submissions, it is endeavoured to avoid repetition – where issues have already been raised and summarised.

8.1 1st Party Response to 3rd Party Appeals

- 8.1.1 The response of McCarthy Keville O'Sullivan, agent on behalf of the applicant, Keel Energy Ltd, received by the Board on 28th April 2016, can be summarised in bullet point format as follows-
- The 3rd Party appellants would not have had sight of the 1st party appeal, and it is not proposed to repeat issues which were already addressed within that submission to the Board.
 - Where 3rd Party appeal issues were dealt with in the reports of Cork County Council, it is not proposed to repeat them.
 - The development is in accordance with Development Plan and Skibbereen Local Area Plan policies.
 - A comprehensive noise assessment was made for the development. A technical note accompanied the 1st party appeal in relation to issues raised in 3rd Party appeals.
 - The public consultation process was appropriate. The public has engaged through submissions to Cork County Council and the Board.

- Project splitting is generally used to avoid the necessity of submitting an EIS. Details of the wind farm and grid connection route to Barnadivane have been submitted.
- The NIS submitted fully considered the impact of the development on European sites. The EIS contains measures to avoid and minimise impacts on sensitive ecological receptors where they occur outside European sites.
- The issue of Japanese knotweed was addressed in the 1st party appeal document.
- A comprehensive assessment of bird activity on the site has been completed. The site is more than 10km away from the closest SPA, and surveys over two years were not considered necessary. One Vantage Point was substituted during the survey work due to forestry works.
- Cork County Council was satisfied with the level of bird surveys undertaken.
- Concerns in relation to White-tailed sea eagle were addressed in the 1st Party appeal documentation.
- Issues relating to bats are dealt with in the 1st Party appeal documentation.
- Multiple surveys for Kerry slug were considered unnecessary given the nature of the habitats present on the site.
- Otter, Red squirrel, Irish hare, Hedgehog, Pine marten and Stoat species were all addressed within the EIS and the 1st party appeal documentation.
- Reference to 'Mountain moorland' in the Landscape and Visual Impact section of the EIS is not an error. This classification is mentioned at section 6.9 of the Wind Farm Guidelines 2006 (one of six classifications), and the applicant considers that it is of relevance. The Landscape Character Types (26 types in total) of the Cork County Draft Landscape Strategy 2007 (Cork County Development Plan 2014-2020), are also referenced in the EIS. Both references are correct and they are not mutually exclusive.
- Additional photomontages have been submitted by way of 1st Party appeal documentation.
- Reference within 3rd Party appeal documentation that "wind energy developments should be relatively small in terms of spatial extent" refers to 2006 Guidelines for landscape type 'Transitional Marginal landscapes' and not 'Mountain Moorland landscapes'. The development is limited in terms of turbine numbers and spatial extent; therefore, the impact on the landscape is limited.
- A total of 11 viewpoints were selected in the EIS with an additional 13 in the 1st Party appeal documentation. These are sufficient to indicate the potential impact on the landscape.
- Cumulative visual impact was accounted for in the Zone of Theoretical Visibility (ZTV) maps and the photomontages. The ZTV

maps cover an area of 1,256sq.km. Eight of the twelve proposed turbines at Shehy More wind farm are within 5km of the proposed wind farm at Carrigarierk. Within 5-10km are the remaining four turbines at Shehy More, six turbines at Derragh, 11 turbines at Cleanrath and 11 turbines at Dromleena.

- The Knockeenboy wind farm is located 12.75km to the south of the appeal site. For that appeal, the Inspector's concerns related to cumulative impact on roads between Dunmanway and Bantry.
- Impacts on Scenic Routes are dealt with in the 1st Party appeal documentation.
- The EIS does not refer to the 'sculptural aspect' of wind turbines.
- The EIS addresses the issue of property devaluation. There is no statistical evidence relating to property devaluation near wind turbines.
- Limits set out in the Wind Farm Guidelines 2006, in relation to shadow flicker, will be observed. The modelling within the EIS assumes a worst case scenario. The scheme is designed to maximise the distances between turbines and houses. H43 is 755m from the closest turbine; H15 is 775m from the closest turbine; H66 is 742m from the closest turbine. There are 23 properties within 1km of a turbine – of whom three are consenting landowners. Of the remaining 20, four are derelict. The closest house (H29) is 707m from the nearest turbine.
- The grid connection, when complete, will become part of the national grid. Works will be completed by the applicant, on behalf of Eirgrid. It is acknowledged that a Road Opening Licence will be required from Cork County Council.
- The grid connection will be 38kV, and this voltage will not be exceeded.
- The underground grid connection will not impact on the future development potential of lands flanking the route. The cable will be treated the same as any utility in the public road when consideration is given by Cork County Council to future proposed developments along the route.
- The Construction Environmental Management Plan provides a detailed methodology of how the grid connection will be laid. Existing services in the road will be protected and maintained during construction. Blasting will not be used. Joint bays are permanently backfilled and landscaped and/or surfaced over as a trafficable surface – there are no manhole covers.
- The grid connection will be located within the public road, and Cork County Council has is amenable to laying such cables in the public road.
- Anecdotal reports of health impacts from wind turbines are not backed up by peer-reviewed research. There is no published

scientifically-proven evidence to definitively link wind turbines with adverse health effects.

- There is no evidence to prove that electro-magnetic fields can cause harm to humans or animals. The underground cable will comply with the relevant guidelines established by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and relevant EU guidance (2013/35/EU).
- Accidents with turbines in wind farms in Ireland are limited to four – as of 18/02/16. Fencing is not necessary for safety. There is a very remote possibility of injury to persons. Blades are composite structures. Turbines are fitted with anti-vibration sensors to detect ice. Lightning conductors are fitted to nacelles.
- The issue of *Phytophthora ramorum* is dealt with in the 1st Party appeal documentation. The Forest Service is implementing protocols, and conditions on Felling Licences will prevent the spread of disease through harvesting, haulage and processing of timber from infected sites. Should the proposed felling areas be infected, this will be reported to the Forest Service.
- Permission was not refused for reasons relating to archaeology. The impact of the development on Farrannahineeny stone row has been assessed in the EIS and the 1st Party appeal documentation. A moderate impact on the stone row is likely. The astronomical alignment of the stone row is addressed by the applicant. The applicant was fully aware that permission had been refused for a wind farm at Farrannahineeny (ref. 05/1024). There are no designated/protected archaeological landscapes within the Development Plan or any other statutory document.

8.1.2 The submission is accompanied by the following documentation of note-

- Technical Note on Noise outlining those involved with the noise section of the EIS and their qualifications.
 - Cork County Council Development Plan policy requires compliance with noise requirements of the 2006 Wind Energy Guidelines (Policy ED 3-1).
 - Cork County Council raised no issues in relation to assessment, monitoring, findings or methodologies contained in the EIS relating to noise.
 - AWN Consulting is satisfied that Enfonic Ltd, who carried out the noise surveying, did so in accordance with guidance set out in “A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise”.
 - Instruments were calibrated appropriately, where necessary in accordance with the above-referenced Guidelines.
 - Periods in the data, affected by rainfall, were removed from the dataset used for deriving the typical background noise levels at each location.

- Baseline noise data cannot alter the results of the noise models used.
- Noise monitoring for Location D (H07) was lost due to equipment being tampered with. An additional baseline noise monitoring survey was conducted at Location D over the period 14th December 2015 to 7th January 2016. The new data for Location D is embedded within the submission. This data shows that the derived day-time and night-time noise levels at various 10m high wind speeds for this fourth location are within acceptable parameters.
- Summary of conclusions in 25 reviews of the research literature on wind farms and health.
- Executive Summary of Research Paper prepared for Eirgrid plc by E^xponent, relating to Overview of Scientific Assessments of Research on ELF EMF and Health and Epidemiologic Studies 2007-2015.
- Report of Hydro Environmental Services in relation to peatland drainage.
 - Within chapter 7 of the EIS it was assumed that every house was served by well.
 - There will be no impact on water supplies from excavations on the site or for the grid connection.
 - Surface water run-off will be of an equal quality to what currently exists.
 - A door-to-door well/supply survey was undertaken by the applicant on 18th April 2016. Details are provided of locations on Figure 1 and at Table A of the document.
 - Particular attention was given to gravity supplies from springs or streams. Only one spring along the grid connection route was considered to be at risk from the development. The grid connection trench will be located on the opposite (southern) side of the road to avoid impact on this spring supply to the house of the First 3rd Party appellant (indicated on Figure no. 1). There is already a deep drain on the southern side of the road which is not impacting on the spring. A shallow trench for the grid connection will not have any impact on the spring.
 - Gravity-fed water supplies have been identified in the vicinity of the wind farm boundary. Most will not be impacted by the development. To the northeast of the site, the grid connection route will run along Stream no. 9, and some access track is also located in this catchment. This stream is used as a temporary back-up water supply by a number of dwellings in the area if shallow wells run dry. Mitigation measures for protection of surface watercourses will protect this stream. Only 30m length of the grid connection route

runs close to this stream (2-3m), and this is along an existing forestry access track where there is a bank between the road and the stream for much of this distance. The cable crossing over Stream no. 9 is via an existing bridge – and no instream works are proposed.

- Water supplies which could be potentially impacted are indicated at Table A.
- Water balance carried out in Section 7.3.1.6 of the EIS was undertaken to characterise the long-term baseline hydrological conditions at the development site. These figures are not intended to be used for drainage design capacity. Any changes in run-off volumes will be minimal, due to the naturally high run-off rates and due to the relatively small footprint area of development (2% of the overall site area).
- Drainage calculations use the 1-in-100 year six-hour rainfall event. The 30-minute event generates a higher storage requirement.
- Detailed design calculations for elements such as drainage would not normally be submitted at this stage of the planning process. However, to meet with claims that the calculations have not been made, the applicant submits maximum/peak surface water run-off rates and peak storage volumes for a typical stilling pond at a turbine hardstanding area. Annual rainfall in this area is 2,150mm. A 20% increase was factored in for climate change in the future. The peak storage volume required for a typical turbine hard-standing is 10.49m³ – and pond storage of 12m³ is being adopted. Similarly a 12m³ stilling pond will be required to attenuate run-off from each 180m length of access road. Check dams will provide additional surface-water storage within roadside drains
- Standard mobile ‘Siltbusters’ can treat 50m³ or 100m³ per hour, depending on the model. These will be deployed, as required, during the construction phase.
- Vegetation filters on site are not stand-alone proposals, but used in association with a treatment train of systems – applied in series. Levels of drainage control are shown at Figure B for borrow pits; Figure C for turbine bases; and figure D for access roads. The vegetation filter is the last in line of a series of measures.
- Attached Figure 2 is a Hydrological Constraints Map. Most of the proposed development is set back 50m from the nearest watercourse (with the exception of some sections of access road. Most of the development footprint is well over 100m from the closest watercourse.

- Watercourse crossing methodologies for the grid connection were set out in the Construction Environmental Management Plan submitted as part of the EIS. Appendix III of this submission sets out the exact methodology for each of the 15 watercourse crossings along the route.
- There will be no change in run-off from borrow pit locations from pre- to post-construction stages. Stilling ponds will be located at each to attenuate surface water run-off. Upslope interceptor drains are also proposed.

8.2 2nd Party Response to 3rd Party Appeals

None received.

8.3 2nd Party Response to 1st Party Appeal

None received.

8.4 First 3rd Party Response to Other Appeals

The response, received by the Board on 25th April 2016, is in two parts – the first relating to the 1st Party appeal, and the second relating to the Third 3rd Party appeal.

8.4.1 Response to 1st Party Appeal

The points of note can be summarised in bullet point format as follows-

- Photomontages are of limited use in assessing visual impact. They cannot replicate the view, as seen by the human eye. Photomontage from the viewpoint (no. 6) from Johnstown is inaccurate. Turbines are visually discordant and out of scale with the surrounding countryside.
- Turbines will impact on Scenic Routes in the area.
- That consenting landowners agree to dis-benefits from wind turbines (such as shadow flicker and noise) should not be taken into consideration when deciding on this appeal.
- Turbines will impact severely on archaeological heritage of the area. This is not a renewable resource.
- White-tailed sea eagle uses this area – particularly around Lough Allua. Birds fly very large distances. Wind farms result in fatalities for these birds. This bird species has been spotted flying over Carrigierk.
- No four-season bat survey was undertaken; therefore there is no information on hibernation sites.
- There will be disturbance to nesting birds and other breeding fauna during the construction phase.

8.4.2 Response to Third 3rd Party Appeal

The points of note can be summarised in bullet point format as follows-

- The appellant agrees with the case as set out by the Third 3rd Party appellant.
- The turbines will negatively impact on Farrannahineeny stone row.
- The structures cannot be described a 'sculptural'.
- Bird surveys were insufficient in terms of time, and locations used.
- Bat species, and Leisler's bat in particular, will be negatively impacted by turbines. The recorded level of bat activity on this site is high. The Lesser horseshoe bat is protected under Annex II of the Habitats Directive. A Derogation Licence is needed to interfere with bat roosts. Lights on top of turbines will attract insects, which in turn will attract bats.
- Coots are living and breeding in the townland of Carrigdangan and Johnstown.
- Release of nutrients into watercourses (arising from felling of trees) could have an impact on Freshwater pearl mussel.
- The Ecologist for Cork County Council had a long list of additional information requirements – something which ought to have been addressed before the application was made.
- A stream on the northeastern boundary of the site is used as a secondary water supply for houses in the area. This stream is close to the proposed cable route.
- The developer has failed to indicate the location of private wells in the vicinity.
- *Phytophthora ramorum* is already resulting in the closing down of trails within Gougane Barra as the authorities attempt to get the spread of this pathogen under control.
- Japanese knotweed is present at Carrigdangan (L4607) on the cable route.
- Houses in the area are homes, with much leisure and working time spent in gardens and working the land. The natural aspect from houses in this area is the principal attraction for residents.
- Houses located downwind of the prevailing southwesterly winds will be most affected in terms of noise.
- Noise limits imposed by way of conditions attached to planning permission do not protect residential amenity.
- Children will roam close to turbines, and could be at risk in the event of malfunction or accident, where turbines go on fire, collapse or parts become dislodged.

8.5 **Second 3rd Party Response to Other Appeals**

8.5.1 The response, received by the Board on 26th April 2016, relates to the 1st party appeal. The points of note can be summarised in bullet point format as follows-

- The development cannot be accommodated in the landscape.
- Three full-time jobs cannot be set against the potential loss of jobs in tourism if this project goes ahead.
- Johnstown is the closest settlement to the wind farm. The settlements of Kilmichael and Inchigeelagh are also in the vicinity. This settlement is indicated in the Skibbereen Local Area Plan. The LAP gives short descriptions of settlements, their setting in the landscape and comments on pertinent planning issues.
- The population density of this rural area of the county is not very different from the rest of Cork North West (when settlements are excluded).
- There are a number of wind farms in the R585 corridor from Bantry to Drimoleague – which are not referenced in the application and EIS.
- It is noted that the Planning Authority originally considered refusing permission for a second reason relating to archaeology (impact on Farrannahineeny stone row) but ultimately decided not to include this reason.
- A full and proper scoping consultation was not carried out for the EIS, as a number of those consulted did not respond.
- A large number of letters of objection were received by Cork County Council and no letters of support were received in relation to this application.
- The applicant has given no indication of the outcome of the one pre-submission meeting held in Dunmanway – other than to state that it was well-attended.
- The Planner's Report states that there will be no impact from Scenic Route S33, and then goes on to recommend refusal of permission because of impact on S33 (amongst other Scenic Routes). The wind farm will be visible from Scenic Route 33 – particularly from the panoramic view at Kealvaugh townland.
- There were serious deficiencies in the surveys of background noise. The 500m setback distance referred to in the 2006 Guidelines is inadequate to protect the amenity of nearby residents.
- The 1st party appeal provides additional information which ought to have been included with the application to Cork County Council in the first instance. What is submitted is in the nature of a new planning application.
- The level of greenhouse gas displacement for this development is disputed.
- Trees will not effectively screen turbines from view – particularly where turbines are at a higher elevation than houses or roads.
- Figure 9.2 of the EIS seems to contemplate an 11-turbine layout rather than the five turbines applied for – indicated at Figure 5.3.4 of the response submission.
- Scenic Route S32 is part of a way-marked cycling trail.

- The elevation of turbine bases (233-329m OD) will result in them towering over houses on lower ground.
- National renewable energy targets, as enshrined in the 2009 NREAP, have scant environmental justification in the absence of a Strategic Environmental Assessment (SEA) of the Plan.
- There has been no real attempt to assess the cumulative impact of this development – particularly in association with the Shehy More wind farm proposal.

8.5.2 The response is accompanied by the following documentation of note-

- Original observation of the appellant in relation to adequacy of noise monitoring carried out for the EIS.
- Appendix A-3 – Scenic Route 32 (ZTV Overlay).
- Appendix A-4 – Scenic Route 33 (ZTV Overlay).
- Appendix A-5 – Scenic Route 34 (ZTV Overlay).

8.6 Third 3rd Party Response to Other Appeals

8.6.1 The response, received by the Board on 27th April 2016, supports the grounds of appeal made by other 3rd Parties. The response in relation to the 1st Party appeal can be summarised in bullet point format as follows-

- The Board should heed the restrictions outlined in section 37(2)(b) of the Planning and Development Act, if considering a grant of planning permission.
- The applicant has not provided the Board with sufficient information to enable the Board come to a conclusion in relation to environmental impact.
- Economic well-being of surrounding residents was not considered in the EIS.
- Motorists will be distracted by turbines – with obvious safety implications.
- Observers/appellants have been forced to submit a significant number of observations (as a financial cost) for different applications for what is essentially the one large wind farm.
- The community is menaced by the threat of these turbines.
- Turbine no. 5 appears separated from the remainder of the wind farm in many views – particularly from Johnstown RC church.
- It would not be possible to disinfect all vehicles leaving this site – in line with recommendations to halt the spread of *Phytophthora ramorum*. The result would be possible contamination of watercourses in the area. Disease control notices have been erected at the entrance to the forest at Carrigarierk for at least a year.
- The applicant acknowledges that the Lee valley is not suitable for wind farm development due to the sensitivity of the ecology.

Notwithstanding this, the grid connection is located within the Lee valley catchment.

- Roads in the area flood after heavy rainfall. Increasing run-off from this wind farm site will exacerbate the problem.
- The recent judgment of Barton J, in the case of the Cleanrath wind farm development (2013 No. 450 JR) overturned the decision of ABP to grant planning permission on the grounds of reasonable scientific doubt in relation to detrimental effect on The Gearagh SAC and The Gearagh SPA. As part of this site is located within the catchment of the River Lee, the judgement is of relevance. The Board must decide as a matter of certainty that the development, in combination with other developments will not adversely affect the integrity of the European sites in question. It was determined that there is continued degradation of the hydrology of the Lee and Bandon Rivers, primarily by existing wind farms and other projects such as agricultural reclamation and blanket afforestation. This has an impact on hydrological features of the rivers such as alluvial forest, caused through flash-flooding and its consequent erosive effects. The sponge-like nature of the upland heaths and bogs of the Shehy and Derrynasaggart Mountains help attenuate and stabilise the hydrology of Lee and Bandon Rivers – preventing highly erosive flash-flooding from occurring. Flash flooding has a detrimental impact on the alluvial forests of these rivers. The damage already done and the ongoing threats posed to protected European sites is no longer a case of reasonable scientific doubt but one of hard scientific evidence. No amount of soak pits, vegetation filters or artificial drainage ditches will replace the mitigating effects that the ecological habitats of uplands naturally provide.

