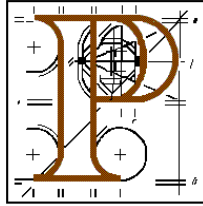


An Bord Pleanála



Inspector's Report

Reference No:

09.PA0041

Proposed Development:

Erection of 47 wind turbines with a tip height of up to 169m in 5 no. clusters, access tracks, a sub-station, a permanent metrological mast, borrow pits and associated works, temporary compounds, temporary alterations to the public road for the delivery of turbines at Ballynakill (10 turbines), Windmill (3 turbines), Drehid-Hortland (21 turbines), Derrybrennan (2 turbines) and Cloncumber (11 turbines), Co. Meath and Co. Kildare with connection via underground medium voltage cables which run predominantly along the public road network to the proposed substation at Drehid and connection via high voltage (220kV) underground cables to one of two existing substations at Woodland, Co. Meath or Maynooth, Co. Kildare, (subsequently altered to connection at Dunfirth)

Planning Authority:

Meath County Council and Kildare County Council

Applicant:

Element Power Ltd.

Type of Application:

Strategic Infrastructure

Submissions and observations

Kildare County Council:

Yes

Meath County Council:	Yes
Observers:	Yes
Prescribed bodies:	Yes
Date of Site Inspections:	Various June/July 2015, 10 Feb 2016, 22 May, 24 May 2016
Inspector:	Mary Kennelly, Senior Planning Inspector
Appendices:	<p><u>Appendix 1</u> Report of Senior Planning Inspector John Desmond</p> <p><u>Appendix 2</u> Avian Ecology Report – Howard Fearn</p> <p><u>Appendix 3</u> Compendium of third party observations</p> <p><u>Appendix 4</u> Observations in response to Further Information and to SEVESO/COMAH Notification</p>

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1.0 INTRODUCTION

1.1 The application

This is a direct planning application to the Board under Section 37(E) of the Planning and Development Act 2000, as amended by the Planning and Development (Strategic Infrastructure) Act, 2006. The application is being made by Element Power Ireland Ltd. to erect 47 no. wind turbines with an overall tip height of 169m, access tracks, a sub-station, a permanent meteorological mast, borrow pits and associated works, including temporary alterations to public roads. The proposed turbines are arranged in five separate clusters, which are connected by means of underground medium voltage cables, and would have a combined output of up to 125MW. The majority of the proposed turbines are located within Co. Kildare with just two turbines located within Co. Meath.

The proposed cabling runs predominantly along the public roads and would link each cluster to the proposed substation at Drehid. The power would be converted to AC at the substation and transported to the National Grid. The application as originally submitted proposed connection to the grid by means of underground high voltage cables to one of two existing substations at either Woodland, (north of Kilcock), Co. Meath or Maynooth, Co. Kildare. However, the grid connection was subsequently revised on 24th September 2015. The proposed HV cable routes to Maynooth and Kilcock were omitted and a new proposal was made to connect to the grid at Dunfirih, at the site of an existing substation located near the proposed cable route connecting the proposed windfarm to the proposed substation.

The application is for a ten-year permission and it is envisaged that the wind farm would operate for a period of 30 years, once commissioned. The application is accompanied by the following documentation

- Environmental Impact Statement
- Natura Impact Statement
- Photomontages
- Drawings

1.2 Pre-application consultation

Having regard to the provisions of Section 37B, the applicant, Element Power Ireland Ltd., engaged in pre-application consultation with the Board, (Ref. 09.PC0186). Three meetings were held between An Bord Pleanála and the applicant and its agents on 4th November 2014, on 23rd January 2015 and on 13th February 2015. A meeting was also held between An Bord Pleanála and one of the planning authorities, Kildare County Council, on 4th February 2015. Issues which were identified are set out in the records of the meetings and are also summarised in the Inspector's Report. By Order dated 24th March 2015, the Board decided that

the proposed development of a 47 turbine wind farm in five clusters at Maighne, Co. Kildare, together with a new substation, underground cable connections between each wind farm cluster and the proposed substation and onward connection to one of two options for export to the national grid would be strategic infrastructure within the meaning of section 37A of the Planning and Development Act, 2000, as amended. The current application to the Board is made on foot of that decision.

1.3 Submissions and observations

Submissions were received by the Board in response to the application from each of the two planning authorities, from a number of prescribed bodies and from 807 no. third parties, including several public representatives and interest groups.

1.4 Further information

The applicant responded to the submissions and observations on 24th September, 2015. This submission included revisions to the application, significant additional information, a detailed response to the issues raised by each of the planning authorities and a response on a topic basis to the issues raised in the third party observations. The principal revisions/significant additional information related to the revised grid connection, (as referred to in 1.1 above), a further visual impact assessment with an additional set of photomontages for Longwood Village ACA, and further detailed information in the form of structural surveys of the proposed transport/cable routes, including additional information regarding site entrances and specific node points. The additional information also included a further detailed response to the submission by the Department of Defence on Aviation matters, information on typical turbine bases and details regarding the Longwood Water supply (Clonguiffen).

1.5 Response to Further Information

The further information was advertised and a further 143 submissions were received including detailed responses from Kildare Co. Co. and Meath Co. Co.

1.6 Need for Oral Hearing

The Board considered a memorandum from the Inspector on the matter of whether an oral hearing should be held in respect of the proposed development at a meeting on the 10th February, 2016. The Board decided, by a majority of 3:1, that an oral hearing should not be held generally in accordance with the reasoning set out in the Inspector's memorandum and cited the following reasons and considerations:

Reasons and considerations

Notwithstanding the volume of public submissions received in relation to the application, having regard to the comprehensive nature of the documentation available from all of the parties to the case – including the response of the applicant (received on 24th September 2015) to the observations received, and the subsequent further submissions received from observers – the Board is satisfied that the considerations arising can be satisfactorily addressed without the need for an oral hearing in this case.

2.0 SITE LOCATION AND DESCRIPTION

2.1 The site is located across North County Kildare and South County Meath. It has a stated area of 1,389 hectares and is generally linear in shape. The topography is relatively flat or gently sloping, and the Bog of Allen dominates the landscape of the general area. It consists primarily of improved agricultural farmland, raised bog, cut-over bog and forestry with a number of small towns, villages and a considerable amount of dispersed housing. The area comprising the proposed wind farm clusters with associated underground cabling extends from the villages of Longwood and Enfield in the North-West in a generally southerly direction towards Rathangan, passing in the general vicinity of Carbury and Edenderry to the west and Allenwood and Prosperous to the east. The first of the originally proposed grid connection options (Option 1) extended from Drehid, (south of Enfield) in a north-easterly direction through Johnstown Bridge, Enfield and Kilcock to the existing substation at Woodland near the M3. Option 2 extended in a south-easterly direction passing Donadea Forest Park towards Taghadoe substation, which is south of Maynooth. The revised grid connection is to an existing 110kV substation which is located just to the south of the proposed cable route linking the Hortland cluster (most easterly of the clusters) to the proposed substation at Drehid.

2.2 The proposed wind farm clusters are as follows:-

Ballinakill:-	10 Turbines – north of M4, south of Royal Canal
Windmill:-	3 Turbines – west of Cadamstown, north of Carbury
Drehid-Hortland	21 Turbines - Bord na Mona bog north of Timahoe
Derrybrennan	2 Turbines – adjacent to Coillte forest/Grand Canal
Cloncumber	11 Turbines – between R. Slate and Barrow Line

2.3 The M4 (Galway/Sligo-Dublin motorway) transects the northern part of the site area, as does the Royal Canal and the Sligo-Dublin mainline railway. The Grand Canal transects the southern end of the site area, to the west of Robertstown, which includes linkages to the Barrow system. The overall area is drained by a number of river catchments, namely the River Boyne

(to the west and north-west), the River Blackwater (to the east), the River Slate to the south and the River Figile, (via the R. Cushaling and River Crabtree), to the southwest.

2.4 The principal access route to the site is Junction 9 (Enfield) of the M4 motorway. The Ballynakill cluster is located to the north of the motorway and the other four clusters are located to the south. The area is generally served by a network of regional and local roads. The Regional roads within and in the vicinity of the site are:-

- The R402 - Enfield to Edenderry, via Johnstown Bridge, Kilshancoe and Carbury;
- The R148 - old N4 west of Enfield to Maynooth, via Kilcock. Runs parallel to and north of the M4;
- The R403 - Carbury to Allenwood and onward to Prosperous and Clane. Crosses the Grand Canal near Allenwood;
- The R414 - Allenwood to Rathangan, via Lullymore.

2.5 There are a number of airports and aerodromes within the general vicinity of the site, which are as follows:-

Dublin International Airport – located 36km to northeast

Dublin Weston Airport – located c.20km from closest cluster to east. This is a private commercial airport which facilitates charter flights and is used as a base for fixed and rotary wing flight training.

Casement Aerodrome – located c.24 km to east at Baldonnel. This is a military base for the Irish Air Corps (Dept. of Defence) from which it operates its training and operational activities. The Garda Air Support Unit is also based here.

Clonbullogue Aerodrome – located c.13km to the southwest in Co. Offaly. It is a base for parachute and sky diving clubs.

2.6 The bedrock in the area is predominantly limestone and shale, whilst the soils are generally dominated by peat or sand and gravel deposits. Of the five wind farm clusters, two are located in improved farmland, Ballynakill at the northern end and Cloncumber at the southern end of the site. The other three clusters border either historic or existing areas of raised bog, the majority of which have been exploited for either forestry or commercial peat extraction. However, areas of active raised bog are present to the south of the Windmill cluster and in two locations within the Drehid-Hortland cluster. There are industrial railway lines running through some of the cut-away bogs.

2.7 The landscape is generally flat to gently undulating with occasional isolated low hills. The overall area is contained to the south-west and south-east by the foothills of the Slieve Bloom Mountains and the Wicklow Mountains respectively. The Northern Hills and the Newton Hills provide relief at the

northern end of the site and the Chair of Kildare (Hill of Allen, Boston Hill and Grange Hill) provide relief to the south. The central part of the site is a mixture of bogland, forestry and farmland. The proposed wind farm clusters are generally arranged in an arc bordering several bogs including the Bog of Allen, Lullymore and Carbury Bogs.

- 2.8 The landscape within which the clusters are set has a rich tapestry of ancient and historic sites. Within this landscape there are approx. 114 protected structures and 282 recorded archaeological monuments which are stated to be within 3km radius of the site. Carbury Hill and Lullymore Monastic Complex are national monuments, which are within a 5km radius. There are two UNESCO candidate world heritage sites within a 30km radius which are Tara Complex (c.25km to NE) and Dun Ailinne (c.17km to SW). There are a significant number of demesne landscapes and large country houses dating from the 18th and 19th centuries some of which have associated parklands and/or designed landscapes.
- 2.9 The area within which the wind farm is set is densely populated with a network of towns and villages interspersed by rural areas which support a high density of one-off houses and clusters of single houses. North Kildare and South Meath form part of the Dublin commuter belt and it is also an area which is heavily used by the population of Greater Dublin for recreation and amenity purposes. There are approx. 1000 homes within 1.2km of a proposed turbine. The area is very settled and is well served by national road infrastructure (M4 and M7) as well as public transport. There is a considerable diversity of long-established land uses and businesses including 22 no. stud farms and a number of tourist attractions. These include the National Stud and Japanese Gardens, Donadea Forest Park, Lullymore Heritage Park, The Millennium Maze and the amenity facilities associated with the Royal and Grand Canals, as well as some large country house hotels, castles and golf courses.
- 2.10 Agriculture is the predominant use in the overall area. Bord na Mona also has a significant presence in the general area with commercial peat harvesting adjacent to the central part of the site. There are also a number of industrial and infrastructural uses in the vicinity including Dredge Waste Management Facility, Carbury Compost, Monaghan Mushrooms, Brady's Family Ham, Moyvalley Meats and Irish Industrial Explosives factory at Cloonagh. A number of gravel pits and quarries are located within the vicinity of the site.
- 2.11 The EIS states that there are 36 designated sites within 15km of the development site. It is noted that ten of these are European sites forming part of the Natura 2000 network. The remainder are either Natural Heritage Areas (4 no.) or proposed NHAs. However, there are no European sites within the development site area. The European sites are as follows:

R. Boyne and R. Blackwater SPA (004232)
R. Boyne and R. Blackwater cSAC (002299)
Ballynafagh Bog cSAC (000391)
Pollardstown Fen cSAC (000396)
Ballynafagh Lake cSAC (001387)
Rye Water Valley/Cartron cSAC (001398)
R. Barrow and R. Nore cSAC (002162)
Mouds Bog cSAC (002331)
Mount Hevey Bog cSAC (002342)
The Long Derries, Edenderry cSAC (000925)

3.0 PROPOSED DEVELOPMENT

3.1 Project Introduction and Background

The Maighne Wind Farm, which is composed of individual clusters of turbines, is predominantly located in Co. Kildare, with just two turbines and one of the potential grid-connection options located in County Meath. It was formerly part of the Greenwire Wind Energy Export Project, which comprised over 100 turbines spread over 5 counties in the midlands, from which it was intended to export power to the U.K. However, the current proposal is for 47 turbines and the wind farm would have a combined output of up to 125 MW. It is the stated intention of the applicant that the power generated by the Maighne Wind Farm would be connected to the Irish National Grid using a Gate 3 connection. This would be achieved by supplying power from the proposed wind farm to the Irish electricity network via underground cables to the existing substation at Dunfirth, Co. Kildare, which would need to be upgraded and expanded to accommodate the increased power generation.

The applicants are seeking a ten year planning permission for the proposed wind farm which would have an operational period of 30 years from the date of commissioning.

3.2 Project description

3.2.1 Application Main elements

The proposed development consists of the following main elements:

- The erection of 47 turbines in 5 distinct clusters with an overall tip height of 169m (maximum);
- The final turbine design/manufacturer has not been chosen but the rotor diameter is assumed to be 120m with an assumed hub height of 109m;
- Hardstanding and foundations for each turbine (up to 25m x 25m);
- 9 no. site entrances from public roads;
- 31 km of new site access tracks with associated drainage;
- Upgrade of 10km of existing tracks;

- New 220kV substation with 2 no. control buildings within the Drehid cluster;
- Erect a 100m high permanent meteorological mast;
- 3 no. borrow pits, (2 no. within Ballynakill cluster, 1 no. in Cloncumber);
- 4 no. temporary construction compounds, (1 in Ballynakill, 2 in Drehid-Hortland, 1 in Cloncumber);
- Construct drainage and sediment control systems;
- Fell 63ha of forestry to facilitate works of which 45ha is within Coillte plantations;
- Peat excavation;
- Site works and landscaping works;
- Temporary alterations to public roads to facilitate delivery of turbines;
- Provide 75km of medium voltage (33kV) underground cabling between the proposed turbines and the proposed substation, of which 36km will be laid within the public roadway;
- Proposed grid connection (see 3.2.2 below)
- Install joint bays along cable routes;
- Underground communication cables.

3.2.2 Wind Farm Layout

The wind farm clusters and associated cabling extend southwards from the town of Longwood, Co. Meath to Moyvalley, Cadamstown, Derrinturn, Allenwood, Robertstown and Rathangan in Co. Kildare.

The proposed wind farm clusters are as follows:-

Ballynakill cluster - 10 Turbines – T1-T10, located southwest of the Royal Canal and north of the M4, the R148 and the Glash River. The River Boyne flows to the northwest of the cluster and Moyvalley village is located to the southeast. This cluster is located in predominantly agricultural farmland and has two access points from the R148. The cluster straddles the R160 at Calf Field and from here extends south-westwards to meet the R148 and north-eastwards to meet the Royal Canal, along which it follows the southern bank until it meets the R148 again just north of Moyvalley.

This cluster would also accommodate 2 no. borrow pits and 1 no. construction compound.

Windmill cluster - 3 Turbines – T24-T26, located southwest of Cadamstown and north of Carbury. This cluster is accessed from a local road, (L1002, which runs northwards from Carbury to the M4 at Ballynadrummy), and through a small private forest. It is generally sited on raised bog which has been commercially worked. The River Boyne flows to the west

and Carbury Bog pNHA (raised bog) is located immediately to the southwest. The development of this cluster would necessitate the felling of 2.2ha of privately owned commercial forestry.

Drehid-Hortland -

21 Turbines - This is essentially two sub-clusters which are located on either side of a large Bord na Mona bog in an area which is roughly bounded by Timahoe to the south, Kilshancoe to the west, Johnson's Bridge to the north and Donadea Forest Park to the east. Development of the overall cluster will necessitate the felling of 45ha of commercially owned forestry.

The Drehid sub-cluster (14 turbines, T11-T23 & T47) is long and narrow and extends from south of Johnstown Bridge village to the local road between Drehid and Timahoe Crossroads. The northern section comprises Coillte forest – Dunfirth and Kilmurray plantations, (site of T11-T13 and the proposed substation), which gives way to some private forest (T14/T15) to the southeast of Kilshancoe village. T16-T23 are located at the southern end of this sub-cluster in low lying farmland which borders the worked bog immediately to the east. T47 is located on farmland on the far side of the local Drehid-Timahoe road.

The Hortland sub-cluster (7 turbines, T40-T46) is located further to the east on the eastern side of the bog, near Bishop's Chair Bridge and to the north of Donadea Forest Park. This sub-cluster is mainly comprised of Coillte forest (T40, T42, T43, and T44) with some private forests and farmland bordering the plantation.

The D/H cluster also includes 2 no. construction compounds.

Derrybrennan -

2 Turbines – (T27-T28) located on the western side of a private road which runs parallel and to the west of the R403 (Carbury-Allenwood road). It is accessed via Bord na Mona Firepak premises to the northwest. It is situated to the south-east of Edenderry and the closest settlement would be Derrinturn to the north. The site of the cluster comprises farmland consisting of a small private forest and a number of fields to the south of the farmyard. There is a Coillte forest immediately to the south and the Cushaling River flows to the north-west. The Grand Canal lies to the north and east of the site. The general area is a patchwork of bogs and farmland with some small patches of forestry.

The development of this cluster will necessitate the felling of 0.77ha of privately owned forestry.

Cloncumber -

11 Turbines – (T29-T39) located on an elongated site between Rathangan and Robertstown and is wedged between the Slate River and a branch of the Grand Canal (Barrow Way). A feeder line from Athy and the Barrow, “The Grand Canal Barrow Line” is also a branch of the canal and flows past the eastern side of the cluster. The north-eastern end of the cluster, T29-T32, consists of a Coillte forest (Ballyteige) and the remaining section to the southwest (T33-T39) comprises farmland. There are a number of villages/settlements in the vicinity which are dispersed across the area to the south of the R414. These include Allenwood South, Ballyteige North, Allenwood, Littleton, Kilmeage and Bostoncommon. It is proposed to locate the third borrow pit adjacent to the Barrow Line and to provide a temporary construction compound in the middle of the cluster. The development of this site will necessitate the felling of 15ha of Coillte owned forestry.

3.2.3 Turbine design

It is stated at 2.4.2.1 of the EIS that the exact make and model of the final turbine design will be chosen at procurement stage on the basis of economics and efficiency of energy production associated with turbines on the market. However, detailed drawings showing a typical turbine are included in the submitted drawings and a sample description of the turbines currently available is set out in Table 2.7 of the EIS. The overall tip height (base to blade tip) would be 169m. Although no tower height is specified, it is stated that the appraisals in the EIS have been carried out on the basis of a tower height of 109m and a rotor blade diameter of 120m. There are 5 no. candidate turbine models proposed. The rotor diameter varies from 113m to 126m. However, it is stated that the overall tip height will not be exceeded. Each turbine would generate electricity at 660volts which would be converted by the transformer (within each tower) to 33kV.

3.2.4 Access tracks

Approx. 10km of the proposed access tracks are existing and these will be upgraded. A further 31km of internal access tracks will be constructed. The access tracks would generally be 4.5m wide, would be finished with a well graded aggregate and would include a drainage system adjacent to the access tracks. Floating roads would be used where the peat is less than 1m deep and where site conditions dictate. These will consist of a layer of combined geotextile and geogrid laid directly on top of the existing surface, followed by a layer of stone and a layer of compacted coarse material. All other tracks will be constructed by excavating to provide a competent stratum and filling with layers of compacted stone. The

decision regarding whether to use floating roads or not will be made post-decision and will be based on detailed geotechnical site investigations. Stone required for internal tracks would be sourced from the proposed borrow pits and from some existing local pits.

3.2.5 Proposed substation

The proposed substation would be located within a Coillte forest at the Drehid cluster. The substation would be of the Air Insulated Switchgear type and would convert the voltage from 33kV to the specified HV. The connection voltage may be at 110kV or at 220kV, depending on Eirgrid's requirements. The dimensions of the substation are given as 112.5m x 85m. The plant and equipment would be enclosed by a 2.4m high palisade fence. The entire footprint would be on impenetrable hardstanding and would have a sealed drainage system. Wastewater would be stored in a sealed holding tank which would be serviced by a licensed contractor.

3.2.6 Grid connection

It is proposed to provide one point of connection to the national grid. The application as originally submitted had proposed the following:

- Install 220kV cabling between proposed substation and existing substation at Woodland Co. Meath – 29km of which 28km within public road.
- Install 220kV cabling between proposed Drehid substation and existing substation at Maynooth, Co. Kildare – 23km of which 17km within public road.

As previously stated, it is now proposed to connect to the 110kv substation at Dunfirth. As this substation is close to the previously proposed medium voltage cable route and is within the red line boundary for the overall site, it would involve a small additional stretch of underground cabling to connect the wind farm to this substation. However, the capacity of the substation is likely to need to be upgraded and expanded and this is referred to in the Further Information submission of 24th September 2015.

3.2.7 Underground cable routes

The application, as originally submitted, included routes for both medium voltage (MV – 33kV) and high voltage (HV-220kV) underground cabling. Each cable circuit would have three cables which would generally be laid in a trefoil formation but some may be laid in a flat formation. The depth of the cabling would be 950mm to the top of the duct and 1250mm to the base. The width would vary from 600mm (trefoil) to 1100mm (flat). It is intended that communication cables will be laid alongside the electrical cables. The cable routes include watercourse crossings, canal crossings, and crossings of the M4 and mainline railway line. The watercourse crossings will generally be by means of either Horizontal Directional

Drilling or Trenchless Techniques, except where there is sufficient space in a culvert or bridge. When none of these options are available, it will be necessary to excavate a trench and lay the cable ducts in the bed of the watercourse. It is stated that the appropriate technique will be selected following detailed engineering and consultation with the relevant authorities.

There are two canal crossings proposed, one (MV cable route) which crosses the Grand Canal at Kilpatrick Bridge, and the other (HV cable route) which crosses the Royal Canal at Allen Bridge. This latter crossing is on the superceded option 1 for grid connection. Kilpatrick Bridge is on the haul route and may need to be upgraded. If not, a trenchless technique will be used to cross the canal.

There are two proposed crossings of the M4, one (MV cable) adjacent to the L5006 at Moyvalley and the other (HV cable route) between Johnstown Bridge and Enfield. This latter crossing is on the superceded HV cable route. Trenchless/Horizontal Directional Drilling techniques will be used which will mean that the cable ducts will be below the foundations of the motorway, following detailed discussions with the relevant transport authorities/motorway operators.

The only railway crossing is on the HV route to Woodland, which has now been superceded.

3.2.7.1 High voltage cabling

The purpose of the high voltage cabling is to transport the electricity generated from the Drehid substation to the national grid. The original proposal involved either the laying of 29km of HV cabling, (28km of which would have been along public roads), to Kilcock, (Option 1 to Woodland substation), or the laying of 23km of cabling, (17km of which would be along public roads), to Maynooth, (Option 2 to Taghadoo substation).

Option 1 - proposed cable route from Drehid along a local road to the centre of Johnstown Bridge. The proposed route then would have travelled along the R402, under the M4 and onto the R148 south of Enfield. It then followed the R148 from Enfield Relief Road to Kilcock, crossing the Royal Canal at Allen Bridge and the Dublin-Sligo railway line before heading northwards to Woodland. This latter stretch of the cable route principally followed the R125 from Kilcock, the R156 from Jenkinstown Co. Meath and two local roads, the L6205 and the L6207 to Woodland substation.

Option 2 – proposed cable route from Drehid would have travelled eastwards along a local road north of Donadea Forest Park, which crossed the R407 at Baltracey Crossroads and the R408 at Ladychapel Crossroads, to Taghadoo substation, west of Maynooth.

Revised grid connection - As previously stated, these two options have now been omitted, which has significantly reduced the level of proposed high voltage cabling

along public roads. It is now proposed to install 110kV of underground cabling between the proposed substation at Drehid and the existing ESB 110kV substation at Dunfirth, totalling approx. 2.3km. It is stated that 1.1km of this HV cable will be laid in the public roadway.

3.2.7.2 Medium voltage cabling

The purpose of the medium voltage cabling is to connect the turbines located in the proposed 5 wind farm clusters to the proposed substation at Drehid. In total, it is proposed to lay approx. 75km of MV cabling, of which 36km would be along the public roadways. Section 13.2 of the EIS provides a detailed description of the cable routes. The MV cable route overlaps with the haul route along certain sections (see Fig. 13.1 of EIS). The combined routes include section of the R404, R414, the L5012, L-1004 and the L-7004. The length along the regional roads is stated as 9.2km. The MV cable route can be described in five sections as follows:-

Windmill to Cadamstown Crossroads

The cable route travels northwards from the Windmill entrance on the L-1005 and then the L-1002, before turning eastwards on the L-5010 towards Cadamstown Cross. Here it meets the MV cable route from the Ballinakill cluster.

Ballinakill to Drehid

The cable route leaves Ballinakill and travels eastwards along the R148 for 0.25km before travelling south along the L-5006 to Cadamstown (west of the Moyvalley Hotel and Golf Resort). From here it continues on the L-5005 and L5011 to Cadamstown Cross roads. The two cables (from Ballinakill and Windmill clusters) combine and proceed eastwards along the L-5010 to Kilshancoe where it meets the R402. The cable route then heads north along the R402 for a short distance (0.15km) and turns onto the L-5012 and proceeds to the Drehid-Hortland entrance.

Drehid-Hortland

The Hortland section of the DH cluster links back to the proposed substation at Drehid by means of the L-1004 (from Knockanally) and the L-5012. A section of the L-1004 was also earmarked for part of the HV cable route and a small section (1.1km) would still follow this route following the proposed revision to the scheme.

Cloncumber to Derrybrennan

The cable route follows the L-7004 for 730m until it joins the R414 at Cappanargid, from where it travels northwards for approx. 6km towards Derrybrennan cluster. It then leaves the R414 at Lullymore West and follows a private road to Derrybrennan.

Derrybrennan to Drehid Hortland

The MV cable crosses the Grand Canal north of the Derrybrennan cluster and leaves the private lands before proceeding along a local road (un-named) for approx. 250m from the entrance to the Bord na Mona Lullymore facility. It continues on this road until it joins the R403 at Abbeylough Bridge. The cable route follows the R403 as far as Windmill Crossroads and then follows two consecutive local roads for a distance of approx. 3km as far as Drehid Crossroads, (the L-5022 and the L-5024). It then follows the L-5025 from Drehid Crossroads towards Timahoe where it enters the Drehid section of the DH cluster.

3.3 Construction - Main elements

The construction period is expected to take approx. 23 months. This will include all civil, electrical, grid works and turbine assembly. A description of the project construction is contained in Section 2.5 of the EIS. In addition, an Outline Construction and Environmental Management Plan is contained in Appendix D of Volume 3 of the EIS. This document is subdivided into 6 sections as follows:

- 1) Introduction – details of existing site and proposed development
- 2) Existing site environmental conditions – geotechnical, hydrological, ecological, archaeological conditions on site
- 3) Overview of construction works – including drainage and sediment controls to be installed
- 4) Environmental Management Plan – outlines main requirements and operational controls for the protection of the environment (e.g. soil management, waste management, site drainage management, site reinstatement, decommissioning, habitat management and archaeological management).
- 5) Safety and Health Management Plan – health and safety of design, construction and operation of wind farm.
- 6) Outline Emergency Response Plan – guidelines and procedures w.r.t. health, safety and welfare of persons involved in project and protection of the environment during construction phase.

3.3.1 Turbine foundations/hardstanding

Turbine hard-standings will typically have an area of 30m x 50m. The turbine foundations will be excavated to a suitable bearing strata and, where the depth requires, piling may be necessitated. However, this is to be determined post-decision following detailed site investigation.

3.3.2 Turbine Delivery Routes

The Turbine Delivery Route is set out in Figure 2.9 of the EIS and is described in detail in Appendix K1 Vol. 3 of the EIS. It is likely that Dublin Port will be the point of entry. There are 23 node points which will require alteration to accommodate the

loads. These include ten under the control of Kildare Co. Co., two under the control of Meath Co. Co., one under the control of Waterways Ireland and two under the control of Bord na Mona. It is stated that there are 9 no. of the node points which involve private landowners.

3.3.3 Haul Routes

The haul routes are shown on Fig. 13.1 and described in Section 13.3.4 of the EIS. It is anticipated that the site would be accessed in the first instance from the M4, Junction 9 (Enfield). The Ballinakill cluster would be accessed by means of the R146 to the north of the M4 and all other clusters would be accessed by means of the regional roads R402, R403 and R414 and by a network of local roads as follows:

- R402 – from M4 southwards to Johnstown Bridge, to Kilshancoe and onwards to Carbury.
- L-1005 - from Carbury (R402) northwards to the windmill cluster – 3.3km.
- L-5025 - from R402 eastwards to Drehid X and Timahoe X to serve the Drehid section of the Drehid/Hortland cluster.
- L-1004 - from R402 at Johnstownbridge eastwards to New Bridge and Knockanally and then onto the L-5012 to serve the Hortland section of the Drehid/Hortland cluster.
- R403 - Access to the Derrybrennan and Cloncumber clusters is provided initially along the R403 south from Carbury, through Derrinturn as far as Abbeylough Bridge (Northwest of Allenwood). From Abbeylough Bridge, the haul route travels south-westwards along an unnamed local road to the Derrybrennan entrance (via the entrance to Bord na Mona Lullymore Firepak Facility).
- R414 - The haul route continues on the local road south of Derrybrennan cluster where it re-joins the R414 (regional road from Allenwood to Rathangan) near Lullymore. It then travels along the R414 until it meets the L-7005.
- L-7005 - The haul route leaves the R414 and travels along the L-7005 for approx. 730m before entering the Cloncumber site west of the Grand Canal (Glenaree Bridge 22nd Lock).

3.3.4 Drainage

It is intended to use the existing drainage system as much as possible and where new drainage is required, to use similar systems to that existing at the site currently. The existing tracks are generally 3m wide with roadside drainage in the form of swales alongside the tracks. These would be widened to 4.5m with the existing swales retained where possible, or relocated. Proposed new tracks and hard standing areas would be drained using roadside swales and stilling ponds at the end of the swale run. The proposed floating roads would incorporate “drains over the edge” and silt traps would be incorporated into existing drains. The use of silt fencing would also be employed where required.

3.3.5 Borrow Pits

The 3 no. borrow pits (2 no. at Ballynakill cluster and one at Cloncumber cluster) will cover a total surface area of 73,000m². It is stated that the maximum depth of excavation would be 4-5m below ground level. It is estimated that approx. 198,500m³ of the total aggregate requirement (292,500m³) would be obtained from the proposed borrow pits. The remainder of the required aggregate would be obtained from the existing quarries in the local area.

3.3.6 Construction compounds

It is proposed to provide four temporary compounds which will contain facilities for the construction personnel. The location of the proposed construction compounds are shown on Fig. 2.1. Each one is located within a proposed wind farm cluster. One compound is proposed at Ballinakill, off the R148. There are 2 compounds proposed at Drehid-Hortland, one off the L-5017 and another directly adjacent to the site of the proposed substation. There is also one compound to be located in Cloncumber, which would be located in the centre of the cluster, to the south of proposed T33.

3.3.7 Tree felling and replanting

3.3.7.1 Tree felling

The areas of proposed tree felling, which would be required to facilitate the construction of the wind farm, are shown on Fig. 2.8 of the EIS. The total area estimated for tree felling is 63ha, which would be carried out at 4 of the clusters as follows:

Drehid-Hortland -	45ha (35.5ha Coillte/9.5ha privately owned)
Windmill -	2.2ha (all privately owned)
Derrybrennan -	0.77ha (privately owned)
Cloncumber -	15ha (Coillte)

The Coillte forests are generally commercial plantations of coniferous tree species which were planted in the 1950s and 1960s. Tree felling will be subject to a licence from the Forest Service and would be carried out in accordance with any conditions of such a licence. It is stated (2.4.10) that the tree clearing would follow the specifications set out in the Forest Service Forestry and Water Quality Guidelines (2000) and Forest Harvesting and environmental Guidelines (2000). The proposed method of tree felling is described as follows:

66m radius around each turbine located in forestry
33m wide corridors for access tracks
20m buffer surrounding the substation at Drehid

20m of dimension of hardstanding
33m wide corridor for cables.

3.3.7.2 Replanting

It is stated (2.4.10) that replanting will be required as a condition of the licence and that the

“replant lands will be properly certified as suitable for forestry by a certified forester.....to be of an appropriate yield class and soil type and recommendations as to the types and amounts of fertilisation required will also be provided by a certified forester at the time of applying for the felling licence”

There will be areas which are not replanted and will be maintained as cleared areas. These include 33m wide corridors along track routes, an area of approx. 1.3ha at each turbine location and an area of approx. 1.9ha at the site of the proposed substation.

The information provided regarding replanting is limited. It is stated at 2.4.10 :-

“To increase the diversity of woodland cover within this site some planting of native tree species is proposed. These species will, in time, form areas of low growing scrubby woodland, which will add to the overall habitat fertility and better drainage which is most conducive to tree growth.”

3.3.8 Peat excavation

Peat will be excavated along internal tracks and at hardstanding sites. It will be stored on/near the site it is excavated from and will be used in landscaping and reinstatement. The peat excavated within the Windmill cluster will be stored temporarily prior to use in the existing peat milling facility.

3.3.9 Meteorological mast

It is proposed to erect a permanent meteorological monitoring mast to ensure that the wind resources at the site are measured. The mast would be 100m in height and would be located within the Drehid-Hortland cluster, between T17 and T18, (Fig. 2.1.3 of the EIS).

3.3.10 Micro-siting

Flexibility is sought in terms of the siting of turbines to take account of geotechnical or other reasons. It is stated (2.4.12) that the extent of flexibility will be site specific and will not extend beyond 20 metres. Any such movement would be in a direction which would maintain or lessen the changes to the environment and to within limits

at nearby residences. Any proposed micrositing would be agreed with the P.A. prior to construction and the impact as stated in the EIS would not be increased.

3.4 Decommissioning

The operational life of the wind farm is intended to be 30 years from the date of commissioning. On decommissioning, cranes will disassemble the turbines. It is proposed to leave the hard-standings and internal tracks in situ. They will be covered over and allowed to re-vegetate naturally, if required, or left in place subject to agreement with the planning authority. The substation would remain in place as it would be owned by the ESB. Underground cables would be cut back and left in place. An outline decommissioning plan is contained in appendix D of Vol. 3 of the EIS. However, the final decommissioning plan would be agreed in advance of construction with Kildare Co. Co. and Meath Co. Co.

4.0 SUBMISSIONS RECEIVED

4.1 Planning authority Kildare County Council

4.1.1 The submission from Kildare County Council (18th June 2015) is a comprehensive and detailed submission, in which the P.A. has indicated its overall objection to the proposed wind farm. The report comprises the following documents:

- Chief Executive's Report – This report constitutes the executive and professional input from the planning authority. It included an overview of the application, the planning history, and the policy guidance to which regard must be had; a summary of the internal departmental reports; and appraisal of the EIS and the NIS; and a summary setting out the key issues and overall considered view. The reports contain suggested conditions as recommended by the various departments as well as an overall commentary, and incorporate further information requests where relevant.
- Minutes of a special planning meeting of Kildare County Council held on 8th June 2015 to consider the Chief Executive's Report – This included a number of motions and resolutions in respect of same regarding the proposed development. Reference is also made to the *Kildare County Council Energy Committee* which had made its own submission directly to the Board in respect of the proposed development.
- The Internal Departmental Reports – these were from the Transport Dept., the Water Services Dept., the Environment Section, Kildare Fire Service, the Environmental Health Officer, the Architectural Conservation Officer and the Heritage Officer.
- CAAS Report – Assessment of Likely Landscape and Visual Effects of the proposed development prepared at the request of KCC

- Aerial Photographs of the site – There are 24 no. A3 sized photos many of which were taken on 14th May 2015 and are annotated with some views and significant features. The remainder appear to be taken from a GIS based system (such as Google earth).
- Planning History of the site and area – A comprehensive map-based record of all planning history in the area together with a summary table.

4.1.2 The KCC submission is contained in Folder No. 1 of the submissions received by the Board. The following summary sets out the main issues raised.

4.1.2.1 Policy Vacuum

The P.A. was of the view that the proposed development is premature pending the imminent revision of the Wind Energy Guidelines and the adoption of a Wind Energy Strategy for the area. It was noted that the proposed development had been formulated on the basis of the current Wind Energy Guidelines 2006, which are outdated, and stated that any revisions to these guidelines in relation to proximity to dwellings, shadow flicker and noise, should inform the Board's consideration of the application. It was further noted that the development had been formulated in the absence of a Wind Energy Development Strategy for Co. Kildare. The preparation of this strategy had been deferred, on instruction from the DECLG, pending the issuing of finalised revised Wind Energy Guidelines from the DECLG and the completion of the Renewable Energy Export Policy and Development Framework by the DCENR.

Reference is made to the Regional Planning Guidelines for the GDA Policy PIR34 which recommends that a study be undertaken on wind energy potential by local authorities jointly in the GDA focusing on suitable areas for larger wind energy projects with a view to producing regionally consistent land use policies. Reference is also made to the objectives within the KCC Development Plan to prepare such a strategy. It is stated that whilst the CDP provides some parameters for the consideration of wind energy development, the WE Strategy will establish a detailed local planning policy framework including identification of suitable locations for wind farms. Given the existing policy vacuum, a grant of permission would set an undesirable planning precedent for wind farms of such a scale and dispersed nature without due consideration of the impacts.

4.1.2.2 Visual impact

Concern was raised regarding the significant visual impact of the proposed turbines on the area due to the scale and height of the turbines, the geographical extent of the application and the dispersed nature of the layout. Rural development policy in the CDP seeks to cluster new structures in the landscape so that they form a distinct and unified feature. The geographical extent and dispersed cluster approach would be at variance with this policy. The P. A. considered that the dispersed nature of the development would give rise to significant and disproportionate visual impacts. The option of using just one site location for the proposed wind farm does not appear to have been considered as an alternative. The importance of tourism to the national and local economy was emphasised and in this context, the critical importance of the cultural and physical environment within which tourism takes place. It was considered that the proposed development would have a significant effect on the cultural and physical landscape which in turn would unduly affect the tourism potential of the area.

Concern was also expressed regarding the regional concentration and significant eastward expansion of wind energy development and the dominant visual presence of the turbines. It was noted that this area includes the western suburbs of Dublin and some of the major road and rail approaches to same, and hence contains the largest population concentration in the state. Reference was made to elements of the CAAS report which highlighted the fact that the zones of greatest concentrated effects coincide with the zones of highest population density, which occur at the northern and southern ends of the site. These zones were noted as containing dense concentrations of settlement, routes, amenities and features. Thus the proximity of the turbines to sensitive receptors was found to be much greater for the Ballinakill and Cloncumber clusters than for the other clusters, where the turbines are seen at a greater distance. CAAS had concluded that the areas that would be most significantly affected were Robertstown, Allenwood, Ballyteigue, Bostoncommon, Moyvalley and Longwood. It was also concluded that many people will continuously live, work and travel through a landscape dominated by the presence of wind farms.

4.1.2.3 Landscape Impact

Extensive references are made to the CAAS report in respect of the impact of the proposal on the landscape of North Kildare. The impact on the sensitive upland and water corridor areas of the county were highlighted. These include the Chair of Kildare (i.e. Hill of Allen, Red Hill, Boston Hill, Grange Hill), the North Western

Lowlands, the Western Boglands, the Grand Canal and the Royal Canal each of which contains areas of significant landscape value. The 'Western Boglands', it is pointed out, is designated as 'Medium Sensitivity' due to its inability to absorb development, despite being thinly populated. Similarly, the long distance views of the canal corridors and the views from the bridges are particularly sensitive due to the smooth terrain and uninterrupted views of the upland areas. Impacts on scenic routes, protected views and significant features in the landscape were also highlighted as being particularly vulnerable, as well as areas that are overlooked by/from areas of 'High Sensitivity' (e.g. long distance views from the top of Carbury Hill, over the Plains of Kildare from Northern Hills, and the views of the central plains and boglands from the Chair of Kildare).

It is stated that Council policy seeks to protect and enhance the visual integrity of the landscape. Concern was expressed that the introduction of the proposed wind farm clusters would significantly alter the appearance and character of areas that include designated scenic routes, protected views, hilltop views, historic/heritage sites/settings and national and regional landscape features. The said designations, it is pointed out, underpin the amenity and recreational value of the landscape.

4.1.2.4 Impact on Cultural Heritage

The P.A. considered that there would be a significant visual impact on the cultural landscape of Kildare. The considerable wealth of sites and features of historic, heritage and cultural value are detailed in the A.C.O.'s report and are highlighted in the Chief Officer's report. The wider landscape includes two Royal Sites, which are UNESCO candidate World Heritage sites. These are the Hill of Tara complex (25km to NE) and Dún Áillinne (17km to SW). Other significant sites within 30km include Croghan Hill complex, Trim Castle, Hill of Ward and Rock of Dunamase. There are two national monuments within a 5km radius, Lullymore Monastic Complex and Carbury Hill. The built heritage also includes protected structures, demesne landscapes and NIAH listed buildings.

It is acknowledged that whilst the proposed turbines would not physically impact any protected structure, they would visually impact on the setting of a number of them. The A.C.O. expressed a difference of opinion in terms of the determination of what constitutes the 'setting' of a number of such structures and attention is drawn to the definitions of setting contained, not only in English Heritage and ICOMOS guidance, but also in the CDP, the Architectural Heritage Conservation Guidelines and the Historic Scotland – Managing Change in the Historic Environment. Concerns were raised in particular with regard to the tendency in the EIS to identify

curtilage as being identical to the setting and to the low importance assigned to visual impact on the wider landscape setting of a site. Carbury Hill/Castle and the associated Newbury Hall and demesne, were singled out as being key topographical features.

It was considered that the proposed clusters would be contrary to KCC Development Plan policies PS16, CH1 and CH2 and that the visual impact of the proposal would:

- a) Negatively impact on the setting of the protected structures and the existing rural landscape skyline character;
- b) Negatively impact on historic designed, landscape of the demesne character within the receiving environment;
- c) Negatively impact on views and prospects to and from the protected structures within the receiving environment.

The A.C.O. also queried whether certain protected structures and/or demesnes had been evaluated in the context of the potential impact from the proposed development. Further information was sought in respect of these matters.

4.1.2.5 Impact on road network

Serious concerns were raised by the Transportation Dept. regarding what was considered to be a deficiency in the information provided with the application and in the EIS with regard to the proposed cabling routes, the haul routes, the turbine delivery routes and the proposed entrances. It was considered that the dispersed nature of the development would result in significant impacts on the public road network due to the extent of cabling required to connect the disparate sites. A more consolidated layout would have been preferable for that reason. Furthermore, it is asserted that the proposed cabling routes are primarily composed of 'legacy roads'. Many of these roads have little or no foundations and this raises serious concerns over the future maintenance costs that the Council would incur in the future. In addition a number of bog roads are proposed as part of the haul and turbine delivery route network.

The Transportation Dept. also raised concerns regarding the significant quantity of investigative works still outstanding and, as such, it was considered that the proposed routes for cabling and deliveries had not been proven to be acceptable or achievable. Anticipated issues arising include :-

- Lack of evidence that structural capability of routes has been investigated which could result in alternative routes being pursued;
- Failure to identify landowners where third party lands are involved and no evidence of legal agreements in place (and no CPO powers available);
- Failure to demonstrate that adequate sight lines at entrances can be achieved;
- Lack of a detailed traffic analysis of the impact of construction traffic on the road network. Local roads should be assessed for their suitability to cater for a significant increase in HGV traffic for a sustained period of time.
- Substandard nature of road network – majority of roads are narrow with no verge and are in widely varying states of repair and some are across bog areas. Serious concern is, therefore, raised regarding the condition of the roads and their structural capacity to withstand trench excavation and reinstatement without failure in the future, leading to significant maintenance issues for the local authority.

These issues formed the basis for a comprehensive schedule of further information including the following:-

- Full structural assessments of the roads which would form a baseline survey;
- Road reinstatement designs in advance of a decision;
- A topographical survey of the routes in order to identify the best location for cables and joint bays in advance of a decision as well as enabling accurate swept path analysis;
- A full structural analysis for each of the structures where direct drilling is required.
- Identification of existing services within the road
- Details of capacity of proposed cabling w.r.t. power generation
- Traffic impact assessment of HGV traffic on haul routes including proposals for monitoring and controlling the haulage of material
- Where a route/structure is shown to be structurally unsuitable, plans to upgrade the structure should be provided in advance of decision.
- Traffic Management Plan for the cable routes, haul routes and TDRs
- Further detailed information regarding specific node points in terms of works required to facilitate transport of the loads.
- Further detailed information regarding the proposed site entrances including topographical surveys, applicant's land holding, new access road onto the R414 from the road serving the Derrybrennan cluster and full detailed designs for the proposed entrances.

Although the Transportation Dept. reiterated its concern regarding the large body of investigative work that is outstanding, it provided a schedule of suggested conditions in the event that the Board decided to grant permission.

4.1.2.6 Impact on water quality and water supply

Lack of detailed drainage design and site investigations

The *Water Services Section* considered that a detailed drainage design and details of the proposed turbine foundations should have been provided, given the scale and nature of the proposed development. Concern was raised regarding the fact that the site drainage management plan would only be finalised in accordance with an outline plan following the appointment of the contractor for the main construction works. This was considered to be inadequate for a project of this scale. Concern was also raised regarding the lack of detailed information regarding the turbine foundations and the existing/proposed finished ground levels of the proposed turbine sites and the associated access roads. The *Environment Section* also raised concerns regarding the lack of information on excavation activities, borrow pits, excavation of peat soils and dewatering at borrow pits. It was considered that impacts relating to drainage and water quality issues could not be properly assessed without more detailed information on these matters. Further information was required regarding these matters and it was also advised that a competent Geologist should be employed to assess soil erosion, slope failure and peat extraction activities. Concern was also expressed regarding the proposal to backfill cable trenches with cement bound material which would potentially pose a threat to surface water quality. Further information was sought in regard to this and to the proposed holding tanks. A number of conditions were also proposed in the event of a grant of permission.

Flood risk assessment

It was noted that a flood risk identification and assessment had been carried out and that the EIS had concluded that there would be no appreciable obstruction to flood flows in the floodplain as a result of new access roads and turbine hard-standings. However, it was considered that this was inadequate considering that four turbines are located within Flood Zone A, and that the designation of the development as water compatible, does not remove the need to consider the displacement of flood waters and provision of compensatory storage should the need arise. The lack of information on turbine foundation design and on existing and proposed ground/floor levels for each turbine site and access roads was considered to be problematic in terms of flood risk assessment.

Water supply

Johnstown Well field is described as being part of the proposed Ballyna Group Water Scheme. It is pointed out that several turbine (T11-13, T43-45) and Drehid substation are located within the catchment area for this field and that the proposed cable route passes through the Inner and the Outer Source Protection Zones. Concern was expressed that the ground water resource could be compromised by the construction of turbines, the substation and access tracks. The Source Protection Zones, particularly the Inner Zone, should be avoided. Concern was also expressed regarding private wells, especially shallow wells, which are located close to the cable routes and access tracks. These wells are especially vulnerable to changes in water table levels and would be at risk of contamination. The River Boyne and River Barrow are described as significant water supplies and it is stated that immediate notification will be required in the event of any contamination.

4.1.2.7 Impact on Human Environment

Noise

The Environment Section and the Environmental Health Officer each expressed concern about the fact that the EIS does not specify the make and model of the turbine to be used at each site, as it would not be possible to fully assess noise emissions until after the decision was made. This was considered to be unacceptable. The E.H.O. also expressed concern that some turbines would be 200m from the boundaries of residential properties. Furthermore, it was noted that the proposed borrow pits would be as close as 120m from some residential property boundaries. The hours of operation would need to be strictly controlled during construction.

It was advised that the noise output from the substation would need to be assessed and monitored and that a noise and vibration monitoring plan would be required for the proposed development in terms of both the construction and operational phases. Cumulative impacts in terms of noise levels from the turbines/clusters should be included in the assessment. It was stated that it would have been useful if the EIS had included an overlay of noise data/results relative to the location of dwellings/noise sensitive receptors. It was also queried whether the assessment had taken into account the permissions granted, but not constructed, as well as the existing dwelling houses.

Shadow Flicker

It was noted that the EIS does not specify the make and model of the turbines but that it is intended that the shadow flicker control system would be programmed to

ensure that the relevant limits would be complied with. In this respect, the P.A. noted that the current adopted guidelines require that dwellings within 500m should not experience more than 30 hours p.a. or 30 mins per day, but that the Draft Revised Guidelines indicate that there would be a very low impact where a distance of 10 rotor diameters was respected. Thus it is recommended that there should be a condition requiring that shadow flicker be controlled and monitored for residential properties within 10 rotor diameters of a turbine. In addition, it was suggested that mapping of such properties should be provided, and should overlay maps indicating the shadow flicker results data. It was also queried whether real time sunlight monitoring could be carried out given that there are 42 buildings which would experience more than 30 hours SF p.a. (based on a 31% sunshine assumption and a 42% wind direction assumption).

4.1.2.8 Ecology and Appropriate Assessment

The Heritage Officer raised a number of concerns regarding ecological issues which are summarised in both Section 5.2.7 and Section 6.2.7 (EIS/NIS) of the Chief Officer's report. In essence, these included the following main points:-

- Adequacy of Design Details and Method Statements – Board must satisfy itself that detail, which will not be provided until after a decision is made, will be adequate to ensure that a full Appropriate Assessment can be carried out. It is considered that more detailed information is required prior to making a decision in order to determine whether the proposed development would have direct or indirect impacts on habitats and species. Furthermore, it is considered that the method statements and mitigation plans need to be screened in order to assess the impacts on Natura sites prior to the commencement of development. Thus it is considered that the NIS would need to be revised to take account of any changes to the proposed development on foot of the FI requests and detailed mitigation measures/method statements.
- Detailed surveys plan – need for additional surveys of habitats and a detailed plan of all surveys prior to development.
- Habitats and species assessment - Need for more detailed assessment of habitats and species during all stages of the development. Assessment seems to have been on a whole site basis rather than on a cluster basis, which is inadequate given size and scale of development. Ecological significance of habitats and species needs to be addressed on a cluster basis, as well as in terms of the proposed haul routes, TDRs and cable routes, and on a county basis.

- Fragmentation of habitats – Loss of habitat not adequately addressed in EIS. This issue needs to be assessed across the entire development due to the dispersed/clustered layout and the amount/location of compensatory habitat must be identified and ecologically assessed.
- Turbine design - Lack of detail on final make/model of turbine means that further detail required regarding how the ecological assessment has been carried out with respect to varying heights and rotor diameters.
- Tree felling/hedge removal – inadequate detail in respect of haul routes, cable routes and TDRs with regard to extent of removal, ecological assessment of vegetation to be removed, protective measures during construction for retained trees and replanting proposals.
- Woodland Replanting – location, extent and nature (quantity and species) of replanting not specified. Impacts of replanting proposals must be assessed as part of the EIA in terms of ecology, archaeology and water quality.
- Raised Bog Habitats - Hortland Bog and Haggard Bog – hydro-geological impacts from Windmill cluster need to be assessed in greater detail.
- Bat species – where it has been identified that there is a high potential for impact on bat species, (due to increased bat activity), every effort should be taken to avoid impact and thus omit relevant turbine from development.
- Curlew – detailed specific mitigation measures required.
- Mammals - Badger setts Cloncumber/Ballinakill – clarification of impacts and mitigation (possible relocation) needs to be specified. No indication that proposed mitigation for badger and otter approved by NPWS.
- Site Ecologist – required for duration of project and to report on compliance with all mitigation.

4.1.2.9 Inadequacies in EIS and NIS

The perceived inadequacies in the EIS and NIS are outlined in Part 6 of the P.A. report. This is a comprehensive appraisal of these documents. These inadequacies have been referred to in some detail under the various topic headings above. In addition, several more general points were made regarding the EIS and NIS, respectively. The principal points of note are as follows:-

Inadequacies in EIS

- Lack of alternatives regarding one single site – considerable objection to dispersed layout (clusters) with linkages via underground cabling along various routes. Also failure to justify avoidance of cut-away bogs despite proximity to same.

- Lack of detail - site/groundwater investigations and reliance on outline CEMP raises serious concerns regarding adequacy of assessment and robustness of conclusions regarding impacts in terms of hydrology, water quality, ecology and soil.
- Lack of detail re soils – need for more detailed information regarding soil erosion, peat excavation and slope failure. No details on other sources of aggregate given.
- Lack of detail – wind turbine make and model – implications for proper assessment of ecology, noise, shadow flicker and visual impact.
- Lack of detail re surveys and condition of roads – not possible to fully assess impact on carrying capacity of roads due to inadequate survey work and lack of information on site investigations.
- Habitat fragmentation and ecological impact of tree felling, hedge removal and replanting – inadequately assessed in EIS.
- Cultural heritage impacts – concern regarding inadequate assessment of impacts on a considerable number of recorded monuments, particularly in Drehid and Cloncumber clusters, (37 no. singled out which are within 500m-1km of a turbine), and regarding what is considered to be significant impacts on the deserted medieval settlement at Cloncurry, and two ringforts in particular. Proposal to carry out test excavations/geophysical surveys after the decision considered to be inadequate. The impact on the setting of a number of protected structures and of the historic landscape of demesne character has been inadequately assessed and it is likely that there would be significant impacts on same.
- Socio-economic –Tourism – impact – criticism of attitudes survey as based on Scottish surveys with little evidence of surveys in Irish setting or consultation with Fáilte Ireland. Lack of assessment of tourism potential of UNESCO sites and reference to ‘Blueway Project’ and ‘Irish Ancient East’.

Inadequacies in NIS

The Board should satisfy itself that adequate information has been provided regarding various method statements and design details which have yet to be provided in terms of being in a position to carry out a full appropriate assessment.

4.1.2.10 Overall conclusions Kildare Co. Co. Chief Executive Report

The Key Issues and Overall Conclusions are set out in Part VII of the Chief Executive’s Report. I would refer the Board to this part of the report. In addition,

Part VII contains a summary of the 'Main Concerns', which essentially are as follows:

- Policy vacuum - The proposed development has been formulated in the absence of
 - (a) Finalisation of the Wind Energy Guideline Revisions and
 - (b) Adoption of the Wind Energy Strategy for County Kildare.
- Visual impact - There would be a significant and disproportionate Visual Impact due to the geographical extent and dispersed cluster site approach. This would represent a significant eastward expansion of the development towards Dublin. This would give rise to significant and disproportionate visual impacts at near, middle and distant vantage points as available from dwellings, roads, rail, watercourses, canal corridors, lowlands, uplands and towns etc.
- Landscape impact - The Visual Integrity of the Landscape would be significantly affected by the clusters which would alter the appearance and character of the area that includes designated scenic routes, protected views, hill top views, historic/heritage sites and settings, national and regional landscape features.
- Road network - There would be a significant and adverse impact on the safety and carrying capacity of the road network of the County.
- Habitat fragmentation - The dispersed nature of the development would be likely to result in habitat fragmentation, which has been inadequately addressed in the EIS.

4.2 Planning authority - Meath County Council

- 4.2.1 The submission from Meath County Council (12th June 2015) is in the form of a Report from the Chief Executive, complete with two appendices, and Minutes of the Meath County Council meeting of 8th June 2015. The Appendices contain planning history (App. 1) and Internal Departmental Reports (App 2). The internal reports included reports from Senior Executive Engineers in the Environment Section, Environment (Flooding), Transportation and the Trim Municipal District. Further reports were prepared by the Conservation Officer and the Heritage Officer.
- 4.2.2 Chief Executive's Report – This report constitutes the executive and professional input from the planning authority. It included an overview of the application, the planning history, and the policy guidance to which regard must be had; a summary of the internal departmental reports; and a

summary of the EIS and the NIS, Section 7 incorporates the Planning Assessment, which sets out the appraisal of the proposed development and incorporates the issues raised in the internal departmental reports, as well as suggested conditions, (as recommended by the various departments), as well as an overall commentary, and incorporates further information requests where relevant. The overall conclusion is that further information is required in order to facilitate a fuller assessment of the application.

4.2.3 Minutes of MCC Meeting of 8th June 2015 – Meath County Council resolved to express its opposition to the proposed development and that the views should be appended to the Chief Executive’s report. A schedule of bullet points setting out the reasons for the objection are set out in the minutes. The grounds for objection include the following:-

- Premature pending review of WE Guidelines, which should be published without further delay.
- Opposition to Emlagh reiterated. Determination of current proposal should be deferred pending outcome of Emlagh Court judgement. Also concern re location on periphery of Meath and likelihood of further such applications.
- Concern regarding potential impact on Royal Canal Greenway and other tourism related amenities/facilities
- Support for Heritage and Conservation Officers’ comments in Chief Executive’s Report. Concern expressed regarding potential impacts on Longwood ACA.
- Significant number of infrastructural developments in Meath could undermine County status as Heritage Capital of Ireland.
- Criticism of extent of public consultation and lack of adequate time for public to fully engage with the project and significant costs to members of the public.
- Alternative sites not adequately addressed.
- Concern expressed regarding potential impacts on local communities in respect of property devaluation, noise, shadow flicker, health impacts and flooding.
- Support expressed for alternative solutions to renewable energy including off-shore wind, solar power etc.
- Strategic Infrastructure Act should not be used for such developments as it disenfranchises third parties. Commercial developments such as this should not be fast tracked through the planning system.
- Queries re decommissioning and how it could be guaranteed that it would be executed properly.

4.2.4 The following is a summary of the main issues raised in the Chief Executive’s Report (MCC):-

4.2.4.1 Principle of Development

Renewable energy targets were acknowledged and it is noted that within the Government guidelines, there is a presumption in favour of wind farm developments in suitable circumstances. National, Regional and local policy was referenced and whilst it was acknowledged that a WE strategy had not yet been prepared, this did not suggest that wind energy proposals could not be considered in the meantime. It was noted that CDP policy encourages wind energy development subject to normal planning considerations, and that a key fundamental in assessing the principle of development pertains to the siting of a development of nature and scale proposed in an appropriate landscape setting.

The application site is located in LCA 6, Central Lowlands, in the Meath Landscape Character Assessment. This LCA has a low capacity to accommodate wind farms due to the high number of receptors. Thus it was considered that there is a necessity to ensure that there is not undue impact on designated views. The P.A. noted that the EIS did not make any reference to the Greenway Project, for which a Part VIII had been approved. This is a proposal to create a walkway/cycleway green route along the Royal Canal towpath in accordance with CDP policy. There are two Protected Views in the vicinity of the Royal Canal, (No. 56 at Boolykeagh and No. 83 at Blackshade Bridge). The potential impact on these views would need to be assessed. The potential impact on the Longwood village ACA would also need to be assessed.

4.2.4.2 Environment

(a) Air and climate

No objection to proposed wind farm in terms of potential impact on air and climate, which is likely to be positive.

(b) Noise and vibration

It was noted that the receptors had not been identified in respect of each turbine or predicted noise levels. It was considered that this information should be provided along with noise contour mapping.

(c) Shadow flicker

It was noted that the EIS did not make any reference to the proposed Revised WE Guidelines which had recommended that properties within 10 rotor diameters be included in the study area. It was noted that although 42 buildings would

experience shadow flicker in excess of the guideline threshold, this was reduced to one property when assumptions of 31% sunshine and wind direction frequency distribution were taken into account. However, it was not clear whether cumulative effects of properties within the 1200m study area had been included in the assessment. Further information on this matter was requested and a number of conditions with suggested mitigation measures were proposed.

(d) Water quality and hydrology

A substantial report from the Water Services Section was included which referred to a lack of information regarding general control of run-off, site drainage and water supply. In addition, substantial further information was required in respect of the potential impact of the proposed development on the Longwood Water Supply at Clonguiffen and on a number of private wells in the vicinity of the development. It was noted that the Outline CEMP contained details of extensive mitigation measures to minimise and negate against potential impacts on water quality and hydrology during construction. In terms of the cable routes, it was considered that there was less risk of environmental pollution associated with horizontal directional drilling and trenchless techniques but it was considered that the CEMP would need to address the protection of watercourses from accidental hydrocarbon or drilling fluid spillages, exclusion and working zones etc. Further information on these issues was sought. A number of conditions were also proposed.

(e) Soils and geology

Although the EIS addressed the issue of contaminated soils and a protocol for same, it did not address the issue of movement of soils between landholdings, which would be classified as 'waste'. It would therefore need proper authorisation and should comply with the relevant legislation.

(f) Flooding

Although T1 is located in Flood Zone A, it was noted that the EIS had concluded that there is no flood risk to the turbines during a flood event. The proposal to provide wash-down areas in association with each turbine site was noted, as was the proposal that the run-off would be collected in a settlement lagoon. However, it was not clear how these lagoons would be emptied and it was considered that a revised flood risk assessment should be provided in respect of these matters. In addition, the discharge of any run-off from these areas to drains/streams would require testing and monitoring to ensure that water quality was not compromised. It was considered that these matters should be requested as further information.

4.2.4.3 Traffic and transportation

It was noted that all construction traffic associated with Ballinakill would use R148 and that access to T1 and T2 and Borrow Pit 2 would be through Kildare. No objections were raised subject to implementation of appropriate surface water drainage measures and a road opening licence. A schedule of conditions was drawn up and included in the Transportation Report.

4.2.4.4 Landscape and Heritage

Reference was made to the internationally recognised sites of heritage value in the vicinity including World Heritage Sites (e.g. Brú na Boinne) and candidate World Heritage sites (e.g. Hill of Tara). It was considered that screening the development from local views would neither be possible nor reasonable and the focus should be on potential impacts on the wider landscape and in particular, designated views in the CDP. However, it was acknowledged that a balance must be struck between national necessity for greater use of renewable sources of energy and heritage protection. The Conservation Officer confined comments to impact on the historic built environment and to cultural heritage sites which would be most negatively impacted due to their international/national importance, their proximity to a turbine/ large number of turbines and to a heritage site whose character would be more sensitive to the impact of industrial structures being located within the wider landscape setting.

It was pointed out that Longwood village contains a number of Protected Structures which were not mentioned in the EIS. Similarly, there were a number of Protected Structures in the vicinity of the Royal Canal which were not mentioned in the appendix (L2). Furthermore, it was considered that Longwood ACA was not referenced in the EIS. Whilst open views were available from the village, and one of the photomontages (to the west of the village) indicated the proximity of the turbines to the village (less than 2km), concern was expressed regarding the potential visual impact of the turbines on the ACA. Further information on this matter was requested as was FI in respect of the protected structures (listed in CDP) which had been omitted from Appendix L2 of the EIS.

4.2.4.5 Ecology and Natura Impact Statement

The Heritage Officer noted that there would be downstream hydrological links between the proposed development site and two Natura 2000 sites, namely the River Boyne and River Blackwater cSAC and the River Boyne and River

Blackwater SPA, and that a NIS had been submitted in respect of these sites. The Heritage Officer recommended that the Board should satisfy itself that sufficient detail has been provided to ensure that an appropriate assessment may be undertaken to determine if the proposed development, either alone or in combination with other plans or projects, would not adversely affect the integrity of these sites in view of the Conservation Objectives for each of the sites.

It was further noted that there are four NHAs or pNHAs within close proximity of the site/have a hydrological connection, and therefore may potentially be directly affected. It was queried whether any potential indirect effects would be likely to occur on Molerick Bog NHA (2.94km distant) or Ballynabarney Fen pNHA (1.52km distant). Further information was requested in respect of this matter.

The inclusion of an Outline CEMP was noted. It was stated that all mitigation measures outlined in the EIS/CEMP/NIS should be strictly adhered to and their implementation monitored by a project ecologist.

4.2.5 Conclusions and Recommendations of Chief Executive Report

Section 8 of the MCC Chief Executive's Report sets out the conclusions and recommendations, which in essence contain a schedule of the further information items, which is generally as set out above. Section 9 includes a schedule of conditions.

4.3 Prescribed bodies/Statutory consultees

The Board has received submissions from the Department of Defence, the Department of Arts Heritage and the Gaeltacht, Inland Fisheries Ireland, the National Roads Authority, the Health Service Executive, An Taisce, Waterways Ireland, Irish Water, Fáilte Ireland, Bird Watch Ireland and the Geological Survey of Ireland. A submission has also been received from Offaly County Council.

4.3.1 Department of Defence

The Department of Defence submitted an observation in which objection was raised to the wind farm as a whole and to each cluster principally on the grounds of interference with the safety and operation of military aircraft operating from Casement Aerodrome at Baldonnel. The concerns raised may be summarised as follows:-

(a) Single Base at Baldonnel

The strategic importance of Baldonnel is emphasised as it is the single base from which all military training and operational activities are carried out, and from which it is necessary to be able to access all regions of the country at all times. The Air Corps is the air element of the Permanent Defence and its operational tasks include security, safety of life, support of government departments and support of civil community. It operates a mixed fleet of helicopter and fixed wing aircraft. In addition, the Garda Air Support Unit is based at Baldonnel. The GASU generally operates at or below 1000ft (305m).

(b) Nature of the air space

Designated airspace for Defence Forces

There are two forms of designated airspace radiating westwards from Baldonnel.

MOA 4 - Military Operating Area 4 is a designated airspace for use by the Defence Forces for military flying. It extends from surface to 45,000 feet (13,716m). Aircraft other than aircraft of the Defence Forces is not permitted to enter this airspace without permission, although civil aircraft may enter MOA4 at or below 4,500 feet at their own risk. It is stated that the majority of the proposed wind farm site lies within MOA 4.

EI-R16 - The MOA4 area underlies EI-R16, a restricted area which primarily provides protection for Instrument Flight Procedures at Casement Aerodrome. This airspace is divided into several sectors, each with a base level varying from 1,000 feet to 4,500 feet above sea level, (305m - 1,372m). Civil aircraft may not enter the R-16 airspace without clearance and must comply with Military ATC instructions. It is stated that VFR aircraft normally route under the bases of R-16 and that the base of the R-16 in the vicinity of the proposed wind farm varies between 1,000 feet and 2,500 ft., (305m – 762m).

Non-military aircraft

It is pointed out that there are a number of features of the area that are significant from an aviation point of view. There are aerodromes at Weston, Clonbullogue, Kilrush and Trim. There are smaller aerodromes at Milicent, Kilmurry, Allenwood (Robertstown) and Lullymore. It is stated that the area is also regularly traversed by light civil aircraft as well as microlights based near Clonard and Kilcock, and that there are a number of flight training schools based at Weston Airport. Thus, it is pointed out, that in addition to military training exercises, civil student pilots frequently pass through the area on navigation exercises, and that VFR aircraft would have to operate below the 1000ft base of R-16.

(c) Nature of operational activities

Military aircraft do not follow the civil model of flying passengers or cargo from Point A to Point B, but involve a form of missions with elements of loitering. Thus flight

operations from Baldonnell may be 'General Air Traffic', which are operated under Civil Rules or 'Official Air Traffic', which are operated under Military Rules. Flights may be carried out under

Visual Flight Rules – (VFR) where navigation, traffic avoidance and obstacle avoidance is carried out visually. The pilot navigates by what can be seen outside the cockpit and takes responsibility for avoiding obstacles/aircraft and is weather dependent, or

Instrument Flight Rules – (IFR) where functions are carried out by non-visual means. Navigation is by instruments on the flight deck by means of electronic signals. It is used in poor weather conditions and requires communication with Air Traffic Control.

Whether a flight is carried out by means of VFR or IFR depends a number of variables including type of aircraft, navigation equipment, height of cloud and nature of mission. It is stated that the majority of Air Corps security and government support missions are operated visually at lower levels, as are the GASU missions. It is submitted that the Drenth-Hortland, Derrybrennan and Cloncumber clusters would penetrate the 'Radar Vectoring Area' for Baldonnell, which would necessitate the raising of the vectoring altitude. This would adversely affect the surveillance radar approach to Runway 11 at Baldonnell and would affect the ability to carry out routine or specialist calibration flights. This could result in the withdrawal of Instrument Flight systems from the airport, which would have significant operational consequences. In addition, the Radar Vectoring Area is used to provide 'cloud break' to military aircraft transitioning from IFR to VFR, and this mitigation measure would reduce the likelihood of a successful cloudbreak.

Use of critical routes as navigational aides

It is pointed out that civil and military aircraft use linear features such as roads, canals and railways for navigation, particularly in poor weather. The M4/N4 is a route that has been identified as such a route providing navigational guidance to and from the West, the North West and the EAS base at Athlone. Specific requirements apply along the route of a linear feature (in terms of lateral and vertical clearance). It is stated that 29 turbines would lie within 3 nautical miles of the route, which it is considered, would impact security operations, reduce the capacity of the Air Corps to access and respond to tasks in the West/North West in poor weather, and would pose a risk to aircrew navigating along the routes.

(d) Air Safety Hazard

Concern has been expressed regarding the proximity of the proposed wind farm (20 nautical miles) to Baldonnell and to the M4 (29 turbines within 3 nautical miles) which is used as a navigational route in all weathers. In particular, it is considered that there would be a significant risk of 'canalisation' or traffic funnelling due to the presence of the wind turbines. This would arise from the increased collision risk due to the effect of the obstacles on the structure of the air space and to the volume of

both civil and military traffic. Thus avoidance of the turbines would lead to canalisation of air traffic or 'choke points' and would also contribute to an increased incidence of unauthorised penetration of the designated/restricted airspace by other aircraft seeking to avoid the wind turbines either laterally or vertically. It is submitted that the creation of such choke points could increase collision risk and limit avoidance options.

It is stated that the proposed mitigation measures of notifying the pilots in advance and/or raising the vectoring altitude by 100ft would be unacceptable as this would have a profound impact on operations and introduce severe constraints on operational activities.

(e) Restriction of operations

It is stated that the Air Corps must ensure the safety of its operations whilst at the same time safeguarding its ability to access all parts of the state in accordance with mission requirements. Statutory Rules of the Air allow aircraft to fly at a minimum of 500ft (152m) above the surface of the ground/water or 500ft (152m) from obstacles. Having regard to these rules, combined with other regulations and aviation guidance, it is considered that the proposed wind turbines would introduce obstacles into a relatively benign obstacle environment, (such as the flat landscape of North Kildare), which would impose severe constraints on the operational activities of the Air Corps and GASU.

It is further pointed out that the ability to fly in an area is determined by a combination of the obstacle environment and weather conditions and that these factors significantly influence the ability to carry out missions safely. In poor weather conditions, obstacle avoidance can lead to cancellation or postponement of flights, which in respect of flights operated by the Air Corps, (security/safety of life), can have serious implications for either individuals or for the State. The combined effect of multiple obstacles, it is stated, can create a 'wall effect', where it is neither possible nor practical to fly over or around the wind farm for reasons of air space restrictions or poor weather conditions. It is submitted that this is likely to be the case in respect of Maighne Wind Farm due to the siting and density of turbines proposed.

It is further considered that the mitigation proposed in terms of notifying pilots in advance of flights and or raising the vectoring altitude would be unacceptable as it would merely seek to address the reduction in collision risk, and would not address other impacts such as the adverse effect on the 'surveillance radar approach' and the reduced probability of carrying out successful cloud breaks.

Another operational impact identified was the effect on the PC9 Air Firing Routes. This is a weapons route from Baldonnell to Gormanstown in Co. Meath to facilitate air firing training. It is stated that such routes avoid populated areas and that a substantial re-route could be required.

(f) Military training operations

It is advised that the designated airspace is used intensively for military flying training. The Allenwood area is the main area used for the training of helicopter and Cessna pilots. Given that this training is normally carried out below the R-16 base, it is considered that the proposed wind farm would create an obstacle environment which would be incompatible with such training. This would necessitate the relocation of the training area with associated additional costs, increased transit time and a reduction in useful training time.

(g) Precedent

Construction of wind farm in an area where the impact is so severe could create a precedent for further similar development in the area. This would further diminish the ability of the Air corps to train and operate and would reduce the amenity of the air space designated for use by the Defence Forces.

4.3.2 Dept. Arts Heritage and the Gaeltacht

Archaeology

DAHG notes the rich archaeological landscape which is representative of a continuum of human activity from the Neolithic to the post Medieval age. It is therefore considered that the potential exists for discovery of archaeological material during construction. The following conditions are recommended:-

1. Mitigation measures set out in S14.5 of the EIS shall be implemented in full.
2. All accessible areas shall be subject to archaeological test excavations and/or monitoring subject to an approved method statement.
3. Applicant shall employ a suitably qualified archaeologist during construction.

Architectural heritage

DAHG noted the EIS conclusion that there would be no direct impact on UNESCO sites, candidate UNESCO sites or National Monuments, and the conclusion that there would be no direct impact on the curtilage or attendant grounds of a Protected Structure, NIAH site/gardens or on ACAs. It is stated that it is a matter for the Board to assess this impact including any potential impact on the Hill of Tara. It was noted from the EIS that there would be 3 turbines visible from Carbury Castle and Carbury Hill. However, clarification was sought on whether views of the castle would be affected by the turbines.

Nature conservation

Nature conservation issues raised include potential impacts on water quality (rivers and wetlands) and potential fatalities to bird species and bat species. It was queried whether the most up-to-date conservation objectives were used in the NIS (Table 6.1). The version no. and date of the C.O. quoted should be provided.

In terms of Appropriate Assessment, concern was raised regarding the screening out of a number of designated sites on the basis of a lack of a hydrological connection, but without sufficient clarity on whether the groundwater connections were included in this analysis. Furthermore, the adequacy of the reliance on an 'Outline CEMP' was raised, particularly in relation to potential need for compliance conditions. Reference was made to Circular Letters PD2/07 and NPWS 1/07 which issued guidance on the need for judicious use of such conditions in respect of EIA and AA. Reference was also made to the intention to rely on post-decision consultation with IFI and NPWS regarding a method statement for protecting watercourses and waterbodies. It was emphasised that the Board should satisfy itself that the measures set out in the outline CEMP would protect water quality, particularly in relation to Natura 2000 sites, and would ensure that the Conservation Objectives of water dependent Qualifying Interests of these sites are met. It is submitted that in such circumstances, there would be no need for further consultations.

It was noted that Chapter 7 of the EIS states that mitigation and monitoring would be provided for in terms of bird and bat fatalities. However, in the event that such fatalities prove to be significant, no additional mitigation methodology is provided for. It is considered that such methodologies are necessary to demonstrate that they would be effective.

4.3.3 Inland Fisheries Ireland

It is pointed out that IFI policy is to maintain a sustainable fisheries resource through preserving the productive capacity of fish habitat, by avoiding habitat loss and/or by mitigating harmful alteration to habitat. It is stated that the proposed development has the potential to impact downstream fisheries if development is not carried out in an environmentally sensitive manner. The potential impact relates to the construction of turbines, access roads and the laying of cables. Similar issues to those raised by DAHG are raised regarding the 'Outline CEMP' and the need to protect watercourses and waterbodies. It is emphasised that the observations made are of a general nature due to the fact that the construction details and method statements are not as yet available.

The EIS indicates that various sites are sited adjacent to and have the potential to impact upon a wide range of fisheries waters including SACs, angling waters, adult holding areas, nursery and spawning waters within the ERDB and the SERDB. In addition, it is noted that many turbines would be sited adjacent to smaller watercourses which act as contributories to habitats for juvenile salmonids and lampreys and to macrophytes, algae and micro-invertebrates, which form a significant part of the food supply chain. The wind farm would have potential impacts on the catchment areas of the River Boyne and the River Barrow, whilst the HV cable route would have a potential impact on the catchment of either the Tolka or the Ryewater. Each of these river systems include habitats for salmonids, lampreys, cyprinids and Atlantic Salmon (Annex II species).

Other issues raised included river/stream crossings and culverts and the need to protect water dependent habitats and species. Detailed advice is provided regarding the most appropriate means of traversing watercourses in order to ensure unimpeded passage of fish/micro-invertebrates and the protection of habitats by preventing erosion and sedimentation. It is stated that culverts are the most problematic regarding passage of fish and that clear span structures are preferable. Advice is also provided regarding timing of works, measures to prevent soil erosion and sedimentation and pollution due to cement and oils. The issue of design capacity for flooding also raised and it is strongly recommended that contact be made with the OPW regarding the design and capacity of bridges and culverts.