8.6.2 The response is accompanied by the following documentation of note-

- 'Gone with the Wind: valuing the visual impacts of wind turbines through house prices'. London School of Economics.
- Extracts from the 2015 National Survey of Breeding Hen Harrier in Ireland by NPWS, Ruddock *et al.*
- Summary of wind turbine accident data to 31st December 2015, in the UK.
- Petition of signatures – objecting to the development.
- Ecological Report on effects of Wind Farms on The Gearagh and Bandon River Natura Sites.
- Fellinging Licence in relation to lands adjoining the site to the east.

8.7 Responses to Board Circulation

The Board circulated the appeals for comment to the following-

- Commission for Energy Regulation.

- Health Service Executive.
- Development Applications Unit of Department of Arts, Heritage and The Gaeltacht.
- The Heritage Council.

8.7.1 Health Service Executive

The response, received by the Board on 4th May 2016, indicated that there was no comment to make.

8.7.2 Commission for Energy Regulation

The response, received by the Board on 22nd July 2016, was in the form of an acknowledgement only.

8.8 **Responses to Board Circulation of 1st Party Response to 3rd Party Appeals and Third 3rd Party Response to Other 3rd Party and 1st Party Appeals**

The Board circulated the response of McCarthy Keville O' Sullivan, agent on behalf of the applicant, (received by the Board on 28th April 2016) to the other parties of the appeal. The Board circulated the response of Noonan Linehan Carroll Coffey, agent on behalf of the Third 3rd Party appellant (received by the Board on 26th April 2016), to the other parties to the appeal. Where responses were received, my summary of the documentation seeks to avoid repetition, where issues have already been raised in appeal or response documentation.

8.8.1 3rd Party Responses to Board's Request for Comment

There were responses received from all three 3rd Party appellants-

- Nigel de Haas, on 15th August 2016.
- Karin Kempf, on 16th August 2016.
- Noonan Linehan Carrol Coffey Solicitors, agent on behalf of Sarah Hodgkinson & Others, on 17th August 2016.

The issues raised can be summarised in bullet point format as follows-

- The Keel Energy submission simply reiterates information within the EIS and NIS and does not directly address the concerns of appellants.
- With regard to the assessment of noise, the 2006 Guidelines are based on knowledge which has since been superseded. The Guidelines are not fit for purpose.
- The risk of spread of *Phytophthora ramorum* is increased as the access roads within this site are close to or within stands of larch trees which are a main host to the pathogen. Biosecurity controls would not be possible with such a large building project.
- Reference to the grid connection being located on the southern side of the road adjacent to the Kempf roadside well are incorrect.

The road runs north/south at this location – so the opposite side of the road to the well would be east, and not south.

- There is no evidence that the company which carried out the noise monitoring operates a satisfactory quality management system, necessary to objectively underpin the integrity of the of the noise measurement services it provides. The planning authority did not raise this issue – even though it had been brought to its attention by the Second 3rd Party appellant. The applicant has been given the opportunity to respond to this claim by way of response to the 3rd Party appeals, but has chosen not to do so. The accuracy status of a field instrument is defined by the traceable calibrations by an accredited laboratory that frame its period of service. If an instrument goes out of tolerance before its next calibration, then the results of any surveys using this instrument must be revisited. Check calibration is an untraceable calibration against a traceable reference standard, but is not a substitute for the periodic traceable calibration performed by an accredited calibration laboratory such as the University of Salford. The calibration certificates issued by the University of Salford do not specify on the sample page provided in Appendix 9-2 whether the calibration applies to the instrument as received or after adjustment. It is not possible to determine if the instruments used at Carrigarierk will be calibrated next time around to ensure that the measurements taken for this wind farm were within tolerance, when used. No calibration certificates were presented for the data logger input channels, anemometer or wind vane. The validity of the baseline noise study underpins the entire noise assessment conducted by the applicant's agents.
- Case C-290/15 CJEU – given on 14th July 2016 – indicates that plans such as the National Renewable Energy Action Plan and the Wind Energy Guidelines 2006 should have been subject to Strategic Environment Assessment (SEA), and have not, therefore, been lawfully adopted. The Board can, therefore, in carrying out EIA, place no reliance upon them.
- The applicant has not addressed all of the concerns of the appellant in relation to noise. The applicant has submitted no expert evidence to rebut the contention of the appellant that noise from turbines will have a negative impact on residents and those working in the area.
- Amplitude Modulation is the problem experienced by many residents living close to large wind farms. Residents have been forced out of their homes because of noise. Planning conditions which do not control Amplitude Modulation do not protect people. Noise limits expressed in dB(A) do not control Amplitude Modulation. The World Health Organisation is currently in the

process of developing noise guidelines for the European Region – which will include wind energy development.

- The Board is not in a position to assess the cumulative impact of developments in the area because it has not been given all the information by the applicant. The applicant has a number of connected wind farm applications in this area.
- The appellant was given insufficient time to deal with the 1st Party Response to the 3rd Party appeal – the letter only reaching them on 2nd August 2016, with a response required by 19th August 2016. This was during the holiday period, and the Board was not willing to give an extension of time. So this response submission is necessarily constrained due to the shortness of time. The appellant does not have the resources of the Board to devote to consideration of the appeal – which is clearly complex.
- The proposed development would result in an over-concentration of wind farm developments in this area.
- Noise from wind turbines has driven local people from their homes.
- The wind farm is just one unit of a huge wind farm project being developed by the same parent company and project team, a project that in its entirety will industrialise the entire uplands of the Lee and Bandon River basins.
- The development is at variance with Article 6(2) of the Habitats Directive where planning authorities are obliged to ensure good water management in the catchment of rivers where Natura sites occur, as in the case of The Gearagh SAC, Bandon River SAC and Lough Allua SAC [sic].
- Cumulative impact has to be assessed to ensure no damage is inflicted on the SACs. There has been no attempt to address the present ongoing deterioration of both The Gearagh SAC and the Bandon River SAC. There has been no attempt to address the serious cumulative impact that this project, in conjunction with all the other existing and proposed wind farms, will have on the hydrology of the River Lee and Bandon basins and the resulting damage that this will cause to the already serious problem with The Gearagh and the Bandon River SACs. There is factual scientific evidence to prove that there is already a serious deterioration occurring in the hydrology of the Lee and Bandon River catchments. There is reasonable scientific doubt as to the impact of the proposed development on the SACs. Surface water mitigation measures implemented at existing wind farms do not work.
- There are a huge number of wind turbines existing, permitted and planned in the vicinity of the Shehy, Boggeragh and Derrynasaggart Mountains – running to the hundreds if not eventually surpassing the thousand mark.

- Families are being driven from their homes and unable to sell their properties.
- Rainfall and heavy flow in streams would have impacted on baseline noise surveys (particularly Location B).
- There was insufficient engagement with the public in relation to this development.
- One year of survey work for birds is not sufficient. Two years of survey work should be required. No survey for barn owls was carried out. Bird observers were still out in January 2016 – an indication that insufficient surveys were carried out. White-tailed sea eagle roosts at the Shehy More area.
- The conclusions drawn by the applicant in relation to impact on the landscape could just as easily be the reverse – based on the information submitted. According to the classifications in the Wind Energy Guidelines, it is considered that the landscape character type is ‘Transitional Marginal Landscape’ rather than the ‘Mountain Moorland’ type suggested by the applicant.
- Shadow flicker would impact on 17 houses – with H66 affected on 69 days per year.
- There are 16 houses within 1km of a turbine – with a further three occupied by consenting parties. The location of turbines on top of a hill would dwarf houses beneath them. The over-riding perception is that for a number of properties, it may be a case of living within a wind farm rather than looking at one.
- The applicant has not addressed the issue of disruption to road users during construction of the grid connection. There is no guarantee that 150m will be completed each day. There is no indication of how bedrock will be dealt with.
- Electromagnetic fields from underground high voltage cables will impact on human health.
- There may be no grid connection available for this development, as the permitted sub-station at Barnadivane (PL 04.244439) is the subject of Judicial Review.
- The applicant has dismissed the concerns of the appellant in relation to safety at turbines. How many accidents have to happen before the concerns of residents are heeded? Manufacturers recommend that people do not come within 400m of a turbine, and yet this wind farm will not be fenced-off.
- Emerging science cannot conclusively state that there is no negative health impact from living close to turbines. The health of consenting landowners needs to be considered, even if they are satisfied to reside close to turbines.
- The company used by the applicant to comment on hydrological issues is not independent, as it relies on the applicant company (amongst others) for its business. Evidence submitted in relation to wells, ground water and surface water is contradictory. Stream 9 is

relied upon by a number of residents for drinking water in summer. Mitigation measures for the protection of watercourses are not satisfactory. Malfunctions might not be discovered immediately – where the site is unmanned.

- No site-specific drainage plan has been submitted. The measures proposed are generalised and used for all wind farm applications. Stilling ponds would easily be overwhelmed by significant rainfall events.
- Fine silt discharged from the site will impact on Freshwater pearl mussel in the Lee and Bandon Rivers.
- Vegetation filters are expected to remove fine sediment. Uneven and steep topography will not allow for proper creation of vegetative filters. The extract from the copy of NJ Stormwater Technical Manual (submitted with the response) indicates that the area used for vegetative filters must be mildly sloped and uniformly graded to maintain sheet flow.
- The applicant has not engaged with the Department of Arts, Heritage, Regional, Rural & Gaeltacht Affairs in relation to Farrannahineeny stone row. The turbines will have a severe impact on the monument.

8.8.1.1 The responses are accompanied by the following documentation of note-

- Hand-drawn map of Kempf property in Carrigdangan townland.
- Details of professional credentials and work experience of Nigel de Haas.
- Article on Calibration Management by Brendan Barry & Nigel de Haas – Journal of Pharmaceutical Engineering, 2003.
- Copy of section of observation from Nigel de Haas to Cork County Council relating to noise and calibration of instruments.
- Appendix 5 of the Institute of Acoustics Good Practice Guide “Application of ETSU-R-97 to Wind Turbine Noise”.

8.8.2 2nd Party Response to Board’s Request for Comment

None received.

8.8.3 1st Party Response to Board’s Request for Comment

The response of McCarthy Keville O’Sullivan, agent on behalf of the applicant, received by the Board on 19th August 2016, can be summarised, where relevant, in bullet point format as follows-

- Policies and objectives of the Development Plan support the ongoing provision of renewable energy targets.
- The conclusion of the Planning Authority that the development would contravene Objective ED 3-5 has been arrived at following a subjective review of visual and residential amenity considerations. Should the Board consider that the proposed development is appropriate at this location, favourable consideration can issue as

there are both conflicting objectives within the Plan and a lack of clarity in relation to the application of the Development Plan requirements in relation to the current proposal. Furthermore, the proposal is also consistent with the policies of the Regional Development Plan, and it could be considered as being of strategic and national importance, as it would contribute towards achieving national renewable energy targets.

- The drainage design for the scheme provides for sufficient attenuation and allows for diffuse discharge at pre-existing 'greenfield' surface run-off rates, thereby avoiding any changes in the hydrographical functioning of the Lee and Bandon River catchments.
- The area of site development works will be 5.4ha. This amounts to 0.17% of the Bandon catchment.
- Concerns in relation to flash-flooding in the Caha and Bandon Rivers have been expressed and the danger that erosion is causing to river banks. There are no wind farms in the Caha River catchment. The report of Kevin Corcoran of the West Cork Ecology Centre makes no reference to the potential effects of climate change and increased rainfall which are likely to be significant factors contributing to increased flash-flooding in these rivers. The likelihood of the development contributing to flash-flooding in the Lee River is minimal – owing to the small area of the development within this catchment. The grid connection will have no impact on the Lee River.
- Run-off from this site was estimated for pre- and post-development stages. This is compared with 100-year flood flows in the Bandon, Caha and Lee Rivers – figures obtained from OPW Flood Studies Update (FSU) Web Portal. The 1-in-100 year six-hour rainfall depth was used. A pre-development run-off coefficient of 70% was used, with a run-off coefficient of 100% used (even though tarmac roads generally have a run-off coefficient of 80-90%). Potential increase in site run-off volumes post-development account for 0.057% and 0.002% of the 1-in-100 year flood flow in the Bandon and Lee Rivers respectively. The figure for the Caha River is 0.102%. Even before surface water attenuation, the increased risk of flooding in these rivers is low.
- Objectors state that there are existing flooding problems on roads in the vicinity of H19, H61 and H66 – caused by overflowing of a mountain stream. This flooding cannot be attributed to the proposed development. There are no wind farm developments upstream of these reported flooding areas. The post-development run-off in the Caha catchment is negligible – 0.1% of the total – and this before mitigation measures are put in place to reduce run-off to 'greenfield' rates.

- The potential increase in site run-off volumes post development account for only 0.002% and 0.088% of the 1-in-100 year flood flow upstream of The Gearagh SAC and the Bandon River SAC respectively – and this before surface water mitigation measures are put in place.
- An increase in flood flows resulting from climate change will have a significantly greater impact on flows in the Lee and Bandon Rivers than this development ever could.
- The reason for refusal issued by Cork County Council did not make any reference to drainage and negative impact on European sites.
- The implementation of a surface water management plan, designed to ensure compliance with the conservation objectives of downstream European sites, will ensure that there will be no significant impacts on European sites – as concluded in the NIS submitted.
- White-tailed sea eagle has not been observed at the Carrigarierk site during any vantage point surveys. Similarly, in surveys carried out for the adjoining Shehy More wind farm site (2011 & 2012), the bird was not recorded. Surveys at Cleanrath and Gortrahilly to the north of Lough Allua have not recorded the bird either. Sightings of the bird in this area are relatively rare.
- The issue of project splitting does not arise in this instance. An EIS has been submitted for this development, and EISs submitted for other relevant wind farm developments in the wider area.
- The landscape is capable of accommodating the development without having a negative impact on residential amenities and views.
- The development has the potential to have significant benefits for the local economy by means of investment, employment, rates and payments to landowners. A Community Gain initiative is also proposed.
- The applicant stands by the contention that ‘Mountain Moorland’ better characterises the landscape than ‘Transitional Marginal’. Notwithstanding this, the proposed turbines conform to the siting and design guidelines for ‘Transitional Marginal’ landscapes. The wind farm development is small, with turbines well-spaced.
- Matters relating to archaeology were comprehensively assessed in the EIS and subsequent submissions to the Board. There will be a moderate impact on Farrannahineeny stone row.

9.0 Assessment General

The principal issues of this appeal relate to the principle of development as set out in national, regional and local policies/plans, visual impact, residential amenity (noise and shadow flicker) and ecology. Other issues include traffic and archaeology. Owing to an outbreak of the *Phytophthora*

ramorum pathogen within the Coillte forest at Carrigarierk, this Inspector, complied with the requirements of a warning notice, posted at the forest entrance, requiring all visitors to remain on tracks to avoid possibility of spreading the pathogen. Whilst no notice was posted at the entrance to forestry on the north side of Carrigarierk, this Inspector nonetheless remained on forest paths to inspect the western portion of the site in the vicinity of T3 & T4. Farmland at T5 was not subject to such entry restrictions.

9.1 Development Plan & Other Guidance

- 9.1.1 Development of energy from wind sources is supported in national and regional guidance. Government policy in relation to wind farms is largely set out in the 2006 Guidelines. Within these Government guidelines, there is a presumption in favour of wind farm development in suitable circumstances. The visibility of a wind farm from designated views or prospects would not automatically preclude an area from such development. The strategic importance of wind farms in reducing dependence on fossil fuels needs to be considered. Birds can be impacted by wind farms in terms of direct loss or degradation of habitats for breeding, feeding or roosting purposes. Noise impact must be examined for noise-sensitive receptors within 500m of the turbines. Careful design can reduce the negative impact of shadow flicker. Peat stability must be considered where applications are on peat lands. It is clear that the Guidelines envisage wind farm developments even where Development Plan policies might appear to indicate that they should not be located within a particular area.
- 9.1.2 Within the Cork County Development Plan 2014-2020, there are general objectives which favour development of electricity from wind energy. The development is located within an area 'Open to Consideration', where the proposed development can avoid adverse impacts on residential amenity and nature conservation, whilst not impacting negatively on the landscape. In deciding to refuse planning permission, the Council stated that the development would have a deleterious impact on the landscape, and would materially contravene the Development Plan. In line with section 37(2)(b) of the Planning and Development Act 2000, the Board can consider granting permission on grounds that the proposed development is of strategic importance in reducing reliance on imported energy (whatever about the merits/demerits of the stated reduction in greenhouse gas emissions arising from wind energy projects); permission could be granted having regard to the Wind Energy Guidelines 2006; and having regard to permissions granted for other wind farms in the immediate area (Shehy More and Derragh) and also to existing wind farms within a 20km radius at Millane Hill, Currabwee, Coomatallin, Garranure, Garranereagh and Lanaght within Co. Cork, and further turbines to the northwest within

Co. Kerry (indicated at Figure 2.4 of the EIS). The issue of visual impact is addressed under the EIA assessment section of this Report relating to Visual Impact. As to the statement that the development would set an undesirable precedent for other similar-type developments, I would consider that the grant of permission for a wind farm development of five turbines would not set a precedent, as any new development would have to be judged on its merits.

- 9.1.3 Wind farms in Ireland are almost all located in rural areas. The locations of such a development type is not necessarily incompatible with Development Plan policies to protect rural communities, recreational facilities, business development or protection of the natural environment.

9.2 Community Gain

It is proposed to establish a Community Gain fund if permission is granted. It will be administered by the developer in consultation with community groups. The amounts involved are €6,250 per megawatt upon commissioning, and thereafter €1,250 per megawatt per annum over the 25-year lifespan of the project – a potential sum of in excess of €0.5m. It has not been the practice of the Board to attach a condition requiring payment into such a Community Gain initiative.

9.3 Duration of Permission

The applicant has sought a ten-year permission. It has been the practice of the Board to grant such permissions, where there may be a long lead-in time to the commencement of construction on site – dependent upon finance, grid connection availability or Gate offer. Objectors have claimed that a standard five-year permission should be sufficient. In the past, permission was often granted without any indication of connection to the national grid or if a Gate offer was available to the owner/operator of a wind farm. I note that the applicant has put forward no case for a ten-year planning permission. Further, having regard to the number of Judicial Review cases in relation to wind farm developments in this area, I would consider that a 10-year permission is reasonable.

9.4 Development Timescale

The EIS indicates that the construction will take up to 12 months – elsewhere in the EIS a figure of 12-18 months is used. It has been the practice of the Board to grant 25-year lifespans for wind farm applications – to allow for reconsideration in the light of new technology developments in wind energy. I would see no reason to depart from this practice in this instance.

9.5 Telecommunications

Section 12.3 of the EIS deals with this issue. There are no masts or communications structures located within the site. Consultation regarding electromagnetic interference during the operational phase of the development was undertaken with the relevant stakeholders. No interference issues were identified. Objectors claim that the wind farm would impact on television signals. If required, repeater relay links can be used out of line with the wind farm where unanticipated broadcast or signal interference arises. The scheme has been designed so as not to impact on telecommunication signals: therefore, there will be no cumulative impact with other wind farm developments in the area. It would be possible to attach a condition to any grant of planning permission requiring the developer to protect radio/television/telecommunications signals.

9.6 Construction Cost & Employment

The estimated construction cost is €30m. The EIS refers variously to up to 20 or 40 jobs during the construction phase and up to two or three long-term jobs in management and maintenance. Approximately €8,000 per megawatt per annum will be paid to Cork County Council by way of rates. Objectors argue that the creation of three jobs is not sufficient to compensate for the potential loss of jobs in tourism – caused by less visitors being attracted to an area with wind turbines. This issue is addressed in the sub-heading on ‘Tourism’ below.