4.3.4 NRA (Transport Infrastructure Ireland)

Issues raised include failure to adequately address the potential impact on Leinster Outer Orbital Route (LOOR) and on the maintenance and safety requirements for the national road network in terms of the turbine delivery and haul routes. It is stated that the LOOR, which is provided for in the County Development Plans for both Kildare and Meath, as well as the RPG for the GDA and in the NTA's Draft Transport Strategy, is not addressed in the EIS and that it is of great importance to ensure that any permission for a wind farm development would not impact on the LOOR route corridors.

The proposed haul route and turbine delivery routes could potentially impact the maintenance and safety of the National Road network. The proposed routes include the use of the M4 (Junctions 8 and 9), which forms part of the M4 PPP Scheme, which is operated by Eurolink motorway operations. It is important to ensure that Eurolink is consulted in terms of delivery timetabling, costs, requirements etc. It is further pointed out that the roundabouts form part of the motorway designation and as such, Section 53 Roads Act approval will be required prior to the commencement of any works.

In addition, criticism is made of the lack of any technical load assessment of structures along the various routes, particularly with regard to abnormal loads. It is cautioned that it is of vital importance that this is carried out to ensure that loading is permissible. It is stated that it is critical that a full assessment of all structures on the national road network is carried out in consultation with the local authorities. Licences may also be required for cabling or trenching along the road network. All proposals and licenses between the applicant and the L.A. should be referred to the NRA (TII).

4.3.5 Health Service Executive

Concerns were raised regarding a number of issues including the outline nature of CEMP and the candidate status of the turbines to be used. A detailed EMP would be required for each stage of the development project, construction, operation and decommissioning.

Residential amenity

Concern was expressed regarding the proximity of such a high number of houses to turbines in terms of the implications for noise and shadow flicker and air safety lights (light pollution). It was noted, however, that a number of sensitive receptors had been omitted from the EIS assessments in terms of noise and shadow flicker. These include Cadmanstown School, Broadford School, Clane Hospital, Dunfirth Autistic Community Residential Farm and Clogherinkoe/Broadford GAA. It was noted that some turbines would be as close as 200m from property boundaries. It was recommended that a noise monitoring plan be put in place in order to assess compliance with noise limit conditions due to the candidate status of the turbines. Noise from the substation also needs to be addressed and monitored. These issues could be addressed by means of conditions.

In addition, it would be necessary to put in place a plan for controlling and monitoring shadow flicker to ensure compliance due to the candidate status of the turbines. This plan should include all residential properties within 1200m (10 rotor diameters) of a turbine. This could be addressed by means of condition. Navigation safety lights should not be permitted to cause light pollution. Issues were raised regarding the potential impact on noise/vibration, air quality, drinking water supplies and water quality during the construction phase. Noise and dust limits, respectively, should be addressed by means of conditions and monitoring would be required. Hours of construction would also need to be controlled.

Water quality/supply

Surface water and ground water protection during construction was considered to be of considerable importance. Private wells must be protected from contamination, especially where they are close to access roads and cable routes. Shallow wells were also identified as being particularly vulnerable to changes in the water table due to dewatering. Measures to ensure safe fuel storage and management is also considered to be vital. It is noted that the wind farm is located within the catchments of the River Boyne and River Barrow, which of which is a significant public drinking water source. Thus it would be essential that measures are put in place to ensure that any incidents would be reported where there would be potential to pollute or to cause an increase in the pH, ammonia levels or siltation of these public drinking water sources.

Furthermore, there is a proposal to provide a new water supply to serve North West Kildare, in the form of the Ballyna Group Water Scheme, for which many householders have already paid financial contributions. The groundwater source for this scheme is the Johnstown Bridge Well Field. Concern was expressed that the proposed substation and six turbines are located within the catchment of this well field, (T11-13 and T43-45). In addition, the proposed cable route passes through the Inner and Outer Source Protection Zones for the well field. It is considered that this resource could be compromised by the proposed development. Whilst mitigation is proposed, it would have been more appropriate to avoid the Source Protection Zones altogether.

4.3.6 Irish Water

Irish Water had no objection in principle, but required further information regarding interactions with existing water supply infrastructure. Much of the submission related to the potential impact on the existing water mains which would intersect or run along the proposed medium voltage cable routes and the high voltage cable routes, (representing options for connection to the national grid, which have since been omitted by the applicant). The concerns related to congestion of services, particularly at pinch points. It was stated that insufficient information had been provided to enable a full evaluation of the effect on water supply/infrastructure. This gave rise to serious concerns about the ability of Irish Water/the L.A. to carry out its statutory duty as Water services Authority in terms of the operation, management and maintenance of the existing infrastructure and in the provision of new infrastructure.

Irish Water also sought information on potential impacts on Longwood water supply and the private water supplies throughout the study area. It was requested that the applicant carry out a full hydrogeological assessment of potential impacts on the public water supply boreholes at Clonguiffen and on the numerous domestic wells in the area. The assessment should include impacts arising from wind turbine foundations, borrow pits and cable ducting trenches associated with the Ballinakill cluster.

Queries were also raised regarding the water supply for the proposed development. Full details were requested of the proposed Rainwater Harvesting system and what it would be used for. Full details were also requested regarding the proposed water supply during construction and the proposed means of waste water management, site drainage and control of surface water runoff and procedures for dealing with oils, fuels and site vehicles.

4.3.7 An Taisce

Issues raised included the current policy vacuum and developer-led nature of the proposed development, the origin of the current proposal as an energy export project, the lack of evidence on capacity and demand for wind energy and the potential adverse impact on communities arising from the development. Given that the WE Guidelines are under review, and that there is increasing conflict within communities regarding such development, it was emphasised that a proper national strategy on wind energy development was urgently needed so that the most appropriate locations could be identified to meet the renewable energy targets. In particular, there is an urgent need to identify the following:

- Current level of permitted wind energy development with viable grid connections;
- Additional capacity needed to meet the 40% renewable energy target;

- Optimum locations for development of wind energy in the country.

An Taisce considers that there is a need for a national low carbon roadmap which should be integrated with proposals to reduce energy demand, increase the efficiency and decarbonisation of energy generation and, in parallel, reduce the importation of energy.

The policy vacuum also exists at local level whereby the Kildare CDP never envisaged a development of this scale and dispersed nature. It is pointed out that the lack of a national or local policy framework means that it is developer driven and that this has resulted in deep divisions within local communities. The anomaly persists that the landowner receives income yet the householder who is affected by the proposed development receives no benefit. There should be a “part-share for communities” to host large-scale wind farms. It is acknowledged that there is some potential in the area but that development should be directed towards the cut-away bogs and away from denser areas of population.

The Board is reminded that Ireland has failed to implement the European Landscape convention (2000), and as such, there is no proper legislation, policy or guidelines to respond to the proposed development and no basis upon which to assess the impact on the landscape. An Taisce believes that there is a need for an SEA to identify the national capacity for location/siting of WE development. In terms of the current proposal, there is a need to consider the impact on the Royal and Grand Canals and to assess the cumulative impact on the landscape.

4.3.8 Fáilte Ireland

The submission by Fáilte Ireland was made by AOS Planning Consultants in order to identify the likely impacts on tourism amenity of the local and wider areas arising from the development and on the longer term implications for the tourism resource. It was also stated that in 2013, Counties Kildare and Meath received 168,000 and 122,000 overseas visitors respectively, which generated €52 million and €39 million for each county respectively. Fáilte Ireland is very supportive of the preparation and adoption of wind energy strategies and plan-led development in order to avoid/minimise disproportionate adverse impacts on other land uses.

Attention was drawn to the diverse and robust tourist offering in the area with a number of significant attractions including world renowned heritage sites. The Military Museum and the Curragh Plains, as well as the Irish National Stud with Japanese Gardens and Horse Museum, were singled out as key attractions, as were Donadea Forest Park and Lullymore Heritage Park. Other amenity attractions of note include those associated with the Grand and Royal Canals, Pollardstown

Fen, Irish Parachute Club at Clonbullogue, heritage properties and historic demesnes and a number of high quality hotels serving the wedding and wellness market etc. It was also noted that equestrian activities feature highly as a significant tourism attraction with a number of racing venues and equestrian centres, as well as a considerable range of outdoor and leisure activities such as walking, cycling, fishing and touring in areas, all of which it was pointed out, are in close proximity to Dublin. Attention is also drawn to the corridors of the Royal and Grand Canals, which are recognised in the CDP as areas of High Amenity. Specific reference is made to well-known trails including The Grand Canal Way (117km trail from Lucan to Shannon Harbour); The Barrow Way (100km trail from Robertstown to St. Mullins in Carlow); and to The Royal Way (144km trail from Dublin to Cloondara in Longford).

Reference was made to the Attitude Surveys carried out for tourists visiting Ireland in 2007 and in 2012, which show a marked polarisation of views in relation to wind farms. Impacts during construction identified included disruption to access to facilities e.g. Moyvalley Hotel/golf, Donadea Park etc. However, the key impacts were considered to be visual impacts, particularly in respect of canals, designated scenic routes and scenic views. It was considered that the most significant impacts would be in the areas adjacent to the northern and southern clusters due to their proximity to existing settlements, scenic routes and existing amenities. These areas were considered to be more sensitive to change and are identified in the CDP as Areas of High Amenity with associated designated views.

The conclusions of the EIS regarding the residual impacts in respect of the canal corridors were questioned on the basis of inconsistency with their status in the CDP. The statements regarding tall vegetation lining the towpaths was also disputed and the straight linear nature of the canals was considered to be likely to give rise to a disproportionate impact. The canals are considered to play an important regional role as tourism and amenity features, a role which will increase in significance with the development of National Greenways. A distinction was drawn between the historical industrial character and the current/future land use and recreational amenity value of the canals. Concern was expressed regarding the significance of visual impacts on the potential amenity value of the canals, (in addition to the existing amenity value). It was considered that the landscape setting of these important features would be changed and that the impact would remain throughout the operational life of the windfarm.

4.3.9 Waterways Ireland

Waterways Ireland is a cross-border navigational authority with a statutory function to manage, maintain, develop and restore the waterways for recreational purposes. Attention is drawn to various projects that could be impacted, as follows:-

- Grand Canal Way – long distance walking route
- Royal Canal Way – marked walks and cycle routes

- Shannon Blueway project – extensive network of paddling, cycling, walking routes which connects villages and communities.
- Barrow Way – mixed urban and rural amenity walkway.

It is stated that these projects represent sustainable activity-based tourism projects which support a myriad of activities and help to grow and develop businesses. The aim is to provide a visitor experience regardless of physical ability or financial capacity and a holistic approach is taken to include all stakeholders. It is emphasised that a high value is placed on the rich natural heritage of the North Shannon region by promoting an experience where visitors are truly engaged with the landscape, flora, fauna of the canal environment.

It is recommended that a condition be attached, in the event of a grant of planning permission requiring a portion of the Community Benefit Scheme to be allocated to such projects. In particular, allocations should address areas of greatest impact on the Royal canal at Ballinakill and on the Grand Canal at Cloncumber.

4.3.10 Geological Survey of Ireland

The Geological society of Ireland had received correspondence directly from the applicant. The GSI has no further comments to make on the application.

4.3.11 Offaly County Council

It is noted that the proposed development site is located 3km at its closest point from the boundary between Offaly and Kildare. It is noted that the application includes assessment of cumulative impacts of the proposed development and the existing Mount Lucas wind farm in Co. Offaly (PL19.237263) and the Yellow River wind farm in Co. Offaly (PL19.PA0032), each of which was granted permission by the Board. It was further noted that examples of photomontages which depict such cumulative views include P01_Kedr02, P07_Kedr13, P16_Kedr40 and P55_ii_10AH03. Offaly Co. Co. also noted that haul routes are not proposed to traverse through the county. It was requested that it be notified of progress on the application.

4.4 *Third parties*

- 4.4.1 Eight hundred and eight (808) third party observers have written to the Board in respect of the proposed development. These included public representatives (TDs, Senators and Councillors), Resident's Associations, Environmental Groups, business interests and individual residents. A significant number arose from interest or umbrella groups, some of whom have also employed their own specialist consultants. There were also a

number of letters of support (73 no.). The name of each observer, together with the Observer Number assigned by the Board, is attached to this report at Appendix 3. However, the main interest groups were as follows:-

36. Ballyna Group Water Scheme
37. Birdwatch Ireland
38. Broadford Area Residents' Association
39. Environmental Awareness Alliance Ireland (Broadford Res. Association)
40. Carbury Ladies Group
41. Castlejordan/Ballinabrackey/Clonmore Wind Action Group
42. Donadea Against Turbines
43. Drehid Community
44. Dublin Weston Airport
45. Eadestown Against Spin
46. Eirgrid Interconnector Ltd.
47. Flight Limited T/A Irish Balloon Flights
48. Friends of Donadea Forest
49. Grid Link Action Group
50. Irish Peatland Conservation Council
51. Irish Thoroughbred Breeders' Association
52. Katesan Naas Ltd.
53. Kildare Co. Co. Energy Committee
54. Knockcor Bog Committee
55. Longwood Gun Club
56. Longwood Play Group Ltd.
57. Longwood Tidy towns
58. Lullymore Heritage and Discovery Park
59. Meath Environmental Protection Alliance
60. Millrace Lawns Residents Association
61. Oakleigh Residents Group
62. Parish of Ballyna
63. Rhode Parish Wind Turbine Action Group
64. Ryan, Patricia Cllr. Mark Lynch & concerned Residents
65. Schram Plants Limited
66. Ballinakill Residents Group
67. Kildare Environmental Awareness Group

- 4.4.2 The nature, level of detail and range of issues raised in the submissions is extremely comprehensive. They occupy 22 lever arch files. The majority of the submissions make observations with regard to a wide range of issues, which can include a number of points per issue. These range from strategic to localized issues. Given the volume, nature and content of the third party submissions, it was decided to establish a spread sheet in order to record the points that had been made. The submissions were read and recorded by me and by the second Inspector assigned by the Board, John Desmond. This is a substantial document and is in two parts, one prepared by each of

the Inspectors. Each part is subdivided into 15 tab sheets, one for each topic heading and each tab is further subdivided into main issues within each topic. The Observer No. has been inserted in the column beside each of the substantive points. This document forms part of the Inspector's report, and is attached at Appendix 3.

- 4.4.3 Whilst the main points raised by each of the observers are recorded in the Submissions Spreadsheet, the main issues arising from these points are summarised below under the broad topic headings, which correspond with the tabs in the spreadsheet, as follows:-

<i>Process</i>	<i>Economic impacts</i>
<i>Policy</i>	<i>Aviation</i>
<i>Residential amenity</i>	<i>Transport/Cable routes</i>
<i>Noise</i>	<i>Ecology</i>
<i>Shadow flicker</i>	<i>Hydrology/Drainage/Soils</i>
<i>Health</i>	<i>Construction impacts</i>

4.4.4 Process / Legal matters

4.4.4.1 Inadequate level of public participation

- *No meaningful engagement with the local community* - This is wholly unacceptable given the size, scale and expanse of the project, the proximity of turbines to so many homes and the extent of population affected. Any engagement has been selective only with landowners and the GAA.
- *Insufficient public meetings* - only one public meeting has been held regarding Maighne, at Hamlet Court, Johnstown Bridge, at which the proposal was presented as a 'fait accompli'. Poor attendance was a reflection of lack of publicity or advertising. The only other public meeting was in relation to the former Greenwire project.
- *No cluster-based consultation* - There should have been a cluster based consultation process given the large number of homes affected by each wind farm cluster.
- *EIS scoping consultation refuted* - Level of consultation described in EIS (1.4.4.2) is refuted. All dissemination of information related to the Greenwire project, which has been abandoned. Majority of public consultation was carried out in respect of the Greenwire project.
- *Obstacles to public participation* – inadequate timeframe given scale and complexity of development; inaccessibility of EIS and prohibitive cost of procuring hard copy (€3,350); PDF format of EIS obstructed proper interrogation.
- *Contrary to Aarhus Convention, particularly Art. 6(3) and 6(4)* - which provide for public participation early in the process and for reasonable timeframes for public involvement. Timeframe of 7 weeks wholly inadequate for public to assess a project of this magnitude and no meaningful engagement with

community whatsoever. ABP also failed to provide for public participation at Pre-application stage, including access to file until after the decision is made, which is contrary to Aarhus.

- *Contrary to Rio Declaration on Public Participation in Environment and Development 1992* - which requires appropriate access to information concerning the environment that is held by public authorities, and the opportunity to participate in the decision-making process, including access to judicial and administrative proceedings. This has not happened in this case.
- *Contrary to Gunning Principles* – consultation process contrary to Gunning or Sedley principles (R v. Brent London Borough Co.) that public consultation must be carried out at formative stage of project; that adequate information must be provided to allow for an intelligent input; that adequate time must be given for a response from public; and that the product of the consultation must be conscientiously taken into account.

4.4.4.2 Need for Oral Hearing

- *Inadequacy of the information* contained in the submissions, the complexity of the issues and the widespread impact of the proposed development necessitates the holding of an Oral Hearing.
- *The SID status of the application* means that there is no appeal possible. An Oral Hearing is required given the Board's Mission Statement to ensure impartiality and protection of the environment.
- *The Aarhus Convention* envisages public participation in environmental decision making. Given that the public consultation process carried out by the applicant has been largely confined to the Greenwire project, an Oral Hearing is required to help non-expert communities to fully access the information that is presented by the applicant.

4.4.4.3 Non- compliance with Public Participation Directive 2003/35/EC

- Parts of Aarhus Convention have been accepted as part of Irish Law, but the Board has consistently failed to take cognisance of this. P.A.s are mandated to facilitate the rights of citizens to participate in the decision making process and there has been a clear failure in this regard in the current case and in respect of NREAP.
- European Court judgement CJEU C-240/09 – EIS legally flawed as makes no reference to Public Participation Directive. Thus not in accordance with Pillars 1 and 2 of Aarhus and Maighne WF does not, therefore, comply with Art 6 of A.C. and should be returned to applicant
- European Court judgement CJEU C-427/07 - Ireland's failure to comply with Directive 2003/35/EC – resulted in DoECLG issuing Circular EPS/3/2013 which requires all public bodies to comply with Aarhus. Art. 6 must be implemented to give proper scope to both EIA Directive and Public Participation Directive. Maighne WF is an Activity under Annex 1 and must therefore comply with Art 6. It has failed in following respects:-

- Failure by ABP to guarantee public participation at all stages of the decision making process, from conception to operating and decommissioning the project, and including SEA, EIS Scoping etc.
- Failure to notify public in an adequate, effective and timely manner.
- Failure to set time frames for public participation at each stage of the process – no public participation in scoping stage
- Failure to allow early participation – no public participation in assessment of alternatives and choice of site
- Failure to exchange information between applicant and public before application submitted – i.e. at pre-application stage
- Failure to provide public with access to all information – Non-Technical summary inadequate.

4.4.4.4 Strategic Infrastructure Development Status

- *Does not qualify as strategic infrastructure development* – The SID process was instigated to facilitate the fast tracking of major strategic infrastructure development and not intended to deal with a number of individual projects spread over a massive area. Highly dispersed nature of development raises questions of qualification as SID. This is unprecedented. It is also claimed that the wind farm would have a lower output in reality than 125MW, with a load factor of just 37.5MW, which is less than the 50MW threshold for a SID.
- *Contribution to Renewable Energy Target disputed* – There is already a massive over capacity of output from wind energy (6,886MW) and Eirgrid's New Draft Strategy for the Development of Ireland's Grid (27/03/15) indicates that 3200-3800MW WE needed to meet 40% target.
- *Not part of Gate 3* - SID status was based on premise that project was part of Gate 3, but this is not the case. Eirgrid/CER have not corroborated applicant's claim that part of Gate 3. Project added after initial CER approval of 3,900MW had been awarded. Without Gate 3 access, project cannot be classed as contributing to 40% renewable energy target and cannot be deemed a SID.
- *No justifiable need for development* – According to ESB, Gate 3 is fully subscribed and the operational and permitted WFs combined currently exceed the 40% targets (by 2020). The development is not therefore essential infrastructure.
- *Failed to prove contribution to reliable, secure energy supply which is low carbon* – applicant claims will provide equivalent of 187,000 tonnes saving on CO₂ but has not illustrated this by calculations. Such estimates are called into question by international scientists. Inadequate consideration of real alternatives to wind power in terms of plans for cut-away bogs. ABP had duty to inform applicant of such potential alternative methods of generating power.
- *Designation as SID* – eroded rights of citizens to participate in process.

4.4.4.5 Grid connection - Project splitting/cumulative impact

- *No grid connection* - The proposed development is not part of Gate 3 according to letter from Eirgrid of 19/05/15 and did not receive a connection offer. Following O’Grianna decision, grid connection is integral to the project and cumulative impact must be considered. Thus the project falls foul of EIA Directive. Proposal is therefore premature and speculative.
- *Greenwire Project - Project splitting* – proposed development was formerly part of ‘Greenwire’ but energy is now intended for home market. Claim that Greenwire project is still being pursued by the applicant and that Maighne WF is effectively still part of this project. Pointed out that applicant currently pursuing interconnector link to UK and that potential exists for proposed development to form part of a Project of Common Interest. This is essentially project splitting. The Board should consider all applications including the Greenwire project.
- *Cumulative impact – Greenwire* - Applicant should be required to provide information on all their projects in Ireland to ensure that this and other WF proposals do not constitute project splitting of the Greenwire project.
- *Cumulative impacts back-up generation* - A project cannot be split so as to frustrate the EIA process. If wind speeds are inadequate, a back-up source will be needed. Wind energy cannot connect to the grid if amounting to more than 50% capacity. Cumulative impact of back-up facility, such as fossil fuel powered generator, should also be included in EIA.

4.4.4.6 Non-compliance with EIA/SEA Directives

- *SEA mandatory and at earliest possible stage* - The application fails to comply with Article 3 of EIA Directive which requires that all energy programmes and those Annex I/II developments which set a framework for the future must be subject to SEA, which must be carried out at the earliest possible stage in the development. This has not been done.
- *SEA is required because Competent Authority cannot conduct Partial EIA* – The C.A. cannot ignore other aspects of the development which are to be assessed by other C.A.s as this would result in partial EIA. CJEU C-50/09 required that integrated assessment must be carried out by separate agencies of the state.
- *EIA Directive (Art 3) not properly transposed into Irish Law* – CJEU C-50/09 rules that Schedule 6 of P&D Regs. 2001 ‘Inadequate’ as it merely sets out what information is to be contained in an EIS rather than what is required by Annex IV of EIA Directive, and fails to identify and describe the direct and indirect effects on the environment with regard to (a) human beings, flora and fauna; (b) soil, water, air, climate and landscape; (c) material assets and cultural heritage; and (d) interactions between (a), (b) and (c).
- *Maighne EIS defective as 2001 Regs have no purpose in law as it fails to comply with Art 3 of Directive and as 2014/52/EC (revised EIA Dir) not yet transposed into Irish Law* – Defective w.r.t all 7 headings as follows:-

H1 – Description of WHOLE project required – EIS fails to comply due to failure to include grid connection; Clearly identify whether energy is intended for UK or Irish market; Provide evidence of Gate 3 Licence, and hence cannot be considered a SID.

H2 – Description of Main Alternatives required – EIS fails to comply as does not adequately describe main alternatives or reasons for choices.

H3 – Adequate Description of aspects of the environment likely to be significantly affected required – EIS fails to provide adequate description in respect of interrelationships between population, flora, fauna, soil, water, air, climate, material, architecture, archaeology and landscape.

H4 – Adequate Description of Likely Significant Effects required – EIS fails to provide adequate description of the likely significant effects resulting from (a) existence of project; (b) use of natural resources; and (c) emission of pollutants, creation of nuisance and elimination of wastes.

H5 – Adequate Description of Forecasting Methods required – EIS fails to provide adequate description of forecasting methods which were used in assessing the effects on the environment under H4

H6 – adequate description of mitigation measures – EIS fails to adequately describe the measures envisaged to avoid, reduce, and remedy the significant adverse effects on the environment.

H7 – No Technical Summary – EIS fails to provide Non-Technical summary because no information has been provided under H4 and H5 and inadequate information has been provided under H1.

- *Maighne falls foul of both EIA and Public Participation Directives as they are linked as follows:-*

Non-technical summary – information must be presented in a comprehensive and accessible form to comply with both Directives. The lack of a NTS fails to comply with Art 5 of EIA Directive.

Description of proposed development deficient – in respect of likely significant effects, mitigation measures and non-technical summary. Thus it fails to comply with Aarhus.

Broad collection of techniques – Maighne EIS fails to use a broad collection of techniques such as AA, Social Impact Assessment, Cumulative Impact assessment, Environmental Health Impact assessment, Integrated Biodiversity Impact assessment etc. Thus the proposed development fails to comply with Art 5 of EIA and/or with requirements of Aarhus convention.

- *Renewable Energy Policy not subject to SEA – inadmissible* – neither EU policy on Renewable Energy nor the National Renewable Energy Action Plan have been subjected to SEA. Thus neither of these policies are compliant with the EIA Directive. NREAP is heavily reliant on wind power, yet there has been no assessment on what, where, how to build wind energy development and the purpose of such development. Thus the application, which relies on these policies for its justification, is legally invalid.

4.4.4.7 Inadequacy of EIS

- *Inadequate description of proposed development* – Deficiencies in level of information /degree of detail provided includes the following
 - *Lack of site investigations* – deferred until post decision – means Board cannot decide on merits of entire application and would impact on third parties without ability to comment.
 - *Final WT model not identified* – implications for assessment of noise, shadow flicker and visual impacts.
 - *Foundation details/quantity of stone required* - not identified in sufficient detail and hence consequent traffic generation (construction) cannot be predicted with confidence.
 - *No consideration of weight of cranes* and consequent impact on roads and aquifer.
 - *Delivery route* not finalised.
 - *Inadequate detail of borrow pits* – only surface area identified.
 - *Impact on public roads/legacy roads* - No assessment of impact on bog roads. Impact of cable works on roads in very poor condition without proposals to improve same is inadequate. Site investigations post decision inappropriate.
 - *Kilpatrick Bridge* – proposals to upgrade bridge on haul route and with cable accommodated within structure is included in NIAH but no EIS carried out of same.
 - *M4 Crossing* – this will be subject to detailed technical analysis and agreement with the NRA and the PPP co. Eurolink prior to completion of work – unsuitable for compliance condition
 - *Proposed tracks* – inadequate assessment of environmental impact of tracks. Purported use of compliance conditions in respect of such a considerable length of track inappropriate and does not comply with EIA directive.
- *Inadequate Identification of Likely Significant Effects* – in relation to noise, shadow flicker, landscape character, visual impact, traffic impact, cultural heritage, ecology, property value, impacts on specific sites and fails to show all likely effects, direct and indirect.

- *Inadequate consideration of Alternatives* - single geographical site not considered as an alternative as suggested in pre-application advice (PC0186)
- *Decommissioning* – Not possible with such large concrete bases and proposed not to remove proposed tracks, subject to approval of P.A. Inadequate consideration of impacts arising from abandonment of wind farm.
- *Cumulative impacts* – *Bord na Mona* - not adequately considered in terms of possible future development of Bord na Mona bogs, as advised in PC0186.
- *EIS not objective* – EIS not independently prepared

4.4.4.8 Inadequate legal interest

- *Eirgrid Interconnector Ltd. (EIL)* submitted that the applicant does not appear to intend to install the final section of HV cables for the Woodland 400kV substation connection in the Red Bog road in Meath. As there are existing cables and fibre optic communication cables already installed along this section of road, which relate to the E-W interconnector, EIL requests confirmation that no further cables be laid along this stretch of road, as any such installation and associated construction works could have a serious impact on the E-W Interconnector.
- *Land ownership* - The P & D Regs require control over landownership or evidence of consent. It is claimed that not all landowners have given consent and will not do so. The precise form of written consent has been laid down by High Court in *McCallig v ABP* (24/01/13), must include personal signature of owner and cross referenced to map. Although list of names provided, no accompanying plans/maps. Any permission in respect of such lands likely to be void following any legal challenge.
- *Legal agreements* – inadequate evidence of legal agreements re third party lands. They are extraordinarily one-sided and effectively sterilise development of land in ownership of that farmer. Potential sterilisation of up to 16% of the county. Full disclosure of legal agreements required.
- *Pressure to enter into legal agreements* – undue pressure put on local landowners by applicant to enter agreements and misled regarding ability to withdraw.
- *Node NKCLNC003* – applicant has no legal consent or ownership of the necessary lands required to access Cloncumber cluster and no alternative route for connection. Does not comply with requirements of *McCallig* judgement. Thus development, including grid connection, completely unviable.

4.4.4.9 Precedent

Legal Precedent

- *O’Grianna v. ABP* – Project splitting and cumulative impact – must consider whole project including grid connection and cumulative impacts.

- *Kelly v Others and ABP* – requires stringent and comprehensive analysis to be carried out when considering AA and in conducting and recording Stage 1 and Stage 2

Board precedent

- **243523 Refusal of wind monitoring mast on air safety grounds** - Timahoe South Bog. Refusal based on air navigability as well as risk to flight safety. Only 5.35km east of Derrybrennan. Note that Inspector had considered that a multiple turbine wind farm at this location would raise air traffic safety issues. Note that Osprey consulting (authors of Aviation Impact Assessment for Maighne) also used by applicant in that case and DoD did not accept conclusions.
- **241728 Gaybrook Wind Farm**, Mullingar refused by ABP. This related to a proposal for 12 turbines in a historic landscape containing remnants of 18/19 Century demesnes of particular significance w.r.t tourism, amenity and heritage. ABP considered WF would result in dominant and obtrusive feature in this small scale, high quality landscape and would interfere with the character of the landscape which it was necessary to preserve.
- **PA0025 Doonbeg, Co. Clare** Refusal of 45 turbine WF - 126m height. Reasons included scale, visual intrusion and overbearing visual impact on tourism resource. Also highlights issue of scale of WF in close proximity to residential dwellings.
- **203801 Refusal of landfill at calf field** - Padraic Thornton Waste Disposal. Refusal based on significant adverse effect on conservation/protection of R Boyne (SAC and source of public water supply to Co. Meath), and that it would be prejudicial to public health, having regard to the complex hydrological and hydrogeological conditions, to the limited site investigations carried out, (and thus the potentially inadequate mitigation measures), and to the proximity of the site to the Boyne River (SAC).
- **PA0031 Cluddaun, Co. Mayo** Refusal 48 turbine WF. Reference made to scale of development and to its widely dispersed spatial extent and unconsolidated nature. Note - Cluddaun significantly more compact than Maighne with just 3 clusters and a spread over 8.26km x 5.16km. Also max. tip height was 150m.
- **243630 - Ardglass WF Cork**, 11 turbines (156.5m height) refused - reasons included no., scale and height of turbines, location in quiet rural area, lack of significant landscape features, the open and exposed nature of the receiving landscape and proximity to noise sensitive receptors
- **242354 - Cloghan, Co. Offaly** - refusal of 10 turbines tip height of 170m - single reason related to landscape impact due to open nature of receiving environment, scale, height and spatial extent of turbines - excessively dominant and visually obtrusive.
- **241777 - Tougher Business Park**, Lewistown, Newbridge - Refusal of permission by ABP in 2011 for Straw and Woodchip Fired Combined Heat and Power plant in Newbridge on the grounds that it would be premature

pending the determination of the Leinster Orbital Route, the route corridor for which is an objective set out in the KCC CDP and in the RRPg for the GDA. Note no change in status of LOOR in intervening period.

- **243364 - Knocknabranagh Co. Carlow** - Refusal 21 Turbines, Tip height 140m. Reason 2 - deficiencies in EIS w.r.t. geotechnical info; bat survey; character of local roads; impact on residential amenity; protection of surface water.
- **238669 – Clonard Co. Meath** – Refusal of 30m high telecommunications mast on grounds of visual amenity by virtue of its location adjacent to Royal Canal – would seriously injure the visual character and scenic amenities of area and contrary to Policy HER 40 Meath CDP 2007.

Establishment of a precedent

- Bord na Mona/ Coillte lands - Concern re setting of a precedent for further similar development, particularly on Bord na Mona and Coillte lands. Minutes of meeting between ABP and KCC (Ref PC0186) indicates that B na M intends developing 1 WF per year over next 7 years and Element Power had originally proposed 750 WTs and extent of cabling would suggest future WF development.

4.4.4.10 Errors/discrepancies in documents

- *Errors in site and public notices* – Martinstown in Kildare, not in Meath; Coonough incorrectly spelt as Coonagh in site notices; Newtown graveyard notice erected later than all other notices; no consent obtained to erect notices on third party lands; some notices have not been erected in the locations indicated.
- *Errors in application/site description* – site and proposed development not adequately described particularly w.r.t. scale/expanse of development.
- *Discrepancies re distances between turbines and existing facilities* – Explosives factory and Drehid Waste Management Facility not accurately shown and differs from Table 1 (Results of Shadow Flicker model). Also 2 no. stud farms not recorded on fig 11.1.3 and a further one not included within Drehid/Hortland cluster. See Appendix 8 of Observation no. 715.
- *Exclusion of derelict properties* – some properties omitted from map e.g. one near T47 – remains of a cottage, only 400m from T47. This would have breached guidelines. Also a moated site omitted from maps – See Appendix 10 of Observation No. 715.
- *Inadequacy of detail* – Longwood Village – LE1473104-002 – site layout plan do not clearly show Longwood village. Details of turbines inadequate.
- *Miscellaneous* – Clonkeeran House (Carbury) Stud farm – following an approach by applicant, observer did own research. Distrusts information provided by applicant w.r.t. costs, payments, Env. Impact, tax implications, property devaluation.

4.4.11 Miscellaneous objection issues – legal/process

- *Not in accordance with principles of sustainable development* – Sustainable development defined in Art 3 of EU Treaty as having 3 distinct elements, Economic, Social, and Environmental. EIS does not include assessment of economic issues and has not allowed public participation and is therefore not sustainable development. Must also include Cost Benefit Analysis, which has not been done.
- *Not in accordance with principle of proportionality* – a Plan/Programme must state what benefit to society would be and balance this with environmental impact. This is a legally binding principle. NREAP is flawed as wind energy not effective way to displace fossil fuel. Impact on health and property valuation would bring destruction to amenities of area. EIS has no assessed impact on property values and the benefit-balance ratio cannot therefore be determined.
- *Impartiality of Board* - It is requested that members of the Board who have previous pro-wind opinions regarding infrasound, noise, shadow flicker, appropriate size/setback distances, other impacts on human health, impacts on wildlife, landscapes, tourism and the local economy and with regard to the purported benefits, to set these opinions aside and to address the issues arising from this case in an objective and impartial manner.
- **PA0186 - Issues raised in pre-application SID report Maighne** - included dispersed nature of development and ABP advice was to consider single geographic location as alternative; Extensive network of cable laying on public roads; Cumulative impacts including possible future WF dev. on Bord na Mona lands nearby; Location of site on 'most sensitive' lands on Macro Environmental Sensitivity Map; Air Safety and navigation issues raised with particular reference to ABP refusal under 243523.

4.4.12 In support of proposal - process

- Claims that community information meetings that have been held are anti-wind energy meetings which include significant elements of misinformation on issues such as children's health, noise, shadow flicker, property devaluation.

4.4.5 Policy / Guidance

4.4.5.1 European/National Renewable Energy Policy

- *EU and National Renewable Energy Targets* – Directive 2009/28/EC required 20% energy to be from 'Renewables' by 2020 and for each Member State to prepare and justify a NREAP. Ireland's commitment to the Kyoto Agreement is in the form of a Memorandum of Understanding with the EC but this was modified in 2003. The EU independently decided to increase the proportion of

renewables to be provided by wind energy without any proper analysis and is contrary to the binding legal principle of the EU to carry out Cost Benefit Analysis and SEA and to consider alternatives. Thus EU energy policy is without any legal foundation.

- *NREAP has no SEA and falls foul of EIA directive* – the objectives of such a Plan must be assessed; alternatives to these objectives must be considered, including proceeding with no Plan; the significant environmental effects of the Plan must be assessed; as well as the necessary mitigation measures and monitoring of unforeseen adverse environmental impacts.
- *There has been no Cost Benefit Analysis of NREAP* – Government policy on wind energy is flawed and has not had the benefit of cost benefit analysis of the value and effectiveness of large-scale wind energy on the Irish Grid and its potential to deliver acceptable returns. There is a need for a clear, honest evaluation of the net impact on carbon emissions as a result of wind energy.
- *Government policy not supported by evidence* – 40% of electricity to be from renewables by 2020 target was set without credible techno-economic studies to investigate the technical and economic barriers to be overcome. There has been no verification of green-house gas emissions saving from wind industry installed to date, nor has there been any estimate of GHG savings completed for NREAP. The funding mechanisms are designed to ensure delivery of EU obligations on renewables rather than being part of a commitment to contribute to any quantifiable target related to CO₂ savings.
- *No National Plan/Framework* – The Framework Plan for Renewable Energy /Electricity Policy is not yet in place. The DCENR is in the process of preparing a Framework Plan. Development is premature pending the adoption of this Framework Plan. There is a need for national plan/strategy to identify optimum and most appropriate sites and a strategic approach to the siting of wind energy projects in areas with greatest wind energy resource. Kildare is one of the least windy counties. Proposal is developer-led. Development of such a large scale project in the absence of plan-led policies/strategy is premature and should be refused.
- *GRID 25 – lack of justification for proposed development* - EirGrid's GRID 25 programme outlines the development of the transmission system required in order to deliver future targets. There are no additional benefits to the transmission system in the proposed development. The Board should consider carefully, in consultation with the relevant bodies, the implications of granting permission to projects that are not consistent with EirGrid's Generation and Transmission Plans vis a vis the strategic benefit the proposed development is claiming to possess. The board should note that there is no reference in GRID 25 to the Interconnector application completed by Element Power TG234

4.4.5.2 Need/policy justification for proposed output not established

4.4.5.2.1 Disputes basis of government policy justification

- *Wind energy is inefficient* - Government Energy targets are based on flawed energy policy. Wind energy does not deliver the savings envisaged. Wind energy programme is also excessively high in terms of cost when compared with other forms of renewable energy. Other power stations taken off line to permit the use of wind power on the grid. Wind energy is not an effective way to displace fossil fuel or abate CO₂
- *Renewable Obligations Scheme* - This Government policy is unsustainable as it allows for generous payments through the RO Scheme, which is funded through green levies on consumer energy bills. However, UK Government has ceased such public subsidies. The community is paying for this through higher energy bills.
- *Demand driven by international agreement with UK to supply energy for export*. This no longer the case. Case for proceeding with this project as SID is undermined by the collapse of the Memorandum of Understanding. IAE stated that the case for exporting wind energy as a profitable commercial enterprise is without any sound economic basis. What market is the energy to serve?
- *Market for wind generated* - It has not been clearly established which market the energy is intended for. It is unlikely that investors would invest in a project such as this with just one single market/customer, i.e. Eirgrid. It is more likely that the wind power will be sold to the highest bidder. Currently the wind industry is being subsidised by the electricity customers, but if or when that ceases, the Irish people will be left with the problem.
- *Demand for output unjustified* - No special need for this wind farm as already have more than enough electricity to suffice our requirements. 3,900MW is sufficient to supply hundreds of thousands of properties for a year. There is insufficient demand in this area for this level of energy generation. Should therefore await outcome of WEPG review. Applicant states 200MW required to be added to Grid annually, (to meet 40% renewables target), and that only 177MW added in 2013. However, IWEA indicates that 706MW installed in 2014, almost enough for 3 years.
- *All Ireland Capacity factor* – Eirgrid's figures for this are very high. It is considered to be based on misleading data. Board must establish what the likely capacity factor is likely to be and being in the Midlands, it is unlikely that it would be above 20%, yet any lower that this would mean bankruptcy.
- *Wind energy penetration* – this is the percentage of demand covered by WE in a region on an annual basis. Eirgrid Engineering Report 2004 stated that as WE penetration rises, the adverse effect on thermal plant increases. Thus the

WE programme is excessively high cost compared with alternative options for CO₂ reduction. There is increasing evidence to support the view that wind penetrations save negligible emissions of CO₂. Given that onshore wind is intermittent and unreliable and requires 100% of energy demand to be served by back-up measures. DOCNER indicates that WE accounts for 15.3% of energy production in Ireland. Although 20% is upper limit, the practical upper limit for WE penetration is 10% (Korchinski).