9.7 Public Consultation

A public meeting was held in Dunmanway in relation to the project on 15th December 2015 – shortly before the application was lodged with Cork County Council. There is no obligation on an applicant to consult with members of the public – public notices of a proposed development indicating that members of the public are invited to make comments to the planning authority during consideration of an application. Section 2.10.2.1 of the EIS indicates public bodies and telecommunications providers contacted by the developer prior to submission of the planning application (not all of whom responded). It is noted that the application attracted a large number of letters of objection to Cork County Council, notwithstanding the claim by objectors that drawings were not available for inspection at the offices of Cork County Council until mid-January 2016: this is necessarily a matter for operational organisation of Cork County Council. There are similarly, a large number of appeals/observations objecting to the development – giving an indication of wide awareness of the application/appeal within the community. It would appear that the requirements for REFIT (the feed-in tariff for the national grid) obliged the

applicant to lodge the application with (and have it validated by) Cork County Council prior to the end of 2015. I note the concerns of a number of objectors in relation to the time afforded for response submissions to the Board. However, in view of the involvement of appellant parties since the lodging of the application with Cork County Council; the prior submission of objections to Cork County Council and appeals to the Board; the fact that all parties are afforded the same time period within which to make response submissions to the Board; and the requirement on the Board to deal with appeals in an expeditious manner, I would not consider that parties to the appeal have been placed at a disadvantage. There is a substantial amount of information submitted to the Board on all aspects of this proposed development.

9.8 Depreciation in Property Values

No evidence has been submitted to justify the claim that wind turbines result in devaluation of residential property. There are a number of wind farms in the wider area, and permission exists for further wind farm developments. There is no evidence that studies carried out in other countries have applicability to this particular part of Co. Cork.

9.9 Impact on Tourism

No evidence has been provided one way or another in relation to claims of impact/no impact on tourism. This is a rural area. Planning permission has recently been granted for a number of wind farms in the wider area. The site does not benefit from any special tourist designation in the Development Plan. Lough Allua and the surrounding area, some 4km to the north, is designated a Scenic Landscape. Gouganebarra, some 12km to the northwest is a noted beauty spot. The visual impact of turbines in terms of the beauty or rural nature of a site, in terms of tourism, is a subjective one. There is no evidence that tourists avoid areas within which turbines are located. The existence of a cycleway along part of the S32 (that portion which follows the southern shore of Lough Allua) is not a reason for refusing planning permission. There are no cycleways or walking routes on the roads or tracks within or immediately abutting the site. Existing Coillte forestry tracks at Carrigarierk are limited.

9.10 Financial Contribution/Bonds

It has not been the practice of Cork County Council to attach development contribution conditions to wind farm permissions. The Cork County Development Contribution Scheme – dating from 2004 (with rates regularly updated), does not provide for payment of a development contribution for wind farms – not even for buildings within such wind farm developments. The Scheme provides for Special Development

Contributions for wind farms, where deemed necessary by the Council. The Council has refused planning permission in this instance. The Area Engineer's Report in relation to the application (dated 3rd February 2016), has a section relating to 'Development Contribution'. There is no mention made of the need for a Special Development Contribution. It is the practice of Cork County Council to require payment of bonds for reinstatement of roads (if damaged during the construction phase) and for reinstatement of the site (upon decommissioning of the wind farm). The 1st Party appeal indicates that the applicant would not object to such a bond condition. A bond condition should be attached to any grant of planning permission issuing from the Board in relation to damage to roads during the construction phase. Similarly, a bond for the restitution of the site upon decommissioning should be payable to Cork County Council. It has been the practice of the Board to attach a condition requiring payment of a Special Development Contribution (sum to be agreed by the parties) where there is a likelihood of damage being caused to access roads (particularly by outsize loads and construction traffic). It would be prudent to attach such a condition to any grant of planning permission issuing from the Board.

9.11 Decommissioning

Section 3.10 of the EIS refers briefly to decommissioning. It is standard practice to limit the lifetime of a wind farm development to 25 years from the date of commissioning of the first wind turbine on the site. This will allow the planning authority to review the operation of the wind farm in the light of conditions then prevailing. It is obviously open to applicants to seek to extend planning permissions or seek permission for alterations to turbines in the future. It is stated that turbines will be removed, and foundations covered over and the areas allowed to revegetate. Access tracks will be retained for forestry and agricultural use. The sub-station is a permanent feature (as is the underground grid connection) and will remain in place. Proposals put forward would seem reasonable. I have elsewhere in this report referred to the desirability of a bond to be paid to the planning authority to ensure appropriate restitution of the site upon decommissioning.

9.12 Aircraft Safety

The site is located roughly equidistant from Farranfore Airport in Co. Kerry and Cork City Airport – approximately 45km. The applicant consulted the IAA prior to making the application, with no response received. The application was referred by Cork County Council to the IAA for comment: no comment was received. Provided the development complies with requirements for aeronautical lighting, I would not see any difficulty with the application. A standard condition relating to requirements for

aeronautical lighting should be attached to any grant of planning permission issuing from the Board, in the interests of the safe navigation of aircraft. It has been pointed out by one of the observers that red lights on turbines distract from the rural feel of an area at night-time. Whilst this may be true, the requirements of the safe navigation of aircraft would over-ride such consideration.

9.13 New Information

I would not agree with the contention that the 1st Party appeal submission is in the nature of a new application – being information which ought to have been submitted to Cork County Council in the first instance. The 1st Party appeal attempts to deal with the reason for refusal, the comments made within internal reports of the Council, observations made to the Council during consideration of the application and points raised by the appellants. I would note that Cork County Council did not make an additional information request in relation to this application – so that the appeal is the first opportunity afforded to the applicant to deal with matters which may have been of concern to Cork County Council. The nature of the proposed development remains the same and has not been altered – 5 no. wind turbines, sub-station and grid connection.

9.14 Prematurity

The contention of appellants and observers that the application is premature, pending the existence of a connection to the national grid, has, to some extent, been overtaken by circumstances. The proposal is to connect to the proposed wind farm at Barnadivane. Permission exists for this wind farm – ref. 11/6605 – however, no development has taken place to date. This application was superseded by an application to erect 6 no. turbines on the same site – ref.14/6760, which included a sub-station. The decision to grant planning permission was the subject of 3rd Party appeals to the Board (PL 04.245824) – granted permission on 8th July 2016. There was a second application to replace a sub-station (originally permitted) at Barnadivane – ref. 14/557. The decision of Cork County Council to grant permission for this sub-station replacement was the subject of 3rd Party appeal to the Board (PL 04.244439). The Board confirmed the grant of permission on 11th July 2016. Planning permission does, therefore, exist for a sub-station into which the proposed grid connection from the wind farm at Carrigarierk can connect. I note that decisions PL 04.245824 and 04.244439 are subject to Judicial Review.

9.15 Extent of Permission

The proposed development stands on its own, and no other project is contingent upon it. The application is for 5 turbines with a dedicated grid

connection. Reference to pre-planning discussions with Cork County Council for 16 or 11 wind turbines at this site is not relevant to the appeal before the Board. The proposed development is not part of the Shehy More wind farm to the west – the closest turbine of which is located approximately 3.0km to the west.

9.16 Accuracy of Maps Submitted

It has been contended that H43 is located closer to T4 than shown on maps. I have visited this property in the course of my site inspections. There is indeed a second residence (as claimed) at this property – a timber chalet – constructed some 80m to the north of the existing older two-storey farmhouse. I would be satisfied that H43 itself is, in fact, 755m from T4 as indicated by the applicant; whilst the chalet on the same property is, by deduction, located approximately 680m from T4. The occupants of H17 & H18 state that the separation distance of these houses from the closest turbines (T5 and T4 respectively) has been underestimated by the applicant. The 1st Party appeal includes a drawing (Figure 5.6.1) indicating the distances of houses from the closest turbines. H17 is indicated at being 919m from T4 and 927m from T5, whilst H18 is indicated as being 1,034m from T5. These distances would appear to be correct. I would be satisfied that the separation distances indicated in Figure 5.6.1 are broadly correct.

9.17 Other Issues Raised by Appellants/Observers

What follows is a list, not necessarily exhaustive, of comment on issues which may have a planning impact, as raised by appellants/observers to the proposed development-

- It is a matter for Cork County Council to include as many reasons for refusal as it sees fit. The fact that some sections of the Council may recommend further information, grant of permission or refusal is not relevant. Cork County Council refused permission for one reason only.
- In assessing the appeal, the Board has regard to all relevant planning considerations. There is no good planning reason why the wishes of one group should prevail over another, in terms of whether permission should or should not be granted. Each case must be dealt with on its merits – regard being had to the proper planning and sustainable development of the area.
- There is no requirement in planning law for payment of compensation by a developer for a development such as this.
- There is no fixed fraction of the wind energy developed within the country which should come from a particular county.
- The site is not zoned for agricultural use, and reference to wind turbines as being ‘industrial’ does not have a bearing on

consideration of the proper planning and sustainable development of the area.

- It is a subjective matter, as to whether turbines are sculptural objects in a landscape.
- The response of writers/poets/artists to landscape is entirely subjective and is not a relevant planning consideration.
- There is no evidence submitted to support the claim that the development of wind farms results in people leaving an area.
- Moon flicker is not considered to be a significant impact on residential amenity – given the faint light which the moon casts.
- There is no reason why development of a wind farm should have any impact on work with the rescue of wild birds and animals – particularly given the separation distance of the nearest turbines from any such premises.
- Whether an area is available or not for rural film shoots is not a relevant planning consideration.
- Wind turbines will not prevent people using gardens and curtilage of houses for amenity purposes.
- The fact that no letters of support were received by Cork County Council, from people living in the locality, is not a relevant planning consideration. Equally, the number of objections received is not a relevant planning consideration. Each case is considered on its planning merits.
- The carrying out of Strategic Environmental Assessment (SEA) on the 2009 National Renewable Energy Action Plan, is not a matter for the applicant, Cork County Council or the Board. The Board is tasked with the consideration of the appeal – regard being had to national, regional and local policies, with particular regard being had to the EIA, Habitats and Birds Directives, and to proper planning and sustainable development of the area.
- There is no evidence submitted to back-up the claim that wind turbines impact negatively on the health of livestock or wildlife.
- The proposed grid connection will be just one amongst a number of services which may be buried along sections of county roads. There is no reason to suppose that excavation of a trench will damage other services within the public road. Any such damage accidentally caused will have to be made good by the applicant. A Road Opening Licence from Cork County Council will be required by the developer.
- The grid connection route will not place any restrictions on future development of lands flanking the route. There are already a variety of development types along the route.
- The applicant is under no obligation to carry out a survey for Dipper (a species of bird) at the Cooldorrihy River (located along the grid connection route).

- The applicant will be obliged to protect private property during works for laying the grid connection cable. The trench to dug at the gable elevation of the Cill Éanna Bar is located within the public road and will not encroach on the building itself.

10.0 ENVIRONMENTAL IMPACT ASSESSMENT

10.1 General Comment

10.1.1 The EIS submitted uses the grouped format method to describe impacts on human beings, flora & fauna, soils & geology, water, air & climate, noise, landscape, cultural heritage, material assets, and interaction of the foregoing. The EIS is accompanied by a Non-Technical Summary at the beginning of Volume 1. Volume 2 comprises a photomontage booklet. Some of the maps prepared for the EIS relate to a larger wind farm development than was subsequently applied for. The fact that a number of bodies consulted during the scoping exercise did not respond to the applicant's invitation to engage, does not have any impact on the status of the EIS as a document.

10.1.2 The proposed development, in overall terms, is in compliance with Articles 94 and 111 of the Planning and Development Regulations, 2001, as amended. To this extent I would observe that-

- The EIS contains the information specified in paragraph 1 of Schedule 6 of the Regulations. The EIS-
 - Describes the proposal, including the site and the development's design and size;
 - Describes the measures envisaged to avoid, reduce and, if possible, to remedy significant adverse effects;
 - Provides the data necessary to identify and assess the main effects the project is likely to have on the environment;
 - Gives an outline of the main alternatives studied and the main reasons for the choice of site and development, taking into account the effects on the environment.
- The EIS contains the relevant information specified in paragraph 2 of Schedule 6 of the Regulations. This includes-
 - A description of the physical characteristics of the project and its land use requirements – including the grid connection;
 - The main characteristics of the wind energy process to be pursued;
 - The emissions arising;
 - A description of the aspects of the environment likely to be significantly affected by the proposal;
 - A description of the likely significant effects on the environment resulting from the development's existence, the development's use of natural resources, the emission of pollutants and creation of nuisances, and a description of the forecasting methods used;

- An indication of any difficulties encountered in compiling information.
- There is an adequate summary of the EIS in non-technical language.

10.1.3 The fact that the one parent company may be behind some or all of the applications for wind farms in the vicinity, and at Barnadivane, does not add up to project-splitting. The environmental impact of the proposed development is assessed and, where relevant, the cumulative impact with other permitted or proposed developments in the area is considered as part of the EIA process. Other large-scale developments in the area are similarly subject to the EIA process. The claim that Cork County Council does not have the relevant expertise to assess the EIS submitted is not borne out by the comprehensive report which accompanied the recommendation to refuse planning permission.

10.2 Consideration of Alternatives

10.2.1 Schedule 6 of the Planning and Development Regulations, 2001, as amended, requires an EIS to include 'An outline of the main alternatives studied by the developer and an indication of the main reasons for his or her choice, taking into account the effects on the environment'. Section 2.9 of the EIS states that the strategic site selection process for the subject proposal was constraints-led from the outset, with the initial site search area limited by the need to locate the development proposed within a distance of approximately 15km from the grid connection node at the proposed Barnadivane sub-station, in order to ensure economic viability. Within this study area potential alternative site locations were eliminated having regard to certain critical site selection criteria and other design constraints, including wind speeds, planning history, environmental designations (such as Natura 2000 sites and Natural Heritage Areas), the provisions of the Development Plan (in reference to 'Strategically Unsuitable Areas') and other physical site considerations/characteristics – particularly the proximity of houses. This process culminated in the identification of this wind farm site as the optimum location for the proposed development. Section 2.9.2.3 states that the original proposal was for eleven turbines – subsequently refined to five. The largest turbines have been selected to achieve the maximum power output of 3MW each. The turbine model has not been chosen – other than to state that maximum height will be 140m. Existing tracks within the site were utilised where possible. Turbines were sited having regard, amongst other factors, to proximity to houses and watercourses, and shadow flicker/noise impacts.

10.2.2 It is of relevance to note that the 'Guidelines on the information to be contained in Environmental Impact Statements' published by the Environmental Protection Agency in March 2002, acknowledge the

existence of difficulties and limitations when considering alternatives in the context of Environmental Impact Assessment. In this respect it should be noted that whilst EIA is confined to the assessment of the environmental effects which influence the consideration of alternatives, it is important to acknowledge that other non-environmental factors may have equal or overriding importance to the developer, such as project economics, land availability, engineering feasibility and planning considerations. Similarly, the consideration of alternatives also needs to be set within the parameters of the availability of land or the need for the project to accommodate demands or opportunities which are site-specific.

10.3 Human Beings

10.3.1 Population & Employment

Section 4 of the EIS deals, amongst other things, with potential impacts on human beings. Latest census figures from 2011 indicate a population of 1,192 over 94 sq.km – a population density of 12.7 persons per sq.km. The national population density is 65.4 persons per sq.km and the Co. Cork figure is 54.0 persons per sq.km. The development will not have any impact on population, notwithstanding claims by objectors that local people will be forced out of their houses because of health concerns. Construction-phase employment is expected to result in up to 40 jobs over a 12-18 month period; resulting in a short-term beneficial impact on the area. Up to three permanent jobs are expected to be created. This will not have a significant effect on employment in the area.

10.3.2 Health & Safety

Exposure to electromagnetic fields (EMF) is common – even within houses. Houses flanking the grid connection route are generally set back from the edge of the carriageway – the exceptions being the Cill Éanna Bar, a house in Johnstown, and buildings in the hamlets of Kilmichael and Teerelton. No evidence has been submitted by appellants to indicate that 38kV cables, buried 1.0m below the road surface, would have a deleterious impact on human health. The applicant has stated that the voltage of the three cables will be 38kV in total. The magnetic field associated with underground cables decreases rapidly with distance, as the ground absorbs the magnetic field. The grid connection would be laid in accordance with the international guidelines for ELF-EMF of the International Commission on Non-Ionizing Radiation Protection (ICNIRP). Objectors have claimed that wind turbines affect those suffering from epilepsy, although no evidence has been submitted to substantiate the claim. There are a number of wind farms constructed around the country, and it would not be reasonable to refuse permission on these grounds.

The wind farm will be constructed, operated and decommissioned in accordance with existing safety, health and welfare legislation and

standards. The wind farm will be remotely monitored, and routine maintenance visits will be undertaken. The sub-station will be surrounded by 2.5m high palisade fencing, and turbine access doors will be locked to prevent trespass. Objectors have referred to safety considerations on the site – particularly in relation to turbine malfunction and fire, and have listed instances of accidents with turbines elsewhere in Ireland and throughout the world. Reference is made to the safety requirements of one manufacturer of turbines. The applicant has stated that turbines will be routinely monitored and controlled remotely. Sensors will be able to detect malfunctions or abnormal operating conditions (particularly in relation to ice formation on blades). If constructed properly and regularly maintained, turbines should not malfunction and cause a health risk to workers or visitors to the site. I would note that at many wind farms in Ireland it is open to visitors to approach turbine bases. The EIA process requires the Board to assess the likely impacts of projects which could have significant effects on the environment. The likelihood of an accident is remote and is not a reason for refusing planning permission. The claim by objectors that motorists will be distracted by turbines is not a significant effect on the environment. Wind farms are common in many parts of the country without causing a traffic hazard.

10.3.3 Shadow Flicker

The 2006 Wind Energy Guidelines recommend that shadow flicker at neighbouring dwellings should not exceed a total of 30 hours per year or 30 minutes per day. This standard has been applied to houses within ten rotor diameters (1,130m) of the development. Figure 4.8 of the EIS shows the position of houses in the vicinity of the proposed wind farm. There are no houses within 500m of any turbine. There are some 35 houses/permited houses within 1,130m of the turbines. Not all of these 35 houses are occupied – and some are semi-derelict. Four of these houses are occupied by landowners who are promoting the wind farm (H8, H30, H42 & H62). H61 is the closest to any turbine (529m) – but is derelict and roofless, as confirmed by this Inspector during site visit. The next closest house to any turbine is H29 (707m). The 1st Party appeal indicates that there are 17 no. occupied non-participating houses within 1.0km of a turbine – of which 5 no. are between 700-800m; 4 no. are between 800-900m; and 8 no. between 900-1,000m (one of which would appear to be unoccupied – but it is not indicated into which bracket it falls). Table 5.6.1 of the 1st Party appeal sets out the distance and status of houses within 1.0km of any turbine. This table is supplemented by Figure 5.6.1 – a large-scale map/drawing. Shadow flicker will not be a nuisance if affected rooms in houses are not occupied at the time. Wind direction will have an impact on shadow flicker for recipient houses – insofar as turbines revolving perpendicular to sunlight will have the most impact. Cloud cover is a significant feature in Ireland – reducing the instances of potential shadow flicker nuisance. Modelling does not take account of

intervening buildings or vegetation – all of which help to lessen the incidence of shadow flicker. Obviously the greater the wind speed, the more likely that shadow flicker will be perceived as a nuisance, as the flicker-effect will not be so noticeable when turbines are rotating slowly. Insufficient/excessive wind speed will mean that turbines will not be rotating at all.

Modelling assumed a rotor diameter of 113m and a hub height of 83.5m. Table 4.11 of the EIS presents maximum or worst case shadow flicker analysis for each of the 35 houses within 10 rotor diameters of a turbine. Some ten houses could be subject to more than 30 minutes shadow flicker per day (but none more than one hour). Two of these houses are owned by promoters of the wind farm development. Of the houses within 1,130m of a wind turbine, four could possibly experience shadow flicker for more than 30 days (33, 34, 55 and 69 days respectively). The house which could be affected for 55 days (H61) is owned by one of the promoters of the development, and is currently derelict. H66, which could potentially be affected on 69 days is located 740m from the closest turbine T5. The rear elevation of the dormer bungalow addresses the wind farm. The house is of recent construction, and garden planting is maturing around the house. Weather data for this area indicates that sunshine is available for 32.5% of the daylight hours per year (based on Cork Airport data). If this percentage of sunshine is applied, then no houses would be subjected to unacceptable amounts of shadow flicker. This is obviously an average figure – and the times when H66 would most likely be impacted would be summer evenings.

Mitigation measures proposed include the installation of blinds or curtains in affected rooms, or screen planting between the affected window and the offending turbine(s). Wind turbine control software (SCADA) is available which can programme the relevant turbine to switch off at specific times and dates. This will be based on complaints received by occupants of houses. Site visits will be used to verify complaints and any mitigation measures to be employed – with the agreement of the house occupant. Table 4.13 of the EIS indicates potentially affected houses, offending turbine number, and days of year when mitigation may be required: Turbine 1 is the most consistent likely offender. A condition could be attached to any grant of planning permission relating to shutting down of wind turbine(s) in the event of exceedances of shadow flicker as set down in the Wind Farm Guidelines 2006.

Objectors have contended that consenting owners should not be subjected to unacceptable levels of shadow flicker. Any nuisance caused would be easily remedied, by occupants/owners carrying out simple mitigation measures such as the installation of blinds within houses.

10.3.4 Noise & Vibration

These associated issues are addressed under a separate heading within this Report.

10.4 **Flora & Fauna**

Section 5 of the EIS deals with the issue of ecology. A separate NIS accompanies the application (to deal with possible impacts on European sites). Site visits were undertaken over the years 2013 to 2015. EIA of the application was carried out by the Ecologist of Cork County Council, with regard to ecological receptors such as Natural Heritage Areas (NHAs).

10.4.1 Habitats

Habitats were mapped during survey work, carried out from July to September 2014. Habitats were revisited in August and September 2015. Figure 5.2 is a map of the habitats within the site – the majority of which is Conifer plantation, with lesser areas of Dry heath, Scrub and Improved agricultural grassland. Habitats along the grid connection route were not mapped – being largely within the road or verges. In-stream crossing will not be required at any of the 15 no. watercourse crossings along the cable route – being either above culverts or below the culvert using excavated trench or else using trenchless technology (directional drilling beneath the watercourse). The grid connection will not have any significant impact on ecology. The loss of habitat for turbine bases, roads and ancillary elements (13.0ha), with some additional turbulence felling of trees (2.97ha), will not be significant in terms of the amount of similar-type habitat within the wider red-line boundary of the site and within surrounding lands. An Habitat Restoration Plan was submitted as part of the 1st Party appeal – outlining how 0.5ha of heath in the east of the site will be rehabilitated to compensate for the loss of such heath as a result of the construction of the wind farm. In addition, some 2.97ha of felled area will be subject to enhancement measures (around the bases of T1-T4). Some 15.3ha of coniferous plantation will have to be replanted as a condition of any Felling Licence (proposed within Co. Clare). Decommissioning will result in short-term disruption for fauna, but will not have any significant impact on habitats, as turbine bases, roads and the sub-station will remain in place.

10.4.2 Natural Heritage Areas

The closest proposed NHA to the site is Lough Allua – some 2.8km to the north. No part of the development works drain to Lough Allua. Mitigation measures for the control of sedimentation of watercourses and for the handling of hydrocarbons within the site will ensure that discharge of sediment/accidental spillage of hydrocarbons during the construction phase will not result in a deterioration in water quality within the NHA. The

majority of the wind farm is located on or close to the ridge – and has been set back, where possible by 50m from the closest watercourse. The next closest NHA is Boylegrove Wood – some 7.8km to the northeast (not hydrologically connected to the wind farm site). There will be no other significant impacts on Natural Heritage Areas, as a result of the proposed development – the Bandon Valley West of Bandon pNHA being located some 13km downstream of the wind farm site.

10.4.3 European Sites

The closest European site is the Bandon River SAC – some 3.0km to the south. The possible impact of the development on European sites is addressed in the Appropriate Assessment section of this Inspector's Report.

10.4.4 Avifauna

Bird surveys were carried out between October 2013 and September 2014, using Vantage Point and Walkover surveys (144 hours in total). Further surveys were undertaken in November 2015 (36 hours). Surveys are included in Appendix 5-3 of the EIS. Vantage point surveys (using four points) were for Whooper swan, Hen harrier, Merlin, Peregrine and Golden plover. Annex I species, Hen harrier, Peregrine and Golden plover were observed using or crossing the site or in its vicinity. Hen harrier sightings, in winter only, accounted for 0.2% of the total vantage point hours – and of this total approximately half was outside of the wind farm site boundary. Most of the flying time was below the swept path height of the rotor blades. There was only one sighting of Peregrine within the site boundary during surveys – a total of 0.005% of vantage hours). Flocks of Golden plover (10-100 birds) were sighted on 5 different days in winter to the northwest of the site – two small flocks encroaching into the site. Winter and summer walkover surveys for birds were carried out – listed at Table 5.18 of the EIS. Breeding bird surveys were carried out in May and June 2014 (results at Table 5.19 of the EIS). No trees will be felled during the period 1st March to 31st August. There are records of the following Annex I birds in the area:- Peregrine, Corncrake, Whooper swan, Hen harrier, Merlin, Golden plover and Kingfisher. In addition, Birds of Conservation Concern in Ireland (BoCCI) Red List species include:- Red grouse, Lapwing, Curlew, Black-headed gull, Barn owl, Grey wagtail, Meadow pipit, Corncrake, Golden plover, Yellowhammer, Wigeon, Tufted duck, and Goldeneye. Monthly waterbird counts were undertaken at Lough Allua. A small number of Whooper swans (five birds were recorded on two occasions) and one sighting of Black-throated diver (one bird was recorded on one occasion) are indicated at Table 5.20. There is no indication that the wind farm site is on any key migration route for waterbirds moving to and from Lough Allua. The Ecologist for Cork County Council was satisfied with the level of bird surveys carried out.

However, it was considered that the EIS did not address the issue of the White-tailed sea eagle which had been observed in the wider area.

Collision risk for birds flying above 25m is a concern – particularly for Hen harrier. Observations of this species during survey indicated almost 90% of flight below this level. There is stated to be no detailed study in relation to collision for Hen harrier in Ireland, although evidence from the UK concluded that Hen harrier is not susceptible to collision with rotating blades. Monitoring of bird activity and breeding within the wind farm will occur during the operational phase, and it would be possible to attach a condition to any grant of planning permission requiring such. The recommended is in years 1, 2, 3, 5, 10 and 15. The site is not a key foraging area for Hen harrier. Hen harrier has been observed hunting within wind farms elsewhere in Ireland. The turbines are sufficiently spaced (500m) to reduce the barrier effect for passing birds – the small number of turbines will not produce a significant barrier. The cumulative impact with the proposed wind farm at Shehy More will not result in barrier effect – the separation distance between the two being approximately 3.0km. No Annex I species were recorded within the study area during the breeding season. No work will be carried out on the grid connection route during bird breeding season 1st March to 31st August.

The 1st Party appeal addresses further the issue of White-tailed sea eagle. There were no sightings of this bird during survey work. The bird has been sighted around Lough Allua – likely from a roost at Sillahertane in Co. Kerry. Sightings of this bird are rare within the bird surveys carried out for wind farms in the area – just one sighting. Whilst the bird may visit Lough Allua, sightings on surrounding upland areas are infrequent. The principal threat to the species is poisoning. There have been recorded deaths (3 in no.) at nearby Sillahertane wind farm in Co. Kerry. The birds are known to nest at Glengarriff in Co. Cork. Objectors have noted sightings of the bird in the area and even over Carrigarierk.

Objectors argue that two years of bird surveys should have been carried out. It is also contended that a night-time survey for Barn owl should have been carried out. No evidence has been submitted as to the impact of wind turbines on Barn owl. There is no reason why a survey for Barn owl should have been carried out. The species is not listed as a conservation interest for any nearby European site. I would be satisfied that the level of bird surveys carried out for this proposed development is adequate for the purposes of establishing if the proposed development would have any significant impact on this aspect of ecology.

10.4.5 Selected Mammals

Walkover surveys were carried out in September and October 2014. Follow-up surveys for badger was carried out in 2015, with no records of

any activity. Any badger setts encountered will be dealt with under Licence from NPWS. Otter was not encountered during site surveys. Red squirrel, Irish hare, Pine marten, Hedgehog and Stoat could occur within the site but would not be common – with the exception of Pine marten. The proposed development will result in some disturbance for these species during construction, but this will be of limited duration. The Ecologist for Cork County Council was concerned that the impact of the grid connection on Otter was not considered within the EIS. The 1st Party appeal addressed this issue. An Otter survey was carried out along the grid connection route between 4th and 9th of March 2016. The survey also included areas where temporary widening work will be required on the turbine delivery route where there was a nearby watercourse. Most of the watercourse crossings on the grid connection route are small streams/drainage ditches, with a width of less than 1m. Signs of Otter activity were recorded at a number of sites, although no holts were encountered. The cable will be laid entirely within the road or verge: there will be no instream works. Works will be of short duration in any one location – a few days. It is concluded that there could be no disturbance to breeding sites or resting places. This conclusion would appear to be reasonable.

10.4.6 Reptiles

The EIS indicates that suitable habitat exists for Frog, Common lizard and Smooth newt within the site. The limited area of the development will ensure that there will be no significant impact on these species.

10.4.7 Bats

Bat surveys were undertaken in September 2014, with follow-up surveys in August and September 2015. Survey results are presented in Appendix 5-4 of the EIS – for six points (four of which are inside the red line boundary of the site). Results are indicated at Table 5.21 of the EIS, and indicate moderate levels of bat activity. Lesser horseshoe bat (5 no. recordings at the site) is listed at Annex II of the Habitats Directive. Each recording of this bat species was on a different night – and likely to be the one bat. The species is associated with vegetative cover and is a low-risk species for wind turbine development. Walkover surveys did not encounter any Lesser horseshoe bats. No suitable bat roosts were found on the site during surveys. Trees on site are mostly Sitka spruce or Lodgepole pine. Bat mortality due to collision with rotating blades has not been the subject of significant study in Ireland. Low pressure close to turbines can lead to barotrauma mortality. Felling of trees will ensure that there is an interval of 50m between woodland edge and the nearest rotating blade. The Ecologist for Cork County Council was concerned that the number of bats using the site was relatively high, particularly in the vicinity of T4, and that clear-felling around the turbine would be insufficient to protect bats. The 1st Party appeal includes a Bat Fauna Assessment

(dated March 2016). The document indicates all measures that will be observed during construction and operation phases to protect bats. The report suggests a complicated cut-in speed during the active bat period from April to September inclusive. Increasing the cut-in speed to 5.5m/s from 30 minutes prior to dusk to 30 minutes after dawn has been shown to protect bats. It is stated that this measure should be implemented during optimal bat hunting conditions when wind speeds are less than 5.5m/s and air temperature is greater than 7 degrees Celsius (as measured on site), but stops short of stating that such a measure will be implemented. I would consider that attempting to apply and enforce such limits by way of condition attached to a planning permission would not, in reality, be feasible.

10.4.8 Aquatic Ecology

Watercourses and ditches were surveyed in September 2014. Biological monitoring was undertaken at a number of sites within the red-line boundary, or downstream of it, to determine baseline water quality conditions. Most drains within the site are seasonal – given its elevation and ridge location. Streams drain north to the Gortnalour Stream and from thence into the Lee River, or south into the Cummernamart and/or Caha Rivers, and from thence into the Bandon River. Most of the 13 no. sampling sites are located within the Lee River catchment, as the EPA monitors the Caha and Bandon Rivers. Q-values for sampling sites were in the range 3-4 or 4 – status unsatisfactory to satisfactory. It was not possible to get Q-values for four of the thirteen sites due to low flow. EPA monitoring for both the Lee and Caha/Bandon Rivers indicates satisfactory status. The Water Framework Directive indicates ‘Good’ status for the Lee River tributary, and ‘Good’ and ‘High’ status for two tributaries of the Bandon River to which the site drains – the Cummernamart and Caha Rivers.

There is no salmonid habitat within the site. White-clawed crayfish are unlikely to be present in streams. Freshwater pearl mussel is present in both the Lee and Bandon Rivers. The species is a qualifying interest of the Bandon River SAC only. Watercourses within the study area are too small or lack appropriate habitat for this species. The closest Freshwater pearl mussel sites are 3.1-4.2km away (depending on stream route) within the Caha River; 8.5km to the closest site in the Bandon River; and 14km to the closest site in the Lee River. Forestry Service draft Freshwater Pearl Mussel requirements will apply to all felling operations. Nutrients released from brash will not be any different from trees felled in the normal course of forestry rotation at this plantation. Lamprey species are possibly present in the Lee River, and the Bandon River is known to support River and Brook Lamprey.

Inland Fisheries Ireland was satisfied with the proposed development, and recommended that conditions be attached relating to interference with drainage and banks of watercourses, control of suspended solids released to watercourses and requirements for bridging or culverting of watercourses, so as not to obstruct movement of fish. Sediment control measures will provide the surest means of limiting the impact of the development on aquatic ecology.

10.4.9 Kerry Slug

Surveys were carried out in September 2014 for this Annex II species. The site contains some appropriate habitat for this species. Siliceous rock outcrops are generally required for feeding. The species was not recorded on the site. Outcrops of sandstone with lichen communities (on which the species feeds) were limited within the site.

10.4.10 Invasive Species

There is no record of any invasive species within the wind farm site. There is a record of Japanese Knotweed along the route of the grid line. The control of this invasive species is a matter for the Council or the private landowner within whose land the species occurs. Notwithstanding this, there is the possibility of spread of the species with the excavation works which will be required for the grid connection through the movement of machinery and plant along different sections of the route. The EIS states that a pre-commencement survey would be undertaken in order to identify any non-native invasive plant species within the works area, and that the NRA Guidelines with regard to management and control of such species would be followed in the event of any such species being identified. The 1st Party appeal contained a Knotweed Survey (all three species) of the grid connection and the areas to be widened to facilitate delivery of outsize loads – carried out to allay the concerns of the Ecologist of Cork County Council. Japanese knotweed was discovered at only one location on the grid connection route (on both sides of the road). Excavation in this area will be managed so as to prevent the spread of this species – and a series of eight different options are outlined for dealing with the problem. I note that there is knotweed at one point along the L8535 construction access route. However, no works are being proposed in this area. Given the time delay between a grant of permission and commencement of development, there is a likelihood that such invasive species could spread in the meantime. Therefore, a pre-construction commencement survey would seem to be prudent.

10.4.11 Forestry Plant Pathogen

The Ecologist for Cork County Council was concerned about reports of *Phytophthora ramorum* in conifer plantations in the area. This fungus-like plant pathogen largely affects oak trees, but has spread to other species – particularly larch. There were notices erected at the forest entrance at

Carrigarierk in relation to this issue, on the date of site inspection in August 2016. The 1st Party appeal addressed this issue – particularly in relation to the identification of trees which need to be felled which may be affected by the pathogen. Felling has already been carried out within parts of this plantation – particularly to the north of the Carrigarierk ridge. The Forest Service of the Department of Agriculture, Food and Marine is responsible for plant health. Any clear-felling will be carried out in accordance with a Licence from the Forestry Service, which would include conditions relating to the control and handling of timber affected by this pathogen. The proposals put forward are a reasonable response to the possibility that trees, which will have to be felled to facilitate the development, might be affected by the pathogen.

10.4.12 Cumulative Impact with Other Projects

The EIS states that there are no other operational wind farms within 10km of the proposed site. Planning permission has been sought/granted for up to 40 turbines within a 10km radius. There are a further 12 wind farms operating between 10-20km (total 102 turbines) with permission sought/granted for a further eight wind farms (total 77 turbines). The cumulative impact of this 5-turbine wind farm on habitats and flora & fauna in the wider area will not be significant. There are no other significant developments in the immediate area which could have any significant cumulative impact on ecology – the proposed wind farm at Shehy More being 3.0km to the west at its closest.

10.5 **Soils & Geology**

10.5.1 General

Section 6 and Appendix 6 of the EIS deal with these interrelated issues. The site is on the eastern flank of the Shehy Mountains. Rocky ridgelines trend generally southwest/northeast. The elevation of the site is between 165m and 343m OD. Mineral sub-soil and peat coverage is thin, with bedrock close to the surface and outcropping in places. Peat probing (Figure 6.2 of the EIS) indicates depths of between 0.0 and 0.6m over most of the site: peat depths of up to 1.3m were encountered close to the proposed sub-station. Bedrock comprises Devonian old red sandstones: faults within the area are numerous (indicated at Figure 6.3). Estimated volumes of peat to be removed are 14,628m³ – dried down to 10,240m³. Some peat will be re-used for reinstatement and landscaping. Brash mats will be used for heavy machinery to limit soil compaction. I note that there are no geological heritage sites in the vicinity of the development.

10.5.2 Borrow Pits

The estimated amount of rock to be won from the two borrow pits is 15,580m³. This amount is of no significance in terms of the amount of

similar-type rock in the vicinity. Excess peat will be deposited within the used borrow pits.

10.5.3 Peat Stability

Appendix 6-1 of the EIS comprises a Peat Stability Assessment – dated December 2015 – site visits having been undertaken within the same month. There are no recorded peat failures at the wind farm site. Turbines are located in areas with slopes from 1-4 degrees. The slope at the sub-station is 5 degrees and that at the monitoring mast is 6 degrees. Analysis of 160 peat probes was undertaken. Peat shear strengths were in the range of 11 to 36kPa – with an average value of 22kPa. The strengths recorded are indicative of shallow, well-drained peat. Peat depth of 1.3m was encountered along a proposed length of track leading to the sub-station site. This area of the site is flat and poses no risk of peat slippage. The Factor of Safety (FoS) of peat slopes is a derived measure of the degree of stability of a slope – anything less than 1.0 being unstable. For thoroughness, undrained peat is assumed to extend over the site, with a shear strength of 6kPa. The acceptable safe range is generally considered to be 1.3 or above. Table 4 of Appendix 6-1 indicates FoS for two conditions – (1) no surcharge loading and (2) surcharge of 10kPa – the equivalent of 1m of stockpiled peat on top of the surface. The lowest FoS [for Condition (2)] was 4.12 at the monitoring mast: for turbines the lowest FoS was 6.63. The results for drained peat were even higher. It was concluded that the proposed development posed no risk of a peat slide. Cork County Council engaged the services of O’Callaghan Moran & Associates to comment, *inter alia*, on peat stability. The Consultants were satisfied with the proposals, as originally outlined in the EIS, to deal with the issue of peat stability during construction.

10.5.4 Grid Connection

The 18.2km grid connection will be located mostly within roads and forest tracks. Elevation ranges from 210m OD at the boundary of the wind farm site to a low of 80-90m OD, before climbing again to the Barnadivane wind farm site for connection to the permitted sub-station at approximately 250m OD. Excavation will be 1.2m below existing road/verge level, and will not have any significant impact on soils or geology.

10.6 **Water**

10.6.1 General

Section 7 of the EIS deals with this issue. A site visit was undertaken on 11th December 2015. The site straddles the Lee (HA19) and Bandon (HA20) hydrometric area catchments – Lee to the north and Bandon to the south; with more of the site draining south than draining north. The site drains to the Lee downstream of Lough Allua. There are numerous man-

made drains on the site for coniferous forestry plantations. EPA water quality monitoring indicates either Q4 or Q5 for both catchments in the vicinity of the site. Tests for pH, temperature and electrical conductivity were undertaken in streams in December 2015 – during a wet period. Surface waters within the South Western River Basin District (which includes both Lee and Bandon Rivers) – indicated that some sections are at risk (mostly from forestry). The highest risk arising from the development would be from accidental spills of hydrocarbons or concrete. Siltation of watercourses would also be of concern.