- *Inefficiency of wind turbines* - can only harvest a portion of the kinetic energy available from the wind (Betz's law - maximum achievable extraction of wind power by WT is 59% total kinetic energy of air flowing through). Commercial WT deliver 75-80% of the Betz's limit of power extractable at operating speed ('Wind Energy handbook' John Wiley and Sons, 2001, Burton et al (ed)). Sporadic nature of wind energy means alternative sources must be available to provide all electricity as necessary (spinning reserve).
- *Rate of Change of Frequency – (ROCOF)* – WE penetration has a practical upper limit as the more wind we get, the more likely we will have problems in managing the fluctuations in power (due to ROCOF). EirGrid DS3 Programme notes the technical challenges in operating the transmission system (including ROCOF) in terms of managing fluctuating power intake due to increased wind intake, (which doesn't arise with sources such as geothermal), and sets 11 work streams to address them up to 2018.
- *No economic justification* – wind energy policy is seriously flawed, as operators are paid to stop producing electricity. National policy is biased in favour of wind energy, with grants available to wind farms not available to other forms of renewable energy. Grant system distorts demand in favour of WE instead of more promising sustainable energy sources.

4.4.5.2.2 *Disputes justification on basis of decarbonisation*

- *Decarbonisation justification of scheme disputed* – once the spinning reserve is accounted for, reductions in CO₂ or imports of fossil fuel are negligible. The green-house gas reductions are also questioned as GHG emitted during production of WTs/construction of WF including the removal of peat, (which is a carbon sink), all have to be taken into account. As there is no way of measuring the contribution of WE to the grid, or to determine the savings in fuel use of CO₂ saving, the principle should be refusal.
- *Benefits to society/community* – renewable technology is welcomed but not at the cost of destroying the country. The area should not be blighted by monstrous turbines. Alternatives are available such as solar farms or off shore wind. A full CBA needs to be carried out to assess the economic costs and benefits of renewable energy. The socially adverse impact of dividing the community must also be taken into account. Increased energy security is questioned on the basis that wind energy is so unreliable and unpredictable.

- *Production and transport of turbines more harmful to environment* - More environmental pollution produced worldwide than that saved from the use of wind energy. This is due to a wide variety of factors including pollution arising from mining of rare metals for production of metals used in wind turbines (e.g. toxic lakes in Mongolia), CO2 emissions from heavily pollution shipping of parts/metals from China, Mongolia etc. to Europe and the CO2 emissions and air pollution created in China (as well as human rights abuses). It is claimed that there are far more environmentally friendly and humane ways of producing renewable energy such as tidal power, solar power, capture of lithium from car batteries and the capture of the greatest pollutant of all, methane, and its conversion to energy. Also ref to chemtrails and spraying of aluminium oxide into the atmosphere, problems associated with methane in frozen lakes around the world.

4.4.5.3 Alternative Renewable Energy Sources not adequately investigated

- *Alternative renewable energy sources* - are far more promising, stable, constant and sustainable in production and construction terms - solar, biomass, biofuels, hydrogen, tidal, wave, hydroelectric, geothermal, deep geothermal, wind at sea (floating WF to be developed by UK Gov. backed research). Deep geothermal (the 2015 Spring legislative programme features the Geothermal Energy Bill no.46) potential in Ireland due to the Caledonian fault line traversing the country (e.g. 'Hotwell' near Enfield) from Limerick to Dundalk and has been used in other countries such as Austria. Developing a deep geothermal plant at Dundalk would obviate the need for extensive cabling.
- *Legitimate goals for alternative renewable energy sources* - were set and should be carried out rather than just building loads of wind farms. In other words, to facilitate government policy only the most appropriate sites should be used - not change policy. Government White Paper applied initial target of 33% of electricity consumption from renewable sources by 2020 (15% by 2010) through support for research, development, commercialisation and technology transfer as well as grid connects and planning issues for offshore wind, ocean technology and biomass'. It is not government policy that 40% must come from onshore wind. This would obviate the need for the Offshore Renewable Energy Plan, the draft Bioenergy Plan, energy efficient measure and the draft Geothermal Energy Development Bill 2010, along with all other measures being explored by Government and SEAI.
- *Lack of justification on grounds of wind speed* - section 1.2.7 of EIS estimates wind speeds for site of 7-7.5m/s. 7m/s doesn't hit the speed needed. Running only 35% captive raw wind, the wind isn't there to warrant intrusion of the development. Not aware of the wind monitoring mast adjacent the Cloncumber cluster referred to in EIS. The wind speeds for Baldonnel are not relevant as it is located in a tunnel which affects same and is not representative.

- *More appropriate locations* - The applicant submits there are no wind farms within Meath or Kildare. Based on OSI Wind Survey and SEAI Wind Atlas 2013, there are far better areas in Ireland for WF with greater generating capacity. The applicant appears to take the view that if there is a poor wind area, simply erect massive tower to get as high as you need to get the wind required.

4.4.5.4 Policy Vacuum

- *Wind Energy Strategy not in place* - KCC prepared Wind Energy Strategy but was instructed to suspend any variations to the Development Plan by the DoECLG until such time as the anticipated revision to the WE Guidelines is published and DCENR Framework Plan for Renewable Energy Export policy have concluded. However, the Framework Plan has yet to be completed and the Guidelines have yet to be revised. In the meantime, there is a policy vacuum as there are no national, regional or county strategies in place.
- *Piecemeal wind energy development* – In the absence of any national, regional or local strategies to guide the best location for wind energy development, development is developer-led instead of being plan-led. This is unacceptable, particularly in the case of large scale developments such as Maighne, as it results in ad hoc, piecemeal and haphazard development.
- *Premature development* – The Wind Energy Planning Guidelines 2006 and the Regional Planning Guidelines for the GDA each require P.A.s to identify areas suitable for WE development. Neither KCC nor MCC have such strategies in place. In absence of such a plan-led approach, development is premature and should be refused.
- *Developer-led infrastructure provision* - all previous major infrastructure has been the subject of considerable public scrutiny, debate and planning in a democratic manner, e.g. Motorways, regional landfill sites, regional waste treatment plants etc. This development, in contrast, is developer-led in the pursuit of profits and they see no value in the beauty of the area. It is considered to be a ‘Stalking horse’ for further such development e.g. Bord na Mona - a third wind farm to the south and west of Rathangan in the valley of the River Slate/Grand Canal.
- *Sieve Mapping Analysis* - Wind energy mapping should include sieve mapping analysis of the main constraints as required by WEPG 2006. This process should include the location of sensitive equine operations, given the strategic importance of the equine industry to Kildare.

4.4.5.5 Wind Energy Planning Guidelines 2006

Guidelines outdated

- *WEPG 2006 are out of date and currently under review.* Revised guidelines will establish new setback distances for dwellings and more stringent controls to protect properties from the impacts of noise and shadow flicker.
- *The WEPG 06 do not relate to size of modern turbines* - were devised in relation to turbines which had a hub height of 50m, and the 500m setback distance was based on a setback distance of 10 rotor diameters. This is completely irrelevant to the turbines being proposed today which are over three times the height. This setback is completely inadequate to protect residential amenities.
- *Premature and inappropriate* – it would be inappropriate for the Board to grant permission for a wind farm of such a large scale and with such tall turbines in close proximity to a significant number of houses, when the Board is cognisant of the imminent revision of standards in the review of the guidelines. Scale of development significantly exceeds that envisaged in the guidelines.

Non-compliance with WEPG 06 Guidelines

- *Layout and Scale* - Contrary to locational guidance in terms of the layout, spatial extent, scale relative to landscape and cumulative impact. Turbines should have respect for scale and human activity. A grid layout is suggested for a flat landscape and they should never dominate the landscape visually and should not therefore be tall. The current proposal fails to comply with these guidelines.
- *Noise and Shadow Flicker* - Contrary to locational guidance in terms of the noise and shadow flicker standards
- *Wind-take* - to ensure optimal performance and to account for turbulence and wake effects, the minimum distance between turbines is recommended at 3 times the rotor diameter in the cross wind direction and 7 times Rotor Diameter in the prevailing down wind direction. The distance from adjacent property boundaries should not be less than 2 Rotor Blades except with the written agreement of the third party landowner. No letters of consent provided with respect to wind-take and is contrary to the guidelines.

4.4.5.6 Revised Wind Energy Guidelines

- *Huge Response to RWEG consultation* – 7,500 submissions received, the majority of which favoured the increase of setback distances from properties and of thresholds in respect of noise, shadow flicker etc.

- *Setback distances likely to be increased* – 500m (current guidelines) totally inadequate and ignores cumulative impact. 700m distance mooted is also inadequate. Setback needs to be 10 rotor diameters as supported by research findings (Hanning, Yano etc.)
- *Setback distance should be increased to:*
 - i) take account of flat landscapes which offer less mitigation from visual, noise and shadow flicker impacts than upland areas,
 - ii) reflect increased height of wind turbines with a setback distance to turbine height ratio of 10:1,
 - iii) acknowledge specific vulnerability of thoroughbred industry,
 - iv) to provide for the noise limits to apply to boundary of thoroughbred breeding facilities,
 - v) provide for mitigation specific to the thoroughbred industry,
 - vi) provide for prevention of visible encroachment on the undisturbed rural landscape surrounding studfarms, etc., to prevent flight of capital investment from the industry.
- *Noise Setback Distance should be amended to*
 - i) adopt LAeq(time) noise measurement method recognised by the WHO,
 - ii) amend absolute noise limit to a hybrid limit that takes account of different noise environment,
 - iii) impose stricter noise limit where turbine produces discernible beating character (say 33dBLAeq(time)),
 - iv) require background noise measurements across noise receptor area to accord with EIA Directive and,
 - v) require that predictable audible noise modelling be used to take account of wind speed and direction and varying climatic conditions in order to determine realistic setback distances greater than 500m.
- *Shadow Flicker Setback Distance should be amended* – to require
 - i) planning applications to demonstrate, through use of solar projection and scattering models, how shadow flicker will occur and how it will be prevented at existing dwellings and other affected properties with 10 rotor diameter distance,
 - ii) mitigation comprising turbine shutdown schedules to be made publicly available and subject to review, and
 - iii) to require definition of 'other affected property' in s.5.12.1 to include 'thoroughbred breeding and training facilities' as SF is particularly invasive for people and animals with mild and acute photosensitivity.

4.4.5.7 Regional Planning Guidelines

- *RPG for GDA* - Proposal is contrary to the Regional Planning Guidelines for the Greater Dublin Area, which envisage offshore wind farms, not on shore.
- *Policy GIP2* - Proposal is contrary to Strategic Policy GIP2 which seeks to protect and conserve the natural environment and designated areas.
- *References to RPPGDA are selective* - does not refer to the following:
 - i) up to 240MW wind generation expected to be connected to grid from this region;
 - ii) wind farms provide new source of income for farmers where feasible, but development of new turbines needs to take place within context of clear development plan policies and the WEG;
 - iii) the GDA capacity for renewable energy is only 4% of the national, with potential wind resources largely offshore, with focus on strengthened network to facilitate demand being met by generators located in the west of the country.

- *RPPGDA identifies the following –*
 - i) 5500MW required to meet the 40% total consumption from renewables. This will require development of options e.g. offshore wind generation and marine-based energy generation subject to adequate capacity in the grid to receive, transport and distribute renewable energy.
 - ii) Recognises the need for cross-council regional wind energy study of WE potential, and appropriate location for varying WT types and appropriate policy response;
 - iii) Strategic recommendation to seek delivery of necessary integration of transmission network requirements in a sustainable and timely manner, and that a study is undertaken jointly by the L.A.s focusing on suitable areas for larger turbine projects, the role of micro wind energy in urban and rural settings and in industrial areas, providing regionally consistent land use policies and objectives and development management guidelines to potential projects.

4.4.5.8 Kildare County Development Plan

- *Kildare CDP (general)* - Wind farm contrary to policies in CDP due to scale which is inconsistent with the principle of proper planning and sustainable development. In particular, inconsistent with Chapter 8 Energy and Communication, Chapter 13 Natural Heritage and Biodiversity, Chapter 14 Landscape & Recreation, Appendix 3. Also strong emphasis on Tourism policies including natural environment, landscape and bogs.
- *Commuter belt* - CDP Core Strategy recognises importance of sustainable/integrated communities. 76% population of county commute,

which is unhealthy for sustaining integrated communities. Proposed wind farm would further disintegrate the nature of society by reason of reduction in property values, sterilisation/reduction in land use options, damage to farming enterprise options and negative effect on tourism options. Sterilisation of land along cable routes would exacerbate this and hinder sustainable population growth.

- *Kildare CDP supports green energy projects but only where there is adequate protection for landscape sensitivity, residential amenity, views and prospects, public rights of way, wildlife, habitats, SACs, protected structures, bird migration paths etc. Current proposal does not accord with this.*
- *KCC Energy policies - WE2 requires suitable locations to be chosen. WE3 requires consideration to be given to the scale, size, layout and cumulative effects of a WE project. This proposal contravenes WE3 due to geographical dispersal over 7 wind farm sites. CDP seeks to ensure that the location of renewable energy structures minimise/mitigate any adverse visual or environmental impacts on built/natural environment*
- *KCC Wind Energy Strategy – absent - This policy vacuum means any WF proposal would be premature, haphazard and piecemeal planning. KCC - reported on 23/12/13 that its CDP Wind Energy policies outdated and it is the intention of the Council to review these policies. Notwithstanding the instructions of Circular PL 20-13, it is intended to complete the review as a Variation to Chapter 8. In the meantime, applications of this scale, which are developer led, should be refused as premature.*
- *KCC - Environmental Sensitivity (Macro) - site is located in most sensitive part of county - Map 2.4 CDP. 'Western Boglands' is Medium sensitivity which means that it can accommodate development pressure, but with limitations in scale and magnitude. The proposed 5 clusters is contrary to this. CDP emphasises the extensive long distance views without disruption and the disproportionate visual impact due to the inability to absorb development. 'Northern Hills' and 'Chair of Kildare' adjoin NW Lowlands and W Boglands. These are High Sensitivity and Scenic views to/from these hills and from Scenic routes would be seriously compromised by Maighne WF.*
- *KCC Landscape protection policies – Maighne is contrary to policies on Landscape, Recreation and Amenity (Chap 14, Appendix 3) including Scenic Route classifications, Sensitive Landscape designations and Designated Views. The P&D Act requires the inclusion of such policies and objectives for the preservation of landscapes, views, prospects and the amenities of places, features of natural beauty.*
- *Designated views and Scenic Routes - Proposal contravenes 14.4.2, 14.9 and 14.10 as fails to preserve and protect the County's landscape and the character of views from designated views and scenic routes due to scale of WF and height, bulk of turbines.*
- *KCC - Policy Archaeology (chapter 12) seeks to ensure that development in vicinity of archaeological sites is not detrimental to the character of that site or its setting by reason of scale, bulk and location. Proposal is contrary to this and Policies AAO12, AAO14, AAO16.*

- *Leinster Outer Orbital Route* - the proposed route passes through the Drehid cluster (T11-T13). Renewable energy projects in Co. Kildare have previously been refused by ABP on the grounds that they were located on the pathway of the LOOR. Objective RP15 of KCC CDP 2011-17 seeks to protect zones along the key radial routes from Dublin where there are junctions with the proposed route of the LOOR.
- *Inconsistent with decisions of P.A. re protection of visual amenity* - KCC policies seek to protect the landscape and visual amenity of the area and refusals of pp are generally due to non-compliance with these policies. Yet the site of some such refusals (for single dwellings) are now within 5-600m of a proposed wind turbine. This is completely inconsistent with the approach taken to date with the protection of the landscape.
- *Rezoning agricultural land to industrial* - fails to respect landscape character by effectively rezoning large area of agricultural land to industrial/commercial use without appropriate public consultation
- *KCC WE Committee and Absence of Wind Energy Strategy* - EIS notes that KCC has not adopted a Wind Energy Strategy which would normally be driven by the LCA and landscape sensitivity ratings. But there can be little doubt about the Council's strategy having regard to the KCC's WE Committee submission to the DoE on revision of WE Guidelines and the KCC motion of 28 April 2015. The Board must have regard to the Kildare Wind Energy Committee submission which sets out the position adopted by the Council. Includes recommendation to adopt WHO noise measure LAeq, to amend absolute noise limit with hybrid to take account of quieter areas (absolute noise limit of 38dBLAeq) and of WT with discernible beating character (absolute limit to 33dBLAeq).
- *KCC adopted motion on 28 April 2015* - requiring substantial mandatory setback for all proposed wind farm projects in excess of the outdated WEG 2006. The proposal directly conflicts with this KCC motion in terms of its proximity to grid connections, impact on sensitive and scenic areas and local environmental impacts, including noise and shadow flicker.

4.4.5.9 Meath County Development Plan

- *Meath CDP - (general)* - wind farm contrary to policies in Meath CDP due to industrial nature and scale of development which is totally at odds with the beautiful countryside. Chapter 4 Economic Development Strategy, Chapter 5 Social Strategy, Chapter 9 Cultural and Natural Assets, Chapter 10 Rural Development, and Appendix 12 Views and Prospects; HER POL1 (to protect wildlife) and HER POL 2 (biodiversity).
- *Meath CDP - Landscape Policies* - Area has highly sensitive landscape including monastic heritage, protected structures, and scenic route classifications. Proposed development is inappropriate and will damage conservation, amenity and tourist development zones.

- *Landscape character areas* - location of windfarm development must have regard to Landscape Character Areas of the County (Ch.9 & Appendix 7 in Meath CDP). Proposed wind farm would constitute a Material Contravention of LCA14 referring to Royal Canal ‘...within this LCA....the impact of wind farms and turbines could be potentially significant...’
- *Local Area Plan Clonard 2009-2015* - LAC15 Southwest Lowlands is of high value and medium/high sensitivity. The proposed development is contrary to LAP objectives on zoning, heritage (archaeological protection), natural heritage, and to land use policies.

4.4.5.10 National Landscape Policy

- *The National Spatial Strategy* - places significant value of rural landscapes (S. 1.3, 3.5.3), and the need to avoid adverse impact on this most important national resource which underpins the rural and national economies. The NSS clearly envisages wind farms of cut-away bogs. However, only 3 of the proposed 47 turbines are on cut-away bogs.
- *SEAI guidelines for windfarm development* - wind speed is most important requirement, the size of the site, access to a local grid entry point, visibility of site from important viewpoints, proximity to dwellings, ecology, archaeological, architectural and cultural heritage, recreational uses in restricted areas (e.g. airports)
- *The European Landscape Convention* (AKA the Florence Convention), formally ratified by Ireland in 2002 and in force from 1st March 2007, has been side-lined by the Government and denies Irish citizens the protection of the Convention. The Convention commits all parties to recognise ‘Landscape’ in law; to establish and implement landscape protection policies; to establish procedures for public participation in landscape matters; and to integrate landscape into a range of national and regional policies;. A fully implemented Convention would stand in the way of degradation of the landscape which is inherent in wind energy development. The proposed development is contrary to the Convention and the Convention is not referred to in WEG 2006.
- *National Landscape Strategy* – The proposed development will make it impossible to meet the objectives of the National Landscape Strategy for Ireland 2014-2024. The Foreword of the NLS states ‘landscape is composed of various elements and have to be taken together, not in isolation. It emphasises the importance of the long vistas tying the layers of landscape together; Section 1.1 Objective will ‘help us support a living landscape and strengthen community identity, but a large wind farm by outsiders will be to the detriment of community spirit; Section 1.2 Objective to ‘carry out evidence-based identification and description of the character...of the landscape’ (e.g. Environmental Geophysics Unit, UCD, study).
- *Lack of national guidance and regulation* - Reference made to Scottish guidance in the landscape and visual assessment emphasizes the lack of national guidance and regulation. The Landscape assessment in the EIS

refers to 'Guidelines for Landscape and Visual Impact'. However, it is submitted that this was produced by the Landscape Institute, which it is claimed, is a client of the wind industry, and it attempts to create an illusion that wind farms are entirely natural and beneficial to the landscape.

4.4.5.11 Policy approach in UK/Northern Ireland

- *Northern Ireland Environmental Agency* - EIS does not take into account the Review of the Impacts of Onshore Wind Energy (by QUB) commissioned by the NI Environment. Agency
- *Northern Ireland Best Practice Guidance to Planning Policy Statement 18 'Renewable Energy' August 2009* - recommends 10 rotor separation distance from any occupied property. This should be mandatory to mitigate noise, sleep, health, property value, shadow flicker and general amenity.
- *Change of policy in UK* – The UK Government has shut down the generous subsidy scheme for the wind farm industry, [Daily Mail, May 2015, Gosden], reflecting a similar policy change in other countries. According to UK Energy Secretary, Amber Rudd, no more on-shore wind farm schemes will be given the go-ahead unless they have the support of local people. It would be inappropriate to allow a development in Ireland to generate energy for the UK that would not itself be allowed in the UK.

4.4.5.12 Policy based support for proposed development

- *Green energy must replace fossil fuels* - must move away from fossil fuels to cleaner sources of energy. Projects such as Maighne would help Ireland meet its renewable energy targets (2020) and avoid paying carbon taxes. Wind energy plays a major role in reducing Ireland's dependency on international markets. Kildare must play its part in increasing green energy production. Ireland will not achieve 2020 targets if projects such as this do not go ahead.
- *Wind energy development helps economy* - plays an important role in the attraction of foreign direct investment to Ireland as we need to be able to offer a reliable clean source of energy.
- *Tradition of energy production in area* - Long proud tradition of producing energy in this area with ESB stations in Allenwood, Portarlinton, Rhode and with Bord na Mona in Edenderry. These power stations are now producing alternative energy and it is a positive change.
- *Must embrace change* - people don't like change but change is good for the country. Must look to the future and be proactive rather than reactive
- *Support for project in area* - believes most people in favour of the development but afraid to express support due to vocal anti-wind lobby

4.4.6 Landscape and visual amenity

4.4.6.1 Visual Amenity – Dominance/Scale

- *Scale excessive relative to landscape* - Proposal to erect 47 turbines 169m high at 260m above sea level, with no backdrop landscape would be visually dominant against an elevated skyline backdrop and would adversely affect the sensitive landscape of this part of Kildare and damage the landscape character. The proliferation of excessively tall turbines would be visually obtrusive, out of character, out of proportion and inappropriate in this small scale, flat, low-lying midlands landscape. It would be totally unacceptable, overbearing and visible for miles around due to the excessive height, scale and spatial extent in a visually vulnerable and scenic rural area with a significant level of residential development. It would exceed the scale envisaged in WEPG 06.
- *Proximity to houses, farmland and recreational uses* – There are over 1000 homes within 10 rotor diameter distance, which would give rise to an excessive visual intrusion due to scale and height. The industrial scale of the turbines is incompatible with large number of houses, farmland, hotels, golf courses and stud farms.
- *Screening ineffective* - no amount of tree planting or screening could mitigate such a massive visual impact on rural landscape and no planning conditions could reduce the visual impact. The adverse impact would be exacerbated in late autumn, winter and early spring when deciduous plants are not in leaf. EIS statement that degree of vegetation would limit views disputed.
- *Visual impact exacerbated by spinning effect of blades* - Impact on landscape not limited to effect on views of fields, trees and hill, also exist within the sky, clouds and sunlight. Tall turbines are highly visible against the sky for long distances. Their blades passing in front of the sun produce light strobing effects similar to flashing lights in a night club and their red aviation warning lights adversely affect the landscape at night.
- *Low wind speed area* – the proposal is sited in an extremely flat landscape and the associated low wind speed necessitates enormously high turbines, in order to obtain the necessary energy feedback. The proposed turbines are amongst the tallest in Ireland which is so flat and lacks any structures or natural features to counteract the height of the turbines.
- *Turbine Height Unprecedented* - comparison with permitted turbines and Images of Mount Lucas WF - Observation No. 43 Pg. 35-36; Observation No. 59 pg. 31-32. Mount Lucas turbines very distracting. No source of analysis given to support height of turbines and wind speeds given support lower hub heights of 101m (Wind Atlas).
- *Severe Visual Impact on Property No. 60* - surrounded by turbines T40, T41, T42, T43, T44, T45, T46 - severe visual impact and seriously adverse impact on residential amenity as turbines visible and dominant in every view from home. Currently flat landscape surrounding property apart from a Coillte

forest, but the trees are only 20m high and would not screen the effects of the turbines.

4.4.6.2 Layout and extent

- *Piecemeal development* - Derrybrennan 2 turbines - isolated from other clusters - would require extensive cabling to facilitate connection to grid. Wind turbines not connected to the established land use.
- *Unprecedented geographic extent and scale of development* - there have been no applications for large-scale development in the general area. KCC well known for application of meticulous detail to issues re visual amenity. This development would have massive, permanent and irreversible negative implications on visual amenity. Every time one travels for work, school, shopping, recreational pursuits and other daily living requirements will be affected.
- *Best Practice Layout* - WF should respond to topographical profile achieving a visual balance and accentuation of landform. In order to achieve appropriate spatial extent, there should be sufficient distance from buildings especially at lower elevations to avoid dominance of turbines. Proposal to erect 47 turbines of 169m height in an area with no back-drop landscape would exceed the capacity of the landscape and the scale envisaged for in the 2006 Guidelines. WEPG requires Grid Layout in flat landscape - dispersed, non-geometric layout clearly does not comply with this.

4.4.6.3 Rural character of area

- *Height, Scale, Size - Inappropriate to rural character* - Size, scale and quantity overwhelms area - can be seen 20km away. Height of 169m at the very top end of the scale of turbines permitted in country to date, would dwarf dwellings and the sheer industrial size of the turbines is totally out of proportion with any natural feature or development in the area. Trees in area around Cloncumber are 20m tall and are the highest things in the landscape apart from Boston Hill. Contrary to advice in Guidelines which states that turbines should relate to the scale of landscape and should not therefore be tall.
- *Proposed development completely at odds with the character of the natural environment and would damage the landscape irreparably* - ref to 15.12.2 in EIS where it is acknowledged that development would introduce movement into a static landscape and built elements into one that is currently characterised by low levels of such development. WF should therefore be rejected.
- *Dramatic intervention* - Dramatically and drastically alters character and appearance of rural area which people have enjoyed for generations due to the industrial nature and scale of the development which is out of character with the beautiful countryside. Will dominate small villages and towns

- *Industrialisation of countryside* - transforms area from tranquil low-lying rural area to an overwhelmingly industrial one - industrialises an agricultural landscape. Introduction of large industrial turbines will result in a grotesque visual impact on a low-lying, flat and picturesque setting. Turbines would have a massive, permanent and irreversible impact on visual amenity.
- *Cumulative effect* - wind farm, together with other WF's in neighbouring counties, would have a cumulative, transformative effect and would create an industrial wind farm landscape.
- *Artistic inspiration of boglands* - Derrycrib and Hortland have been landscapes that have inspired artists for years (e.g. Terry Harrington, Maura Roche). Proposed WF would destroy skyline of this bog.
- *Marginal land* - More suited to marginal land. There are many areas in Ireland where the housing density is much lower and which would be more suitable locations for wind farms than this flat lowland county. This development is not comparable to the development of wind farms in a mountainous area.
- *More massive than any manmade structure in Ireland* - Higher than the Spire or Liberty Hall and it would not be possible to introduce such structures within the countryside without impacting on the visual quality and the nature of Ireland's landscapes. Dublin Spire just 120m, and the towers at 109m would be 49m taller, and the blade tip height would be 109m taller, than Liberty Hall. In one fell swoop, 47 turbines would utterly destroy the landscape of NW Kildare.
- *Visual and Wildlife quality* - Wind turbines, pylons & substations do not only have a visual impact but also impact on wildlife, which in turn, degrades the quality of our landscapes

4.4.6.4 Landscape Character of area

- *Landscape Character means* - distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape and how these are perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place. The capacity of a landscape to accommodate change will vary with the landscape type and the nature of the change. There is no capacity in the Kildare landscape or the Meath landscape to accommodate these industrial scale turbines. The WF would cause damage to the landscape character. Will affect both the area around the WF and the wider area from which the turbines will be visible.
- *Kildare CDP Landscape protection policies* - Proposal is contrary to CDP re landscape protection policies, including scenic routes and protected views, and the value of the landscape. EIS is therefore fundamentally flawed.
- *Meath CDP Landscape Protection Policies* - Proposal is contrary to Meath CDP re landscape protection policies, including scenic routes and protected views and the value of the landscape.

- *Landscape character areas inadequately addressed* - Although red line within just 2 LCAs, given the scale and extent of development, impact on adjoining LCA's would be more significant than stated in EIS. Especially re Grand Canal, Northern Hills and Chair of Kildare. Water corridors and upland areas inadequately addressed in EIS. Development would adversely affect these LCAs.
- *Midland Bog Landscape* which may be a candidate for SAC status - asset would be lost if industrialised in this manner. Contain distant horizons with little in the way of man-made structures - very rare in Europe - international value. Growing attraction within Ireland and for visitors from abroad. Turbines would destroy the visual integrity of these landscapes.
- *Western Boglands* - Flat terrain with undisrupted vistas over long distances - 2 no. critical landscape factors:- Landscape characteristic - smooth, flat terrain means disproportionate visual impact due to inability to absorb development. Designated as Medium Sensitivity means that limitations on scale and magnitude that can be absorbed. Bogland Type Vegetation - usually uniform in appearance, failing to break up vistas and allowing long distance visibility. Thus this landscape is incapable of absorbing new development.
- *Flat Open Lowlands, with scattered trees and scrub vegetation*, framed by Northern Hills and Hill of Allen to/from which there are protected views in the Development Plan (KCC). Lowlands not capable of providing the level of screening suggested in the EIS and protection of views ignored. EIS states only 20m difference in height variation across the area of the development. This demonstrates how flat the landscape is and how the WF would dominate the landscape.
- *Varied and working nature of lowland landscape* - Policy LL1 CDP - not sufficient justification for proposed industrial type turbines. Although bog - working landscape, has been devoid of large-scale man-made structures. Rather than a "robust and productive rural area without a high degree of distinction or uniqueness", it is described in the SEA as the most environmentally sensitive area with a medium level of landscape sensitivity in the CDP.
- *Kildare Natural Heritage Guide (KCC & KELT, 2008)* - combination of large flat plain, the west central and eastern upland areas together with the background skyline of Wicklow Mountains, River Liffey confluence and River Barrow that provide high amenity and aesthetic value "like no other". Proposed MWF is not compatible with these findings. Will cause damage to this landscape character and skyline will be permanently altered.
- Cloncumber LCAs - Cloncumber made up of 3 no. LCA's. Uplands - Dunmurray Hill/Boston Hill/ Hill of Allen; Lowland Plains & Boglands - Lullymore; River Valley & Water corridors - GC Lock 20 Ballyteigue, Lock 22 Glenaree. Cloncumber more like 'Hilly & Flat' Landscape type - will be viewed to/from Chair of Kildare.
- Drehid Hortland – 'Hilly and Flat' LCA rather than 'Flat Peatland' LCA - does not fall into 'Flat Peatland' description as not vast planar extents and plenty of

evidence of human habitation. More akin to 'Hilly and Flat' LCA. EIS does not adequately address LC types as per WEPG. Proposed Drehid/Hortland cluster would have a significant effect on the local landscape and its visual amenity.

- Lullymore is effectively an island (1.5sq.mile) of rich fertile land rising out of the bog. It is an inhabited rural area with working farms and extensive ribbon development. It is characterised by flat terrain and rich vegetation defined by clusters of trees and low hedgerows.
- Boston Hill viewing lay-by on Naas-Rathangan Road - beautiful vistas of boglands from here would be ruined by wind turbines. Residents of Boston Hill will be looking directly into 11 turbines.

4.4.6.5 Landscape sensitivity

- *Dispersed layout inappropriate* - in Medium/High Sensitivity landscape as results in maximum adverse impact on the environment and on heritage value of area. Landscape designated in CDP as Medium/High Sensitivity means that it is vulnerable with limited capacity to accommodate development. When pressure for development exceeds capacity, landscape character can change. This landscape is not suitable for large scale industrial development of the type proposed and it should therefore be rejected
- *Dominant and visible for miles in all directions and from sensitive vantage points* - including Carbury Castle and Hill, Donadea Forest Park, Hill of Allen, Dunmurray Hill, Dunfirth Hill, Boston Hill, Red Hill, Cappagh Hill, Rathcore Hill (Meath). Would be dominant and obtrusive when seen against the elevated skyline background from public roads and turbines would dwarf these hills. Also visible from canal system and Bog of Allen landscape as well as Monastic Village of Clonard, from the Motte of Clonard and by tourists travelling to Trim Castle.
- *Carbury Hill & Carbury Bog* – the landscape surrounding Carbury is largely low-lying, with Carbury Bog located to the North/NW of the village and further extensive areas of bogland lying further to the East, South and SW. Carbury Hill, an important cultural landmark, therefore, stands out as a prominent topographical feature in this landscape.
- *Ovidstown Hill* - Views to/from Ovidstown Hill are protected, yet turbines would exceed the height of this hill (135m above sea level) by approximately 95-100m. Ovidstown Hill was site of battle of 1798 and Cappagh Hill, which is noted as the most arable lands in Leinster and marks the boundary between Meath and Kildare. View from Newton Lawns shows that 4 turbines would be visible above Ovidstown Hill (P01 Kedr02; P012 Kedr30), which reinforces the level of visual obtrusion w.r.t. height and scale
- *Rathangan* - Cloncumber cluster will be visible from a large part of Rathangan along the line of the river/canal and from all approach roads to the village. Yet no opportunity was given to locals to question the developer.
- *Ballyteague area* - very special quality of environment which is both peaceful and rich in biodiversity. Scenic area which has a close-knit community which

is centred around the Grand Canal, its towpaths and the forest. This area must be protected and enhanced for future generations.

4.4.6.6 Protected Views and Scenic Routes

- *High Sensitivity Landscapes and Scenic Routes* - based on these classifications in the Kildare CDP & Meath CDP, the development is inappropriate and will damage conservation and amenity areas as well as tourist development zones. *Chair of Kildare & Grand Canal corridor* - designated as High sensitivity landscapes, which means that they are vulnerable landscapes with limited ability to accommodate change. *Carbury to Broadford* is listed as a tourist route which forms part of Scenic Viewpoint 28 - "high quality vistas to surrounding environs".
- *Protected views/Scenic Routes* - Scale and layout would be visually dominant and prominently obtrusive in views from Carbury Castle and Hill, Dunmurray Hill, Boston Hill, Hill of Allen and Newton Hills, which are protected/scenic views. Also affected would be views of Robertstown countryside, views across the canals, views of Kildare Plains and Boglands from Hill of Allen. Views for county Roads of Carbury Castle and Hill. Policy SR1, HV1 and Map 14.3 of CDP refers. Note designated views No's 6, 19, 20, 27, 28, 37, 38, 39 and Grand Canal views from bridges GC11, GC12, GC13, GC15, GC17, GC18, GC22. All of these views will be impacted by development and would materially contravene these policies of CDP. EIS has not adequately addressed the impact on these views. Note view from Viewpoint 20 (Newton Hills) extends across the "Plains of Kildare" and proposed Hortland cluster would lie in the RH quadrant of this view and would defile this view.
- *River valleys and canal corridors* are highly sensitive landscapes which allow vistas over long distances without disruption and as visually difficult to absorb development. This is recognised in the Kildare CDP (Chap 14). Policies WV1, WV2, WV4, WC3 seek to preserve and enhance the scenic amenities and vistas associated with these corridors. Proposed development inconsistent with these policy objectives. EIS fails to address these policies, which is a material contravention of the CDP. The proposed development would have a material and deleterious effect on the quality of the vistas available on canal corridors due to proximity, scale, height of turbines. Considerable number of Protected Views from canal bridges throughout area affected by the proposed development.
- *Scenic routes - Hortland cluster* - close to Hilltop Views and a Scenic road (No. 20) to NE (Northern Hills). Views of Plains of Kildare & West Central Boglands and Views to/from Newton Hills will be adversely affected. Donadea area is very historic, rural and unspoilt with natural bogland. The proposed turbines will have a significant visual impact on this landscape.
- *Scenic Routes around Cloncumber cluster* - flat landscape with views in need of protection. Many scenic routes and protected views (Table 14.2 CDP) including extensive views to/from hills (including Hill of Allen), and primary

and secondary ridgelines which must be protected. Turbines of this scale will interrupt integrity of ridgelines, which are dominant landscape focal point, and would have significant effect on landscape and visual amenity. Turbines would be visible for 30km radius.