10.6.2 Surface Water Drainage

Details of drainage were indicated at Appendix 3-1 of the EIS – with provision for 50m buffers from watercourses, new collector drains, swales, stilling ponds, silt fences, check dams and level spreaders for outfall to vegetated ground. The ground on this site is rough, and difficulty might be experienced creating the necessary gradients and conditions for discharge to vegetated ground. However, in the context of the earthworks which will be required to create the turbine bases, crane hard stands, and access tracks, there is no reason why an appropriately engineered outfall from an attenuation pond could not be realised on this extensive site. The 5.4ha site area is estimated to increase site run-off by 1,782m³ per month. This represents an increase of 0.29% over current ‘greenfield’ run-off rates. Natural run-off from the site is high (estimated at 88%) - due to rock outcropping and limited soakage of shallow peaty soils. All access tracks will be constructed of permeable materials and will not be tarmacadamed. The 1st Party response to the 3rd Party appeals supplied additional information in relation to surface water drainage. Calculations for maximum peak surface water run-off rates were made. Annual rainfall is 2,150mm. A 20% increase was factored into calculations to allow for global warming. Peak storage required for a 1-in-100 year six-hour storm event was estimated at 10.49m³ per turbine base – an attenuation pond of 12m³ being proposed for each turbine base and for each 180m length of new access road. The exact location of these ponds has not been indicated, and will be dictated by local ground conditions when excavation commences. This is reasonable in the context of the nature of the ground on the site. Additional attenuation will be provided within roadside drains which will be fitted with check dams. Cork County Council engaged the services of O’Callaghan Moran & Associates to comment, *inter alia*, on drainage matters. The Consultants were satisfied with the proposals, as originally outlined in the EIS, to deal with the issue of site drainage, where the Construction Environmental Management Plan includes descriptions of the proposed mitigation measures, particularly in relation to hydrology and water quality. It includes drawings and schematic figures for the various surface water control features – swales, stilling ponds, check dams, level spreaders and silt curtains.

10.6.3 Bedrock Aquifer

The aquifer is classified as Locally Important (LI) moderately productive in local zones only. The vulnerability of the aquifer is 'Extreme' due to the shallow subsoils and rock outcrops. There are no karst features identified in this area of sandstone bedrock. The groundwater body status of the aquifer beneath the site is 'Good'. There is no proposal to extract water for this development, and the proposal will have no significant impact on ground water within the bedrock underlying the site.

10.6.4 Wells

The EIS assumed every house in the area was served by a well. Later survey work for wells was carried out in April 2016, by the applicant. Having regard to the separation distance from turbine bases and borrow pits to dwellings (360m at the closest), there is unlikely to be any hydrogeological connection that could impact on any wells surrounding the site. The grid connection route from the site exits at the northeastern portion of the site in the vicinity of a stream (no. 9) in Carrigdangan townland, which is identified as serving as a summer supply for a number of nearby houses. The 1st Party response to the 3rd Party appeals addressed this issue and identified a length of 30m of the grid connection located 2-3m from this stream, but within an existing forestry track. Mitigation measures for works close to watercourses will be put in place in this area during the laying of the cable. There is a roadside well serving the Kempf property in Carrigdangan townland on the route of the grid connection. The applicant has undertaken to ensure that the trench is excavated on the opposite side of the road as this location. Whilst the road in this area generally runs east/west – there is short section beside the well which runs generally north/south. The trench will be excavated on the eastern side of the road – furthest away from the well. This is a reasonable response to the need to protect this water supply – which is otherwise unprotected from general roadside run-off.

10.6.5 Grid Connection

There are 15 no. water crossings along the 18km grid connection route along public roads. Crossings will be either within the road base or verge at culverts, or beneath the watercourses using directional drilling. In-stream work will not be required at any crossing. Mitigation measures are outlined in section 7.4.2.2 of the EIS, which generally relate to adherence to best practice during construction works. The 1st Party response to the 3rd Party appeals further elaborated on each of the 15 no. identified water crossings – set down within the Construction Environmental Management Plan.

10.6.6 Flooding

No areas of flooding were identified from OPW maps, either within the wind farm site or along the route of the grid connection. Run-off from the

site is already high (estimated at 88%) because of rock outcrops and lack of soakage within thin soils and peat. All surface water will be treated and attenuated on site during construction. The Area Engineer for Cork County Council was concerned that increased run-off from the site could exacerbate flooding in the Cummernamart River to the south of the site – with possible flooding along the L4607 local road and the R585 Regional Road. Objectors state that there are existing flooding problems on roads in the vicinity of H19, H61 and H66 – caused by overflowing of a mountain stream. This flooding cannot be attributed to the proposed development. There are no wind farm developments upstream of these reported flooding areas. The post-development run-off in the Caha River catchment is negligible – 0.1% of the total – and this before mitigation measures are put in place to reduce run-off to ‘greenfield’ rates. If surface water attenuation measures are installed, as indicated in plans submitted with the application/appeal, then there will be no increase in surface water run-off from this site, and no exacerbation of flooding within the Caha River catchment.

10.6.7 Mitigation Measures

The Construction Environmental Management Plan outlines mitigation measures proposed, included within which are the following-

- Any new drains to mimic the existing hydrological regime, thereby avoiding any increase in flow volumes leaving the site.
- 50m buffer zone from streams within the site (excluding forestry drains) will be maintained – except at limited points where the proposed access track either encroaches on or crosses existing watercourses.
- Attenuation of site run-off during construction at existing levels (approximately 20m³ per day during the wettest month – January).
- In the case of new access tracks, upstream interceptor drains will discharge over check dams to level spreaders within buffered outfalls to vegetated ground.
- In the case of new access tracks, downstream collector drains will discharge over check dams into attenuation and settlement ponds before discharge via level spreaders within buffered outfalls to vegetated ground.
- Tree-felling will be carried out in a manner to limit sedimentation of watercourses and nutrient release from brash.
- Refuelling of vehicles will not be carried out within 100m of a watercourse. Spill kits will be available on the site. A double-skinned bowser will be used. Fuel storage areas, if any, will be bunded. The electrical control building will be bunded, as lubricants and chemicals will be stored here during the operational phase.
- Interceptor drains will be excavated up-slope from all development elements – to divert clean water run-off away from excavation works.

- 12m³ capacity attenuation ponds at each turbine base and for each 180m length of access track.
- Buffered outfalls over vegetated ground from all attenuation ponds.
- Removed silt will be deposited away from watercourses.
- Surface water monitoring will be carried out before, during and after felling.
- Large excavations and movements of peat/subsoil or vegetation stripping will be suspended or scaled-back if heavy rain is forecast.
- If required, a 'Siltbuster' capable of treating up to 100m³ of water per hour will be brought to the site for treatment of areas of the site which may need dewatering (turbine foundations or borrow pits).
- A chemical toilet will be used on site (with integrated tank) during the construction phase.
- Water for use in canteen/toilets during construction will be imported into the site.
- No cement batching will be carried out on site.
- Pre-cast concrete elements will be used where possible.
- Concrete washing water will be removed from the site.
- Construction stage mitigation measures will be put in place during decommissioning.

10.6.8 Cumulative Impact

The hydrological cumulative impact with other wind farm developments will not be significant having regard to the limited footprint of this development for 5 wind turbines, and the fact that the site drains to two different catchments – the Lee and the Bandon. Turbines are all located within the Bandon catchment – with only a small section of access track (600m) and roughly half of borrow pit no. 2 located within the Lee River catchment. The density of turbine development within the Bandon River catchment (indicated at Figure 7.7 of the EIS) is limited to an estimated one turbine per 8km². It is noted that some wind farms are completed, and construction-phase surface water run-off would not be considered an issue. This statement is contested by appellants who blame excessive surface water run-off from wind farms for damage being caused to the anastomosing river network of the Lee/Toon Rivers at The Gearagh SAC and the Bandon River SAC. [This issue is addressed in the Appropriate Assessment section of this Inspector's Report].

10.7 **Air & Climate**

Section 8 of the EIS deals with these associated issues. The development will have no significant impact on air quality in the area. There may be some dust nuisance caused during construction, depending on how dry the weather is, but this will be of limited duration. The development of a wind farm will improve the national position in relation to emissions of greenhouse gases. Electricity generation from renewable

sources is the most effective way of reducing the contribution of power generation to Ireland's greenhouse gas emissions. Having regard to the scale of the proposed development, there will be no significant impact on climate in the immediate area, and a small impact nationally. During wind farm construction, carbon is lost as a result of peat excavation and peat drainage. Carbon is similarly lost from felling of coniferous plantation – however this will be compensated for by plantation in Co. Clare. Carbon is a principal input in the construction of wind turbines. It is estimated that CO₂ equivalent losses will be 24,191 tonnes over the 25-year lifetime of the project (and based on the fact that the site would be restored after that period of time). These figures are set out at Appendix 8-1 of the EIS, and are worst case figures. Peat stripped from the site will be deposited within the worked-out borrow pits. The generation of electricity, it is claimed, will displace 539,125 tonnes of CO₂ if produced by burning fossil fuels. This figure is stated to more than offset the carbon losses as a result of construction of the wind farm. However, there are questions relating to how precise these figures can be. Alternative means of electricity generation are available – such as the nuclear option – which do not result in the creation of greenhouse gases. The development is not justified for planning purposes by a demonstration that it would, by itself, lead to a reduction in greenhouse gas emissions. It is justified by its compliance with national policy to reduce greenhouse gas emissions.

10.8 Noise & Vibration

10.8.1 General

Section 9 of the EIS deals with these issues. Appendix 9 of the EIS contains supplementary information in relation to noise. A noise contour map is included at Appendix 9-5 (including the eastern portion of the proposed Shehy More wind farm of 12 turbines). Additional information in relation to noise was provided by way of 1st Party appeal and the 1st Party response to the 3rd Party grounds of appeal submitted.

10.8.2 Wind Energy Guidelines Noise Standards

The 2006 Guidelines contain a list of noise standards for the protection of human health. At p.30 it is stated- "In general, a lower fixed limit of 45dB(A) or a maximum increase of 5dB(A) above background noise at nearby noise sensitive locations is considered appropriate to provide protection to wind energy development neighbours. However, in very quiet areas, the use of a margin of 5dB(A) above background noise at nearby noise sensitive properties is not necessary to offer a reasonable degree of protection and may unduly restrict wind energy developments which should be recognised as having wider national and global benefits. Instead, in low noise environments where background noise is less than 30dB(A), it is recommended that the daytime level of the LA10, 10min of the wind energy development noise be limited to an absolute level within

the range of 35-40dB(A)". The Guidelines go on to state- "Separate noise limits should apply for day-time and for night-time. During the night, the protection of external amenity becomes less important and the emphasis should be on preventing sleep disturbance. A fixed limit of 43dB(A) will protect sleep inside properties during the night".

The 2006 Guidelines are based on the UK Department of Trade & Industry, Energy Technology Support Unit (ETSU) publication "The Assessment and Rating of Noise from Wind Farms" (1996). Claims by objectors that this ETSU publication is out-dated and not fit for purpose is not a relevant planning consideration. Further claims that a C-weighting rather than an A-weighting would be more appropriate is not a relevant consideration. The 2006 Guidelines are as they are, and remain in force.

Proposed changes to these Guidelines, outlined in the Department of Environment, Community & Local Government "Proposed Revisions to Wind Energy Development Guidelines 2006 – Targeted Review in relation to Noise, Proximity and Shadow Flicker" (December 2013), have not yet been adopted. The applicant notes that the 2013 revision proposes a noise limit of 40dB_{LA90, 10 min} which should be applied to noise-sensitive properties – as measured outside such properties. The limit would apply either day or night, and would not apply at properties of those with a financial interest in the wind farm.

The applicant has adopted the following standards for this development-

- 40dB_{LA90, 10 min} for quiet day-time environments of less than 30dB_{LA90, 10 min}
- 45dB_{LA90, 10 min} for day-time environments of greater than 30dB_{LA90, 10 min} or a maximum increase of 5dB(A) above background noise (whichever is the higher).
- 43dB_{LA90, 10 min} for night-time periods.
- 45dB_{LA90, 10 min} for both day-time and night-time at the houses of participating landowners.

10.8.3 Background Noise

The sources of noise associated with wind farms are mechanical and aerodynamic. A fixed limit of 43dBA, it is stated, will protect sleep within residential units. As the area is a quiet rural one, it is proposed to adopt a lower noise threshold of 40dB_{LA90 10min} for quiet day-time environments of less than 30dB_{LA90 10min}. For the purpose of measuring background noise – four monitoring points A-D were used (indicated at Figure 9.2) with measurements taking place over November/December 2015. This Figure would appear to indicate that a larger wind farm proposal was originally considered for this site (judging by the 1.5km buffer used) – extending to the northwest. Noise data from point D was lost due to tampering with the measurement equipment. Wind speeds were measured using a 10m high

mast at H61 (Point B), with wind speeds extrapolated for higher hub heights i.e. +3m/s for hub heights proposed for this wind farm. Derived noise levels for wind speeds between 4-12m/s are outlined at Table 9.6 for points A-C and for a further point at the adjacent proposed Shehy More wind farm (12 turbines) – the closest turbine of which is located 3.0km to the west of the Carrigarierk site. The applicant subsequently submitted results for Point D, based on monitoring carried out from 14th December 2015 to 7th January 2016 (during which period the application was lodged with Cork County Council). Derived baseline noise levels for Point D are presented at Table 1 of the submission of 28th April 2016. Additional measurements at Point D, are stated not to alter the conclusions reached in the EIS. The number of monitoring points are sufficient to give an indication of background noise levels in the vicinity of the wind farm site.

Objectors are concerned that background noise modelling has not been properly carried out. I would be satisfied that those carrying out noise monitoring and modelling are suitably qualified. The applicant has stated that periods in the data affected by rainfall were removed from the dataset used for deriving the typical background noise levels at each location. Claims that noise levels at Point B were unduly affected by proximity to a mountain stream is not borne out by the photograph submitted in the EIS, which shows the measuring equipment located beside H61 (a derelict house). This is approximately 30m from the closest stream to the west – screened by intervening vegetation and ruined buildings. Objectors contend that houses of participating landowners should not be subject to greater noise levels than would be permitted at other houses in the area. It is open to participating residents to install additional measures at houses to screen unwanted noise. In any event, I note that the closest participating landowner house is H61 at 529m – and this house is roofless. The next closest house of a participating landowner (H42) is 768m from the closest turbine – so the issue does not really arise.

Claims that there is insufficient evidence on the file that noise monitoring equipment was appropriately calibrated and certified is summarised in the response submission from the Second 3rd Party, received by the Board on 15th August 2016. It claims there is no evidence that the company which carried out the noise monitoring operates a satisfactory quality management system. The accuracy status of a field instrument is defined by the traceable calibrations of an accredited laboratory that frame its period of service. If an instrument goes out of tolerance before its next calibration, then the results of any surveys using this instrument must be revisited. Check calibration is an untraceable calibration against a traceable reference standard, but is not a substitute for the periodic traceable calibration performed by an accredited calibration laboratory, such as the University of Salford. The calibration certificates issued by the University of Salford do not specify on the sample page provided in

Appendix 9-2 whether the calibration applies to the instrument as received or after adjustment. It is not possible to determine if the instruments used at Carrigierk will be calibrated next time around to ensure that the measurements taken for this wind farm were within tolerance, when used. No calibration certificates were presented for the data logger input channels, anemometer or wind vane. The applicant claims that check calibration was carried out before and after survey results. The objectors claim that this is not sufficient. The applicant has submitted calibration certificates at Appendix 9.2 of the EIS. It has not been the practice of the Board to require such detailed information in relation to equipment used by professionally qualified individuals/companies who carry out survey work for a proposed development – not just in relation to noise, but also in relation to photography, land surveying, hydrology, ecology or air quality. Such might only be required where it was felt that the individual/company involved with measurement was not suitably qualified, or where the results were such that they raised questions of credibility by those assessing them. The applicant has indicated a willingness to comply with noise control conditions which the Board might see fit to attach to any grant of planning permission.

I note the Cork County Council did not raise any issue in relation to adequacy of noise monitoring or modelling. Nor was noise included as part of the reason for refusal of planning permission.

10.8.4 Construction Phase Noise

This phase will last between 12 and 18 months. The principal sources of noise will be from HGVs and excavators/rock crushers – particularly at the borrow pits. H15 is likely to be most affected – being 360m to the southeast of Borrow Pit no. 1. The excavations will take place during normal working hours (07.00-19.00). Blasting will result in a lower requirement for rock breaking/crushing, and hence lower noise emissions. The Environment Section of Cork County Council recommended strict conditions be attached for blasting times and notification to surrounding residents. Noise from the excavation for laying the grid connection cable will result in some short-term nuisance for adjacent residences. This will be of limited duration and will occur during normal working hours. The impact on humans will not be significant.

10.8.5 Construction Phase Mitigation Measures

Significant mitigation measures proposed include the following-

- Limiting hours of construction and hours during which noise could cause nuisance.
- Monitoring of noise levels so as to guide future activities on the site.
- Internal road maintenance to reduce vibration from HGVs.
- Maintenance of all plant and vehicles in good working order – including use of exhaust silencers.

- Pumps or plant to be operated outside of daytime hours will be surrounded with an acoustic barrier.

10.8.6 Operational Phase Noise

Whilst a definite turbine type has not been selected for this wind farm, for the purposes of noise modelling a Siemens S113 3000 was used. For the purposes of all predictions presented in the EIS and to account for various uncertainties in the measurement of turbine source levels, a factor of 2dB has been added to the manufacturer's values in line with best practice wind turbine noise assessment. Noise sensitive locations were assumed to be houses within 10 rotor diameters of any turbine – numbered R01-R80 in Table 9.17: of these, six are participating landowners. Noise modelling predictions for all 80 is presented at Table 9.19. I note that the final two receptors R60 & R61 have mistaken night-time criterion of 45dB $LA_{90, 10 \text{ min}}$ indicated, where it should read 43dB $LA_{90, 10 \text{ min}}$. A threshold of 40-46.2dB was used for daytime (depending on wind speed) with a flat night-time threshold of 43dB being used. In the event that the lower threshold of 40dB is used, then exceedances would occur at receptors R33 and R61. The former is affected by the proposed Shehy More wind farm, whilst the latter is a participating landowner. The exceedance at R33 is minor, and only occurs at wind speeds in excess of 7m/s. The exceedance is blamed on the Shehy More proposed wind farm and not on this current appeal wind farm at Carrigarierk. This would appear reasonable at the house is located approximately 2.5km from the closest turbine T4 at the Carrigarierk wind farm, but much closer to the nearest turbine within the proposed Shehy More development. R33 is only exposed to likely noise infraction during certain wind directions – when the wind is from the southeast or south. Noise levels from the substation will not have any impact on residences – arising from the low level of noise and the separation from houses.

10.8.7 Infrasound & Amplitude Modulation

Objectors are concerned that infrasound and amplitude modulation will cause nuisance for residents. There is no evidence that infrasound from wind turbines results in harmful effects on human health. Infrasound was identified in the past with passive yaw 'downwind' turbines. Modern active yaw turbines result in rotation of blades upwind of the support tower. The separation distances of turbines from residential properties should ensure that infrasound is not perceptible to humans. The applicant notes that if future studies do identify problems with specific turbines and low frequency noise, then mitigation measures could be employed through curtailment of turbine operation.

The issue of Amplitude Modulation (AM) is addressed in the EIS. Normal AM is characterised by a swish sound as blades pass the hearer. Other AM can result in a periodic 'thumping' or 'whoomphing' sound at relatively

low frequencies, and often at greater distances from turbines (particularly downwind). Occurrence depends on atmospheric factors including wind speed and direction, topography and blade design. It is concluded that it is not possible to be prescriptive as to whether any particular site or wind farm design is more or less likely to give rise to Other AM (OAM). Occurrence is the exception rather than the rule – based on studies of existing wind farms. Even at sites where it did occur, studies show it was likely to occur 7-15% of the time. The only mitigation measure is the cessation of operation of offending turbines during those conditions under which OAM is found to occur. And this can only be established after monitoring and measurement to establish the extent of the problem. It is possible that improvements in blade design and changes in operational parameters can lessen the incidence of OAM.

10.8.8 Operational Phase Mitigation Measures

Significant mitigation measures proposed include the following-

- Curtailment of turbine operation in certain wind conditions using the SCADA system.
- Noise monitoring to confirm if Amplitude Modulation is a problem once turbines have been commissioned; and then control and regulation of the operation of turbine unit(s) in certain atmospheric and meteorological conditions, if required.

10.8.9 Vibration

Vibration may result from excavation at borrow pits. The closest house (H15) is 360m from Borrow Pit no. 1. This house is well-screened by trees and vegetation. The use of blasting to facilitate extraction of rock has not been excluded. A mobile drilling rig is to be used. Peak Particle Velocity (PPV) at houses should not exceed 8mm/s at less than 10Hz, 12.5mm/s at between 10 and 50Hz and 20mm/s between 50 and 100Hz and above. EPA guidance indicates acceptable air overpressure limits as $125\text{dB(Lin)}_{\text{max peak}}$. Prior notification of blasts will be given to residents.

10.8.10 Decommissioning Phase Noise

Turbines will be removed, but not concrete foundations. Tracks, cabling and the sub-station will not be removed. The disassembly of turbines for transport off-site will be a limited operation, and noise generation will not have a significant impact on the environment.

10.8.11 Appropriate Conditions

It is contended by objectors that the standard noise conditions applied by the Board to wind farm permissions are not sufficient to protect residential amenity. Conditions attached are in compliance with those set down in the 2006 Wind Farm Guidelines. It would be appropriate to attach conditions regulating noise to the greater of 5dB(A) above background noise levels or 43 dB(A)_{L90, 10min} when measured externally at dwellings.

Vibration levels from blasting should be limited to Peak Particle Velocity of 12mm/s, or 8mm/s if blasting occurs more than once a week. Air overpressure values should not exceed 125 dB (Lin)_{max peak} with a 95% confidence limit. Blasting should not occur outside of the hours of 11.00-17.00 Monday to Friday.

10.9 Landscape & Visual

10.9.1 General

Section 10 of the EIS deals with this issue. Blade tip height of 140m was used for assessment purposes. A Zone of Theoretical Visibility Map is attached at Appendix 10-1. Four concentric rings of 5km, 10km, 15km & 20km are indicated. Not surprisingly, some part of turbines will be visible from almost all areas within 5km – diminishing as distance increases to 20km. This is to some extent explained by the elevated nature of the site on a ridge at Carrigarierk. The ZTV map does not take into account screening vegetation/structures or weather and atmospheric conditions. Mountains on the Cork/Kerry boundary largely restrict views of the proposed development from adjoining County Kerry. The principal views from the site are to the south and southwest. Visibility will obviously decrease with distance. Some 11 points were selected for photographs and photomontages – mostly from within 5km of the site. These are indicated in Volume 2 of the EIS.

10.9.2 Baseline Assessment

The site is within a relatively remote upland area, characterised by coniferous forestry, scrub and marginal agricultural land. Settlement in the area is dispersed. The Shehy Mountains are the dominant landscape feature in the area. Whilst planning permission has been granted for a number of wind farm developments in the wider area, there is no perception at present of an area dominated by wind turbines. The Wind Energy Strategy for the county indicates that the site is not within any important landscape or heritage area. Wind farms are open for consideration in this area of the county where the proposal can avoid adverse impacts on the visual quality of the landscape and the degree to which impacts are highly visible over wider areas. Cork county Landscape Character Assessment indicates that the site is largely located within 'Rolling Marginal Middleground' (12b) with a small section to the north located within 'Ridged and Peaked Upland' (15a). The landscape value of the former is 'Medium', whilst that of the latter is 'High'. The landscape sensitivity of the former is 'Medium', whilst that of the latter is 'High'. Reference in the appeal to 'Mountain Moorland' and 'Transitional Marginal Landscape' classifications from the Wind Energy Guidelines 2006, does not require a determination from the Board as to which more appropriately describes this appeal site. The appellants/observers favour the latter whilst the applicant favours the former. The landscape classifications

within the Development Plan are the more detailed classifications with defined boundaries in this area.

10.9.3 Visual Impact

Turbines proposed on site are large structures, and there is no disguising them in the landscape. Poor weather will serve, on occasion, to disguise the turbines in daylight hours. Mountains to the west and northwest will limit the visual impact of the development. The proposed colour is matt-grey – the generally accepted colour in Ireland. Aviation warning lights, if required, will result in the presence of the turbines being announced in the night sky. I would be satisfied that the impact of the development on nucleated and non-nucleated settlement within the surrounding area has been considered in the EIS and subsequent submissions from the applicant to the Board. Cumulative visual impact has been considered with other built, permitted and proposed wind farms in the wider area (particularly the proposed wind farm of 12 no. turbines at Shehy More to the west) and ZTV maps produced. Photomontages attempt to illustrate the impact of the turbines on the landscape: 11 were submitted as part of the EIS – supplemented by a further 13, by way of 1st Party appeal. Photomontages, as correctly pointed out by objectors, are not the same as scaled drawings. In assessing the visual impact of this development on the visual amenities of the area, I have not relied on photomontages submitted, other than as an indication of what turbines might look like in the landscape. The 1st Party appeal submission attempted to estimate the screening value of trees and hedgerows on local roads surrounding the site. The county road to the northwest of the wind farm, through Knockaunabipee, is neither a way-marked walking nor cycling route. The turbines will be visible over a wide area. However, the limited number of turbines proposed, the separation distances between them, in conjunction with the folding nature of the landscape, will result in the development being acceptable in this area and not having a significant impact on landscape character. I would note that it is usual to condition the life-time of a wind farm to 25 years, after which time turbines may be removed. The comparative cumulative ZTV maps illustrate no noticeable increase in the extent of visibility as a result of the proposed wind farm. There is a separation distance of approximately 3.0km from the closest turbine in the Shehy More wind farm development – ensuring that the two wind farms will not appear as one – except in limited distant views. The visual impact of the construction phase of the development within a largely forested site will not be significant. There will be no visual impact arising from construction of the grid connection.

The 3rd Party appellants and observers comment at length on the visibility of turbines from houses and curtilage lands. The location of houses in the vicinity of the site has been indicated in the EIS. The EIS, quite correctly, concentrates on houses which are located close to the wind farm site –

within 1.5km, notwithstanding that turbines will be visible from a much wider area. The reference within the EIS to the population density and proximity of settlements is not a significant factor in this instance. Neither is the orientation of particular houses relative to the wind farm. Houses will often have windows on all sides. Notwithstanding that turbines will be erected on elevated ground relative to houses, I would be satisfied that the separation distance would be sufficient to ensure that turbines would not appear to tower over houses or to give the impression to residents of living within a wind farm. There are no turbines within the cluster of five turbines on this site. Even for those houses to the west of Carrigarierk, the separation distance of 3km between the closest turbines within this proposed development and the proposed wind farm at Shehy More, would not result in the creation of an impression of living within a wind farm. The visual impact from Johnstown RC church has been assessed. The wind farm will be clearly visible from the vicinity of the church, and whilst T5 may appear to be separate from the other four turbines, there will always be some element of either separation or clustering depending on the location of the viewer. There are no listed or protected views from individual houses. It is open to property owners to undertake screening/planting within the curtilage of houses or adjoining lands in their ownership in order to increase privacy or to obscure/screen outside developments (of whatever nature). It is not reasonable to expect that a visual *cordon sanitaire* can be placed around particular types of development, particularly where land for proposed development is in the ownership of others. In relation to the issue of capacity of certain landscapes to accommodate a finite number of wind turbines, I would comment that it is more properly the domain of the Development Plan, which in this instance has indicated that the area is 'Open to Consideration'. The applicant has referenced wind farms within a 20km radius of the site (both existing and proposed), and I would consider that this extent is more than sufficient in considering the cumulative visual impact of any development at Carrigarierk. I would not agree with the contention of appellants that there will be an over-concentration of wind turbines in this area. The density of turbines to the northwest, across the county boundary in Kerry, is far higher. The perception of visual impact is, necessarily, a subjective one. This section of the EIS does not purport to be entirely scientific, dealing as it does with subjective emotions.

10.9.4 Scenic Routes

The decision to refuse planning permission referred to detrimental impact on Scenic Routes S29, S32, S33 & S34. Scenic Route S32 runs along a narrow county road (L-8536-7) with grass growing along its centre for some stretches, to the northwest of the site – from the townland of Curraheen towards Lough Allua, with intermittent views of the site. That portion of the S32 along the south shore of Lough Allua will not be impacted by the wind farm due to topography and screening. Whilst some

or all of the proposed turbines will be clearly visible from the remainder of the Scenic Route (Curraheen to Tullagh), they will not obscure the view: the closest turbine (T4) will be approximately 670m from the road. The 1st Party appeal included some new photomontages from this Scenic Route. The principal views from this Scenic Route are stated to be away from the site towards mountains/hills to the southwest, west, northwest and north. The proposed wind farm at Shehy More will be clearly visible from S32. I would note that this county road (S32) to the northwest of the wind farm site is not signposted as a cycling route or a walking route. It is narrow with grass growing along the central margin and limited pull-in places for motorists. The turbines will be visible in longer view from sections of other Scenic Routes in the area – most notably S34 to the north (4km+ distant), S35 to the northeast (5km+ distant), and S29 to the southwest (5km+ distant). The site will also be visible from an elevated section of the circular S33 to the northwest at Kealvaugh (6km+ distant). Proposed wind farms at Shehy More and Derragh would also be visible from sections of some or all of the aforementioned Scenic Routes. The separation distances and the intermittent nature of the views will have the effect of lessening the impact of the development. The impact on these Scenic Routes will not be significant.

10.10 Archaeology & Cultural Heritage

Section 11 of the EIS deals with these related issues.

10.10.1 Archaeology

There are four recorded monuments within the site boundary, indicated on aerial photograph Figure 11-2 of the EIS-

- CO093-019 – a wedge tomb, some 100m to the closest proposed road. It was not examined during site survey due to being surrounded by coniferous plantation – although a later photomontage, submitted as part of the 1st Party appeal, indicates that it was subsequently visited.
- CO093-021 – a ringfort/cashel with souterrain, some 317m from the sub-station. This monument was visible on the date of site survey.
- CO093-091 – a mass-rock, located some 21m from the closest track. This monument could not be located due to dense overgrowth.
- CO093-092 – a mass-house located some 28m from the closest track. This monument was accessed during site visit – although overgrown with vegetation and trees.

In addition, there are two recorded monuments along the route of the grid connection CO093-022002 (megalithic wedge tomb) and CO094-001 (ringfort/rath) – the former obliterated. Archaeological monitoring of trench work in the immediate vicinity of these monuments should be undertaken. Trench work will be located within the road pavement. There are potential impacts on unknown archaeological remains arising from the extensive soil stripping and trenching that will be required for this development.

Archaeological monitoring is proposed for site works – particularly in relation to two monuments within 21m and 28m respectively of a new section of access track at the eastern end of the site. Particular archaeological monitoring will be required also for grid connection excavations adjacent to two monuments CO093-022002 and CO094-001.

The Archaeologist for Cork County Council was concerned that the full visual impact of the development on archaeology in the area was not addressed in the EIS. The 1st Party grounds of appeal sought to address these concerns – addressing, in particular the impact on monuments within the site and on Farrannahineeny stone row to the south. I would note that there are wind farms visible from this monument away to the east and to the south, albeit at a considerably greater distance than the 500m separation distance which is proposed at Carrigarierk. The application was referred for comment by Cork County Council to the Development Applications Unit of the Department of Arts Heritage and The Gaeltacht: no comments were received.

The settings of National Monuments will not be significantly altered, and whilst turbines may be visible from such monuments, the slight to moderate impact is capable of being reversed in the future. The stone row at Farrannahineeny, to the south of the wind farm site, is a National Monument. Wind turbines will be visible from the stone row – indicated in a photomontage submitted as part of the 1st Party appeal. The closest turbine (T5) is located approximately 500m to the north. This stone row is aligned with the setting sun on 21st December and the rising sun on 21st June (Figures 11-16 and 11-17). None of the turbines will impact on this alignment. Permission was refused by the Board for a wind farm development in 2006, where one of the turbines was within 60m of this National Monument, and in the same field. There is no public footpath or indicated access to this National Monument. No dedicated parking is provided for visitors. The proposed wind farm will not have any impact on any future decision to provide such. The setback of turbines from this monument will ensure that the monument will not be overwhelmed. The Development Plan does not refer to any archaeological or protection zone around this monument, as is the case in respect of landscapes of archaeological importance elsewhere in the country – such as Lough Gur in Co. Limerick. It would appear that none such are designated in Co. Cork. The reference to “collective prehistoric/historic landscape” does not have any meaning in planning terms, and indeed could be applied to large swathes of the Irish countryside. If the planning authority considered this landscape of such importance, then it should be indicated in the Development Plan, and not left for potential developers to intuit. Planning permission has been granted for houses within this “collective prehistoric/historic landscape”. The wind farm will not alter the inter-relationship (if there is one) between monuments in this area.

Two further photomontages were submitted by way of 1st Party appeal to address the potential impact of the wind farm on a ringfort/cashel with souterrain in the townland of Gurteen (within the wider site boundary – some 317m from the sub-station) and a wedge tomb in the townland of Clogher (within the wider site boundary – some 100m from a proposed new access track). The change arising from the construction of the turbines is reversible. The construction of a wind farm comprising up to 12 turbines at Shehy More to the west of the site will not result in any cumulative impact on archaeological heritage.

10.10.2 Architectural & Cultural Heritage

There are no Protected Structures located within the wind farm site. There are the remains of some old stone field boundaries within the site. One 19th century farm building was noted on the eastern part of the site, and will not be impacted by the development. There are no Protected Structures along the route of the grid connection. However, old maps indicate that there are/were a number of items of cultural heritage interest such as lime kilns and schoolhouses. Most of these have no above-ground presence. These will not be impacted by the excavation of a trench in the road base or road verge. There are no structures of architectural/heritage merit which could be impacted by outsize loads being hauled to the site.

10.10.3 Mitigation Measures

The principal measures proposed are indicated at section 11.5.1 of the EIS as follows-

- Clear-felling of areas around mass-rock and mass-house on the site to be supervised by archaeologist.
- Buffer zone of 30m proposed around wedge tomb CO093-019.
- Buffer zone of 20m proposed around mass-rock CO093-091.
- Buffer zone of 25m proposed around mass-house CO093-092.
- Archaeological monitoring of the cable route in the vicinity of wedge tomb CO093-022002.
- Archaeological monitoring of the cable route in the vicinity of ringfort/rath CO094-001.
- Archaeological monitoring of all ground works within the wind farm site and along the cable route.

10.10.4 I would be satisfied that if mitigation measures as outlined in the EIS are adhered to, the proposed development will not have any significant impact on the archaeological heritage of the area.

10.11 Traffic & Transport

Section 12.1 & 12.2 of the EIS and Appendix 12 deal with these issues.

10.11.1 Construction Phase Traffic

Traffic counts were undertaken in 2013 at five points along the delivery route. In addition, Transport Infrastructure Ireland (TII) traffic counts for the N22 were utilised. Annual Average Daily Traffic (AADT) figures were estimated for points along the delivery route between the N22 and the site. Allowances were made for annual increases in traffic volumes based on TII projections. The estimated HGV component of AADT was put at 6.5%. AADT for 2017 was estimated at 14,900 on the N22; 3,478 on the R585 north of Crookstown; 7,753 at Béal na mBláth on the R585; 3,104 at Gloun (junction with the R487) on the R585; and 392 on the L4607 south of the site access. The construction period is estimated to last 18 months. Poured concrete for the bases of each turbine will be over a 12-hour period in one day – requiring 75 concrete loads each. This will result in approximately 12 HGV trips per hour (full & empty) on each of the five days in question. The delivery of other materials to the site such as steel, ducting, cables will be spread over the construction period and will be insignificant in terms of existing traffic volumes. Stone will be won from borrow pits on site, thereby significantly reducing the volume of HGV traffic to and from the site. Workers on site will largely travel by private car/van – with the maximum estimated to be on site at any one time being 65 – reducing to a maximum of 40 during the erection of turbines. Junctions have sufficient capacity to cater for additional traffic volumes associated with the development. The 600m length of the L8535 is not wide enough to permit two vehicles to pass along most of its length, and certainly not passing movements involving HGVs. The road is not heavily trafficked, but is used for local access. At least two passing places along the 600m length of the L8535 would be desirable, in order to prevent nuisance caused by passing vehicles using residential access points as passing places (I note that there is only one such between the site access and the junction of the L8535 with the L4607 – serving a cluster of houses).

10.11.2 Operational Phase Traffic

Traffic volumes generated by up to three permanent staff will be minimal in terms of roads capacity. It is expected that the wind turbines will initially attract some small amount of visitor traffic.

10.11.3 Outsize Loads

Outsize loads such as turbine towers, blades and nacelles will be delivered from Ringaskiddy, Co. Cork. The route will be along National Primary Routes as far as Castlemore on the N22; from thence onto the R585 Regional Route through the village of Crookstown and turning right just before the village of Shanlaragh; then further along the R585 to turn right onto the L4607 for 1.8km; left turn onto the L8535 for 0.6km; right turn into Coillte forestry track. Temporary junction realignment will be required at three locations-

- Junction of the R585 with the L4607.
- Junction of the L4607 with the L8535.
- Junction of the L8535 with the Coillte forestry entrance.

These revised junction layouts are shown on drawings submitted. It is estimated that 35 outsize loads will have to be delivered to the site over a period of three weeks. It is likely that such loads will be delivered at night with Garda escort. A Traffic Management Plan for delivery of such loads will be submitted to Cork County Council for agreement. The haul route from the N22 has been assessed, and remedial measures determined for pinch-points and junctions (a total of nine identified) within the EIS – maps and photographs included.

10.11.4 Structural Stability of Roads

The report of the Area Engineer for Cork County Council states that the structure of the L4607, and the L8535 in particular (a bog road), would not be able to accommodate the loadings which construction traffic would place on them. Upgrading work would be required prior to commencement of development. There is no mention made in the Report as to what such works would cost. The applicant has indicated, by way of the 1st Party appeal, that there is no objection to a bond condition for any construction traffic damage to these roads being attached to any grant of permission from the Board. It would be possible to attach a condition to any grant of planning permission requiring written agreement of the planning authority to a programme of necessary strengthening works (to be paid for by the developer), and to be carried out prior to commencement of development. This would be necessary as the road network serves other development in the area. Alternatively, a bond condition for reinstatement of any damage caused to roads by construction traffic could be attached to any grant of planning permission.