- *Scenic route Rathangan - Allenwood via Lullymore* - extensive views of intact bog at Lullymore can be gained from this local road, with Red Hill, Boston Hill and the Hill of Allen defining the skyline around the bog. Views from this road would be seriously compromised due to superimposition of such large structures - will dominate this flat landscape and cannot be absorbed into landscape.
- *EIS analysis of impacts on designated scenic routes flawed* - e.g. Route R425 Rathbride, the Harberton Bridge on Barrow line, Hilltop view Tower of Hill of Allen, Hill of Tara. The analysis of impacts on these illustrate a serious disconnect to what the designations represent and the purpose of the intention of retaining the character of the landscape, which was not to provide an opportunity for people to come and view a wind farm. This undermines the purpose and intent of the evaluations of the impact on designated views. The Guidelines for Landscape and Visual Assessment (GLVA) identifies the visual receptors most sensitive to changes in views and amenity as
 - i) residents at home,
 - ii) those at outdoor recreation,
 - iii) visitors to heritage assets,
 - iv) communities where views contribute to the landscape setting enjoyed by residents,
 - v) travellers on recognised scenic routes.

4.4.6.7 Inadequacy of EIS

- *EIS fails to address alternative sites* - Geographical extent and effect of dispersed nature of development, which exacerbates impact, is ignored by applicant. The wind farm alone extends over 30km N-S and 23km E-W, affecting over 100 townlands. There is no justification for dispersed layout and no consideration of alternative layouts. EIS plays down the impact due to the dispersed nature, but ignores the effect of the dispersed clusters on those closest to the turbines. However, the impact on those living in between two or more clusters would be unacceptably greater.
- *EIS fails to address alternative turbine design/height* - tip height range of 156-185m considered but not heights lower than this. This is inadequate and no justification for heights given. Turbine design not yet finalised.
- *Inadequate description of scale/extent of development* - proposed WF extends for 30km N-S and 23km E-W and will affect over 100 townlands in NW Kildare and South Meath. This is not adequately stated in any of the documents submitted with the application.
- *Theoretical Visual Impact* – EIS claims that TVI of 600-800% occurs where at least 5-6 turbines located within 2km. However, as such areas are largely

contained within bog areas, well away from the nearest residential receptors, EIS concludes that the effects would be noticeably greater than where fewer turbines occur in the immediate area. This is strongly refuted as there are very many residential properties within 2km of the D/H cluster, for example, and other clusters. Such a high TVI is "hemmed in in the middle of a WF, rather than looking in from the outside"

- *Photomontages inadequate – integrity challenged in following ways –*
 - V.P.R's are very limited in number despite long stretches of roads with views over flat landscapes and the high number of residential properties in the area.
 - A number of roads with direct views are ignored and are not based on the worst-case-scenarios. Eg P14 (i) KEDR38, P34 (i & ii) KEDR39.
 - Need a series of photomontages from around the area of each cluster.
 - There should be a medium sized tethered balloon to a height of 169m for each cluster to enable an assessment of the impact of the height of the proposed turbines on the surrounding landscape.
 - Irrespective of the no. of turbines visible from a VPR, any number of turbines at the scale and height proposed would have a significant effect.
 - No VPRs from heritage structures/protected structures such as Williamstown House, Clonard Village
 - No views from Northern hills – only 800m from nearest turbine and from where all turbines will dominate landscape.
 - Failure to demonstrate impact from settlements eg. Kilshancoe – nearest VPR 3km away from village.

Other examples of these issues:-

- Timahoe Crossroads & Local road south from Knockanally - adjacent views are much more open and screening effect of hedgerows only effective in Late Spring and Summer.
- Protected view from Newton Hills at 110m OD overlooking Hortland cluster – significant impact regardless of no. turbines visible.
- The flat open landscape around Cloncumber, with many stretches of 'red-lined roads' on the maps (in EIS), are not adequately represented in the photomontages.
- In Allenwood South, only one photomontage provided - Shee Bridge. This misrepresents the significance and extent of the impact on this entire area.
- *Impact on Canal corridors* underestimated - the justification in EIS for low sensitivity value of canals is due to previous industrial associations. This is utterly refuted due to the high amenity value of the canals and their status in the area. View 06Ah4 – contrary to European Landscape convention – Visual blight on canals due to proximity and scale – T1, T2, T7, T8 within 500m.

- *Subjectivity of Landscape assessment* - the validity of ratings rests on judgements about the quality of the landscape which varies depending on who is making the judgement. The judgement of the assessors differs from that of the local residents because the assessment focuses too heavily on the Designated Views, Scenic Landscapes and Scenic Routes. It disregards the importance and value of residential amenity, of people's sense of place, and of attachment to place. This is unjustified given the high density of population throughout study area.
- *Categories of 'Sensitive Receptor' disputed* – Failure to identify any 'highly sensitive' visual impact receptors or to acknowledge impact on individuals and the communities within which they live.
- *LVA assessment criteria* - Disagree with Assessment Criteria and over emphasis on high value landscapes - e.g. Cut-over bog - would be 'naturalistic' once left undisturbed, and sensitivity value is demoted on these grounds. The 'Number of turbines visible' is also irrelevant, given the 169m height and close proximity to roads and to where people live. The actual number of turbines visible from a viewpoint is irrelevant in terms of the impact. The visual impact from local roads throughout the area would be major, regardless of the number of turbines that would be visible due to the size and scale of the structures. Landscape Assessment should be based on Appraisal of Landscape Capacity which takes a broader account of landscape sensitivity and of landscape value, but overly generalised in EIS.
- *Landscape Sensitivity Values underscored* - Judgements on ratings of impact is lower than can be justified. Landscape Sensitivity status – the values reduce from 'Moderate' in CDP to 'Low' without adequate justification. The consequence is to lower the overall impact. Categorisation as 'robust' and 'productive' and 'without a high degree of distinction or uniqueness' contrasts with SEA – most environmentally sensitive with Medium sensitivity level.
- *Mitigation measures inadequate w.r.t. choice of tall turbines dispersed in the landscape as a means of reducing impact.* The contrary is also true - 169m high turbines in flat landscape have a significant impact. The justification for tall turbines and a wide spread is inappropriate as both of these measures can also be seen as intensifying the negative impacts of the development.
- *LVA Value Judgement* - Mitigation is inadequate as the scale of the contrast between the turbines and residential dwellings could not be described as 'slight'. The complementarity between wind farms and uses such as forestry, agriculture and peat extraction is difficult to sustain given the industrial nature of the wind farms.
- *No community consultation* – methodology of LVA criticised - no community consultation as recommended by Heritage Council in order to include local understanding in landscape assessment and disregards importance of people's sense of place. Impact from nearest dwelling - not assessed in EIS. Most of visual impacts assessed in terms of views from a distance. Failure to include local consultation weakens the conclusions.

4.4.6.8 In support – visual impact

- One observer (118) had no objection to visual impact of wind turbines.

4.4.7 Cultural Heritage

4.4.7.1 Rich cultural heritage of area and wider landscape

- *Ancient and Historical Landscape* - Area has exceptional wealth of historical and archaeological sites. Locating a wind farm here would negatively impact on the setting which overshadows an ancient and historic landscape containing listed buildings and archaeological sites. Stated that there are 114 Protected Structures, 282 Recorded Archaeological Monuments and complexes within 3km and 2 no. National Monuments all within 5km of the wind farm. Proposed WF would also impact on views from Hill of Tara and Trim Castle.
- *Historically rich area with noteworthy ancient/historic sites of significance* - including ancient routes through the area, battle sites, landmark features and remnants of the past. These include the Hill of Allen, the site of the Battle of Allen, ancient Toghers which linked Cross Patrick Hill with the Bog Islands and ancient ringforts/raths in Cloncumber and Drumsru. More recent historical sites include the Fitzgerald Castle of Ballyteague close to the Grand Canal, Mass Rocks from Penal times, (including Ballyteague Mass Rock), the Mass Path from Drumsru to Allen Catholic Church, Cross Patrick Hill. All of these are of great historical significance and used by the local community. There is the potential to develop historical tours based on these ancient and historically important sites. These tourist and heritage features would be diminished by the proposed wind farm.
- *Kildare has a wealth of architectural and archaeological heritage* - Extensive archaeological heritage in close proximity to site - 152 historical monuments and 46 protected structures within 2-3km. Includes Lullymore Monastic Complex and Carbury Hill. Placing a wind farm here would negatively impact and overshadow an ancient and historic landscape. Reference also made to various archaeological sites/recorded monuments listed in Kildare CDP Sheets 12, 17.
- *Meath has a wealth of architectural and archaeological heritage* - Extensive archaeological heritage in close proximity to site - Includes Clonard Monastic Complex and Village, Grange West, Carrick Castle, Donore and low lying lands between Boyne & Blackwater Rivers. Placing a wind farm here would negatively impact and overshadow an ancient and historic landscape and visually overpower protected structures and ancient sites.
- *National Monuments and Protected Structures* – Permanent adverse impact on National Monuments and Protected Structures e.g. Carbury Castle, Taghadoe Round Tower and Abbey, Knockanally House, Ballyteague Castle,

Ardkill Castle, Donadea Castle, Carrick Castle, Foxes Hill, Croppies Grave, St. Finian's Monastery and Well, Lullymore Graveyard, Grand Canal, Royal Canal, Clonard Motte, Monastic site at Clonard, Tichrohan Castle, Ard na Reilige, Leinster Bridge, Toll House, Tyrell's Fortified Mansion, Clonard Old Inn, Brennanstown Hill (1798 Rebellion battle site). These sites have been inadequately, or not addressed, in EIS.

- *Industrial heritage plays an important role* in the county with the canals making a strong contribution. The Grand Canal commenced in 1756 and helped sustain urban and industrial growth in the area.

4.4.7.2 Contrary to national and local policy

- *National policy is clear* that views associated with heritage assets should not be adversely affected. It is impossible to think that this will go ahead and ruin the character of protected monuments.
- *Contrary to KCC CDP policies* - There are numerous historical monuments and protected structures which need to be taken into account in the assessment of the impact of the proposed wind turbines. These are listed in the CDP for Kildare (chap 12). Policies AH1 and AH3 prohibits development in the vicinity of a recorded feature where it would detract from its setting and require an archaeological assessment.
- *Kildare Archaeological sites* - Reference to individual Archaeological monuments and historic sites/recorded monuments/protected structures - Kildare - listed in Observation No. 199 (Aisling Cully, Broadford). Taken from Co. Kildare CDP.
- *Meath Archaeological sites* - Reference to individual Archaeological monuments and historic sites/recorded monuments/protected structures - Meath - listed in Observation No. 108 (Patrick Buckland, Longwood). Taken from Co. Meath CDP.

4.4.7.3 Architectural heritage

- *Longwood ACA* - Wind farm will dominate and permanently alter the visual impact of the landscape in the vicinity of Longwood Architectural Conservation Area, with specific impact on a number of Protected Structures. In particular, the impact on the following must be assessed. RPS Nos. MH047 - 207/208/209/211/212/213/214, 234, 237, 241, 249, 250, 254
- *Protected Structures* and associated demesnes – there are several country houses with associated designed landscapes and/or demesnes in close proximity to proposed wind turbines. These include Ballinderry House (RPSO3-05), Newbury Hall, Williamstown House, Balrennet House (RPSO3-09), The Haggard & Demesne (RPSO8-275), and Teelough House (RPSO8-26), Cooldyna House (RPS BO8-27). Reference made to English Heritage Guidance Document on definition of 'Setting of Heritage Assets'

- *Newbury Hall – c. 1750s – ascribed to Nathaniel Clements who had designed Aras an Uachtarain. This PS is of archaeological, architectural and historical significance with established links to Carbury.*
- *Williamstown House, 18th Century Palladian mansion RPS BO3-06 (1760), completely restored in 1999, is one of 10 houses with shared characteristics with Newberry House and some 18th Century Irish Houses' (Desmond Fitzgerald, 1966, Apollo Magazine) (designed by Nathaniel Clements who designed and lived in Aras an Uachtarain). The walled garden was completely regenerated since 1999 and the garden, part of a 700 acre estate, was awarded the Viking All-Ireland garden award in 2007 and is covered in Georgina Campbell's Ireland, a website reviewing outstanding gardens. T26 would be 1.2km to west, T45 would be 1.25km to southwest, and T24 would be 1.8km to southwest (within Windmill cluster). Yet no view of the proposed development taken from property. *Royal and Grand Canals* – a unique national resource and industrial heritage, including the Boyne Aqueduct, which would be impacted by the proposed development.*
- *Knockanally House - Protected Structure* – the outer boundary of this would be 534m NE of T46. It dates from 1850s, Italianate design. It is situated on the summit of a low hill and is designed to have extensive views of low-lying lands to the south. This would be totally compromised by the proposed Drehid Hortland cluster. It is currently occupied by Knockanally Golf Club. While 4 golf clubs are listed in EIS, this one is not. EIS Section 14.4.2.2 accepts that there will be an impact on the view captured by the house but it is concluded that it would be an indirect impact on the basis that it will not impact on the historical integrity or understanding of the site or its context and is considered to be 'Slight'. The Preface states that such impacts are non-permanent "persisting for the lifetime of the WF". This is strongly disputed.
- *Protected Structures on Woodlands cable route* - A full impact assessment must be carried out on the Protected Structures along the proposed Woodlands route including mitigation proposals - prior to commencement of development.

4.4.7.4 Archaeological heritage

- *Visual impact on Archaeological features* - WF would dominate and permanently alter the visual impact on a range of archaeological features in both Kildare and Meath. Reference is made to several archaeological items in Kildare on OS Map - CDP Six Inch Sheet 12/17. Reference is also made to the potential impact on a range of Co. Meath archaeological sites, including Grange West, Carrick Castle, Donore, Clonard motte and Clonard Monastic site. These sites have not been adequately addressed in the EIS. The application should therefore be refused.
- *Range of Ringforts and other Recorded Monuments at Cloncumber* – This area has an abundance of archaeological features. There are 2 no. raths at Cloncumber - Cloncumber Rath (KD017-004) and Drumsru Rath (not listed).

There are also two footbridges over the River Slate, as well as Glenaree Bridge, Feighcullen Field systems, Cloncumber Burial Ground and Drumsru Moated site.

- *Proximity of T33 to Recorded Monuments* - T33 would be very close to Cloncumber Ringfort, (KD017-004), a Road-gravel stone path (KD012-007) and Burial Ground (KD012-017), as well as Moated site Drumsru KD17-003 and enclosures at Drumsru (KD017-01/02).
- *Ancient roadways of Sli Dala and Sli Mor (from Tara) and Esker Riada to Edenderry*. The crossroads at Ballagh is part of the ancient highway linking Tara and the Hill of Allen. (See 14.8 of CDP) It would be a travesty to allow this ancient road to be excavated to facilitate the burying of high voltage cables, or to build a wind farm within close proximity of this ancient site.
- *Lullymore ancient roadways* - There are a number of ancient roadways within Lullymore known as 'Dane's Roads', estimated at 3,000-6,000 years old. These ancient roadways are located within the Drehid area and are of great historical and archaeological importance, and must be protected. However, they are not even mentioned in the EIS.
- *Possible moated site near T47* – There seems to have been an omission from EIS (See App 10 of Observation 715) in respect of this archaeological site in Drehid Hortland.
- *Crannogs discovered close to Blackwater* - near site of T46.

4.4.7.5 Historic Sites of Significant note

- *Overwhelming visual impact on historic sites* - Wind Turbines would visually overpower important historic buildings/ancient sites and their historical importance would be diminished. These include:-
 - *The Hill of Allen/Battle of Allen* - in the centuries preceding Fionn MacCumhaill, great battles recorded by the Four Masters in AD 562, AD718.
 - Lullymore East Monastic Site (dates from 5th century, founded by St. Erc) and modern burial ground with stone alleged to contain foot of St. Patrick);
 - Lullymore 1798 Monument (in honour of Captain John Doorly);
 - Lullymore Hunting Lodge (1860, family of Major Brundell Murphy);
 - Site of Battle of Ovidstown (1798) – Ovidstown Hill RMP KD004-106);
 - Brennanstown Hill - on the route from Enfield to Rathcore - one of the most northern battle sites of the 1798 rebellion.
- *Clonard Heritage Trail* – The wind farm would have an unacceptable adverse impact on this historically significant area. The heritage trail takes one through the centuries in the Monastic village, with the 12 Holy Men of Ireland who studied at Clonard. It also includes the following:-
 - St. Finian's Catholic church,

- Ancient Church of St. Finian on the monastic site
 - Baptismal font,
 - St. Finian's statue,
 - St. Finian's Well,
 - The Motte,
 - The Trough,
 - Ard na Reilige,
 - Leinster Bridge (predates Glendalough),
 - Toll House,
 - Clonard Old Inn,
 - Clonard Hall
 - Tyrell's Fortified Mansion,
 - The Croppies Grave and
 - Ticroghan Castle.
- *Carbury Hill very important site throughout history* – Its importance as an ancient site stems from the location of Trinity Well at the foot of Carbury Hill, which is the source of the R Boyne. It is suggested by archaeologists that it was of particular importance because the Hill of Tara was half way between Carbury, where R Boyne rises, and where R Boyne reaches the sea at Drogheda and was especially relevant to those who worshipped the R Boyne. Trinity Well is stated to be located on grounds of Newbury Demesne, which plays an integral part in the cultural landscape of Carbury. Thus the proposed WF would have a detrimental effect on this site.
 - *Carbury Castle and Carbury Hill/graveyard* – is also closely linked to Queen Elizabeth, whose ancestors are buried in the graveyard. Prior to this, Carbury Hill was an important Celtic site from the Bronze Age onwards. Lands were granted by Strongbow to Fitzhenry when the motte was first built. It also featured in the 1798 Rebellion. Carbury also linked with Eamon De Valera.
 - *Thatched cottage PS* - Dwelling no. 364 (Joe Leonard) protected structure and historic building, part of our heritage - should not have several large scale turbines in such close proximity
 - *Hortland road and bridges* - Bridges over Blackwater River which access the site could be adversely affected and are older than the state. Road which goes through Hortland past Ballagh Cross was the old road which connected the historical Hill of Tara to the Hill of Allen.

4.4.7.6 Deficiencies in EIS

- *Architectural heritage* - EIS failed to establish the exact nature and extent of the potential architectural heritage in the area and the vicinity, to identify the architectural heritage that might be affected by the proposal, and to assess this impact. Thus the Board cannot come to a conclusion on the assessment.
- *Archaeological heritage* - EIS inadequate - failed to establish the exact nature and extent of the potential archaeological heritage, to identify the

archaeological heritage that might be affected by the proposal, and to assess this impact. Potential significant adverse impacts not identified either.

- *Proposed post-decision archaeological assessment inappropriate* - the EIS acknowledges that the archaeological assessment process is incomplete and proposes to carry out a program of geophysical survey and test excavation after planning permission has been granted as part of the mitigation phase. However, this is contrary to the EIA Regulations and EIA Guidelines. *Architectural Heritage* - EIS has failed to establish the exact nature and extent of potential architectural heritage in the application area and vicinity and to assess the impact of the proposed development on this heritage.
- *Adverse impact* - due to these deficiencies, the Board cannot be satisfied that the proposed development will not have an adverse impact on cultural heritage and should determine that the proposal is contrary to the proper planning and sustainable development of the area.

4.4.8 Socio-Economic impacts

4.4.8.1 Tourism and recreational amenity of area

- *Widespread impact on tourism elements* - There are many elements of the tourism industry that would be affected. These include impacts on landscape, protected structures and national monuments, sites of historical and archaeological interest including ancient routes through the area, activity elements such as walking routes, cycling routes, fishing, boating, nature walks, forests, etc.
- *Rich and ancient landscape of Co. Meath* - strong pillar of local economy. Trim Castle (18km from Ballinacill cluster) attracts over 80,000 visitors every year. Would also be visible from the historic Hill of Tara
- *Fáilte Ireland* - landscape and beautiful scenery, people, safety, relaxed pace of life, unspoilt environment, nature/wildlife, history/culture and natural attractions are main reasons for tourists to visit the country. Other reasons included unspoilt environment, nature, wildlife and flora, interesting history and culture, good range of natural attractions. Thus a Plan-led framework would be most unlikely to allow for turbines in close proximity to tourism assets such as Lullymore Heritage Park. Tourism will inevitably be impacted.
- *Behaviour and attitudes survey Scotland* - Mountaineering Council of Scotland survey (2014) '*wind farms and changing mountaineering behaviour in Scotland*' found 68% respondents found WF made visiting Scotland less appealing, that mountain goers do not want to pursue activity in areas of WFs and change behaviour accordingly. This is consistent with other surveys. Surveys of general public suggest trend of rising visitor discouragement due to WFs from 10% (2008), 17% (2011) to 26% (2013). This contradicts the applicant's reference surveys from 2003 on attitudes to WFs and that of Bord Fáilte 2008 - long recognised that visitors to Ireland are heavily influenced by landscape and natural and built heritage.

- *Regeneration proposals for boglands* - once turf cutting has ceased, there are plans to regenerate/rehabilitate the boglands to create amenity areas for walkers, cyclists etc. such as that at Boora Bog. This proposal will interfere with such plans and will increase the divisions within the community even further.
- *Bog of Allen National Park* - huge potential to develop the cut-away bogs into national park, similar to Glenveagh in Donegal. Hill of Allen (219m) commands extensive views - remarkable as the site of the royal residence of Fionn McCool. Giant human bones discovered during construction of tower - said to be those of Fionn McCool.
- *Robertstown Area* - potential to develop this area as a recreational and tourism centre as per An Foras Fortbatha Report in conjunction with the boglands and a Grand Canal Linear park. This proposal was put forward for the proposed CDP 2017-23
- *Cloncumber Area* - an area of outstanding beauty with flat landscapes looking towards Wicklow Mountains and interspersed with the most canalised area of Ireland, where the Grand Canal splits into three. The Shannon Line runs to the north of the Cloncumber Cluster, The Barrow Line runs along its southern border and the Milltown Feeder runs to the southwest. Tourism by boat, barge, cycling and walking in this tranquil and unspoilt area will be diminished by the proposed Cloncumber Cluster.

4.4.8.1.1 Importance of Tourism Industry to area

- *Adverse impact on Tourism industry* – Wind farm would reduce no. visitors to area and the economic growth potential from tourism. It would also damage the amenity and tourist development zones and adversely impact economic development, local employment, existing and future investment and tourism development potential. It would be a major disincentive to future expansion of tourism facilities in the region.
- *Inadequate assessment of impact on tourist industry* – There has been no objective assessment of tourist assets, respective visitor numbers and likely impact on same. Conclusions drawn without any evidence base. Contrary to the EIA Directive which requires an evaluation of socio-economic considerations and tourism.
- *Economic value of tourism* - Midlands Region 2013 – received 381,000 overseas tourists, which was worth €1116.1m to local economy. There were 168,000 visitors to Kildare and 122,000 to Meath. The current income value to Kildare from tourism is estimated at €300-400 per head of population. This compares to €3 - €4 per head compensation offered to local communities in terms of proposals to compensate individual homeowners
- *Tourism employment* - jobs will be lost as a result of this development. It is estimated that the proposed wind farm would generate 25 jobs locally, but this is significantly less than those that are likely to be lost.

4.4.8.1.2 *Potential Impact on Key Tourist destinations/amenities/facilities*

- *Key tourist destinations/amenity facilities in area* will be adversely and significantly affected - Lullymore Heritage Park, Donadea Forest, Hill of Allen, Bog of Allen, Wallaby Woods Wildlife Park, Emerald Equine Centre, Lullymore Equine Centre, Millennium Maze, Ballynafagh Lake, Royal and Grand Canals, Fishing, Barrow Blueway Project and Ballyteague Forest.
- *Historic houses* - Adverse impact on historic houses and castles in the area which are tourist destinations, such as Maynooth Castle, Carton House, Trim Castle, Lyons Demesne, Straffon House, Leixlip Castle, Luttrellstown Castle, Dunsany Castle, Summerhill House, Knockanally House
- *Hotels / golf courses* will be adversely affected by the proposed WF - Moyvalley GC, Edenderry GC, Highfield Edenderry GC, Kilcock GC, Kileen Castle GC, Rathcore GC Enfield, and Knockanally GC Kilcock. Adverse impact on future Irish Open championship prospects. Knockanally golf club not listed in EIS yet it has 350 members, was established in 1985 and attracts 100's of visitors every year. It is used annually for regional competitions and is a well-known amenity worthy of protection.
- *Equine Industry* - tourism integrated with Horse racing at Punchestown, The Curragh and Fairyhouse, as well as the National Stud would all have a general adverse impact from the development of the proposed wind farm.
- *Hunting / gun clubs* - farmers rear wild game birds for use by local gun clubs. This type of enterprise will cease. One observer hunts on lands where D/H cluster proposed. Concerned that will no longer have access and/or impact on recreational pastime due to disturbance of wildlife
- *International World Falconry Association Convention* – there is a planned convention at Moyvalley Hotel, 1000 delegates for 1 week - will walk and hunt across blanket bogs. Future conventions would be jeopardised by this development.

4.4.8.1.3 *Potential Impacts on Recreational amenities - Walking/Cycling*

- *Existing walking routes and public rights of way* such as those along the canal tow paths would be adversely affected.
- *Grand/Royal Canals* – these 2 no. long distance walking routes are identified as needing to be protected in Section 14.11.3 of KCC CDP - High Amenity areas need to be protected. Plans for future development of such walking routes could be undermined.
- *Cycle trail from Dunmurray Hill* around Boston Hill to the Hill of Rathbride. This amenity would be destroyed by the proposed development.
- *Plan to develop cycling route* along Royal Canal would be damaged.
- *Tourist potential of plans for future development of walking routes could be undermined* - including 'Ireland's Ancient East' initiative (launched 2015)

intended to achieved €950m boost to the economy over the next 5 years; Ancient roadways of *Sli Dala* and *Sli Mor* (from Tara) and *Esker Riada to Edenderry*, from *Hill of Tara to Hill of Allen*, which could rival the 'Wild Atlantic Way'. Impact on future long distance walking routes - see 14.11.3 of KCDP.

- *Impact on future plans for cycle routes* - including 'The Grand Tour' a 200km tourist circuit of Kildare and Wicklow; the *Barrow Blueway cycle route* project and *Barrow Corridor* and its setting which is abundant with architectural bridges etc; the *Royal Canal Greenway* (from Dublin to the River Shannon) would be damaged as well as adverse impact on the amenities and tourist value of the canal.

4.4.8.1.4 Potential Impacts on Amenity and Tourist Value of Waterways

- *Amenity & tourist value of waterways* - Royal Canal corridor, Grand Canal corridor and River Boyne would be affected disproportionately by reason of close proximity to proposed large scale industrial turbines. The development would impact on their unique amenities (including industrial heritage, e.g. Boyne Aqueduct) and setting, and their use by walkers, cyclists, horse riders, kayaking, public rights of ways. Waterways Ireland promotes many activities along the canals such as cycling, walking, boating, and fishing. A peaceful, unspoilt landscape enhances these activities hugely.
- *Key tourist routes such as along the Royal Canal and Grand Canal* - views from such routes would be adversely affected to an unacceptable degree. Proposed development will have a degrading effect on this landscape and will deter visitors. Current upgrade of 35km section for walking and cycling, the Barrow Way (feeder canal to Grand Canal) and the Royal Canal Way.
- *Grand Canal corridor* - flows along Cloncumber cluster. Locks 19, 20, 21 and 22 are distinctive features. Canal corridor is characterised by smooth terrain with long vistas. How can it absorb the proposed 11 no. turbines at 169m height? This development will have a disproportionate visual impact along this stretch of the canal, would be unacceptably close to Grand Canal corridor and would deter visitors. This vulnerable linear landscape and the integrity of the canal corridor need to be protected.
- *Amenity Value of Grand Canal* - used by locals and visitors for walking, cycling, fishing and boating. The industrialisation of the landscape will diminish the amenity of the area and will hinder plans for upgrading the amenity/facilities of the area.
- *Tourism value of Royal Canal* – The Royal Canal is a tourist attraction which would be seriously adversely affected by wind turbines in such close proximity. Tourism value to the economies of Meath and Kildare is substantially greater than that of Maighne WF. Royal Canal Walking route - Waterways Ireland proposing to upgrade 35km of this canal corridor for walking/cycling, fishing, boating. This development would have a serious impact on this tourism initiative.
- *Amenity value of Royal Canal* - Ballinakill cluster is unacceptably close to RC corridor. Adverse impact on amenities, walkers, cyclists, horse riders and will

deter visitors from coming to the area. Walking, cycling route along canal needs to be protected

- *Undermine efforts of Save the Royal Canal* - The RC re-opened in 2010 due to supreme efforts of Save the Royal Canal Group. This is a unique national resource, including the Boyne Aqueduct. Adverse impact on structure of canal from the vibration of industrial scale turbines spinning.
- *Biodiversity of RC* - Would destroy biodiversity of RC including species of bird, bats, red squirrels, pine martens etc.
- *Ribbontail Paddler's club* - local canoe club, just recently upgraded old canal house to promote canal sports in the area and to attract tourism. This development would devastate tourism and the related economy.
- *Ribbontail Bridge* - T7 will be within 250m of this well-known bridge and the beautiful tranquil walk along the canal at this point. It will ruin the tranquillity of this amenity.
- Ballyteague area - very special quality of environment which is both peaceful and rich in biodiversity. Scenic area which has a close-knit community which is centred around the Grand Canal, its towpaths and the forest. This area must be protected and enhanced for future generations.

4.4.8.1.5 Potential Impacts on Specific Tourist Attractions of area

- *Donadea Forest Park* - attracts up to 10,000 visitors a year and will be severely impacted. It is designated as a NHA and was originally a demesne owned by the Aylmer Family, whose connections with the area date to medieval times. It comprises approx. 243ha of mixed woodland including the remains of a castle, walled gardens, a church, a lake and walking trails. There is a monument to the victims of the NY Twin towers (9/11). It would be completely unsuitable for visitors to this iconic and quiet sylvan setting to be confronted by a horizon of enormous wind turbines.
- *Access to Donadea Forest Park impeded* - road in front would have underground cables which would cause significant disruption and damage this tourist facility.
- *Bog of Allen Nature Centre – IPCC* - a centre of educational excellence and a tourism amenity would be severely disrupted by the proposed cable-laying along the R414 and onward to the Derrybrennan cluster. This is the sole access to the IPCC HQ and to the museum. The road is narrow and buses would be severely impeded. Given that school tours regularly visit, this would be impractical and dangerous.
- *Lullymore Heritage and Discovery Park* - A key tourism asset in Kildare. 40,000 visitors in 2014. Founded on basis of being able to showcase unspoilt bogland landscape. Has tourism and educational role. Would irrevocably change the character of the landscape, the very essence of what is being showcased. Provides employment in an economic hotspot.
- *Barrow Blueway project* - millions invested in this initiative by KCC, Waterways Ireland, Bord Fáilte. Stretches from Lowtown to St. Mullins Co. Carlow for a distance of 114km. Tremendous potential given rich diversity of

amenities including architectural, historical and natural features in close proximity to the walkway. Industrial turbines would detract from this amenity.

- *The Kildare Way' walking route* - one of a number of documented walking routes in the area between the Barrow Navigation Canal to Carlow and the Grand Canal Line to Shannon (Bord Fáilte Information Sheet 62 attached). This historic, tranquil and beautiful area would be destroyed by the introduction of noisy, monstrous and unsightly windmills.

4.4.8.2 Potential impact on Employment in area

- *TCD and ESRI study on WF job creation 'An Enterprising Wind'* - only 0.09 jobs in repair, operation and maintenance per megawatt of wind power (Irish Independent, May 2015). Mount Lucas WF - only 2 local jobs were created (security guards), the rest of the employment was for the German Company producing WTs and the English company delivering them and a Cork company is facilitator. Operational and maintenance jobs would amount to less than 12.
- *Employment creation disputed* - claims that the proposal would provide employment in the area are unsubstantiated. Operational employment based on IWEA is speculative, biased and the claim that 60 jobs would be created is disputed. The study referenced has not been peer reviewed, and there is no guarantee that jobs would go to local people. In any case, jobs would not be permanent or long term. A large number of the jobs to be generated are already in existence and relate to planning, R&D, etc., and cannot be considered 'new' jobs.
- *Construction Employment* - would not compensate for adverse impact on landscape character.
- *Tourism employment* - jobs will be lost as a result of this development. It is estimated that the proposed wind farm would generate 25 jobs locally, but this is significantly less than those that are likely to be lost. Loss of existing and future tourist jobs could well exceed the 60 jobs estimated to be generated by the proposed development. The current income value to Kildare from tourism is estimated at €300-400 per head of population. How has the EIS analysed the risk to tourism employment?
- *Equine Industry Employment* - Bloodstock leading employer in area - 14,000 directly in Ireland and 5,000 in Co. Kildare – This does not include employment in auxiliary industries such as feed and bedding suppliers, veterinary services, regulation, farriers, research and development, educational establishments, administration organisations, insurance providers and transportation. The proposed wind farm would have a detrimental effect on employment in the area.

4.4.8.3 Potential impact on Equine Industry

4.4.8.3.1 Contrary to Kildare CDP

- *KCC Development Plan Chapter 10* recognises the importance of the Equine Industry to the county, both in land use terms and in its role in the rural economy. Policy EQ2 encourages expansion of the industry by seeking to protect the environmental and amenity value of rural areas from urban sprawl or inappropriate development. Proposed wind farm would be contrary to this policy. It would also contravene CDP policy EQ1 and EQ5 and compromise the safety of horses.
- *Tourism - CDP* recognises the intrinsic importance of the equine industry and how it interacts with the tourism industry - proposed development threatens the very foundation of the industry within the county. Anne-Marie O'Brien also supports this view.

4.4.8.3.2 Potential Impact on Thoroughbred Industry and National/Local Economy

- *Kildare - The Thoroughbred County* - reputation of Kildare is based on clean, green environment. Ireland is home to one of the most renowned and successful breeding industries in the world. Kildare Co. and several towns are twinned with other internationally renowned horse breeding centres around the world. Significant level of foreign investment in many stud farms in County. Several champion racehorses produced within 5km radius of Donadea. The spatial extent, level of visual obtrusion and the disruption arising from the construction of the wind farm and associated cabling would render the development incompatible with the Equine Industry.
- *Visual impact - Damage to multi-million euro industry* - Foreign investment is attracted by the quality of the land and the green approach. This rural idyll landscape with lush green pastures is an integral part of the image that attracts foreign capital. It is highly sensitive to change and both direct and indirect visual impacts. The proposed development would result in visual encroachment of stud farms and training yards and an incompatible form of industrial scale development. This would risk a flight of capital, pose a risk to future funding and support of overseas investors and would result in the depreciation in the value of stud farms in the area.
- *Economic impact* - The contribution of the Equine industry to the National Economy was €1.1 billion in 2012; the Value of exports to the economy was €149 million in 2010. The impact of the wind farm on the local rural economy would also be significant due to the importance of the equine industry to the local economy. Investment by foreign racehorse owners has provided significant employment and spin off to the local rural economy and

helps to address the shortage of rural employment in other sectors. Bloodstock employment - 14,000 directly in Ireland and 5,000 in Co. Kildare - Does not include employment in auxiliary industries such as feed and bedding suppliers, veterinary services, regulation, farriers, research and development, educational establishments, administration organisations, insurance providers and transportation.

- *Impact on horse breeding* - as many thoroughbreds are brought in from abroad for short periods, they do not have time to get accustomed to the presence of wind turbines in close proximity to the equine breeding facility. The impacts of visual encroachment, noise and shadow flicker could undermine the international breeding reputation of the county, with significant costs to the industry and to the local economy. The presence of moving turbines would cause significant stress for pregnant mares and would destroy the industry. Ruby Walsh and Anne Marie O'Brien are on record as stating that the presence of wind farms in close proximity to stud farms would be detrimental to the industry.
- *Number of stud farms in area* – The no. of stud farms in Kildare has declined from 145 in 2008 to 108 in 2015.
- *Power cables to be run along L1010*, 14.5km to Taghadoe substation - this road bounds Derrinstown Stud, Loughtown Stud, Kilnamoragh Stud, all of which have produced champions. These businesses would be adversely impacted due to need to use heavy machinery for installation of cables along road adjoining stud farms. These thoroughbred racehorses are highly strung athletes and any such disturbance to their normal routine will spook them and put their lives at risk.
- *Race horse breeder, Coolelan, Rathangan* - concern re impact of LFN on breeding of horses. Report based on a study carried out in Portugal w.r.t. deformities in horses arising from wind turbine syndrome which it is claimed was caused by wind farms close to a stud farm. Report enclosed.
- *Clonkeeran Stud Farm* - the imposition of turbines in D/H in close proximity to stud farm - catastrophic. Road frontage from Collinstown to Kilshanroe would be sterilised and to the rear of the farm, the cabling along the Broadford-Kilshanroe would further sterilise his property. This will diminish the value of the farm in a serious and considerable way.

4.4.8.3.3 *Potential Impact on Safety and Welfare of Thoroughbred Horses*

- *WF detrimental to Thoroughbred Horses* - Comments in EIS not relevant to thoroughbreds, who are especially sensitive and valuable animals and who would be affected by noise, shadow flicker and visual presence of wind turbines. It is submitted that the turbines would be of such a scale and in such close proximity that they would be detrimental to the bloodstock industry. Thoroughbreds have a highly developed 'flight response' and the visual distraction associated with moving blades could result in injury to horses. They can see objects within a 355 degree range and have a highly evolved flight response. They are also known to suffer from stress. Tremors

from turbines can affect reproduction and the growth of horses' feet. Horse hearing is 14 times greater than that of humans and the impact of same is of paramount importance

- *Safety risk for those riding or working with horses arising from shadow flicker and infrasound* – risk associated with flight response/startle to stimuli for thoroughbreds, but also for non-thoroughbred and recreational horses, riding schools, etc. Reference is made to a UK appeal case wherein the Inspector had reported on the very significant implications of a 9 turbine wind farm in close proximity to three nearby equine businesses. Considerable weight was attached to potential adverse impacts from effects of visual (movement of blades), shadow flicker and noise. It was considered that it could potentially compromise the safety of horses and riders and pose a significant risk to the investment potential of this highly competitive industry.
- *Melbourne Cup study disputed* - Many experienced racehorses never learn to cope with noise and disturbance, such as a parade ring. Race events are of short duration in any case and are not directly comparable to the long term continuous effects of wind turbines.
- *Marshall Day Study - findings disputed* - EIS seeks to leverage a Marshall Day study [attachment 004] of the effects of a music concert on horses as proof of the absence of the adverse effects of the proposed development. Comparison of WF with music concert - inappropriate as ignores movement of blades, shadow flicker, sudden starting and stopping etc. MD Study also stated impact on animals likely to be greater if noise associated with visual stimuli. Faults with comparison -; no regard to visual stimuli; no regard to impact of combination of noise and visual stimuli of concern to bloodstock MD Study invalid as no control group. Unscientific study without reference to type of horse used e.g. a 2- year old colt would be more jumpy.
- *Equestrian Centres/Riding Schools* - no. of riding schools in vicinity. Turbines would cause problems in the handling and control of riding horses.
- *Risk to safety of horses* - It is impossible to know how each horse will react to the huge industrial structures and the sound and shadows they generate as horses are, by their nature, very unpredictable, particularly when exposed to unexpected movement, sound, shadows and vibrations. British horse society survey [attachment 005] found that some horses never acclimatise to WT presence and stated '*the incidence of adverse reaction in quiet horses and with highly skilled riders is of particular concern. It means that the impact is across all horses, even those chosen for their placidity for more vulnerable riders such as the inexperience, older disable and children.*' (BHS Survey - Wind Turbines Experiences 2012) This is a particular concern for Sweep Stud in its role - training Irish Young Rider Event teams and etc.
- *Wind Turbine Syndrome and Horse Health Impacts* - Study 'Horses get Wind Turbine Syndrome (Portugal)' - 'acquired flexural deformity of the distal interphalangeic joint in foals' Faculty of Veterinary Medicine, Technical University of Lisbon - deformities attributed to WF proximity; sleep disturbance, from infrasound, and SF affects horses which require undisturbed environments in which to thrive.