10.11.5 Grid Connection

Where possible, the trench for the grid connection will be excavated within the roadside verge or else along the edge of the carriageway. The route is almost entirely along county roads (approximately 5m wide). However, roads are narrower at either end of the route – but particularly the western end. In addition, the road is narrow in the vicinity of Haremount and Gorteenadrolane townlands. However, I would note that there are no *culs de sac* involved, which will mean that even if roads have to be temporarily closed, there will be an alternative detour available for motorists. It should be possible to accommodate pedestrians during construction. Joint bays will be constructed approximately every 600-1,000m. These will facilitate pulling cables through ducting. The bays will be filled in after cables have been pulled through ducts. They will be temporarily filled in pending the completion of the cable-laying. Two teams will operate simultaneously – one from the east and the other from the west. Each team will lay approximately 150m of cable per day – resulting in a works programme of

approximately 60 days. If rock is encountered, it will have to be broken-up using an excavator: no blasting is proposed. Traffic will be controlled using a local 'stop-go' system. All roads will remain open. Road closure for not more than one day may be required to facilitate directional drilling under watercourses. Local diversions will be put in place with appropriate signage. This will, of necessity, cause some nuisance and disruption for local residents. However, the disruption will be of limited duration. There are no cul de sac roads along the grid connection route. Normal construction management will ensure that the trench does not pose a danger to pedestrians, cyclists or others using the public road at the time.

The Area Engineer was concerned that trenching work would break up recently completed surfacing works in the villages of Dromleigh and Teerelton, and considered that alternative routes should be considered. However, given that any grant of planning permission would be for a period of 10 years, it may be that work on the grid connection aspect of the development might not commence for a number of years. It would be possible to attach a bond condition to any grant of planning permission for the reinstatement of any damage caused to the public road network during construction works for the laying of the grid connection.

10.12 Interaction of the Foregoing

Section 13 of the EIS deals with this issue. Table 13.1 provides a matrix table of possible interactions between the foregoing sections of the EIS for both construction and operational phases of the development. Both positive and negative impacts are identified, as well as those where there is no impact or a neutral impact. The EIS addresses possible interactions between human beings and noise; human beings and traffic; human beings and landscape; flora & fauna and hydrology. The interaction of the above has been considered within the relevant sections of this environmental impact assessment.

10.13 Conclusion

I would be satisfied that the EIS submitted, as supplemented by submissions from the 1st Party to the Board (both by way of 1st Party appeal and 1st Party response to 3rd Party appeals and responses), comprehensively addresses the likely significant impacts on the environment. Baseline surveys have been carried out, likely impacts identified and mitigation measures put forward. Having regard to the foregoing, and following a review of the available information, including the consideration of alternatives as set out in the submitted EIS, I would be satisfied that the applicant has complied with the requirements of the Regulations. The proposed development will not have any significant impact on the environment.

11.0 Appropriate Assessment

11.1 General Comment

11.1.1 The application was accompanied by a Natura Impact Statement (NIS) – dated December 2015. The NIS addresses the potential impact of the wind farm and the grid connection on European sites. The layout of the proposed development has been ‘constraints led’ – with the objective of avoiding environmentally sensitive parts of the site and the surrounding area. A preliminary screening assessment determined that an NIS was required. The site is largely occupied by coniferous forestry – some of which has recently been clear-felled. The wind farm site naturally drains to the Lee River catchment to the north and the Bandon River catchment to the south – most of the site draining to the south. The grid connection route is located almost entirely within the Lee River catchment.

11.1.2 Appropriate assessment of the application was undertaken by the Ecologist of Cork County Council (dated 19th February 2016). Provision has been made in the Construction Environmental Management Plan for the sensitive management of excavations and ground clearance; for the appropriate storage of equipment and materials; for the implementation of emergency procedures in the event of accidental spills or releases to watercourses; for the attenuation of surface water run-off; for the maintenance of water quality protection infrastructure; as well as for the supervision of site works; and for monitoring of water quality throughout the construction phase. The Ecologist was not satisfied that sufficient information had been submitted in relation to the impact of clear-felling on Freshwater pearl mussel in the Bandon River – arising from possible eutrophication; on the extent of habitat restoration and enhancement; the incidence of White-tailed sea eagle overflight; impact on bats; incidence of Otter along the grid connection route; treatment of Knotweed along public roads; and the plant pathogen *Phytophthora ramorum*.

11.1.3 The 1st Party appeal submission, the 1st Party response to the 3rd Party grounds of appeal, and the 1st Party response submission to the Third 3rd Party response submission elaborated on issues of concern in relation to European sites.

11.2 European Sites within 15km Radius

11.2.1 The identified sites which may be impacted by the proposed development are as follows-

- Mullaghanish to Musheramore SPA (Site code 004162).
- The Gearagh SPA (Site code 004109).
- Bandon River SAC (Site code 002171).

- The Gearagh SAC (Site code 000108).
- St. Gobnet's Wood SAC (Site code 000106).

I would be satisfied that this list incorporates all sites likely to be impacted by the development.

11.2.2 St. Gobnet's Wood can be excluded from consideration, arising from the nature of the conservation objectives of the site, the separation distance of 14.4km from the appeal site, and the absence of any hydrological connectivity between the two. The SACs have generic conservation objectives to maintain or restore the favourable conservation condition of the Annex I habitats and/or the Annex II species for which the SAC has been selected. The SPAs have generic conservation objectives to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for the SPA; and to maintain or restore the favourable conservation condition of wetland habitat at The Gearagh SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

Mullaghanish to Musheramore Mountains SPA

The qualifying species are-

- Hen harrier (*Circus Cyaneus*).

The wind farm site is 14.3km from this site. It has an area of 5,011ha, and also supports a breeding population of Merlin. The Natura 2000 form indicates that the main threat to Hen harrier is afforestation. This site has been specifically designated for Hen harrier (3-4 breeding pairs). Whilst Hen harrier has been observed flying over the site during bird surveys, the sightings were limited. The proposed wind turbine development will not have an adverse impact on the conservation objectives of this SPA.

The Gearagh SAC

The qualifying interests' are-

- Otter (*Lutra lutra*).
- Watercourses of plain to montane levels with the Ranunculion fluitantis and Calitricho-Batrachion vegetation.
- Rivers with muddy banks with Chenopodion rubric p.p. and Bidention p.p. vegetation.
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles.
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicon albae*). [Annex I habitat].

This site covers an area of 558ha. Part of the wider alluvial forest was destroyed by tree-felling and flooding in the mid-1950's for the construction of the Lee River Hydroelectric Scheme (although the site would not have been a European site at that time). The wind farm site is hydrologically linked with the SAC via streams which flow into the Lee River downstream of Lough Allua. The wind farm site is 9.0km from the SAC as the crow flies, and approximately 13.0km via watercourse

connection. Almost the entire wind farm site is located outside the catchment of the Lee River – only 600m of proposed new access track and roughly half of Borrow pit 2 being located within this catchment. The grid connection route is located almost entirely upstream of this SAC – the closest point being some 2.6km.

The Gearagh SPA

The qualifying species are-

- Wigeon (*Anas Penelope*).
- Teal (*Anas crecca*).
- Mallard (*Anas platyrhynchos*).
- Coot (*Fulica atra*).
- Wetland & Waterbirds.

The site covers an area of 323ha (smaller than the SAC of the same name). The site supports an important population of wintering waterfowl – including some waders. There are important populations of Mute swan (*Cygnus olor*), Wigeon (*Anas penelope*), Northern shoveler (*Anas clypeata*), Coot (*Fulica atra*) and European golden plover (*Pluvialis apricaria*). The site is located some 10.0km from the wind farm site. The main threat to birds is indicated as illegal shooting.

Bandon River SAC

The qualifying interests are-

- Watercourses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation.
- Alluvial Forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-padion, Alnion incananae, Salicion albae). [Annex I habitat].
- Freshwater pearl mussel (*Margaritifera margaritifera*).
- Brook lamprey (*Lampetra planeri*).

The site covers an area of 321ha, and is located some 2.9km to the south of the wind farm site (further again via watercourse connection – estimated by the applicant at 4.2km). The Natura 2000 form of the National Parks & Wildlife Service indicates a number of threats to the SAC (both within and without the site) in code form – medium and low risk, with no high risk identified. There is no explanation given as to what the codes mean. Almost all of the wind farm site is upstream of this SAC.

Tributaries of the Bandon River – the Cummernamart River and the Caha River drain the appeal site.

11.2.3 The NIS screens in certain habitats/species for European sites based on the source/pathway/receptor model and NPWS identified pressures and threats for different habitats and species. The application was referred to the Development Applications Unit of the Department of Arts Heritage & the Gaeltacht, with no response received. The Board further referred the appeal to the Development Applications Unit, with no response received.

11.3 Identification of Likely Direct, Indirect or Secondary Impacts

11.3.1 The NIS identifies likely potential impacts on European sites from the following-

- Some 15.3ha of coniferous plantation to be felled to facilitate the development; of particular importance in protection of downstream Freshwater pearl mussel populations.
- Construction phase activities on site could result in siltation of watercourses or pollution through accidental spillages of hydrocarbons.
- New drainage channels within the site could result in siltation of watercourses.
- New drainage on site could result in increased run-off of surface water.
- Turbine blades could result in bird-strike.
- Turbines blades could result in mortality for bats.
- Turbines could discourage the use of the site by certain bird species for breeding or hunting.
- Barrier effect of wind turbines (particularly in conjunction with other wind farms) for birds commuting from one area to another.

11.3.2 Objectors to the development identified a number of likely threats to the Europeans sites, particularly in relation to increased surface-water run-off and the impact this might have on the anastomosing features of the Lee and Bandon Rivers at The Gearagh SAC and the Bandon River SAC respectively. Other concerns related to the impact on White-tailed sea eagle, bat species and Freshwater pearl mussel.

11.4 Impact on Freshwater pearl mussel & Brook lamprey

Freshwater pearl mussel is a qualifying interest of the Bandon River SAC only. Whilst the species is also found in the Lee River catchment – it is not a qualifying interest. The major threat to this species is the release of sediment during construction and also possible eutrophication arising from felling of trees. It must be pointed out that felling of the forest at Carrigarierk will be carried out regardless of whether this development proceeds or not, and as such, there is no likelihood of increased eutrophication. The principal concern relates to phosphorous release. This issue was addressed in detail in the 1st Party appeal submission (Report of Hydro Environmental Services). Felling is subject to licence from the Forest Service which currently limits clear-felling to not greater than 25ha. The 13.8ha to be felled is small in relation to the area of the catchment of the Caha and Bandon Rivers upstream of the closest Freshwater pearl mussel sites – 24.5km² and 100km² respectively. Best practice Forestry Service Guidelines and Freshwater pearl mussel guidelines will be observed during felling. Principal mitigation measures

include suitable aquatic buffer zones, minimisation of soil disturbance, blocking of drains during felling, sediment traps, brash mats to support heavy machinery, timber stacked in dry areas, and no operation during periods of heavy rainfall. The measures outlined will also serve to protect the Brook lamprey species in the Bandon River SAC.

11.5 Impact on Otter

This species is a qualifying interest of The Gearagh SAC – located approximately 2.6km away at its closest and hydrologically linked via streams and rivers. Only a small portion of the wind farm site is located within the catchment of this SAC and there will be no impact on Otter from this aspect of the development. The grid connection route is located almost entirely within the SAC. It will be located within public roads for almost its entire length. Arising from concerns expressed by the Ecologist for Cork County Council, the applicant undertook a survey for this species in March 2016, and submitted the results by way of the 1st Party appeal. There are 15 no. water crossings on the grid connection route, and those which were considered suitable Otter habitat were surveyed for 150m upstream and downstream, whilst those not considered suitable were surveyed for 20m upstream and downstream. A sample section of the Cooldorragha River (where it runs along the road) was also surveyed. Limited evidence of Otter usage was encountered. No in-stream works are proposed for the grid connection. Works along any particular stretch will be of limited duration – a few days at most. Given the lack of evidence of any Otter holts, there is no potential for the grid connection to cause disturbance to this species. The proposed grid connection will not impact on this qualifying interest of The Gearagh SAC.

11.6 Impact on White-tailed sea eagle

The applicant has carried out vantage point surveys for this proposed development and has consulted vantage point surveys for other wind farm developments in the area. Whilst White-tailed sea eagle has been infrequently spotted on Lough Allua, the incidence of flight activity on surrounding upland areas would appear to be low. The eagles likely disperse from a communal roost at Sillahertane just inside the Kerry border to the northwest of Lough Allua: the appeal site is to the south of Lough Allua. The closest nesting area is Garnish Island, Glengarriff, Co. Cork. The species ranges over the entire country and up to Scotland. Because of the range of the bird, there is no designated SPA within Ireland. There are already a number of wind farms within 20km of the proposed site, as indicated in the EIS. Whilst there have been bird fatalities at wind farms at nearby Sillahertane, the principal threat to the species remains poisoning. The re-introduction programme for this

species from Norway is now completed. The development of 5 no. turbines at this location will not have an impact on this Annex I species.

11.7 Impact on Bat Species

The EIS submitted included details of bat surveys carried out. The 1st Party appeal expanded on the information contained within the EIS with a Bat Fauna Assessment Report (March 2016). A detailed bat mitigation plan is included. I would note that the Lesser horseshoe bat is not listed as a conservation interest of any of the nearby SACs. The principal mitigation measure to protect bats is the felling of trees up to 70m from turbine bases – to ensure that the treeline is located at least 50m from the closest point of rotating blades. This will minimise the risk of bat collision with blades and the risk of barotrauma. The Report goes on to suggest cut-in and cut-out wind speeds for turbines at certain times of day, which might be within 50m of trees or treelines. However, I would think that such complicated arrangements would not be likely to work. In any event, the applicant is not proposing that trees be left standing so close to turbine bases. The proposed mitigation measures are acceptable.

11.8 Impact on Annex I Alluvial Forest Habitat

11.8.1 It is the contention of objectors that the development, in combination with other developments will adversely affect the integrity of this Annex I habitat within The Gearagh SAC and the Bandon River SAC. It is claimed that there is continued degradation of the hydrology of the Lee and Bandon Rivers, primarily by existing wind farms and other projects such as agricultural reclamation and blanket afforestation. This, in turn, has an impact on hydrological features of the rivers such as alluvial forest, caused through flash-flooding and its consequent erosive effects. The sponge-like nature of the upland heaths and bogs of the Shehy and Derrynasaggart Mountains help attenuate and stabilise the hydrology of the Lee and Bandon Rivers – preventing highly erosive flash-flooding from occurring. The damage already done, and the ongoing threats posed to European sites, is no longer a case of reasonable scientific doubt but one of hard scientific evidence. It is claimed that no amount of soak pits, vegetation filters or artificial drainage ditches will replace the mitigating effects that the ecological habitats of uplands naturally provide. It is further claimed that surface water drainage mitigation measures implemented at other wind farm sites have been ineffective. In particular, a significant amount of material has been presented in relation to damage caused on the Toon River inflow to The Gearagh SAC, where a significant channel has been formed by erosion within the anastomosing river at this point, and also on the channel of the Bandon River.

11.8.2 In relation to the above claims, it is necessary to point out firstly that there are no wind farms within the catchment of the Lee River upstream of The Gearagh SAC. Planning permission has been sought for a number of such developments, but none have been granted permission. There are no wind farm developments within the Cummernamart and Caha River catchments (tributaries of the Bandon River), upstream of the Bandon River SAC, although there are wind farms upstream within the Bandon catchment itself. Secondly, whilst it is claimed that ‘agriculture and blanket afforestation’ have resulted in increased flash-flooding, there is no evidence submitted to support this contention, and it remains an hypothesis. The report of the Consultant Hydrologist, submitted by the applicant to the Board on 19th August 2016, correctly notes that the report ‘Ecological Report on the Effects of Wind Farms on the Gearagh and Bandon River Natura Sites’ makes no comment on the potential effects of climate change and increased rainfall which, it is contended, are likely to be significant factors contributing to increased flash-flooding in these rivers. The claim, that damage done to these European sites is a matter of hard scientific evidence, may be true, but there is no evidence whatever that the cause lies partly or wholly with wind farm developments. Indeed, the author of the report in question goes on to suggest that reduction in natural floodplains and new flood defence structures (on the Bandon River in particular) are contributory factors to damage caused within the SACs. The damage identified at The Gearagh SAC relates to the Toon River inflow. None of the proposed development site drains to the Toon River inflow – a small portion of the current appeal site instead draining to the Lee River inflow into The Gearagh SAC.

11.8.3 The claim that man-made drainage attenuation within wind farm sites has not worked is not borne out by any evidence submitted. The applicant has proposed a suite of drainage attenuation measures for this wind farm development site which will attenuate 1-in-100 six-hour storm events to current ‘greenfield’ rates (already high due to rock outcrops and poor drainage of thin soils on site) through the use of swales, check dams, attenuation ponds and level spreader discharge to vegetation. The calculations allow for a 20% increase in run-off due to climate change in the future. I would be satisfied that such measures, if correctly constructed and maintained, will be effective in maintaining ‘greenfield’ run-off rates, with the result that there will be no increased run-off which could contribute to down-stream flash-flooding in the Bandon River SAC.

11.8.4 A very small portion of the wind farm site is located within the Lee River catchment, whilst almost all of the grid connection is located within it. Having regard to the nature of the work proposed for the grid connection – the excavation of a trench within an existing road and the subsequent infilling of this trench – I would not consider that this aspect of the development has any potential to impact on the qualifying interests of The

Gearagh SAC. The applicant has outlined measures to control silt at the trench works. Only a tiny portion of the wind farm itself is located within the Lee River catchment (600m of road) – estimated at 0.36ha. The half of Borrow pit 2 located within the Lee River catchment is to be infilled with excess peat from elsewhere within the site, and will not have any significant impact in terms of the ground attenuation of surface water within the overall site. The catchment of the Lee River upstream of The Gearagh is approximately 175km², and the proposed wind farm works within this catchment represents 0.002% of the total. This is an insignificant area. The proposed development will not adversely affect the integrity of this European site. It is further noted that surface water attenuation is proposed for drains which flank access tracks – 12m³ for each 180m of any such track. There will likely be only three, or at most five such attenuation ponds on the 600m of access track within the Lee River catchment portion of the appeal site.

11.9 Mitigation Measures

The Construction and Environmental Management Plan sets down measures necessary to ensure works are carried out in accordance with the mitigation measures set out in the EIS, and also sets out monitoring and inspection procedures and frequency of same. These were elaborated on by way of subsequent 1st party submissions to the Board. Of particular note are the following measures-

- Clay plugs will be used within underground cable trenches within the site – to prevent trenches becoming conduits for rainwater run-off.
- Tree felling will be carried out around turbine bases so as to discourage bat activity along tree lines or forest edges in proximity to rotating blades.
- Management of forestry felling in accordance with terms of Felling Licence(s). Forestry in this area will ultimately be felled with or without this wind farm development. The control of release of nutrients into watercourses will be one of the best practice mitigation measures observed when felling is taking place – indicated in Section 7 of the Hydro Environmental Services Report received by the Board as part of the 1st Party appeal.
- Sediment traps will be installed on forestry drains during felling.
- Working areas will be maintained as small as possible.
- Use of ‘Ready-mix’ concrete only on the site. Impermeably-lined, contained area for washing of concrete chutes on trucks.
- Dust suppression measures during sustained dry periods.
- Location of turbines and other elements of the development at least 50m away from any watercourse.
- No direct discharges to any watercourse within the site.