- *Horse Health impacts - Deformities and vibro-acoustic disease* - MA Thesis of Prof. Mariana Alves-Pereira et al, (presented at 2nd International Conference on Wind Turbine (WT) Noise, Lyon (2007)) – considered the impact on stud farm from low frequency noise (LFN <500Hz). Found that the induced pathology was consistent with vibro-acoustic disease (VAD) generated by 4 WT installed in close proximity (300-700m). Between 2000-2006, 13 no. healthy thoroughbred Lusitanian Horses were born and raised at the property. All horses (=4) born or raised post 2005 developed asymmetrical flexural limb deformities. No changes were introduced in the area other than the turbines. Tissue analyses of defected tendons revealed classical features of LFN-induced biological responses:- thickening of blood vessel walls dues to proliferation of collagen in the absence of inflammatory process. Alves-Pereira 'the observation...is in conformity with the same observations found in... LFN-exposed rats, and in vibro-acoustic disease patients who are employed in LFN-rich environments. The study provided for diet and genetic factors, importing two foals to the site which also developed deformities after 6 months. The thesis found no obvious cause for the development of the problem and hypothesised that the unusual environmental conditions might have played an important role in the development.

4.4.8.3.4 Deficiencies in EIS – Impact on Equine Industry

- *EIS deficient* - impact on equine industry not been adequately addressed in the EIS. The EIA assessment should include an analysis of shadow flicker and noise on the existing stud farms which are located within 10 rotor diameters of the proposed turbines and appropriate mitigation measures should be factored into the proposed development.
- *The number of stud farms in the area is misrepresented* - Map 11.3 Rev A which shows 31 equine facilities is a total misrepresentation of the true number of stud farms/equine facilities in the area. There are 30 such facilities in close proximity to the Hortland cluster alone, and it is claimed that 20 equine facilities in Hortland omitted. There are 13 stud farms in the vicinity of Cloncumber cluster. See also Appendix 8 of Observation 715, which identifies equine facilities not recorded in the EIS.
- *Delabole WF and Stags Holt WF comparison disputed* - the two WF establishments referred to by the applicants - Delabole and Stags Holt are not comparable. Delabole is small and does not concern thoroughbreds and is owned by the WF owner who has a vested interest in painting a positive picture and is therefore not unbiased; Stags Holt is for American Quarter Horses which are warm blooded and completely different and incomparable to hot blooded thoroughbreds; there are no scientific studies on the effects of wind turbines on thoroughbred horses.
- *Specific equine/stud facilities omitted* – Observer no. 164 (fig 11.104) 1160m from WT (no #) for breeding and rearing thoroughbred racehorses and training competition ponies at highest national level; Observer No. 25 250m

from WT45 to paddock for Registered Irish Draft Horse, an endangered species [rare breed of horse], containing 4 horses; Kilmoney Cottage Stud, Rathangan. Gordon Elliot Cullentra House and W Honner, Clonguiffen House- omitted from Map 11.3 Rev A.

- *EIS Assessment deficient re Shadow flicker/Noise on Equine facilities* - assessment should include an analysis of shadow flicker and noise on the existing stud farms which are located within 10 rotor diameters of the proposed turbines and appropriate mitigation measures should be factored into the proposed development. The EIS statement relating to impact of noise on horses is entirely irrelevant and based on isolated noise incidents not constant noise. No assessment of shadow flicker on stabled horses

4.4.8.3.5 *Precedent – Impact on Equine Industry*

- *Precedent* - ABP refused permission (PL23.225138) in respect of a biogas/biodiesel production facility on the grounds of adverse impact on the equine industry of Co. Tipperary which would be contrary to national and local policy objectives to support the equine industry.

4.4.8.4 **Potential impact on Agriculture**

4.4.8.4.1 *Potential impact on availability of productive lands*

- *Loss of agricultural land* - proposal will take many hectares of productive land out of production for agriculture and forestry. Contrary to the Dept. of Ag 2025 Agri-Food Strategy to maximise the contribution of agriculture and forestry. This will have an adverse impact on agriculture and the 'green island' marketing image will be tarnished;
- *Impact on agricultural industry* - Promotes one industry (Wind Farms) to the detriment of another and will result in a decline in farming enterprise options e.g. equestrian due to presence of turbines, due to impacts on livestock from infrasound, including reduction in milk productivity of cattle.
- *Sterilisation of lands* - Shallow depth of cables at 1.2m below ground level will cause the land around them to be sterilised with no animal or plant life. It will affect farmers and people using the land, will impact on the possibility of opening new gates to public roads and access to underground utilities and services.
- *Impact on agricultural lands* - Concern that cable works will impact on field drainage in Ballagh Cross / Kilnamoragh North where there are underground watercourses. One was previously disturbed by minor road works in vicinity of Donadea old Post Office resulting in flooding of adjacent field ever since and making it unsuitable for grain growing.

4.4.8.4.2 *Potential impact on farming practices and crop growing*

- *Health and safety risks to farm workers* - health and safety obligations on farmers as landowners and employers. Risks to visitors, employees and to farmer from shadow flicker, noise, blade throw and structural collapse of Turbines. Leading Wind Turbine manufacturers, Vestas, recommend that workers stay 400m from WT whenever possible for health and safety reasons. Concern about impact on farmers whose lands are within this separation distance. Failure of WT operator to recognise their responsibility towards others to whom the WF will pose a health and safety threat.
- *Impact of reduced light on crops* - concern re reduced light from dust accumulation, which would be detrimental to crops growing in glass houses. Need for artificial lighting on plants within nurseries in area would be detrimental to plant growth and the adverse impact on use of pollytunnels would jeopardise the viability of such businesses.
- *Insects and pollination, crop growth* - viability of crops is dependent on insects for pollination, particularly bees. No evidence that impact on flight paths/collision risks on the insect populations which may impact crop growth and could have a knock-on effect on fodder production, which would also affect the viability of farming during the winter months. Strong correlation between wind farm locations and decline of the honey bee in USA, with consequent impact on this industry.

4.4.8.4.3 *Potential impact on livestock and animal husbandry*

- *Farm animals* - Concern re impact of turbines in close proximity to farms on farm animals and the ability of farmers to continue to farm, especially due to effects of infrasound and shadow flicker. Welfare and productivity of farm animals is of major concern to the business viability of farms. Some of concerns relate to gestation periods and unnecessary stress on animals leading to birth defects in lambs and calves. The developer has not considered the impact on small rural farms, which will become unviable.
- *Japanese study - impact on livestock* - Studies from Japan show cattle living close to turbines develop ill health and deformities. Cattle will not drink from metal troughs that have picked up stray voltage from local turbines (Yuki Tsuruta). This would have a profound impact on farming livelihood. Impacts on farm animals in Nagasaki, Japan, included swelling of shoulder and knee joints, spinal curvature, astasia (disruption of muscle coordination making them unable to stand), stillbirths and unexplained sudden death.
- *Polish study on impact on geese* – Reference to study but no details. States that it concluded - the results indicate the negative impact in the immediate vicinity of wind turbines on feed consumption, weight gain and cortisol concentration in the blood;
- *Taiwan – study of impact on goats* - death of 400 goats on WF in Taiwan 2009 as they were unable to sleep; impact on animals

- *US study - Livestock health impacts* - Observer has identified a farmer, Kevin Ashenbrenner, Glenmore, Brown County, Wisconsin, USA, who lost 17 calves and 15 cows since the development of Shirley Turbine Plan in 2011. *World Council for Nature - Livestock health impacts* - March Duchamp, Chairman of World Council for Nature - Cattle and hens living in vicinity of windfarms suffer wide range of pathologies - stillbirths and deformities.
- *Cattle, sheep and bloodstock* - property No. 36 - farm where animals kept located only 480m from T40 - concern re impact on horses, sheep and cattle.
- *Charollais Sheep* - Property 46 located 686m from T40 - farms pedigree Charollais sheep for export - shadow flicker for much of his working day - safety risk for operating machinery on his land.
- *Impact on greyhounds* - sensitive animals, to visual cues and noise and consequently sleep deprivation
- *Impact of Shadow flicker on farming practice* - Ireland has very low lying sun and given the naturally low-lying nature of the area, the turbines will generate shadow flicker every morning on several farms. This is likely to adversely affect the welfare and productivity of farm animals and of the farmers.
- *Risk of disease spread* - Impact of dead birds (through collisions with WT) which are a serious source of botulism, salmonella and e-coli according to Dept. of Agriculture.

4.4.8.5 *Potential impact on other businesses in area*

- *Disincentive to new businesses coming into area* - undermine jobs and local economy Will deter influx of new residents and businesses, increase rural depopulation and undermine jobs and economy of area. Will also deter development of schools and future tourist sites.
- *Sterilisation of lands* - Established businesses discouraged or prevented from expansion. Concern about uncertainty of impact of sterilisation - clarification is needed regarding extent of sterilisation of land. The proposal could result in a restriction on any other planning applications within 1.5km of the proposed development. Applicant should compensate owners for loss of property value.
- *Impact on workers* - impact on observer's business, a significant employer, located in the Moyvalley. Unreasonable to subject employees to constant swishing noise of WTs. Welfare issues for management and staff of established business must take precedence over developer-led wind proposal.
- *Disruption to businesses during construction* - road closures, road works, restricted access etc. would have a detrimental impact on established businesses and could lead to loss of employment.
- *Impact on business dependent on current setting* - many businesses which are based on the fact that they are based in a tranquil rural setting
- *Indirect impacts* - Potential impact on groundwater through contamination with risk to human health, agricultural industry, to certain industries, recreational amenities and to the economy generally

- *Impact on communications* - Impact on television signals and security setups, internet, business/domestic satellite services reception, mobile phone coverage. No information has been obtained from Sky.

4.4.8.6 *Impacts on specific businesses*

- *Mother Hubbard's Restaurant (R148)* - Disruption to business during construction due to road closure, road works, restricted access to Mother Hubbard's (via R148). This would impede the ability of Mother Hubbard's restaurant to grow and evolve.
- *Longwood Playgroup* - Should children from Longwood Play group be moved to another area due to perceived impacts this would adversely affect the business.
- *Registered childminder* concerned that traffic disruption would affect business
- *Donadea Park Café* - owner concerned that placement of 21 turbines adjacent to park would deter visitors (150,000 annually). Also concerned re noise and visual impact from turbines w.r.t. this business and his home.
- *Greyhound kennels* - greyhound training business - capacity for 28 dogs. Have trained hugely successful dogs and have good reputation. Serious concern re impact of turbines on dogs as have very sensitive hearing and may be adversely affected by infrasound. Well known that dogs have sensitive hearing and can hear sounds that humans cannot. If anything scares them it will affect their ability to perform/racing ability. Have serious concern, therefore, about impact on their business, only source of income. (Article re effect of wind farm on sheep dogs from internet enclosed)
- *Greyhound business* - keep 20 dogs - sensitive to noise and not been assessed satisfactorily in application.
- *Rentes Plants Pollytunnels* - located c. 500m from turbines - employ 20 staff and in business for over 20 years. Horticulture industry moving in the direction of larger use of heat variable Pollytunnels which provide for increased plant quality and higher yields. This is of great importance to the viability/competitiveness of the business. Proposed WF would make use of any further Pollytunnels impossible.
- *Schram Plants Ltd.* - expressed concern re reduced light from dust accumulation, which would be detrimental to crops growing in glass houses and the impact of artificial lighting on plants at the nursery.
- *Artist Studio* - House File Plan 10 Folio No. FE17777 - this property includes an Artist's Studio which would be adversely affected by the significant change to the landscape character.

4.4.9 Aviation impacts

4.4.9.1 Interference with Air Navigation Operations/Safeguarding

- *Air Corps flight path* - Proposed WF on direct flightpath from Baldonnel to Athlone Barracks - EAS (Emergency Air Medical Service) is operated from Athlone and in bad weather, the pilot may choose to fly low level on Visual Flight Rules. Wind turbines at 169m would significantly impact this service.
- *Impact on Aviation Training* - The area south of M4 is often used for fixed wing and helicopter pilot training by Aeronautical Training Organisations (ATOs) based at Weston Aerodrome and occasionally from cross-country training flights for fixed-wing pilot training by Trim Flying club. Pilots of light aircraft, ultra-light and vintage aircraft and helicopters often have to operate below the restricted airspace of EIR16 (military restricted airspace). The level of which aircraft are permitted to fly is further restricted by Rule 3 of SI 72/2004 Irish Aviation (Rules of The Air) Order. When EIR16 is operational and no permission is given to penetrate it, aircraft cannot legally and safely fly over them but will have to go around them. Their distribution will create a disproportionate, unwarranted and unacceptable danger to light aircraft, exacerbated by the poorly visible Permanent Met Mast with its staying cables.
- *Dublin Airport/Weston Airport flight paths* - Interference with flight paths from Dublin Airport, Weston Airport to a number of destinations and private use of helicopters and private planes
 - Interference with departure/arrival routes using Standard Instrument Departure/Arrival Routes
 - Interference with Air Navigation routes and Missed approach routes
 - Interference with Sector Entry/Exit Points, Holding Points and Visual Reporting Points
 - Interference with final approach tracks
 - Interference with published Flight Procedures for Aerodromes.
- *Numerous landing strips in area* – In addition to two mentioned in EIS, Clonbullogue and Casement, there are several landing strips in area.
- *Lullymore Landing Strip* - (included in VFR Flight Guide Ireland 2011, appended to submission 773). Associated works and cabling are close to eastern threshold of Lullymore landing strip - no description of associated works or impact have been discussed in EIS. Impact from proximity of construction works for u/g cabling and from presence of high/medium voltage cables on radio and transponder frequencies. Take-off and landing could also be affected by proximity of T27, T28. This would be extremely dangerous and hazardous to flight paths - this health and safety issue not considered by EIS.
- *Microlight aircraft* - observer's hobby is flying micro-light aircraft, the continuation of which would be severely impacted by the proposed wind farm.

4.4.9.2 Impact on Safety of Air Traffic

- *Air Corps Safety implications* - Need to establish the implications for the Air Corps with regard to low level flying in emergencies during poor weather conditions. VFR flight rules - If visibility is affected by fog, turbines will not be visible at all to VFR pilots. This has the potential to cause serious accidents and loss of life. The fact that helicopters must fly at low altitude and be capable of landing suddenly in the event of an emergency, combined with the dispersed layout of the wind farm, poses a considerable risk in terms of aircraft safety
- *Inadequate consideration of impact on Casement Aerodrome* - Cumulative effect of wind turbines on DoD operations not adequately addressed. Unclear if mitigation measures will need further analysis/input from DoD post decision
- *Restricted Flight Zone* - Land within MO4 of Dept. of Defence - serious concerns re danger from collision risk of helicopters and small aircraft. Dept. of Defence has made it clear that it would be opposed to the development of any wind farm in this area.
- *Aircraft safety would be seriously affected* - turbines very close to flight paths associated with Dublin Airport, Weston Airfield and Baldonnel due to height of turbines. The airspace between these airports and Dreehid are used regularly for practical flight training and for practical flight tests. The location of such tall structures will cause a material hazard for trainee pilots
- *Helicopter flights* - there has been a significant increase in the number of helicopters in private ownership. The proliferation and dispersed nature of the proposed WF together with the fact that helicopters must fly at low altitude and be capable of landing suddenly in the event of an emergency, poses a significant risk for pilots, passengers and residents of the area. There has already been an accident involving a helicopter and overhead lines which occurred within the DH cluster area, near the site of proposed T14, T15, T16
- *The International Civil Aviation Organisation (ICAO)* has defined a volume of air space above which new objects are not permitted. No part of the wind turbines should penetrate these defined surfaces (s.5.11 - casement aerodrome map no.6.5 KCDP)
- *Small aircraft safety implications* - Risk to air traffic safety including helicopters and small aircraft and micro-light flying (ideal conditions for same in low-lying bogland). Indirect impacts - safety impact on residences living with Department of Defence MO4 zone and impact on traffic to/from Weston Aerodrome, Celbridge. Note- companies operating out of Weston Aerodrome were not informed of the proposed development.

4.4.9.3 Relevance of precedent

- *Wind Monitoring Mast Refused* - PL09-243523 - ABP refused single wind monitoring mast on site of 100m height on grounds of adverse impact on air safety. Proposal to erect 47 turbines with moving blades at 169m height

would surely compromise air safety. The site of the refused mast is 3km from closest turbine site in D/H cluster, T47. Notwithstanding the proposed mitigation measures, it is considered that, given that the turbines are 69m higher and are spread over an area stretching from Longwood to Rathangan, the proposed wind farm would represent a significantly greater safety hazard to low flying aircraft in poor weather over a significantly greater geographic area than that posed by the refused mast. The WF should therefore be refused.

- *Eadestown Naas KCC planning application 14/514* - although application for 2 turbines withdrawn, ref to Dept. of Defence opposition to the proposal on Air Safety grounds.

4.4.9.4 Policy and guidance on aviation

- *Irish Aviation Authority 'Policy on Land Use Planning and Offshore Development' (IAA)* notes potential negative effects from wind farm development on aviation - (1) Physical obstruction; (2) generation of false radar returns; (3) electromagnetic interference; (4) turbulence; (5) creation of 'choke points'; (6) detrimental effect on the environment. Large commercial turbines have greatest impact but preliminary activity, such as anemometer masts and erecting cranes also can have negative impact on aviation and require assessment. (4) and (5) are directly applicable to proposal. The development has not taken this or the points made by the IAA into account. Cumulative effect of multiple developments. Impact of dispersed layout is greater than single large cluster due to individual areas of radar clutter, but not always preferable. Issue of dealing with such applications on a first come first serve basis whereby future more acceptable (in aviation context) proposals are objected to on cumulative grounds - issue of proper forward planning for wind energy development.
- *SEAI Guidelines for windfarm development* - restricted areas (airports, etc.)

4.4.9.5 Hot Air Balloon flights

- *Hot Air Ballooning is prolific in Co. Meath* - High percentage of passengers travel from the Dublin catchment area, which is restricted due to the airspace classification and congested nature of the region. Co. Meath is the ideal area for hot air ballooning for many reasons related to landform, land use, land agreements/good relationship with landowners and large catchment of passengers (over 1000 commercial passengers a year). Any necessity to relocate business would be hugely disruptive and prohibitively costly.
- *Restricted to Uncontrolled airspace* - Hot Air Balloon flights are prohibited in Controlled Airspace and confined to Uncontrolled Airspace (Class G). HAB flights are governed by aviation authorities and have to operate within strict guidelines. This requires operating a comprehensive Safety Management system and carrying out a Risk Analysis on each aspect of their work.

- *Potential Impact on Safety* - Hot air balloons fly with the wind and cannot be steered. They also operate at low levels. This means that every balloon flight would run parallel to or in line with operating wind turbines. The balloons frequently land in the Moyvalley/Longwood/Enfield area which is central to the proposed wind turbines. Obstructions in the form of wind turbines pose a significant safety threat to pilots and in particular, less skilled pilots, and to passengers.
- *Stable air conditions required* – Hot air balloons also require extremely stable air conditions - hence the operation of hot air balloon flights at dawn and dusk. Many studies detail the difficulties caused by turbines in terms of air instability or wake turbulence.
- *Mitigation not possible* - Given the severity of any collision with a wind turbine or the need to land immediately downwind of one, the risk factor would be unacceptably high and could not be mitigated against. Similarly, if it was possible to intend a landing slightly upwind of any given turbine, the potential need to overshoot, given an obstacle of almost 200m, would present an immense hazard.

4.4.10 Geological/soil impacts

4.4.10.1 Unique and complex subterranean geology of area

- *The unique geology of the area* - needs to be preserved and studied. There is an abundance of geothermal energy available beneath the surface. Geology requires thorough investigation by competent experts before any advance is made to erect these gigantic turbines. Consider '*Under the Surface*' by Dick Ahlstrom, (Irish Times article appended to letter), outlining underground geological structure of this part of the Midlands. This refers to changes in land formation over 66 million years, to the presence of subterranean clean water reserves and warm springs.
- *Geothermal springs* - Concern about impact on geological features, namely the geothermal springs located along the Kildare-Meath border in NW Leinster. St Gorman's well is within 2km of Ballinakill Cluster. Concern also about impact on 'Hotwell', an exceptional example of a thermal spring, and has been suggested by a renowned geologist for inclusion in listing as Geological Sites under Groundwater and Spring theme for pNHA list, (Duchas 2001). It is proposed as an NHA, and should be listed as a County Geological Site in Meath. It is located long the Blackrock-Rathcoole Fault line, (see geothermal mapping systems at www.gsi.ie), and the proximity of the WF to same can be seen at <http://maps.seai.ie/geothermal/>. If reinforced concrete piling is proposed, pile boring will have adverse effect on local hot springs by creating more outlets and therefore disturbing the local complex sub terrain geology.
- *GSI hotspots* - GSI show on their Gravity Maps a number of hotspots in the locality (Ballinakill), some located directly where the wind turbines are proposed including Calf-field. This has been confirmed by objector's own

experience walking the canal during the winter when the frozen canal was not frozen for 30m in that area. This is supported by other similar anecdotal evidence by local residents.

- *Underground lake* - Microsoft map 1988-1999 shows a large body of water directly to west, south and north of Longwood village, larger than Lough Ennell - there is no lake on surface so there must therefore be a huge underground lake and it would be a folly to erect WTs over such a fragile geological wonder.
- *Fault lines* - EIS has not considered the proximity of the Ballinakill Cluster to the local fault lines, Blackrock-Rathcoole, to allow for safe design of turbines. Risk of land subsidence is greatly increased due to the high chance of underground caverns. It is not clear whether the impact of more than 2000ton weight of a turbine with a reinforced concrete base has been taken into account in the design. Could result in catastrophic disaster, landslips or sinkholes. Ref. to Minnerex Report (1983), which indicated existence of a vast cavern 70m beneath this area (Ballinakill) which could be 'an Armageddon scenario'. An earthquake (0.8 Richter scale) occurred in the area of the large underground lake in 1983, (Dublin Institute of Advanced Studies & other publication from period refer to same - not attached).
- *Impact on Esker Riada* - Unspecified potential impacts on Esker Riada at Ballyronan House and Farm which has been subject of study by the Environmental Geophysics Unit of the Department of Geography UCD since 2008, producing evolutionary deglaciation model for Ireland. Risk of destruction by windfarm.

4.4.10.2 Lack of site investigation

- *Level of site investigation completely inadequate* - site investigation has not been carried out apart from 4 trial pits in Drehid/Hortland. Fails to comply with Best Practice codes for ground investigation. Thus no geotechnical information on soil stratification, peat depths beyond the range of a hand held shear vane. (Specialist Report on Engineering Issues by Donnachadh O' Brien)
- *Lack of geotechnical information for turbine sites, roadway or ancillary structures* - Peat depths only assumed on basis of hand held shear vane testing equipment. No dynamic probing or Standard Penetration Tests values recorded for any soil layers which would inform the allowable bearing capacities of soils. No basic laboratory soil samples taken for assessment to inform foundation design. This is an inappropriate investigation methodology for the assessment of foundation formation levels for turbine bases (Specialist Report on Engineering Issues by Donnachadh O' Brien)
- *Foundation design - insufficient information* to enable assessment of whether piled foundations may be needed in certain areas. Planning drawings indicate traditional bearing foundations at relatively shallow depths. (Specialist Report on Engineering Issues by Donnachadh O' Brien)

- *Assessment of extent of excavations* - lack of geotechnical information means that it is impossible to make a reasonable assessment of the extent of excavations, dewatering or the extent of soil removal from site. (Specialist Report on Engineering Issues by Donnachadh O' Brien)

4.4.11 Hydrological/drainage impacts

4.4.11.1 Potential impact on hydrology of area

- *Risk to groundwater and consequential risk to health and economic impacts of same* - e.g. DoE Northern Ireland report recognises the importance of protecting groundwater - *'The protection of groundwater from the risk of possible contamination is important because pollutants could cause health problems in human beings, reduce the quality of agricultural products, make water unsuitable for certain industrial processes and pose a threat to the countryside and environment including their suitability for recreational purposes.....health and environmental impacts.....also serious economic consequences.'* Development of this scale and size has potential to impact on GW quality, GW quantity and the established GW flow regime. Protection of groundwater is important because of the potential impacts on human health as well as impacts on the environment and hence on the economy.
- *Concretion* - Excavation of soil and peat materials, their replacement with concrete and deposition of the excavated materials over the lands is likely to cause severe disruption to drainage, water displacement and adversely impact wells, sewerage systems, rivers and canals. This would result in a permanent adverse impact on the environment and hydrology of the area, including increasing flood risk.
- *Hydrology operational phase* - concerned re impact of such a large scheme on drainage/hydrology of area and the lack of soakage of surrounding area given scale of foundations and associated road works, as well as significant risk of flooding.
- *Potential impact on Aquifer/underground lake near Longwood* - largest aquifer in Co. Meath stretches from Rathmoylon/Longwood to Johnstown/Enfield and onward to Royal Canal. Evidence of underground cavern/lake near Longwood – described in Minnerex Report (1983) which uncovered a hot spring. Evidence of geysers and sink holes also with significant force in vicinity of Longwood which could pose severe dangers to local population. Aquifer likely to be impacted by use of huge quantities of concrete and chemicals which could affect groundwater and hydrology.
- *Geothermal springs* – concern about impact on geothermal springs located close to Ballinakill Cluster (shown on GSI Gravity Maps) and other GSI 'hotspots'. In particular, the impact of reinforced concrete piling which could create more outlets and disturb the complex subterranean geology in the area and adversely affect the hot springs.
- *Precedent - 203801 Landfill* - Refusal for large landfill at same location as Ballinakill cluster for the reason, inter alia, that it was located atop a huge

underground lake and in relation to impacts on R Boyne and public health. Reason related to complex hydrological/hydrogeological conditions in area and to limited site investigations carried out and that the proposed foundations would have adversely affected the underground lake. Concern about impact of Ballynakill cluster on said underground lake.

4.4.11.2 Surface Water Quality – risk of pollution

- *Water Framework Directive 2000/60/EC* seeks to protect all high status waters, prevent further deterioration of all waters and to restore degraded surface and ground waters to Good Status by 2015. Construction of WF will increase risk of run-off on waterbodies which are already "at-risk". This will be exacerbated by lack of site investigation and groundwater monitoring. Thus the impact has not been properly quantified in the EIS.
- *Runoff poses risk to surface waters* - including River Slate, River Barrow and the Grand Canal and to the water supply of the population.
- *Potential risk to Boyne and Blackwater not adequately addressed in EIS.* Boyne, Blackwater (also via Sweep River) and Glash Rivers supply water for human consumption in Trim, Navan, Drogheda and are automatically shut-down if contamination levels rise as occurred in 2014. Will cause difficulties in delicate water system as can be verified by NRA yearly testing from 2005 (Eurolink Ltd Annual Testing NRA).
- *Irish Industrial Explosives* - T44, T45 too close to Irish Industrial Explosives Ltd which uses alkali anti-leakage methodology and the consequent risks in terms of water pollution.

4.4.11.3 Ground Water Quality – risk of pollution

- *Runoff from construction* – EIS does not adequately address the impact on hydrology, hydrological processes, groundwater flow regime and quality not adequately addressed in EIS. Water pollution risk is increased due to construction from run-off directly into streams and rivers, particularly where excavating along and crossing the rivers and streams. Water table also very close to several turbine sites.
- *Dissolved organic matter* - significant level of disturbance/removal of peatlands could result in the deposit of Dissolved Organic Matter entering watercourses. Treatment including use of Chlorine can produce Trihalomethanes, which are known carcinogens. Inadequately addressed.
- *EIS fails to consider possible effect of displacement of ground water* close to the Drehid waste facility and the effect this could have on ground water contamination in the area. This could arise due to the placement of foundations and hardstands in the bog incorporating 1200-1500 tonnes of concrete per turbine. Accordingly proposed WF should be rejected.
- *Potential Impacts from operational phase* – alteration to groundwater flow regime due to track, turbines and foundations, GW distribution, GW storage,

reduction of forestry cover, change to infiltration, SW runoff, vibration increasing suspended solids and GW quality, due to materials management, hydrocarbons leakages.

- *Decommissioning* - similar issues as above, plus use of vehicles and machinery to remove infrastructure.

4.4.11.4 Potential impacts on public/private water supply

- *Irish Water* - Wells and existing/potential groundwater sources must be protected so that Irish Water will deliver to them in future.
- *Water table levels fluctuate* - Evidence that GW levels can be lowered by as much as 20ft. Many homes in area served by shallow wells due to high water table. WF would render many of these wells useless and result in significant cost to home-owners.
- *Pollution incident near Longwood early 2000s* - Matter was dumped in Quarry at Ardenew which resulted in pollution of wells near Longwood, some distance away.
- *Ballyna Group Water Scheme* has been in existence for 20 years but has been unable to secure a supply of piped water to households in Ballyna area. Proposed turbines in wooded area near Johnstown Bridge and KCC capped wells in the Wood. Turbine construction in Wood likely to undermine this goal
- *Broadford/Clogherinkoe water supply* - 3 bore holes in Kilmurray/Killyon Wood - pipes have been laid alongside the R402 at considerable expense to connect these boreholes to a possible reservoir to supply Broadford/Clogherinkoe. T11, T12, T13 proposed in the Wood close to these boreholes. Queries whether Council have shelved the plans to pump this water due to the proposed location of T11, T12, T13.
- *Disruption of supply - Cable from Hortland to Taghadoe* would seriously disrupt water supply for a considerable period. When the group water scheme was put in, the works interrupted the water supply for a long time
- *Impact of vibration on sand bar* - low level vibration from turbines could affect the sandbar which runs through the area. There is a history of "cave-ins" of wells in this area due to the presence of this sand bar. Any vibrations could increase the risk of further cave-ins which would adversely affect the wells
- *Calp Aquifer* - May jeopardise potential viable groundwater abstraction from the Calp Aquifer (Johnstown Bridge, Co. Kildare) source for the greater Leinster region - proposed in 'Environmental Report' (2003), attached to observation. The EIS only asserts that drinking water supply in Dredhid Hortland has not subsequently been developed, but there is no indication that the proposal is not intended to proceed.
- *Hortland aquifer* - Impact of foundations and HGV traffic on roads on Hortland aquifer.
- *Lead mine at Freagh* - No consideration of impact on Lead mine at Freagh, Co. Kildare, in terms of pollution of waters.

4.4.11.4 Flood risk - general

- *Lack of ground/site investigation prevents adequate hydrological assessment.* There has been no recording of ground water levels across the site and this has significant impact on any hydrological assessment in a bog area where naturally high water tables occur. It is not possible to estimate the extent of dewatering required. Neither is it possible to assess the design of any swales and silt ponds during construction. Thus EIS deficient, (Specialist Report on Engineering Issues by Donnachadh O' Brien).
- *High water table Hortland* - water is generally close to ground level, but varies seasonally due to peaty conditions. During winter months, not uncommon to find water table at ground level. (Specialist Report on Engineering Issues by Donnachadh O' Brien)
- *R. Blackwater- Hortland* - no site specific flood analysis undertaken. Lands adjacent to the River Blackwater in Hortland are known to flood regularly during severe rainfall events. There is an increased risk of flooding from the carrying out of cabling roadworks and foundations and the backing-up of rainwater from structures put in place and an increased cost of insurance. Concern about impact of same on private property. (Specialist Report on Engineering Issues by Donnachadh O' Brien).
- *Relationship between groundwater and local watercourses unclear* - Discharge from silt ponds unclear - appears to rely on network of stagnant local field ditches. Relationship between GW and the intricate surface water network of drainage ditches not been explored.
- *Loss of floodplain* - Impact of construction of access roads has not been assessed in terms of loss of floodplain in the vicinity of T40, which is in the centre of a known flood plain. Thus EIS deficient, (Specialist Report on Engineering Issues by Donnachadh O' Brien).
- *History of flooding* - there is a significant risk of flooding due to the high water table, the history of flooding in the area and the scale of the development proposed. It is likely that the risk of flooding will be significantly increased.
- *Flood risk – intense rainfall* - inadequate consideration of impact of intense rainfall events on existing drainage systems including canals which have limited ability to discharge excess surface water.
- *Excavation flooding* - the EIS states that excavation flooding will be prevented by controlled pumping to transportable holding tanks, but no indication where it will be discharged and what the waste water will be tested for or volume of water involved. No info re associated traffic volumes involved. EIS does not detail the precise volume of peat/soil to be removed or where it will be deposited.
- *EIS deficient - Hydrology:* Impact on and inadequate consideration of natural drainage and hydrology impacted by turbine location and excavations; impact of displacement of groundwater by 20ft, with impact on private wells of 20ft; on the canals, rivers and sewage networks; groundwater contamination; inadequate information (EIS sn. 9.4.3 refers); map 14.1 Ch.14 KCDP

4.4.11.5 Localised flooding

- R Blackwater Flooding - proximity to T40 - this turbine only 70 metres from river bank. Removal of large quantities of earth and replacement with concrete foundations would have a detrimental effect on the river and its surroundings, esp. re risk of flooding at site of T40, the high local water table and the need for dewatering during construction, which has not been quantified in the EIS. Prone to flooding for past 30 years
- R Slate Floodplain - introduction of thousands of tons of concrete will have impact on water table which will exacerbate flooding here in recent years
- R Sweep - Drainage/hydrology - concerned re impacts on drainage and hydrology and the River Sweep which runs across his lands (Dwelling no. 1065)
- R Glash - *Increased flood risk* from River Glash, River Kilcooney and associated insurance cost and pollution.
- R Fear English - Omitted Fear English River - Omission of at least one known water source within one of the clusters from maps.
- Royal Canal burst its banks in 1993 in vicinity of WT1 & WT2 - concern about impact of 1000's tonnes of concrete on local water table. T1, 2, 7 & 8 within 500m of canal bank. Risk of breach of canal by blade throw or structural collapse would cause flooding
- Cable route – prone to flooding - Road between Hortland site and substation at Taghadoe is narrow and windy and prone to subsidence and is used by locals, service and commercial vehicles to access M4. KCC undertook major works on the road in May 2015. Concern about impact of 1.2m trench. Depth of road structure is only barely 1.2m and is prone to flooding in vicinity of objector's dwelling where stream floods (at boundary of Dunmurraghill and Newtownmauneenlaluggah grid ref.N827320) and cannot accommodate underground cable (note, photo attached); concern that it would undermine this and other culverts and result in the flooding of local homes.
- Cable works will impact on field drainage in Ballagh Cross/Kilnamoragh North where there are underground watercourses. One was previously disturbed by minor road works in vicinity of Donadea old Post Office resulting in flooding of adjacent field ever since and making it unsuitable for grain growing.
- Impact of Cloncumber Cluster - base works, removal of bog and forest and construction of roads with potential impact on River Slate, adjacent farmland, local housing adjacent the canal, and Rathangan and Allenwood from flooding
- Williamstown house – Private bog - Unspecified general concern about hydrological impacts on private area of bog, and consequential ecological impact associated with Observer's property, Williamstown House
- Property No. 36 (Hortland) - Part of farm consists of bogland which used to flood 40 yrs. ago but now rivers Blackwater and Clougheran being so well

drained, can use this land for grazing in Spring. Turbine foundations likely to affect underground streams and cause flooding in the area.

- *Property No. 46* - 3 no. rivers adjoining farmlands. Clogheraun, Derryvarogue tributary and R Blackwater. Coillte lands on which T40 is proposed. Contains confluence of 2 major catchments and have flooded extensively in the past. Use of large quantities of concrete and HGVs which are likely to compact the earth => flooding a significant issue in the future and affect his livelihood.
- *Property No. 70* - located 810m from T40 - home directly adjacent to R Blackwater flood plain - observed flooding and significant rise in river water levels over winter months in many years. Any hydrological impact from construction activity related to construction of T40 will potentially increase the risk of flooding to this property because of the direction of flow of the River Blackwater and the natural orientation of various streams and water courses in the immediate area.
- *Properties 90, 108* - water table high around house. Drains/ditches run down towards Blackwater River and onwards towards the wind farm development. Concern re increased risk of flooding as the soil/peat will be removed for foundations and dispersed on adjoining lands, the proposed forestry will be removed, (which maintains water table level), and thousands of tonnes of concrete will be pumped into the holes which will affect water levels and flow rates. As lands and fields in the area flood every year, this is of serious concern.
- *Property No. 198* - Existing regular flooding occurs at / between T40, 41 & 42 and Home No. 198.
- *Upgrading of Access Track for T47* – it is proposed to provide new entrance from main road, across a river, around the back of new homes and alongside observer's land. Will also run behind derelict building owned by observer, which it is intended to redevelop. The existing track referred to in the EIS is a dirt track which will require significant level of upgrading to cope with construction traffic, and will require a lot of filling. Concerned that runoff following filling will cause flooding to observer's land.
- *New Entrance and Access Track to T47* - Risk of flooding - periods of intense rainfall means that the volume of water flowing into proposed run-off systems may risk failure due to inadequate detailed analysis to avert flooding. In the area adjacent to the proposed entrance to T47, new entrance would necessitate covering over of a drain. The construction of the proposed track would cause water displacement and would necessitate the construction of a bridge over an existing stream. Serious impact on adjoining property and would cause flooding of garden.
- *Site Notice 11* - drains on lands adjacent to this site notice - high water table - surface water run-off to Blackwater River. Cutting and filling of soil/peat to accommodate turbines with concrete foundations likely to increase risk of flooding from surface water.

4.4.12 Ecological impacts

4.4.12.1 Designated sites – cSACs, cSPAs, NHAs and pNHAs

- *Contrary to Kildare CDP heritage policies and objectives – Policies DS1, DS2, DS5 and DS6 and Objectives NH01, NH07 seek to protect designated sites from the effects of inappropriate development such as this, (Chapter 13: 13.4.2 Natural Heritage / Biodiversity).*
- *Over 30 designated sites - 10 Natura sites and 20 NHAs - indirect impacts on water quality downstream of the development would have an impact on salmon and otter. Impact on hydrological status of SACs and Salmonid waters from proposed drainage needed at Drehid-Hortland wind farm.*
- *Impact on Natura 2000 sites in Kildare and Meath - Potential significant adverse impact on the Conservation Objectives for the qualifying interests of the Natura 2000 sites.*
- *Impact on NHAs and pNHA's in Kildare and Meath – numerous NHAs will be negatively affected by the proposed development including Jamestown Bog, Girley Bog, Molerick Bog (001582), Ballynabarney Fen (001573), Mount Hevey Bog (002342), the Bog of Allen, Hodgestown Bog, Carbury Bog, Ballina Bog, Killthomas Wood, Donadea Wood, Red Bog, Rivers Boyne and Blackwater (Slate, Figile, Glash, Ryewater, Clonshanbo, Lyreen, Fear English, Cushaling, Abbeylough), Grand Canal and Royal Canal, Ballynafagh Bog (00391), Ballynafagh Lake (01387), Pollardstown Fen.*
 - *Proximity to bogland NHAs - Proposed development is 1.43km from Carbury Bog NHA, 3.67km from Hodgestown Bog NHA and 8.42km from Blackcastle Bog NHA*
 - *Knockor and Haggard Bog NHA likely to be adversely affected by turbines in such close proximity*
 - *Ballynabarney NHA (001573) - close to Ballynakill cluster - Fen located in a deep artificially created valley between embankments of Royal Canal and Railway - good floral representation of a fen community which is a fairly uncommon habitat. Also present is Variegated Horsetail which is very rare in Ireland.*
 - *Molerick Bog NHA - raised and cut-over bog.*
 - *Ballynafagh Lake NHA - this is an old Grand Canal reservoir which has undergone naturalisation and is connected to the River Boyne & R Blackwater - breeding ground for salmonids, lampreys and the ubiquitous frog which is present near the Hortland cluster*
 - *Bog of Allen - a rare wilderness with vista with wide and distant horizons and few man-made structures, a landscape rare in Europe; local bog landscape and related flora and fauna*
 - *River Boyne NHA - freshwater section as far as Boyne Aqueduct*
 - *Donadea Demesne NHA - reason for refusal for a small house on field adjoining Donadea Demesne was that it was adjacent to the NHA. For the sake of consistency, this proposal should also be refused.*

- *Grand Canal NHA and Grand Canal Way* - runs adjacent to the Cloncumber Cluster. This is an important amenity walking route as well as a natural heritage site and is well documented in terms of its biodiversity value. It acts as a wildlife corridor for birds, mammals (including otter and bats) and invertebrates and provides a range of ecosystems. EIS places insufficient value on the resource in terms of its ecosystem services to the county. Impact on Grand Canal as Natura 2000 site is contrary to Habitats Directive. Borrow pit 3 - impact on grand canal and on Natura 2000 site contrary to EU and Irish planning practice
- *Impact on biodiversity of Royal Canal* - Would destroy biodiversity of Royal Canal including species of bird, bats, red squirrels, pine martens etc.

4.4.12.2 Potential Impacts on Habitats/Biodiversity

- *Habitat loss and destruction* - main adverse effects from wind farms is on nature conservation according to past wind energy reports in Ireland and Europe. Direct impact on feeding, roosting, breeding habitats from construction e.g. soil erosion and collision and indirect impacts through habitat damage from hydrological impacts and geological processes, disturbance, displacement and dislocation of habitats and species.
- *Displacement/fragmentation* - no assessment done to determine whether suitable alternative habitat exists, whether there is capacity in the surrounding environment or what would be the impact of fragmentation and disruption on existing and adjoining habitats and species. Area will become depopulated of wildlife, particularly of birds.
- *Ecological dynamics* - a variety of different habitats required to enable species to survive between feeding, resting and nesting sites. Habitat diversity and migration between habitats is very important but overlooked in EIS, as is the need to support rare and unique species. EIS deficient as not given consideration to all environmental criteria.
- *Cumulative impact* - inadequate with regard to impact of the surrounding wind farms along with the proposed development on wildlife, particularly migratory bird species and migratory routes cross referenced with location and number of turbines. Mitigation measures do not address the potential impacts that will arise and/or falls short on compensatory measures.
- *Landscape Management* - Insufficient information in EIS in relation to landscape management, especially during operation and decommissioning phases. Trees and hedgerows will be destroyed to accommodate development and wildlife will be disturbed. This is contrary to the objectives of Chap 13 of the Kildare CDP which seeks to avoid undue negative impacts on the natural environment and to protect/manage existing woodlands, trees, hedgerows which are of biodiversity value and contribute to the landscape character of the area.
- *Rich Diversity of species* - many protected species in this area of rich biodiversity. Includes birds of prey, bats, rabbits, red squirrels, pine martens,

Irish hares, badgers, otters, barn owls. Also cuckoos, pheasants and grouse present. The proposed turbines pose a threat to these species due to permanent disruption and destruction of habitats and will impact on their populations. Proposed WF should be rejected on this basis

- *Impact on Habitats of Kildare* - Kildare is a small county with no coastline, lakes or mountains. Thus the wildlife habitats are confined to small pockets of raised bog and cut-away bog (14%). Clear-felling of forests and large scale removal of trees and hedgerows will severely reduce the availability of habitats in the area.
- *Permanent impact of this massive engineering project* required for construction of turbines will irreparably damage soil and peat structures, water tables, vegetation and the introduction of thousands of tonnes of concrete - will threaten birds and other wildlife, rivers and canals. The removal of vegetation, trees, soil and peat for ground preparation for foundations; the introduction of large quantities of concrete, (2000 tons per turbine), will threaten wildlife and protected species due to its highly alkaline and corrosive nature, giving rise to fish kills (including watercourses within Natura 2000 sites); the permanency of development - foundations can't be decommissioned and hence, leaving the concrete bases in place to re-vegetate naturally, will be impossible as these bogs have grown for centuries; and the re-use of tracks will result in increased trafficking and disturbance of solid and risk contaminated runoff and increased runoff. The site will not therefore be restored.
- *Lack Site Investigation* - completely inadequate level of site investigation for project of this scale and in particular, w.r.t foundations and substructure works associated with the turbines.
- *Cloncumber Cluster* - Ref to Blackthorn Ecology Survey (EP & Waterways Ireland Survey of Grand Canal Barrow Line - list of Mammal spp. And Plant spp. recorded here. Includes Otter, Badger, Irish Hare, Red Squirrel, Opposite Leaved Pondweed, White-Clawed Crayfish
- *Lullymore biodiversity trail* - a rich abundance of butterfly habitats and bird life and a "biodiversity hotspot" will be directly impacted. Interpretative centre/boardwalk adjacent to haul route and Derrybrennan cluster. Adverse impact from Derrybrennan and Cloncumber clusters as immediately adjacent to the walk from Lullymore West Bog to the boardwalk at Lodge Bog, with its unique view towards Hill of Allen. This will be overwhelmingly dominated by development.
- *Biodiversity - Kilnamoragh Stud* - home to foxes, rabbits, hares, badgers, eagles, pigeons, crows, doves, pheasants, wild ducks, and the cuckoo. The Baltreacy River runs through Kilnamonagh Stud and is occupied by otters, cranes and wild ducks, fresh water mussels can also be found here. Introduction of turbines would have a devastating effect on this wildlife.
- *Tidy towns - school project* - bug hotel proposal undermines everything they are promoting

4.4.12.3 Potential Impacts on Trees/Forestry

- *Contrary to KCDP policy TW3* to protect woodlands, trees, hedgerows, Table 14.8 KCDP. Contrary to the objectives under Ch.13 of the KCDP.
- *Excessive forestry felling* - Proposal to fell 63ha of forestry is excessive and will adversely impact existing habitats and biodiversity. Should be rejected. Note that the Irish average woodland land cover is 10% which is significantly less than the EU average of 35%. Kildare is even further below the average at 5%. Loss of woodlands and associated habitat - 63ha at Donadea; 15ha at Ballyteige Forest; 2.3 acres of forestry felled per turbine.
- *Lack of clarity on mitigation of loss of woodland* - no indication of where the intended replacement planting will take place, which would be a condition of the award of a felling license. This needs to be subject to an NIS.
- *Loss of trees and hedgerows* - some, centuries old, will be destroyed to accommodate development. Wildlife will be disturbed - impacts on plants and wildlife habitat. No hedges can be cut from March 1 to August 30 restricting construction works
- *Impact on mature beech trees* - the trees between Ballagh Cross to Kilnamoragh North, Donadea, located within 2m of trench will be at risk.
- *Ballyteague forest* - Cloncumber cluster - proposal to fell 3.2acres of forestry per turbine, plus access tracks, which would equate to 15ha of this forest. Used by locals for walking, cycling, horseriding and would be a big loss to the community. The forest and the river running through it, previously formed part of the Healy Estate and has a special place in the heart of the community. It has a rich biodiversity including several birds such as Curlew. There is also a mass rock, an old mass path and a rath.
- *Donadea Forest Park* - NHA and public amenity. Adjacent to wind turbines and L1010 - location of power line. A national treasure with many historical features including remains of the castle, walled gardens etc. the introduction of wind turbines within the area of this park would have a devastating effect on the tourism amenity of the park and on the abundance of wildlife in the area. Would the Proposed NHA status be in doubt if the development went ahead?
- *Tree felling at Donadea Forest Park* - how can this be permitted if it is a NHA given the statement in the KCP that '*under the Wildlife Amendment Act (2000), NHA's are legally protected from damage from the date they are formally proposed*'. Not adequately addressed in EIS.
- *Killinathomas Woods* - impacted w.r.t. wildlife displacement and visual amenity
- *Forestry owner Derryvarogue* - as a landowner of 25ha local forestry concerned re impact on the environment. There is wild deer which roam the forestry in the area and regularly traverse their lands. No mention of native wild deer in EIS.
- *T31 and T32 located in Coillte forestry* - this is a biodiversity set-aside area and is an example of beautiful bog forest with immense biodiversity which should be retained.

4.4.12.4 Potential Impacts on Boglands

- *Potential for significant impact on boglands* - Disputes Element Power's statement that 'industry best practice and appropriate mitigation measures would result in no significant impacts on the bogs and wetlands. Dispersed nature increases the ecological impact across a large area. Massive engineering project required for construction of turbines will irreparably damage soil and peat structures, water tables, vegetation
- *Hydrological impacts* - Potential to negatively affect surface water and groundwater hydrology with potential for peat slippage and changes in flow of natural streams and rivers
- *Bog bursts/bog slides* - concern re bog bursts associated with wind farm construction such as at Derrybrien (2003) or Stacks Mountains (2008). Bog bursts destroy peatland habitats and also pose a huge risk to drinking water supplies, cause juvenile fish kills and destruction of the aquatic environment when the displaced peat enters local watercourses. Need for adequate peat stress testing as part of the EIA.
- *Lack Site Investigation* - completely inadequate level of site investigation for project of this scale and in particular, with respect to foundations and substructure works associated with the turbines. EIS does not adequately address risk of disturbing peat during construction (quotes section 2.4.11 Peat Extraction, of the EIS).
- *Release of carbon from removal of bog* - carbon locked up in peat proposed to be removed.
- *Bogland habitat* - last refuge for many species of bird, including farmland birds. Species such as cuckoo and curlew are now 100% dependent on this habitat. Evidence from Stacks Mountain in Kerry, where wind farm was established, where species of bird including cuckoo and curlew are now completely gone. This habitat also very important for other wildlife including bats, hares, dragonflies, invertebrates, amphibians, bees, moths, molluscs and wild flora. All of which will be seriously impacted by the proposed development.
- *IPCC 1997 - Analysis of Peatland Biodiversity* - peatlands sustain a rich and unique range of habitats from calcareous-rich fens to acidic bogs. Ireland contains 51% of all raised bogs in the Atlantic region of NW Europe. If development goes ahead will cause significant environmental damage to these habitats.
- *Peatland Habitats* - European and international obligation to protect and restore peatland habitats under Habitats Directive and RAMSAR. In Kildare and Offaly, 90% of this habitat has been destroyed by exploitation, reclamation and development. IPCC significant concerns re potential for proposal to result in the destruction of a mosaic of peatland habitats and its associated wildlife by reason of construction of turbines and access roads.
- *Decommissioning* - proposed to leave concrete pads in place to revegetate naturally - not possible as these boglands have developed over centuries.
Impact on Lodge Bog (raised bog) - part of the great Lullymore Bog will bear

a significant impact from this development. Habitats include breeding Curlew (Annex II of Habitats Directive), Large Heath Butterfly. Also includes a 100m boardwalk, interpretative centre located on site for visitors. Impact of haulage route and cables between Derrybrennan and Cloncumber clusters. Walk from Lullymore West Bog to board walk at Lodge Bog will be visually overwhelmed.

- *Impact on Knockor Bog (aka Ballinderry Bog, Nurney Bog)* - Windmill cluster - turbines would have detrimental effect on local wildlife. Foundations for turbines and construction of access roads would also risk excessive environmental damage to the bog
- *Impact on Williamstown Bog* - hydrology of this bog has already suffered considerably from peat harvesting on the Windmill cluster site. The bog slopes down severely some several metres towards the site boundary. Concern expressed re impacts on hydrology of the bog as well as flora and fauna here.

4.4.12.5 Potential Impacts on Rivers/Water Quality

- *Impacts on wide range of Rivers* - Boyne, Blackwater, Slate, Figile, Glash, Ryewater, Clonshanbo, Lyreen, Fear English, Cushaling and Abbylough will be affected by the proposed wind farm - Risks of contamination of watercourses and tributaries from runoff during construction.
- *Grand Canal NHA and Grand Canal Way* - runs adjacent to the Cloncumber cluster. This is an important amenity walking route as well as a natural heritage site and is well documented in terms of its biodiversity value. It acts as a wildlife corridor for birds, mammals (including otter and bats) and invertebrates and provides a range of ecosystems. EIS places insufficient value on the resource in terms of its ecosystem services to the county.
- *Waterways - ecological corridors* - rivers and canals contain numerous birds, flora, fauna. There are only 2 places in Europe where the river meets the canal, one of which happens to be in Longwood. It is important to protect the biodiversity of this area.
- *Boyne and Blackwater cSAC and adjacent low-lying lands* - general concern; construction phase may negatively affect otter and salmon and conservation objectives of its qualifying interests; contamination and fish kills
- *R Blackwater* - concerned that foundations of almost an acre per turbine for 7 *River Boyne SAC* - Ballinakill site is particularly sensitive due to its proximity to River Boyne SAC
- turbines close to this river will cause pollution and flooding which will affect drainage from surrounding fields.
- *Risk to R Blackwater cSAC from flows from other rivers* - Kilwarden River near Clonard flows into cSAC; any contamination of the Sweep River which runs alongside the proposed development (known as Trout spawning ground) will enter River Blackwater cSAC. During construction phase of Kilmurray Brook, the builder was forbidden to interfere with the Sweep River due to concerns for impact on trout.

4.4.12.6 Potential Impacts on Birds

4.4.12.6.1 Direct and Indirect Impact on bird species

- *Direct/Indirect Impacts* - Direct impacts would be habitat loss and destruction, soil erosion, collisions with animals (e.g. turbine rotors). Indirect impacts - loss of available habitat due to fragmentation and disturbance, displacement of species and individuals, barrier effects and cumulative impacts. These impacts not considered by developer.
- *Habitat loss for Birds* – Habitat loss and degradation will lead to displacement, fragmentation, and barrier effect over a very wide area. This together with mortality from collision risk will have a significant cumulative impact on bird species in the area. EU Directive 2009/147/EC recognises that habitat loss and degradation are the most serious threats to the conservation of wild birds. In light of the large no. species that would be directly affected by loss of habitat, proposed WF should be rejected.
- *Increased collision risk* for turbines will lead to increased mortality. Blade tips on turbines of this size, 169m, will be travelling at 170mph which means that birds will be playing Russian Roulette and will be exacerbated by aviation red lights. Turbines sometimes jammed by excrement of insects and birds killed by collision. No consideration of flight paths, (e.g. for Buzzards in Ballinakill area) in EIS. Such impact recognised by RSPB.
- *Lack of visibility of turbines to birds* - dependent on atmospheric/weather conditions, but also related to the speed of the end of the blade which renders it transparent, has been proven to influence the impact of WT on birds.
- *Migratory routes* - no assessment of potential migratory routes and cross referencing with known locations for migratory birds in midlands and with individual proposed turbines. Whooper swans and Brent Geese migrate through this area.
- *Roosting at Lullymore Heritage Park* - the owners of the park strongly refute the EIS claim (7.2.4) that the lakes in the park not extensive and intensively used by birds on a regular basis.
- *Hortland cluster* - long established colonies of Merlin, Golden Plover, Woodcock, Snipe and Hen Harrier would be put at risk due to proposals to cut back forestry
- *Cloncumber Cluster* - Ref to Blackthorn Ecology Survey (EP & Waterways Ireland Survey of Grand Canal Barrow Line - list of Annex 1, Annex 11 Birds and BoCCI Red and Amber Listed species recorded here.

4.4.12.6.2 Impact on wide range of bird species in the area

- *Impact on several Protected Bird Species recorded in area* - including 3 no. Annex I spp. and Red-Listed species, Hen Harrier, Golden Plover and Merlin.

Research (Pearse Higgins et al. 2009) indicates that 7 out of 12 species of protected birds (including those found on/near site) showed significantly lower frequencies close to turbines, with no recovery post construction.

- *Significant risk to bird species present on site*, such as Whooper Swan, Mute Swan, Kingfisher, Lapwing, Woodcock, Curlew, Teal, Peregrine, Pheasants, Meadow Pipet, Little Egret, Skylark, Snipe, Kestrels and Buzzards which has been understated in the EIS), Red-footed Falcon, Sand Martins, Black-headed Gull, Redshank, Barn Owl, Yellowhammer, Sparrowhawk and Golden Eagle. Golden Plover (Red Listed) is particularly susceptible and is known to avoid wind farms, with a consequent reduction in population. Populations of Merlin and Meadow Pipet also at risk.
- *Kildare Research various bird species - Observer No. 758* has been researching birds in Kildare over the period 1850 - present day. Note that Kildare lost 3 breeding species between 1900-2000, lost 6 species between 2000-2015. Claims that if this project goes ahead, a further 12 species will be under threat of extinction. Notes significant threat to Curlew and several other Red listed birds (lapwing, redshank, woodcock, meadow pipet and winchat) and also to amber listed birds which are dependent on this habitat.
- *Vision of the Dutch Bird Protection Association on wind energy* - effects differ by bird species, with long-living low-fertile species (i.e. raising few young) most vulnerable as extra mortality of a relatively small number of birds can lead to significant decline of population (e.g. purple heron); birds with large wingspan (swans) have proven vulnerable to clashes.
- *Blackthorn Ecology's survey (2014) and Waterways Ireland Ecological Survey of Grand Canal Barrow Line* found a range of bird species listed under Annex I and II of Birds Directive, BoCCI red and Amber listed species, which must be protected and which we cannot let be destroyed by a private developer.
- *Wading birds and wild fowl* - hundreds of thousands travel from Europe, Iceland, Greenland and Canadian Arctic to Ireland because of mild climate. Must be protected.
- *Significant Wetland birds* - Woodcock recorded across forestry/fields within canal property on north bank of GC west of 21st lock. As individual territory can be 20ha, population is dependent of wider area of forestry e.g. Ballyteague Forest. Curlew observed during EP & WI study to NW of Griffith Aqueduct. Kingfisher - recorded twice in vicinity of canal and Slate River
- *Birds of prey and gaming birds* (e.g. partridge, pheasant, peregrine falcons, buzzards) - several species prominent in area - collision risk. Highlight 2 areas where buzzards and other birds of prey present - (1) trees bordering Rentes Plants (53.434194; 6.937343) approx. 400m from nearest T. (2) Area bordering Schram Plants (53.436265; 6.937343)
- *Birds of Prey over Wet Blanket bogs* Observer is highly regarded as world expert on falconry and birds of prey and has been studying such species in the area of the development for over 30 years. Numerous nesting pairs of Peregrine Falcons within the area of the proposed development. Serious risk of collision, mortality, habitat loss, disturbance, barrier effects and cumulative

impacts to Peregrine Falcons as evidenced in areas in the vicinity of wind turbines in Scotland and USA. Peregrine Falcons Hunting at 180mph (e.g. of Snipe), clip of collide with blades. Peregrine Falcons fly at heights of 1000m during day => non-expert observers would not spot them => very unlikely that surveys in EIS are accurate w.r.t. these birds.

4.4.12.6.3 Potential impacts on particular species of birds

- *Kingfisher* - protected species - protected as part of Boyne and Blackwater SPA. The kingfisher has been gone from this area for nearly 20 years but is now back. They must be protected. Kingfisher recorded on canal and likely nests on Slate River.
- *Hen Harrier* - Annex I species is recorded in area. Proposed wind farm will destroy and remove a significant amount of habitat considered ideal for Hen Harrier - forestry and bog. Protected under the Wildlife Amendment Act 2000 and an All-Ireland Species of Conservation Concern and a UK priority species.
- *Whooper Swan* - known flight paths of this migratory bird through the area. No forward vision which increases risk of collision. Wind turbines would threaten the sustainability of the native swan population. No assessment carried out.
- *Curlew* - A population of Curlew utilise part of Lodge Bog and IPCC would have serious concerns for this species due to cable laying proposals. Curlew is Annex II and Red Listed. Birdwatch Ireland report that Curlew population has suffered serious declines (82%) since 1987 and are known to be particularly susceptible to wind farm development, with little recovery post construction. IPCC can confirm that Curlew still thriving on site. One Observer (758) currently conducting survey of county and note only 4 sites where Curlew trying to breed, (one at Lodge Bog and one adj. to Cloncumber). Direct evidence that one pair successfully bred 3 chicks near Cloncumber cluster in 2010. Curlew also recorded northwest of Griffith Aqueduct.
- *Golden Plover (Red Listed)* - particularly susceptible and is known to avoid wind farms, with a consequent reduction in population.
- *Snipe & Woodcock* - Observer no. 201 expert on these wading birds, which inhabit the boglands of Drehid and Hortland on an annual basis. The introduction of very large wind turbines into these boglands can only have a catastrophic impact on the flight paths, resting and feeding habits of these unique birds. Appropriate Habitats include boglands, rivers, estuaries as they have long bills for feeding. Move only at night by astral navigation along well defined flight paths. Both species are unique as cannot be bred in captivity.
- *Snipe* - Observer is highly regarded as world expert on falconry and birds of prey and has been studying such species in the area of the development for over 30 years. Note 80% of migrating Snipe arrive into wet bogs from first full moon in October and remain until first week of March. Snipe exhibit

significant turbine and track avoidance behaviour and bird densities around turbines can suffer a reduction of c.50%

- *Woodcock (red listed)* - recorded in vicinity of 21st lock by Waterways Ireland Survey. As each woodcock has territory of 20ha and the population is likely depended upon wider forestry including Ballyteague Forest;
- *Barn owls* - Derrycreeb and Hortland Forest and bog. Concern about effect of territorial disruption and of the effect of infrasound and ultrasonic sound on these birds.
- *Cuckoo and Meadow Pipet* - Decline by >50% in last 50 years due to loss of habitat. Any industrialisation of bogs would put further pressure on these two endangered species - listed on IUCN Red List of Threatened Species
- *Lapwing* - show decreased utilisation of site areas where wind turbines are operational.
- *Sand Martin* - Balrennet is renowned for their breeding.
- *Tree Sparrow* – recorded twice at Glenaree Bridge

4.4.12.7 Potential Impacts on Bats

4.4.12.7.1 Presence of bats in area – adequacy of surveys

- *All bat species in Ireland - Protected* - under Wildlife Act 1976 and Wildlife Amendment Act 2000 and all species of Bat found in Ireland are listed on Annex IV of Habitats Directives, with the Lesser Horseshoe Bat also under Annex II. Killing of such species is a criminal offence. Ireland will spend €250,000 over next 4 years monitoring protected species of bats.
- *Bat survey is deficient* - mainly conducted during period of very poor bat activity (2013) following a prolonged period of unfavourable weather. The 2014 survey was a structural survey of limited value (table 7.69 records activity as 'Low', which is not surprising, the severe street on the population in 2013).
- *Roosts and breeding bats present in area* - Wide range of bat species present within the area of the wind farm -
 - Daubenton, Common Pipistrelle, Soprano and Leislars Bat (all rare and protected) in area including inter alia Drumsu and Lullymore;
 - rare Natterer Bat sighted at Ballinderry;
 - Common Pipistrelle, Soprano and Nathusius Pipistrelle, Leisler's, Brown Long-eared, Daubentons, Natterer's, Whiskered and Brandt's bats all present in Parsonstown area (Drehid - Hortland);
 - 9 species of bat within 10 known roosts within 10km with high activity around T11 & T12;
 - Colony of bats in Donadea Forest;
 - Bats present in Longwood.

- *Leislars Bats* - Observer's own bat survey found Leislars Bats to be common. A high risk species for wind turbines as a high flier (Carlin & Mitchell-Jones 2009), 10m-70m (Russ 1999), but up to 500m (Bruderer & Popa-Lisseanu 2005); long distance traveller (13.4km recorded in Ireland, Shiel et al 1999) with fast but less manoeuvrable flight (Dietz et al 2007), bringing it into direct risk of collision with turbines and suffering more casualties compared to horseshoe bats known to be killed in low numbers (Eurobats 2005, Hotker et al 2005). The Irish population of Leislars Bats is of international importance and will be negatively affected during construction (loss of roosts) and operation (collision).
- *Pipistrelle Bats* - Noctule, common and Nathusius's Pipistrelle (and likely Soprano) are most commonly found casualties (Eurobats 2005, Hotker et al 2005) and common pipistrelle are found in disproportionately high numbers where wind turbines are located close to trees and hedgerows (Hotker et al 2005) and will likely be attracted to lighting on wind turbines as they are to streetlights (Vaughan et al 1997, Batonicka & Zukal). These species are categorised as being at medium/high risk by Heritage Council report by Scott Cawley 'Bats & Wind Farm, State of the Art and Best Practice Guidelines'.
- *Drumsru area* - surrounded by bats - Daubenton, Common Pipistrelle, Soprano, Leislars Bat - rare and protected species. Evidence available that these bats are affected by sound waves. This development will destroy them.

4.4.12.7.2 Potential impacts on bats

- *Seriously at risk from wind farm due to proximity* - All phases of construction and operation should be considered in terms of impact on bats.
- *Attraction of bats to wind turbines* – Bats are attracted to and investigate Wind Turbines as potential roosts, (attachment of article to 768), increasing adverse impact. Security lights at bottom of tower, colour of turbine and acoustic effects are suspected to attract flying insects and bats into the risk zone (Horn et al 2008, Rydell et al 2010b, Long et al 2011).
- *Increased risk of collision* - risk of collision increased exponentially by the design of the turbines - 120m rotor diameter and distance between rotors and ground being 49m. Blades on turbines of 169m will be travelling at 170mph which means that bats will be playing Russian Roulette. Evidence that rotors in motion can confuse echo-location for bats. Has there been any consideration of flight paths?
- *Failure to detect moving blades* - Blade speed of 250-300kph make blades totally undetectable for echo-locating bats (Long et al 2009, 2010a). The wake effect of blade drastically modifies air pressure, enlarging the risk zone and causing fatal barotraumas to flying bats (Baerwald et al 2008).
- *Serious threat to bats from barotraumas* - This is similar to "the bends" for deep sea divers, which causes the bat's lungs to explode when in proximity to turbines. (See New Scientist Issue 2671, August, 2008).

- *Different bat species at different risk in different weather conditions* - At low wind speeds, insect flight and bat activity occur at higher altitude, increasing risk of collision.
- *Fatality research studies* - show bat species affected differently by turbines depending on their particular behaviour and flight style (Rydell et al, 2010a among 7 others) with aerial hunters at high risk (Bas et al 2014), and long distance high altitude migrators also at increased risk, which may be exacerbated by Wind Turbines acting as landmarks during migration/commuting and, which may act as a population sink if mating bats are drawn thereto.
- *Disputes EIS assessment of magnitude of risk to bats* - Disagrees with Ch.7 EIS which notes risk to a few individual specimen of Leisler's bat as a high flying species, but minor negative impact result and favourable conservation status (FCS) of bat species unaffected for all bat species. Assessment in the Ecological Survey/EIS is naive.
- *Lack of mitigation - Bat mortality due to risk of collision* - No realistic proposals to address this issue in EIS. Merely collection of victims rather than methodology to avoid the collisions in the first place. Natura Impact Statement notes high presence and 27 roosts for high flying Leisler's Bat but provides for no mitigation for impacts on bats citing lack of proper studies.
- *Siting of turbines close to forestry - Contrary to Eurobats Guidelines (Revision 2014)* - 'Wind turbines should not, as a rule, be installed within all types of woodland or within 200m due to the exacerbation risks that this type of siting implies for all bats' [section 5.2.1 p.49 of attachment 005]. A significant proportion of the Cloncumber cluster is located within a forested area.
- *Many examples of refusal permission in Europe having regard to AA findings in respect of bats* (doc.EUROBATS.MoP7.13Annex Draft Guidelines for consideration of bats in wind farm projects - revision2014 - an introduction).

4.4.12.8 Potential Impacts on Butterflies, Moths, Bees and Other Insects

- *Insects in general* - no evidence of consideration of impact on insect flight paths and collision risks which would affect the biodiversity of the area
- *Butterfly surveys* - Observer 758 conducted butterfly transect in Hortland area for National Biodiversity Data Centre in Waterford. Found 19 species of butterfly, not 7 as stated in EIS. Raises questions regarding accuracy of other surveys. At 19 species, this means that this site is close to the top butterfly sites in the country. Included red listed species (Large Heath) and amber listed (Small Heath) which are vulnerable/threatened. Also includes county rarities e.g. Brimstone, Silver Washed Fritillary.
- *Inadequate information on butterflies in area* - Large Heath butterfly on Irish and European Red list, and Dingy Skipper only known sightings are in Kildare. Inadequate information in NIS on butterflies - Annex 8 of NIS does not include Marsh Fritillary. Also, impact on butterfly habitat (bogs), including rare

habitat at Drehid and Drumachon townland (being the only habitat, in Ireland, of an unnamed species) and butterflies generally.

- *Marsh Fritillary* present and legally protected under EU Directive 92/43/EC, Annex II Habitats Directive and one of the most endangered species in Europe. Preferred habitat of damp grasslands dominated by tussock forming grassland (e.g. as found in Drehid/Hortland). It is recorded at a number of sites in Kildare, mainly on natural grassland, (as stated in the Kildare Biodiversity Plan 2009-2014). Reported as present on Drehid Bog between D-H clusters, yet annex 8 of NIS does not include Marsh Fritillary. Proposed WF should be rejected on this basis.
- *Lullymore West Bog/Derrybrennan*, regenerated from cut-over bog to a wetland and woodland habitat and is a breeding habitat for Marsh Fritillary and 22 seen here every year, plus 150 species of moth (not considered by developer). IPCC work to conserve the Marsh Fritillary butterfly at their nature reserve.
- *Moths* - Lepidoptera survey carried out in 2014 by Philip Strickland - found 139 species recorded including very rare species of Bilberry Pug and Waved Carpet - highlights importance of bogland habitat.
- *Bees* - Area is home to approx. 30 bee colonies - Rentes Plants own 10. Wind turbines have proven effect on health of local bee populations. Concern re interference with lifecycle and behaviour of bees from items such as electrical discharges, emissions and cabling. Evidence of adverse impact on crop pollination. There is a strong correlation between wind farm locations and the decline of the honeybee, particularly in the USA.

4.4.12.9 Potential Impacts on other species

- '*Mammals in a Sustainable Environment*' project - Observer 758 has conducted surveys of mammals in the Midlands for this project, particularly otters and pine martens - data stored with WIT Waterford. Work included picking up spraints and scats and having them analysed in WIT. Also sighted Merlin, Hen Harrier, Winchat and Woodcock during the breeding season in Hortland and Merlin in Drehid in winter and otter spraint in Cloncumber in winter. Lack of evidence of presence of several species (EIS) is of concern given that Observer has evidence of presence of such species, e.g. otter, pine marten, breeding hen harrier and breeding merlin.
- *Impact on protected species, other species and wildlife* - Direct loss of habitat for birds, bats, otter & red squirrel (both Red List species near threatened), pine martin, badger, cuckoo, (endangered in UK and becoming endangered in Ireland according to Telegraph), bats, rabbits, hare, fox, hedgehog, pygmy shrew, frog, fungus, red spider mite, etc., (including with reference to siting of Wind Turbines T11, T12 & T13; T40, T42, T43); displacement of animals onto farmland will spread disease; loss of irreplaceable areas of rich biodiversity containing many protected species.
- *Blackthorn Ecology's survey (2014) and Waterways Ireland Ecological Survey of Grand Canal Barrow Line* - found a range of bird species listed

under Annex I and II of Birds Directive, BoCCI red and Amber listed species; Mammals listed under Annex II, IV & V of the Habitats Directive and / or under the Wildlife Act 1976 & Wildlife Amendment Act 2000, as well as legally protected Opposite-leaved Pondweed (*Groenlandia dense*) under Flora Protection Order 1999 (52) on a number of sites on Grand Canal, which must be protected and which we cannot let be destroyed by a private developer.

- *Whorl Snail* - Threat to Whorl Snail and risk to Pollardstown Fen (designated nature reserve and Ramsar Site) refers to NIS sections 4.1.8.4, 5.3.3, 5.3.4 and table 5.5.3.
- *Badgers* - Disputes findings of the Ecological survey report in Ballinakill regarding badgers. Badgers are protected under the Wildlife Act 1976 and Amendment Act 2000. Independent survey into badger population is required as well as mitigation measures and best practice. Element Power proposes to resurvey 10-12 months prior to construction and prior to vegetation clearance, all overseen by project ecologist, but if they have already failed to provide accurate numbers of badgers in initial reports, how can future surveys be trusted?
- *Pine Marten* - one of the rarest species in Ireland. Population in decline due to felling of forests. Population at 2,700 makes it Ireland's rarest spp. It is regularly seen in and around T42 ("Carr's Island")
- *Wild Deer* - There is native wild deer which roam the forestry in the area where tree felling is proposed in respect of T40, T42, T43, (present within, inter alia, Derryvogue). No mention of native wild deer in EIS.
- *Hares* - protected species under Wildlife Acts - prevalent in area around D-H clusters. Proposal should be rejected in view of this presence.
- *Common Frog* - protected species under Wildlife Acts - prevalent throughout the D-H clusters - WF should be refused on this basis.
- *Deformities in horses and mink* - in Portugal and Denmark, wind farms are being blamed for deformities in mink and in horses.
- *Threat to freshwater pearl mussel* - impact on ecology of Baltracey River (through Kilnamoragh Stud) which contains freshwater pearl mussel.
- *Impact on White Clawed Crayfish habitat* - this protected habitat under Annex II & IV Habitat Directive occurs in the watercourses draining the Cloncumber Cluster.
- *Impact on rare plants* - Basil Thyme, Erigeron Acer, Red Hemp Nettle, Opposite-leaved Pondweed & Bog orchid found in the area.
- *Impact on orchid flower* - sensitive to soil compaction (NRA EIS M6 Motorway development 2007) - disturbance of soil and water table will lead to end of this rare plant.

4.4.12.10 Deficiencies in EIS

- *Insufficient information* to make an informed decision. Independent ecological survey would have been preferable. Survey time frame was too short. Inadequate surveys undertaken.
- *EIS deficient* - insufficient information to objectively assess the impact, direct, indirect and cumulative on the proposed development area and on the adjoining environment. Mitigation measures do not address the potential impacts that will arise and alternatively, the EIS falls short on compensatory measures that could be provided to mitigate the impact. Absent from the EIS is the acknowledgement of the specific requirements of some of the rarer species identified during the ecological surveys.
- *Adequacies of EIS surveys questioned* - e.g. Hortland cluster baseline surveys - Butterfly survey indicated presence of 7 species but observer 758 had direct evidence of 19 species of butterfly in this cluster alone. Also concern that EIS did not indicate presence of species such as otter, pine marten and breeding hen harrier, merlin, whereas Observer 758 does have such evidence. Thus how accurate are the other surveys?
- *Mitigation measures* are inadequate and do not include compensatory measures
- *GLAS - EIA inadequate* as cannot take account of potential impact on the increased wildlife/biodiversity which will arise from the implementation of GLAS - This new scheme introduced by the government which will result in farmers being paid grants to introduce practices which would increase wildlife/biodiversity by 20-30%, will take effect during the lifetime of the wind farm. However, the surveys as part of the EIA will not take account of the likely increased incidence of species and habitats, and hence the impact on flora and fauna could be a lot more severe than indicated in the EIS. E.g. impact on birds w.r.t. collision risk will be much greater
- *Drehid-Hortland EIS inadequate* - EIS has not undertaken a comprehensive assessment of the ecology at the proposed development area of Drehid/Hortland
- *Cloncumber-Derrybrennan* - EIS has not undertaken a comprehensive assessment of the ecology at the proposed development area of Cloncumber -Derrybrennan clusters.
- **Specialist Report by Ecologist Niamh Ni Bhroin (PhD) of Dulra is Duchas - engaged by Donadea Against Turbines (Submission no. 43, Appendix C)**
 - *Ecological dynamics not adequately considered* - wildlife require a no. of different habitats to survive between nesting, feeding and resting. Thus habitat diversity and migration between habitats is hugely important but overlooked in EIS along with the potential to support rare and unique species.

- *Whooper Swan flight lines* - EIS identified migratory flight paths for Whooper Swan (Annex 1) through site. WF could pose significant disturbance to this species which could warrant refusal of the application
- *Landscape Management inadequately addressed in EIS* - insufficient info re this during operation and decommissioning phases despite listing environmental impacts for each phase.
- *Wildlife displacement* - no evidence to support view in EIS that displaced wildlife can migrate to adjacent habitats as no assessment as to presence of suitable habitat or capacity of such habitats. No assessment of fragmentation and disruption on existing habitats/species in surrounding lands.
- *Cumulative impact* - of surrounding wind farms and proposed development - inadequately addressed in EIS.
- *Migratory routes inadequately assessed* - no cross referencing of turbine locations/numbers with known locations for migratory birds around the midlands area.
- *EIS deficient* - insufficient info to objectively assess the direct, indirect and cumulative impacts and mitigation measures do not address the potential impacts or propose compensatory measures that could mitigate the impacts, but relies on post decision data collection to mitigate impact on habitat.