- Clean surface water will be diverted around excavation areas within the site using interceptor drains.
- All clean drainage water will be discharged via swales with check dams.
- Outfall from worked area drains will be through attenuation ponds (1-in-100 year six-hour return period) and settlement ponds with final outfall via level spreader over vegetated ground.
- Silt traps will be placed in forestry drains downstream of the site.
- 'Siltbuster' or equivalent to be used on outfall in the event of pumping being required to dewater elements of the development during the construction phase.
- Re-fuelling of machinery and plant will be by way of mobile, double-skinned bowser, with emergency spill kits. Refuelling will not be undertaken within 50m of a watercourse.
- Brush mats will be used to limit soil erosion by heavy machinery.
- Increased site run-off will be controlled through use of permeable surfaces on access tracks and hard-stand areas around turbines and through use of attenuation ponds on new drainage outfalls. [It should be noted that the re-charge co-efficient of the site is already low (estimated at 12% only) due to the presence of poor permeability rock on or close to the surface and limited absorption of shallow peaty soils and subsoils].
- Borrow pits will not be connected to any drain or stream. Silt fences, straw bales and biodegradable geogrids will be used to control outflow of water from borrow pits during deposition of peat. Excess flow will be to constructed swales and stilling ponds with use of 'Siltbuster' or equivalent, if required.
- Excess peat will be deposited within borrow pits.
- Chemical toilets will be used during construction phase.
- Scaling back or suspension of construction works during wet weather - >10mm per hour or >25mm in a 24-hour period or half monthly average in any 7 days.
- Drainage network will be inspected and maintained regularly during construction phase.
- Any works to be carried out close to watercourses within the site will be during the months of May-September inclusive when streams will likely be dry or exhibit low-flow characteristics.
- Construction of silt fences downgradient of areas within which soil is to be moved.

11.10 Further Considerations

11.10.1 Delivery of Outsize Loads

The delivery of outsize loads to the site (35 in total) will utilize existing national, regional and local roads. Some minor alterations will be required at junctions. No significant mitigation measures will be required. There

will be no impact on the integrity of any European sites arising from these minor works.

11.10.2 Grid Connection

The 18km long 38kV grid connection between the site and the permitted sub-station at the proposed Barnadivane wind farm will be entirely underground within public roads/forestry tracks. Where watercourses intervene (15 no. have been identified), the cables will be laid either above the culvert (or where there is insufficient room) will be laid beneath the watercourse using directional drilling so as not impact on the watercourse). This will ensure minimum opportunity for siltation of watercourses which ultimately flow into European sites, and minimum disturbance of aquatic and riparian habitats and species, particularly Otter. The underground grid connection will be laid using two teams working from east and west, proceeding at the rate of approximately 150m per day each. The route is located entirely within the Lee River surface-water catchment. The grid connection route does not encroach on any European site. The closest European site is The Gearagh SAC – some 2.6km (as the crow flies) to the north of the closest point of the grid connection route: the separation distance via watercourse being greater. Principal mitigation measures include-

- Surface water contaminated with sediment will not be discharged to local drains or watercourses.
- Construction materials will not be stockpiled close to watercourses.
- Works will be scaled-back or suspended during forecast periods of heavy rainfall.
- Silt fencing will be erected on sloping ground downstream of trench works.
- Area around handling zone for 'ClearBore' drilling fluid will be bunded using 'terram' and sand bags.

11.10.3 Decommissioning

It is estimated that the wind turbines will be in place for 25 years. The sub-station and grid connection will remain in place, even if turbines are removed. If decommissioning proceeds, above-ground elements will be removed off-site for recycling. Turbine bases would be covered with earth and re-seeded. Site tracks will be used for forestry or agriculture. Such disassembly work will not have any significant affect on the qualifying interests of European sites.

11.11 In-combination Impacts

There are no other wind farms in the immediate vicinity of the site. Planning permission for the Shehy More wind farm, some 3.0km to the west of the appeal site at its closest, is the subject of 3rd party appeals to the Board (PL 04.243486) with no decision to date. The separation of the

two wind farms will ensure that combined, they would not present a barrier to movement of avifauna. In-combination impacts relating to surface water drainage are likely to be the greatest threat to European sites. The hydrological assessment undertaken by the applicant would indicate that if the proposed development were to be constructed at the same time as other permitted or applied-for wind farm developments in the area, the proposed mitigation measures would ensure that there would be no cumulative impacts – either from the wind farms themselves or the grid connections supporting them. This is a reasonable conclusion based on the information submitted with the application/appeal.

11.12 Conclusion

The development will not result in pollution of watercourses which could affect the qualifying interests of European sites, during either the construction or operation phases – regard being had to measures incorporated into the design of the wind farm, and to the measures which will be implemented during the construction phase to prevent (and mitigate) any pollution events or increase in surface water run-off to the Lee or Bandon River catchments. The Construction Environmental Management Plan sets out the proposed mitigation measures, in particular with regard to risks to hydrology and water quality. It includes drawings/schematic figures of the various surface water control features, swales, collector drains, stilling ponds, check dams, level spreaders and silt curtains. The roles and responsibilities of various site operatives are outlined in the Construction Environmental Management Plan. I would not accept the contention of objectors that ‘Reasonable Scientific Doubt’ remains as to the impact of this wind farm development on European sites. I consider it reasonable to conclude on the basis of the information on the file, which I consider adequate in order to carry out a Stage 2 Appropriate Assessment, that the proposed development, individually or in combination with other plans or projects would not adversely affect the integrity of European sites 004162, 004109, 002171 or 000108, or any other European site, in view of the Conservation Objectives for the sites in question.

12.0 Recommendation

I recommend that permission be granted for the Reasons and Considerations set out below, and subject to the attached Conditions.

REASONS AND CONSIDERATIONS

Having regard to-

- (a) national policy with regard to the development of alternative and indigenous energy sources and the minimisation of emissions of greenhouse gases,
- (b) the provisions of the “Wind Energy Development Guidelines – Guidelines for Planning Authorities” issued by the Department of the Environment, Heritage and Local Government in 2006,
- (c) the policies set out in the Regional Planning Guidelines for the South-West Region 2010-2020,
- (d) the policies of the planning authority as set out in the Cork County Development Plan 2014-2020,
- (e) the location of the wind farm site in an area which is identified in the Cork County Development Plan 2014–2020 as an area ‘Open to Consideration’ where it is the policy of the planning authority to facilitate the development of appropriate wind energy proposals,
- (f) the character of the landscape in the area and the absence of any ecological designation on or in the immediate environs of the wind farm site, and the character of the landscape through which the proposed grid connection would be provided,
- (g) the characteristics of the site and of the general vicinity,
- (h) the pattern of existing and permitted development in the area, including other wind farms,
- (i) the distances from the proposed development to dwellings or other sensitive receptors,
- (j) the range of mitigation measures set out in the documentation received, including the Environmental Impact Statement, the Natura Impact Statement and further submissions from the applicant to the Board,
- (k) the planning history of the site and its surrounds, and
- (l) the submissions and observations made in connection with the planning application and the appeal, including submissions in relation to the environmental and Natura impacts of the proposed development.

CONDITIONS

1. The development shall be carried out and completed in accordance with the plans and particulars lodged with the application to Cork County Council, and as submitted to An Bord Pleanála by way of 1st Party appeal (21st March 2016) and 1st Party response submissions to 3rd Party appeals and responses (28th April & 19th August 2016), except as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be agreed with the planning authority, the developer shall agree such details in writing with the planning authority prior to commencement of development, and the development shall be carried out and completed in accordance with the agreed particulars. Specifically, the mitigation measures described in the Environmental Impact Statement, the revised Environmental Impact Statement and Natura impact statement and other details submitted to the planning authority and to An Bord Pleanála shall be implemented in full during the construction, operation and decommissioning of the development.

Reason: In the interest of clarity.

2. The period during which the development hereby permitted may be carried out shall be ten years from the date of this order.

Reason: Having regard to the nature of the proposed development, the Board considered it reasonable and appropriate to specify a period of validity of the permission in excess of five years.

3. The permission shall be for a period of 25 years from the date of the commissioning of any wind turbines. The wind turbines and related ancillary structures shall then be decommissioned and removed unless, prior to the end of the period, planning permission shall have been granted for their continuance for a further period.

Reason: To enable the planning authority to review its operations in the light of the circumstances then prevailing.

4.
 - (a) The permitted turbines shall have a maximum tip height of 150 metres. Details of the turbine design and height shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. The wind turbines, including tower and blades, shall be finished externally in a light-grey colour.
 - (b) Cables within the site shall be laid underground.
 - (c) The wind turbines shall be geared to ensure that the blades rotate in the same direction.

- (d) No advertising material shall be placed on or otherwise be affixed to any structure on the site without a prior grant of planning permission.
- (e) The access tracks within the site shall be surfaced in gravel or hard-core, either from the borrow pits on site or imported to the site from nearby quarries, and shall not be hard topped with tarmacadam or concrete.
- (f) Roads, hard-standing areas and other hard-surfaced areas shall be completed to the written satisfaction of the planning authority within three months of the date of commissioning of the windfarm.
- (g) Soil, rock and other materials excavated during construction shall not be left stockpiled on site following completion of works. Excavated areas including the borrow pits and areas of peat placement shall be appropriately restored within three months of the date of commissioning of the wind farm, to details to be submitted to, and agreed in writing with, the planning authority.

Reason: In the interests of visual amenity, traffic safety and orderly development.

5. Details of aeronautical requirements shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development, following consultation with the Irish Aviation Authority. Prior to the commissioning of the turbines, the developer shall inform the planning authority and the Irish Aviation Authority of the co-ordinates of the as-constructed tip heights and co-ordinates of the turbines.

Reason: In the interest of air traffic safety.

6. Wind turbine noise arising from the proposed development, by itself or in combination with any other permitted wind energy development in the vicinity, shall not exceed the greater of:

- (a) 5 dB(A) above background noise levels or,

- (b) 43 dB(A) $L_{90,10min}$

when measured externally at dwellings or other sensitive receptors.

Prior to commencement of development, the developer shall submit to and agree in writing with the planning authority a noise compliance monitoring programme for the subject development, including any mitigation measures such as the de-rating of particular turbines. All noise measurements shall be carried out in accordance with ISO Recommendation R 1996 "Assessment of Noise with Respect to

Community Response,” as amended by ISO Recommendations R 1996-1. The results of the initial noise compliance monitoring shall be submitted to, and agreed in writing with, the planning authority within six months of commissioning of the wind farm.

Reason: In the interest of residential amenity.

7. (a) Blasting operations at the borrow pits shall take place only between 1000 hours and 1700 hours, Monday to Friday, and shall not take place on Saturdays, Sundays or public holidays. Monitoring of the noise and vibration arising from blasting and the frequency of such blasting shall be carried out at the developer’s expense by an independent contractor who shall be agreed in writing with the planning authority.
- (b) Prior to the firing of any blast, the developer shall give notice of his intention to the occupiers of all dwellings within 500 metres of the borrow pit concerned. An audible alarm for a minimum period of one minute shall be sounded. This alarm shall be of sufficient power to be heard at all such dwellings.

Reason: In the interests of public safety and residential amenity.

8. (a) Vibration levels from blasting shall not exceed a peak particle velocity of 12 mm/second, when measured in any three mutually orthogonal directions at any sensitive location. The peak particle velocity relates to low frequency vibration of less than 40 hertz where blasting occurs no more than once in seven continuous days. Where blasting operations are more frequent, the peak particle velocity limit is reduced to 8 millimetres per second. Blasting shall not give rise to air overpressure values at sensitive locations which are in excess of 125 dB (Lin)_{max peak} with a 95% confidence limit. No individual air overpressure value shall exceed the limit value by more than 5 dB (Lin).
- (b) A monitoring programme, which shall include reviews to be undertaken at [annual] intervals, shall be developed to assess the impact of quarry blasts. Details of this programme shall be submitted to, and agreed in writing with, the planning authority prior to commencement of any quarrying works on the site. This programme shall be undertaken by a suitably qualified person acceptable to the planning authority. The results of the reviews shall be submitted to the planning authority within two weeks of completion. The developer shall carry out any amendments to the programme required by the planning authority following this annual review.

Reason: To protect the [residential] amenity of property in the vicinity.

9. (a) The proposed development shall be fitted with appropriate equipment and software to suitably control shadow flicker at nearby dwellings, in accordance with details which shall be submitted to, and agreed in writing with, the planning authority prior to the commencement of development.
- (b) Shadow flicker arising from the proposed development, by itself or in combination with other existing or permitted wind energy development in the vicinity, shall not exceed 30 hours per year or 30 minutes per day at existing or permitted dwellings or other sensitive receptors.
- (c) A report shall be prepared by a suitably qualified person in accordance with the requirements of the planning authority, indicating compliance with the above shadow flicker requirements at dwellings. Within 12 months of commissioning of the proposed wind farm, this report shall be submitted to, and agreed in writing with, the planning authority. The developer shall outline proposed measures to address any recorded non-compliances, including control of turbine rotation if necessary. A similar report may be requested at reasonable intervals thereafter by the planning authority.

Reason: In the interest of residential amenity.

10. Prior to the commencement of development, the developer shall agree a protocol for assessing any impact on radio or television or other telecommunications reception in the area. In the event of interference occurring, the developer shall remedy such interference according to a methodology to be agreed in writing with the planning authority, following consultation with other relevant authorities.

Reason: In the interest of residential amenity and orderly development, and to prevent any interference with such services.

11. The developer shall review usage by birds of the wind farm site (particularly Hen harrier and Merlin) through an annual monitoring programme, which shall be submitted by the developer to, and agreed in writing with, the planning authority prior to commencement of development. This programme shall be developed following consultation with the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, and shall be repeated annually for a period of three years following completion of construction.

Reason: To ensure appropriate monitoring of the impact of the development on the avifauna of the area.

12. (a) Prior to commencement of development, details of the following shall be submitted to, and agreed in writing with, the planning authority:
- (i) a Transport Management Plan, including details of the road network/haulage routes, the vehicle types to be used to transport materials on- and off-site, and a schedule of control measures for exceptionally wide and heavy delivery loads,
 - (ii) a condition survey of the roads and bridges along the haul routes and grid connection route to be carried out at the developer's expense by a suitably qualified person both before and after construction of the wind farm development. This survey shall include a schedule of required works to enable the haul routes to cater for construction-related traffic. The extent and scope of the survey and the schedule of works shall be agreed with the planning authority prior to commencement of development,
 - (iii) detailed arrangements whereby the rectification of any construction damage which arises shall be completed to the satisfaction of the planning authority/authorities,
 - (iv) detailed arrangements for temporary traffic arrangements/controls on roads, and
 - (v) a programme indicating the timescale within which it is intended to use each public route to facilitate construction of the development.
- (b) All works arising from the aforementioned arrangements shall be completed at the developer's expense, within 12 months of the cessation of the use of each road as a haul route or grid connection route for the proposed development.

In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanála for determination.

Reason: To protect the public road network and to clarify the extent of the permission in the interest of traffic safety and orderly development.

13. Prior to the commencement of development, a detailed reinstatement programme providing for the removal of all turbines and ancillary structures (but not turbine bases, access roads/tracks, cabling or the sub-station) shall be submitted to, and agreed in writing with, the planning authority. On full or partial decommissioning of the windfarm, or if the windfarm ceases operation for a period of more than one year, the masts

and turbines concerned shall be dismantled and removed from the site. The site shall be reinstated in accordance with the agreed programme and all decommissioned structures shall be removed within three months of decommissioning.

Reason: To ensure satisfactory reinstatement of the site upon cessation of the project.

14. The developer shall facilitate the archaeological appraisal of the site and shall provide for the preservation, recording and protection of archaeological materials or features which may exist within the site or along the grid connection route. In this regard, the developer shall:
- (a) notify the planning authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development, and
 - (b) employ a suitably-qualified archaeologist prior to the commencement of development. The archaeologist shall assess the site and monitor all site development works.

The assessment shall address the following issues:-

- (i) the nature and location of archaeological material on the site, and
- (ii) the impact of the proposed development on such archaeological material.

A report, containing the results of the assessment, shall be submitted to the planning authority and, arising from this assessment, the developer shall agree in writing with the planning authority details regarding any further archaeological requirements (including, if necessary, archaeological excavation) prior to commencement of construction works.

In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanála for determination.

Reason: In order to conserve the archaeological heritage of the area and to secure the preservation (*in-situ* or by record) and protection of any archaeological remains that may exist within the site or along the grid connection route.

15. All clear-felling of forestry associated with the development shall be undertaken in accordance with the appropriate Forest Service Guidelines.

All necessary licences shall be obtained from the forest service for any felling operations on site.

Reason: In the interest of orderly development and to protect the amenities of the area.

16. The construction of the development shall be managed in accordance with a Construction Environmental Management Plan, which shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. This Plan shall provide details of intended construction practice for the development, including:-
- (a) location of the site and materials compound including areas identified for the storage of construction waste,
 - (b) location of area for construction site offices and staff facilities,
 - (c) measures providing for access for construction vehicles to the site, including details of the timing and routing of construction traffic to and from the construction site and associated directional signage, to include, in particular, proposals to facilitate and manage the delivery of over-sized loads,
 - (d) measures to prevent the spillage or deposit of clay, rubble or other debris on the public road network,
 - (e) alternative arrangements to be put in place for pedestrians and vehicles in the case of the closure of any public road or footpath during the course of site development works or the laying of the grid connection,
 - (f) details of appropriate mitigation measures for construction-stage noise, dust and vibration, and monitoring of such levels,
 - (g) containment of all construction-related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained; such bunds shall be roofed to exclude rainwater,
 - (h) appropriate provision for re-fuelling of vehicles,
 - (i) off-site disposal of construction waste and construction-stage details of how it is proposed to manage excavated soil/peat,
 - (j) means to ensure that surface water run-off is controlled in accordance with the mitigation measures proposed in the submitted documents, and

(k) details of the intended hours of construction.

Prior to the commencement of construction, proposals for the environmental monitoring of construction works on site by an ecologist and by an environmental scientist or equivalent professional, including the monitoring of the implementation of construction-stage mitigation measures, and illustrating compliance with the requirements set out above, shall be submitted to, and agreed in writing with, the planning authority, together with associated reporting requirements.

Reason: In the interest of protection of the environment and of the amenities of the area.

17. Rock from the borrow pits shall be won only for the purposes of road/hardstand construction on the site, and shall not be sold or transported off site without a prior grant of planning permission.

Reason: In the interest of orderly development.

18. Prior to commencement of development, the developer shall lodge with the planning authority a cash deposit, a bond of an insurance company, or such other security as may be acceptable to the planning authority, to secure the reinstatement of public roads which may be damaged by the transport of materials to the site or by works carried out in relation to the laying of the grid connection, coupled with an agreement empowering the planning authority to apply such security or part thereof to the satisfactory reinstatement of the public road. The form and amount of the security shall be as agreed between the planning authority and the developer or, in default of agreement, shall be referred to An Bord Pleanála for determination.

Reason: In the interest of traffic safety and the proper planning and sustainable development of the area.

19. Prior to commencement of development, the developer shall lodge with the planning authority a cash deposit, a bond of an insurance company, or such other security as may be acceptable to the planning authority, to secure the satisfactory reinstatement of the site upon cessation of the project, coupled with an agreement empowering the planning authority to apply such security or part thereof to such reinstatement. The form and amount of the security shall be as agreed between the planning authority and the developer or, in default of agreement, shall be referred to An Bord Pleanála for determination.

Reason: In the interest of orderly development and visual amenity and to

20. The developer shall pay to the planning authority a financial contribution as a special contribution under section 48(2)(c) of the Planning and Development Act 2000, as amended, in respect of works to the public road in the vicinity of the site which are required to facilitate the proposed development and which are undertaken by the local authority. The amount of the contribution shall be agreed between the planning authority and the developer or, in default of such agreement, the matter shall be referred to An Bord Pleanála for determination. The contribution shall be paid prior to the commencement of the development or in such phased payments as the planning authority may facilitate and shall be updated at the time of payment in accordance with changes in the Wholesale Price Index – Building and Construction (Capital Goods), published by the Central Statistics Office.

Reason: It is considered reasonable that the developer should contribute towards the specific exceptional costs which are incurred by the planning authority which are not covered in the Development Contribution Scheme and which will benefit the proposed development.

**Michael Dillon,
Inspectorate**

13th September 2016.