4.4.12.11 Appropriate Assessment

- *Appropriate Assessment Screening flawed* - AA Stage 1 does not address the impacts (direct, indirect, cumulative) during construction, operation, decommissioning phases on the conservation aspect of the Natura 2000 sites, namely protected habitats for CSACs and for bird species (Kingfisher) in the case of R.Boyne/R Blackwater SPA, listed within 15km of site. Kelly Judgement ruled that there must be no reasonable scientific doubt remaining.
- Habitats Directive & Appropriate Assessment - mitigation measures v compensatory measures: ECJ Briels v Minister van Infrastructuur en Milieu 2 (15.05.14) where European Habitats are concerned, it is not enough to compensate, after the fact, for permanent loss of protected habitat resulting from project by providing for replacement of protected habitat elsewhere, but the loss must be eliminated by mitigation measures.
- *Natura Impact Statement (NIS) - no stage 3 or stage 4 assessment* as the developer "does not purport to place any reliance on Stage 3 or Stage 4". Need to see alternatives. What is the IROPI - the proposal is for the export market; AA required for WF development on peatlands under section 6.3 of the Habitats Directive and permission cannot be granted where a project is likely to have an adverse effect on the integrity of a designated site. The NIS (sn 6.3) predicts no direct impacts but 6.2 notes potential to cause decline in water quality - therefore there is a direct impact on site of extremely rich

wildlife. AA is concerned with adverse impact not whether it would be significant which is not a factual term.

- *No assessment of impact on Bees or pollinators* contrary to the Habitats Directive's protection of many key habitats for bees; impact of same on crops going forward
- *Information in NIS is inadequate in the range and specific species it addresses* - e.g. it refers only to whooper swan and not to the other swan species in Donadea Forest; annex 8 of NIS does not include Marsh Fritillary);
- *The NIS p.54 & 55 note protected species* (e.g. Otter, Annex II Habitats; frog, Wildlife Act 1976 & amendment act 2000; Hare, Birdlife) as present in Drehid Hortland cluster. The numbers of specific species are irrelevant, the mere presence is sufficient to provide habitat protection.
- *NIS notes Whooper Swan, Golden Plover, Merlin, Woodcock, Snipe, Kestrel, Buzzard as present in Drehid Hortland cluster*, within 500m of WT (p.67 refers to buzzard nest). EU Directive 2009/147/EC bans activity that directly threaten birds.

Note - Issues raised by third party observers in respect of Noise, Shadow Flicker, (including issues under the broad headings of Residential Amenity and Health) and Transport, (including issues relating to cable routes), are summarised in the report by John Desmond, Senior Inspector, Appendix 1.

5.0 APPLICANT'S RESPONSE TO SUBMISSIONS

The applicant responded to the submissions on 24th September 2015. The response firstly addressed the issues raised in each of the planning authority reports and then provided a composite response to issues raised by topic. The Further Information is contained in two folders and includes a further set of photomontages in respect of Longwood ACA.

The main revisions/additional information related to the revised grid connection proposal and the carrying out of structural surveys along some of the transport routes. The majority of the further information submitted involved rebuttal of the points of objection made in the third party submissions and reiteration of the material contained in the EIS. The Further Information document used the same observation numbers that were assigned to each submission by the board. The applicant uploaded the Further Information document with appendices to the application website. This Further Information was subsequently advertised. The reason for this was that the application has also been revised in terms of the footprint and grid connection and furthermore, significant additional information was submitted across a broad range of topics.

5.1 Revised Grid Connection

The revised grid connection involves omission of the proposed HV cable routes to Maynooth and Kilcock and a new proposal to connect to the national grid at Dunfirih. This existing 110kV substation is located just off the proposed cable route connecting the Hortland sub-cluster to the proposed new substation at Drehid. It will be necessary to expand and upgrade this substation. The further information regarding the transport routes included additional surveys of the haul/delivery routes, additional information regarding the site entrances and difficulties with node points.

5.2 Response to Kildare County Council Submission

5.2.1 Landscape and Visual Impact Assessment (CASS Report)

- *TVI a theoretical tool* - It was noted that CASS was generally satisfied with the methodology but had disagreed with the determination of impact significance. It was acknowledged that the greatest impact would be likely to occur at the northern and southern extents of the site, due to the fact that the highest scores in the TVI coincided with the areas with the greatest concentrations of population, routes, amenities and features on the ground, with the opposite being the case for the central area of the site. However, the applicant pointed out that the TVI map is a theoretical tool which does not take account of screening provide by vegetation and referred to the Route Screening Analysis, which it considered to be a more appropriate analytical tool which is based on “reality of visibility”.
- *Impact of visual prominence on specific landscapes, settlements, routes and features* – Accepts that Ballinakill and Cloncumber clusters lie in closer proximity to sensitive receptors, but does not accept that the turbines are more visually prominent in these locations. Visual prominence is just one element of a visual impact assessment, the other being impact on visual amenity, which considers aesthetic effects as well as integration of the turbines into the visual setting. Although these two clusters are likely to “give rise to marginally higher levels of impact significance than the more centrally located clusters”, it is considered that the “robustness of the receiving landscape” means that this is “relative”. It is still considered that significant landscape and visual impacts will not arise, mainly because of the presence of considerable screening. The impacts on Ballinakill and Cloncumber are considered to be a fair assessment, but the significance of effects from these receptors in EIS is disputed, compared with other receptors along the RSA routes. It is submitted that the EIS contains a far more comprehensive

analysis of the likely effects on scenic routes (RSA) than that suggested in the CAAS report.

- *CAAS approach demotes LVIA to analysis of proximity and scale* - In response to CAAS's observation that where the height to distance ratio is 1.5km, this would result in a very significant impact, the applicant considered that this represents oversimplification, devalues the judgement of experienced landscape professionals and reduces the assessment to a simple mathematical formula. Furthermore, it was stated that the list of settlements suggested as being affected was unjustified and it was considered that it was based on a desk-top analysis which needed to be verified by site visits. An example of oversimplification is given as the impacts on Longwood Village ACA and the additional photomontages submitted as RFI, it is claimed, substantiates this point, in that views of any turbines from within the settlement are difficult to obtain due to screening effects.
- *Oversimplification of LCA* - The applicant considers that LCAs should not be accepted as definitive, but rather, a first step in preparing the baseline and justification should be provided for departing from LCAs. It was pointed out that this justification was provided at 15.12.1 of the EIS. In response to the CASS observation that the receiving landscape has a "*general sensitivity on account of its inability to visually absorb development*", the applicant considered this to represent an oversimplification of the LCA and a selective interpretation and choice of landscape factors. For example, in respect of canal vistas, CAAS focussed on 'smooth terrain' but not 'shelter vegetation', which is considered selective. It is disputed that a LCA can have a 'general sensitivity to development'. Similarly, the references to 'Western Boglands' as being 'highly distinctive', but without any reference to the CDP policies which describe cut-away bogs as being degraded landscapes capable of development, were criticised.
- *Canals not erroneously classified as medium sensitivity* - the applicant stated that the canals had not been erroneously classified as 'Medium Sensitivity', but had been classified in accordance with universal criteria which had been derived from the 'Guidelines for Landscape and Visual Assessment' (2013). This was considered appropriate in the absence of a national landscape character assessment. The applicant disagrees that canals have low capacity for change and that they should be considered as high sensitivity landscape features.
- *Appraisal criteria in EIS defended* – In response to the criticism in the CAAS report of the appraisal criteria used in the EIS, which it had suggested was designed to deliberately skew the ultimate determination of impact significance, the findings of the CAAS report are disputed.

- *Choice of VPRs for photomontages defended* – CAAS had suggested that the viewpoints are unrepresentative. Applicant reiterates that the purpose of the photomontage is to best represent the view that will be experienced at the location in accordance with strict guidelines and that it should not relate to a “*typical photograph that might be captured at the same location*”. The reproduction by CAAS of photomontages in its report is criticised by applicant as not reflecting best practice. It was further considered that the P.A. has misinterpreted the comments in the CAAS report by stating that “*the wide-angle of view used for the photomontages tends to make turbine images appear smaller because they occupy less of the area of the image*”. This is disputed by the applicant.
- *Disputes claim that greater sensitivity to views of WE developments due to greater population concentration in East Leinster* – applicant believes that most of the receptors in East Leinster are major traffic corridors and from areas with a higher intensity of development. It is stated that there is a low degree of visibility in this most populous area and that the number of receptors is just one of number of criteria relevant to the LVIA assessment.

5.2.2 Ecology issues

- *Need for an appraisal of each individual cluster* - The P.A.’s consideration that there is a need for an appraisal of each individual cluster is disputed as there is “no legal requirement” to do so.
- *Habitat Fragmentation/Loss – no continuous habitat currently exists which connects all 5 clusters or one or more clusters* – the applicant claims that the dispersed nature of the clusters serves to reduce the effect of fragmentation and that with increasing distance between habitat edges, more connectivity pathways can be found. It is stated that habitat loss is fully examined in the EIS with a total habitat land take of 8% which is of ‘low ecological value’. Although hedges and tree-lines are acknowledged as being of high ecological value, it is claimed that the land take is unlikely to be significant.
- *Barrier effect* – has been fully appraised at 7.5.4 of the EIS with regard to avian receptors and to commuting flights. This was found to be ‘low’ to ‘very low’. It is also claimed that hydrological flows will also be maintained with no significant impacts anticipated. Thus the applicant is of the view that due to the low degree of habitat loss, the low impact barrier effect and the retention of the hydrological regimes, there is a low likelihood of significant habitat fragmentation.

- *Compensatory habitat* – final confirmatory detail of reinstatement of habitats and enhancement measures will be in the Habitats and Species Management Plan which will be included in the final CEMP.
- *Lack of quantification of woodlands to be removed/replanted* – applicant states appraisal and details of woodlands to be removed in EIS 7.5.3.1. It is confirmed that replant lands are available and that all areas proposed for replanting will be approved by the Forest Service and that they will adhere to Forest Standards and Procedures Manual.
- *Lack of quantification re hedgerow removal/replanting* – the applicant states that hedgerows to be removed are located at access points and have therefore been fully appraised and included in the land take calculation. It is further stated that ‘non-permanent hedgerow loss’ along TDRs will be replaced with native species of trees.
- *Hortland Bog and Windmill Bog* – these are nationally important raised bogs and the P.A. had expressed concern regarding the impact of changes to the hydrology of these wetland areas. The applicant responded by stating that there would be no significant impact on either bog (1.6.1.12 of RFI). See hydrology related issues below (5.2.4.5).
- *Curlew – lack of mitigation specified* – error acknowledged. It is confirmed that surveys will be carried out and that no construction works will be permitted within 1km of Curlew breeding locations between April and July.
- *Bats – high risk of mortality* – In response to request to omit T11, T34, T42, T43 – applicant has proposed additional mitigation - during the months of June and July, the operation of these turbines would be curtailed during the hours of darkness by cutting the wind speed during this time.
- *Badgers – T32 within 250m of badger sett* – the applicant proposes that mitigation measures for badger and otter in Cloncumber will be in accordance with the NRA Guidance for such measures. It is also stated that T32 is located 324m from the sett.
- *Errata in EIS* - It is acknowledged that there are errors in the EIS relating to mammals and birds, and additional errata have been included and corrected in the RFI at page 18 (Table 1.1).
- *Erroneous inclusion of Barrow Line of Grand Canal* - The Habitats present within the Cloncumber boundary are acknowledged as not being of high amenity value in themselves, but the adjacent Barrow Line is of high amenity value. However as this is outside the red line boundary, the description of habitats classification (FW3) ‘canals’ as being *within* the cluster is erroneous. Thus, it is claimed that there are no lacunae in the appraisal.

- *Lack of clarification on varying turbine heights and rotor diameters* – applicant reiterated that rotor envelope is 50-170m which is based on a rotor diameter of 120m and a hub height of 109m.

5.2.3 Cultural Heritage issues

- *Definition of ‘setting’* – applicant claims that documents used for these purposes were appropriate and that this had been confirmed by DAHG. In response to criticism that there is a certain amount of confusion w.r.t. what constitutes ‘Setting’ and ‘Curtilage’, the applicant states that the assessment of ‘setting’ was carried out on a case-by-case basis. It took into account the property type, the significance of the property, the natural topography, views to/from the property and historical associations in establishing the contribution of setting to the significance of the site. It did not identify curtilage as being identical to the setting. A distinction is drawn between a ‘Setting Study’ and a ‘Visual Impact Assessment’ as setting not solely about the visual envelope, as an impact on setting will only occur if the change affects the contribution made by setting to the significance of the asset.
- *Historic Landscape Characterisation – Confirmation of use in EIS to identify and evaluate the contribution of the past to the landscape* – In response, the applicant states that KCC has not produced a HLC study for the county, and that there is no statutory requirement to consider a formal HLC. However, the applicant provides a justification for the appraisal of historic elements of the character of the landscape on page 24 of the RFI. It is stated that the methodology used is based on the EPA Guidelines and that it is unclear how HLC, which it considers to be a separate process, would assist in the identification of the likely and significant direct and indirect impacts of the proposed development.
- *Requirement to assess certain factors in choice of siting of proposed turbines – Visual dominance, Scale, Inter-visibility, Vistas and Sightlines, Movement, Sound or Light effects and Unaltered Settings* – Applicant claims that each of these factors was included in the assessment of the acceptability of the proposal on the setting of historic sites and monuments. The English Heritage Assessment of Setting approach was used to assess the impact of heritage assets, and a checklist of attributes was used, (reproduced in Appendix 7 of RFI), to assess the contribution made by ‘setting’ to the significance of the asset. It is stated that once this contribution is understood, the factors referred to above are examined in terms of the effect each might have on the asset’s setting and the degree of harm to the property/site’s significance is assessed. It is stated that this information assisted in the siting

of the turbines as detailed in the Alternatives section of the EIS (Vol 2, Section 1.4).

- *Carbury Hill and Castle – linked to Newbury Hall and Demesne* – visual impact on key topographical features, including Carbury Hill/Castle, is examined in Chapter 15 (LVIA) of EIS. Their significance and the historical link with Newbury Hall is discussed in Chapter 14 (CH) of the EIS. In addition, chapter 14 includes a narrative on the archaeological context of various sites on the hill. Mitigation strategy included the omission of turbines where found to dominate views of Newbury Hall from Carbury Hill and Castle.
- *Ballinakill House and Demesne – confirm inclusion in assessment* – Ballinakill House is in NIAH Garden Survey and is located over 3km from T46. It is not a protected structure nor an NIAH built survey site. Large modern agricultural buildings have been built in the core landscape with the main features unrecognisable and only peripheral features visible. The M4 also cuts through the northern part of the lands. At this distance, there will be no impact on the setting of this site.
- *Confirmation of evaluation of impacts on Kilmore House & Demesne; Oldcourt House & Demesne; Drummin House & Demesne* – applicant states all protected structures are located 3km from WF clusters. These were examined as part of the wider study of the proposed development to establish whether they would be subject to setting impacts. Although Kilmore and Oldcourt, respectively, were found to be “intact examples of demesne landscapes”, it was considered that “part of the significance of these demesnes is their deliberate separation from the landscape within which they lie”. Thus the dense vegetation, it is submitted, prevents inward/outward views, reinforcing the social divide that existed between classes in the 18th Century. It was considered that at 3km, the wind farm clusters lie well outside the settings and would not impact on the principal components or designed views/vistas associated with them, nor on the significance of the properties.
- *Confirmation of evaluation of a range of structures and demesnes* - Response by applicant as follows:
 - *Metcalf Park; Hortland & Knockanally Demesne; Donadea Demesne* Impact in relation to Drehid Hortland cluster – these demesnes have delimited and enclosed settings with little physical or visual reference to the landscape around them. The exception is stated to be Knockanally Demesne, as the demesne takes into account the wider landscape. This is taken into account in the EIS – slight impact on the setting predicted.

- *The Range, Range Cross Roads* – Dunmurragh Hill – 2km from T40. Aspects of setting of this terrace which contributes to its significance are Group Value, Relationship with Donadea Demesne and Cross Roads siting. However mature trees at crossroads means that the wider landscape context is not appreciable. No impact on significance of sites.
- *Lullymore Lodge* – Impact in relation to Derrybrennan cluster. Crossroads siting – undesignated site of cultural heritage interest – EIS – no impact on significance of site.
- *Beechgrove House* - not Protected Structure, not in NIAH survey area. 1816 – a ruin. Located 2.4km SW of D/H cluster, which is outside setting of the farm house. Presence of turbines in wider landscape will not alter local significance.
- *Mulgeeth House* - not Protected Structure, not in NIAH survey area. Early-mid 19th Century, considered to be of architectural/cultural heritage merit. Functional relationship between the house, outbuildings, enclosing elements around the house, its gardens and outbuilding and the road are the principal attributes associated with the setting. No clear, unobstructed views into/out of the property, as it is quite enclosed. Located 949m to SE of T13. Given enclosed nature and limited association with the wider landscape to north, there would be no change to setting attributes associated with the significance of this property.
- *Kilmurray/Hermitage House* - not Protected Structure, not in NIAH survey area. Modified Mid-19th Century house. Not enclosed and clear views up the driveway. No open/designed views or vistas of the surrounding landscape to the south. Instead there is a robust roadside mature hedgerow with intermittent breaks. May have had historical relationship with mill race to north. D/H cluster lies 1.1km to SSE in former bogland. Concluded that whilst will be a change to distant rural landscape to south, whereby screened/partial turbines visible, presence of turbines would not alter site's local architectural heritage significance merit.
- *Bloomfield House* - not Protected Structure, not in NIAH survey area. A 20th Century farmhouse, 533m SSW of D/H cluster. The setting relates to dwelling itself and associated large modern farm complex.
- *Drehid House* – not Protected Structure, not in NIAH survey area. A modified 20th Century house – replaced earlier mid-19th C complex. Located 419m SSW of T19. The setting relates to dwelling itself and associated large modern farm complex.

- *Dunfirth House* - not Protected Structure, not in NIAH survey area, but is within the NIAH Garden Survey (NIAH KD-49-N-775391). Located 1.7km from T11. Survey shows that a significant number of modern farm buildings and a care home have been constructed in the core landscape. Thus the main features are unrecognisable and only peripheral features are visible.
- *Contrary to CDP policies PS16, CH1, CH2 – Wind Farm would have a negative visual impact on the setting of Protected Structures, a negative visual impact on Historic Designed Landscapes and a negative visual impact on Views and Prospects to/from Protected Structures* – In response the applicant has stated that not all Protected Structures have settings that would be sensitive to visual change; that the ‘Rural Skyline Setting’ is only relevant where the skyline makes a contribution to the significance of a particular structure; and that a great number of Protected Structures are surrounded by shelter belts of mature trees and can only be appreciated at close quarters. In respect of ‘Demesne Character’, it is stated that the EIS has shown how the individual demesnes lie within separate and distinct land parcels within the farming bog land landscape, and it is only in the immediate vicinity where a landscape displays a ‘demesne character’. There are a small number of Demesnes Characters surrounding Carbury Hill, but these are not linked. Donadea consists of a landscape with a large enclosed walled garden and dense tree-lined roadside boundary. Thus there is a legible demesne character around the circumference which does not extend much further than this enclosed designed landscape.
- *Archaeology* – both the assessment and mitigation strategy for the area of archaeological potential identified in the EIS was discussed with the DAHG and were deemed to be appropriate, which is further reflected in the Department’s submission to the Board.
- *Need for Independent Expert on World Heritage Nominations, (with established relevant previous experience), to assess potential impacts on Royal Sites of Ireland and impacts on the Outstanding Universal Value, including integrity and authenticity of the UNESCO sites* – Two sites within 30km – Tara complex, located 25-46km to NE and 21km from the associated landscape buffer zone; and Dun Ailinne, located 18km to SW. EIS addresses Outstanding Universal Value in accordance with the UNESCO World Heritage Collective Statement (provided by the State to the World Heritage convention). In both cases the wind farm lies well outside the setting of these sites as set out in this document (S. 14.1.2.2, pg 88). There will be an indirect visual impact on the distant views to the north of Dun Ailinne, but the

magnitude of the impact is considered (Chapter 15 EIS) to be low and the significance as slight. The wind farm would be outside of the Tara buffer zone and the wider landscape setting of this site. The EIS found that it would not disrupt the inter-visibility with Tara. The DAHG is the leading Government Agency on this matter and has commented on the proposed development.

- *Protected Structures along Haul routes* – the applicant will carry out baseline condition surveys of Johnstown Bridge, Fear English Bridge, Agar Bridge and numerous other structures identified in the county Industrial Heritage Surveys. These surveys will be carried out in advance of development to record the baseline data which will be monitored during the construction phase. A structural assessment has been carried out and is included in Appendix 21 of the RFI.
- *Significant Archaeological sites – The Ringfort within the Cloncumber cluster* (KD017-004) is located 60m NE of T33. It is stated that there is the potential for a significant impact on subsurface archaeology. However, it is proposed to carry out a combined programme of geophysical survey and test excavation which will avoid the upstanding ring fort. Lullymore West RMP – (KD012-016) – based on the results of testing, a suitable mitigation strategy can be designed in consultation with DAHG.
- *Settlement of Cloncurry (KD004-021002)* - The HV route through Cloncurry is no longer relevant.

5.2.4 Hydrology and hydrogeology issues, including Water Quality issues

Issues raised in respect of water quality protection, hydrological and hydrogeological impacts arose in several departmental reports from Kildare County Council. These included the Transportation Department, the Water Services Department, the Environment Section, the Environmental Health Officer and the Heritage Officer.

5.2.4.1 Flooding and Drainage Design

- *Outline nature of Site Drainage Management Plan* – WS Dept. had expressed concern regarding the statement in S. 9.7.1 of EIS that the Site Drainage Management Plan would not be finalised until after the contractor for the main construction works had been appointed. It had been considered that a development of the type and scale proposed should include a detailed drainage design, and had requested that this be included in the RFI. In response, the applicant considered that the level of detail provided is comprehensive for a SUDS design and pointed out that the current KCC

CDP requires that all drainage design schemes in unserved areas to be in accordance with the Greater Dublin Strategic Drainage Study 2005 and with SUDS in particular. Reference is made in the RFI to the relevant sections of the EIS where the drainage design plan is outlined and reiterates that the main features include swales, stilling ponds with diffuse outfalls and the diversion of uncontaminated surface water runoff from construction areas by using interceptor drains up-gradient of the construction works. It is pointed out that typical dimensions, with detailed drainage drawings, have been provided with the application. In addition, the RFI includes typical drawings of the proposed interceptor drains, cross drains and diffuse outfalls (over vegetated areas).

- *Displacement of flood waters/ provision of compensatory storage* – the WS Dept. had stated that notwithstanding the consideration of the proposed wind farm as water compatible development, there was still a requirement to consider the displacement of flood flows and the provision of compensatory storage should the need arise. This point has not been addressed.
- *Need to avoid obstruction to flood flows* – The WS Dept. had raised concerns that there should be no obstruction to flood flows due to access roads and hard-standings, but had noted that there were four turbines located within a floodplain, T1, T29, T30 and T34. Thus it had been requested that details of turbine foundations, as well as the existing and proposed ground levels of both hardstanding sites and access tracks be provided as FI. Response states that streams will be crossed at the narrowest point of a floodplain and hence there will be no obstruction to flood flow. It is also reiterated that stream crossings will be conveyed in culverts, sized to take the 1 in 100 flood flow with 20% climate change allowance.
- *Turbine foundation details required* – further details required of proposed drainage design for turbine foundations to ensure no obstruction to flood flows. Although the foundation design for turbines will not be finalised until after planning permission is granted, a typical turbine foundation drawing was included in the RFI (Appendix 13). This indicates that the foundations will be up to 25m in diameter (25m x 25m) and 2-3m in height, and thus, the excavations would be 3-4m deep on average. This will depend on a number of factors including the manufacture of the turbines and the results of detailed site investigations, which will not be carried out until detailed design stage. It is stated that there will be two options available to the manufacturer. The first is to design the foundation to suit the ground conditions, which means that the design will vary across the site but the turbine design would be standard. The second is to investigate the ground conditions to ensure that the pre-

designed foundations can meet the requirements for two types of ground conditions, i.e. with and without the effects of buoyancy.

5.2.4.2 *Water Quality issues*

- *Surface water and ground water protection* – EHO had noted need to protect drinking water wells located near new access tracks and along cable routes from contamination during construction, particularly shallow wells, which should not be allowed to run dry. Response indicates that a large number of wells in area, many of which are not on GSI database, but have been addressed in EIS. It is pointed out that generally, given that domestic wells are located within property boundaries, the setback from residential properties will provide protection to these domestic wells. However, there are some exceptions e.g. T3 which is located within a field containing 14 no. wells (both dug and bored). It is pointed out, however, that these are generally for agricultural and industrial use and that an examination of the PA website indicates that many of them relate to a planning application for a landfill (trial holes). Mitigation measures are set out in 1.6.1.10 of the RFI.
- *Johnstown Bridge Well field* – P.A. concern regarding location of wind farm infrastructure within the catchment of this well field, which may compromise the groundwater resource. Although currently unused, there is an expectation that it will serve the Ballyna Group Water Scheme. This is a locally important sand and gravel aquifer and is made up of three areas, each with its own Inner Source Protection Zone and a larger Outer SPZ which encompasses the 3 areas. Noted that T45, tracks and cabling would be within the Inner SPZ and that T11, T12, T13, T43 and T44, the substation and cabling would be within the Outer SPZ. It is pointed out that no infrastructure is proposed within the Well Head Protection Areas and that the outer limit of the Inner SPZs is set at the 100-day travel time for groundwater to reach the well. The RFI reiterates the identified impacts and mitigation measures set out in Chapter 10 of the EIS, as well as the proposed monitoring programme to ensure the effectiveness of the mitigation measures. It is submitted that the presence of the well field does not “sanitise” the SPZ areas for development, but rather, highlights the need for land-use management. It is further submitted that the siting of the proposed WF infrastructure within the well field will not present a significant risk to the well field.
- *Use of Cement Bound Materials in cable trenching* – Concern re potential impact of CBM, to be used as the surround for ducting in cable trenches, being washed to watercourses and affecting pH is addressed in Section 1.6.1.8 of the RFI. The CBM can either be delivered to site in a mixer truck

(i.e. wet), which would involve minimal risk of pollution, or by tipper lorry, whereby it would be tipped into the work area and placed into the trench by an excavator. Potential mitigation measures are outlined which include only accepting CBM from mixer trucks in wet weather; covering the work area in wet weather; or delivery of the quantity of CBM for use that day.

- *Safe fuel oil storage/management* – EHO had recognised importance of this. Response reiterates measures set out in Section 4.3.3 of the Outline CEMP, Appendix D, of EIS.
- *Notification of incidents* – River Boyne and River Barrow – public drinking water sources - EHO observed need to immediately report any incidents with the potential to affect the quality of surface water as well as discharges likely to cause increases in pH, ammonia levels or silt. Response reiterates measures set out in the EIS.
- *Details of holding tanks for wastewater discharge* – no additional details provided in RFI.

5.2.4.3 Soil and peat excavations

- *Excavation details requested re length, breadth and depth of borrow pits* – Response reiterates that EIS provides for the excavation of 3 no. borrow pits which will cover a total area of 73,000m² and will extend to depths of 4-5m, which will be used to source approx.. 198,500m³ of the 292,500m³ aggregate required for the wind farm construction. The balance will be sourced from local quarries. Reference is made to further details of borrow pits in Sections 2.4.6, 8.3.1.6 and 8.4.5.1.1 of the EIS. Further details are, however, provided in the RFI in relation to surface areas, depth, extracted volumes and trial pits (Section 1.6.1.5 of RFI, page 40-42).
- *De-watering activities of Borrow Pits* – Trial pits were excavated to depths of 3-4m. Groundwater was encountered in BP No. 2, but none encountered in other pits. Excavations of 4-5m are anticipated. It is stated that while groundwater may be encountered at some locations, it is typical for gravel to be excavated in ‘wet conditions’ and saturated gravel would be stockpiled on the floor of the pit to dry. The drained water would be contained within the BP void and hence, no requirement to dewater or treat pumped water, as water cannot escape from pit void.
- *Peat excavations* - Volumes of peat to be extracted are provided in EIS, 8.4.5.1.1. Release of ammonium has been observed where the peatland has been drained, resulting in a lowering of the water table. Turbines to be sited within peatlands are detailed in Appendix G1 of the EIS. It is pointed out however, that these peatlands have been drained for milling, forestry and

agriculture, and thus the enhanced release of nutrients (e.g. ammonium) is already ongoing. It is stated that, as such, the small amount of peat to be excavated would result in an imperceptible increase in the release of nutrients. Runoff from excavated peat/soils will, in any case, be collected and treated using stilling ponds, silt fences and diversion channels. It is stated that the removal of suspended solids will reduce the nutrient concentrations in surface waters.

- *Slope failure/soil erosion* - It is confirmed that in response to the recommendation of the Environment Section, a competent geologist/geotechnical engineer will be appointed during construction activities, on a full-time basis, to monitor construction activities, including soil erosion, slope stability and peat extraction activities. It is further stated that the recommendations of the geologist will be implemented to ensure potential impacts are avoided, reduced or mitigated. It is also pointed out that these issues have already been assessed by a competent, experienced geologist in the preparation of the EIS (Chapters 8, 9 and Appendix G1. A summary of these findings are summarised in 1.6.1.7 of the RFI.

5.2.4.4 *Transportation-drainage related issues*

- *Wheelwash facilities* – response confirms that wheelwash facilities will be provided and reiterates details contained in S. 9.7.1 of EIS and in the CEMP in Appendix D of the EIS.
- *Stream crossing – Entrance to Windmill cluster* – response confirms temporary works only required here and that existing entrance is located in the indicative floodplain for a 1 in 100 year return for the Glash River. A temporary bridge will be required which will match the dimensions of the existing bridge and will not therefore introduce any new obstruction to flood flows in the floodplain. Reiterates details contained in Chapter 9 of EIS wherein modifications to entrances were appraised and mitigation proposed.
- *Proximity to stream - Entrance to Hortland cluster – Access to T40* – response confirms that no permanent modifications required at entrance. It is noted that the entrance access road to T40 runs within 50m of Clogheraun Stream, tributary of River Blackwater, with a potential risk of silt infiltration during construction. However, this has been addressed in the EIS, S. 9.6.2.

5.2.5 **Hydro-geological impacts on Haggard Bog and Hortland Bog**

- *Hortland Bog* - Notes that the closest turbines are T42 (550m to NE) and T45 (350m to East), but that both are sited within commercial forestry on cut-over

bog with peat depths of 0.8m and 0.0m respectively. For the wind farm to have a potential impact on the hydrology of the bog, there must be a hydraulic connection. In terms of the potential for a surface water hydraulic connection, it is stated that the proposed windfarm infrastructure is located downstream of the bog. However improved drainage could increase flows from the bog. Thus it is proposed to provide a drainage design that would retain or mimic the existing run-off characteristics. It is submitted that this drainage design, together with a 350m buffer, means that it would be highly unlikely that the wind farm would impact on the drainage of the raised bog. It is acknowledged that it is more difficult to ascertain whether a groundwater hydraulic connection exists. Based on desk-top studies (which indicate subsoil composition, borehole logs etc.) and the fact that the proposed development includes shallow excavations, it is submitted that the proposed wind farm would not impact on the intact raised bog, regardless of whether there is a groundwater connection.

- *Haggard Bog (Windmill)* – Closet turbines to raised bog are T24 (220m to N), T26 (250m to N), T25 (550m to N). This raised bog is an extension to the north of Carbury Bog NHA. Peat depths are 1.8-4.0m. The turbines are downstream of the intact raised bog and are located within the milled peat area, to the north of the raised bog. There are numerous man-made drains draining the bog from SE to NW. If drainage improvements were made for the wind farm, they could increase flows from the bog. Thus it is proposed to design the drainage system for the WF such that it retains or mimics existing run-off characteristics. It is submitted that this drainage design, together with a 220m buffer, means that it would be highly unlikely that the wind farm would impact on the drainage of the raised bog. It is acknowledged that it is more difficult to ascertain whether a groundwater hydraulic connection exists. Based on desk-top studies (which indicate subsoil composition, borehole logs etc.) and the fact that the proposed development includes shallow excavations, it is submitted that the proposed wind farm would not impact on the intact raised bog.

Note - Responses in RFI to Noise, Shadow Flicker and Transport issues and FI requests made by Kildare County Council in respect of these issues are addressed in the report by John Desmond, Senior Inspector, Appendix 1.

5.3 Response to Meath County Council Submission

5.3.1 Longwood ACA

- *Protected Structures* – Response states PS included in EIS and adequately addressed. Additional photomontages included in RFI for Longwood. It is acknowledged that Stoney’s Inn had been included inadvertently.
- *Views from within ACA* – submitted that these are particularly difficult to obtain. The majority of views include just blade tips. However, it is acknowledged that single turbines are visible in parts and that the worst-case-scenario is represented by 06CP12 (Map 37).

5.3.2 Photomontages

- *Royal Canal Greenway* – it is acknowledged that this was not specifically referenced, but at least 3 no. viewpoints illustrate the impact on this amenity. References to walking routes have also been made. Accepts that should the Greenway go ahead, this will increase the number of receptors. However, it is still maintained that there will be no significant impact because the Royal Canal and its associated towpaths are considered to represent “*a linear tourism amenity and recreational resource, where the periodic view of turbines, even in close proximity, is not likely to be at odds with the expectations of users*”.
- *Boolykeagh* – photomontage 06AH4 was wrongly referred to in EIS as “Boyne Dock”. It is stated that this was an oversight but does not relate to CPD Protected View 56 (which is along the Royal Canal at Boolykeagh).

5.3.3 Molerick Bog NHA Code 001582

This raised bog is located 4km to the southwest of Longwood and is 2.94km from the proposed wind farm. It is located within the Boyne catchment area and is upstream of the proposed development. Groundwater flows are expected to be in accordance with the topography and surface water courses. It is stated that the EIS suggests that in the absence of a surface water connection, there is also an absence of ground water connectivity. It is submitted that this is based on best scientific knowledge, following an examination and analysis by a water quality expert. It is concluded, therefore, that there is no likely significant direct or indirect impacts on Molerick Bog NHA by virtue of a hydrological connection.

5.3.4 Ballynabarney Fen pNHA

This is a small, deep, artificially created fen between the railway line and the canal. It has good floral representation and relatively rare vegetation species, including Variegated Horsetail. It is located outside the wind farm development site (1.52km²) but is within the same sub-catchment as Ballinakill cluster. However, the topography and surface water drainage means that the pNHA is upstream of the windfarm development. It was concluded that there would be no likely significant direct/indirect impacts on the pNHA due to a lack of hydrological connectivity. This was based on the topography and surface water drainage.

5.3.5 Drainage issues

- *Drainage from wash-down areas of hardstands* – details are provided in RFI of wash-down areas and reference is made to the details already set out in the EIS, Chapter 9 and the CEMP, Appendix F1. It is stated that there is no need for a revised Flood risk Assessment, however, as the settlement lagoon is outside of the flood plain and is 100m from a watercourse.
- *Disposal of wastewater* – it is reiterated that waste water will be discharged to a holding tanks for collection by a licensed contractor. Details are provided in RFI, page 65-66.
- *SUDS compliance* – full details of diversion of runoff from construction areas and measures to prevent sediment release, as well as details of compliance with SUDS are provided in RFI at page 66-67.
- *Bunded liquid storage areas* – RFI refers to details already provided in EIS and CEMP and are further set out at page 68-69 of RFI.

5.3.6 Water supply issues

- *Longwood Water supply* - need for Hydrogeologist to assess impact on boreholes at Clonguiffen – Response states that closest turbines to SPZ are T7 at 2.3km and T2 at 2.9km. The borrow pit is stated to be 2.7km from the SPZ. It is submitted that no significant impact is likely to occur due to the distances from the SPZ; due to the hydrological separation by the Blackwater River and by the Canal; due to the fact that the cluster overlies a different aquifer and groundwater body than the Longwood Well; and due to depth of excavations (deepest 4-5m for borrow pits), which will not be dewatered, given that the depth to bedrock is anticipated at 5-10m.

- *Water supply for proposed wind farm* – Details of proposals for operational and construction phases, including proposals for rainwater harvesting, included in RFI, page 65

5.3.7 Cultural Heritage issues

- *View from Tara and cumulative impact with Emlagh WF* – reference is made to photomontage MHDR17. It is stated that Maighne WF would be 34km from the nearest proposed turbine of Emlagh WF, and that Tara would be located between the two wind farm proposals. It is further stated that Emlagh would be 20-29km North of the centre of the Hill of Tara and that the Ballinakill cluster would be 26km South of the same point, with the remainder of Maighne WF being between 40 and 52km from Tara. It is also pointed out that Emlagh and Maighne wind farms would not be visible in the same viewshed and that Maighne WF would not disrupt the intervisibility between Tara and other sites. It is further submitted that the proposed development would not impact on the integrity or authenticity of Tara and that there would be no cumulative impact from the two wind farm proposals.
- *Need for Expert in world Heritage sites* – the RFI states that the response to this request is the same as that for Kildare County Council’s Heritage Officer, (see 5.2.3 above).

Note - Responses in RFI to Noise, Shadow Flicker and Transport issues and FI requests made by Meath County Council in respect of these issues are summarised in the report by John Desmond, Senior Inspector, Appendix 1.

5.4 Response to Other Submissions by Topic

5.4.1 Alternatives and Site Selection

- *Alternative of one single site location* – Reference is made to Section 1.2 of the EIS which addresses this. It is submitted that the search for a suitable site had included private lands and Bord na Mona lands, and whilst the latter would have been potentially suitable, these lands were not made available to the developer.
- *Justification for cluster approach* – the approach using 5 clusters relates well to this landscape type due to the screening offered by the prevalence of trees and vegetation, and to the restricted extent of many views. It is stated that the close proximity views of turbines are limited to a small number of turbines from any one location. Thus it is submitted that the cluster approach allows

the landscape to better absorb the development than would be the case with one large grouping of 47 turbines.

5.4.2 Equine issues

- *Impact on Equine Interests* – no published scientific research that wind farms have any ongoing effect on the bloodstock industry. Considered that the concerns appear to be “based on the mere perception that horses will be impacted upon by turbines rather than any detailed or expert analysis”. Notwithstanding this view, the applicant states that it has employed a specialist to prepare a response to the main issues raised.
- *Visibility – resulting in horses taking fright* – this is dismissed on the basis that the closest facility is 800m from a turbine. Thus the turbines will not appear suddenly and startle the horses and they will have time to become acclimatised to the presence of turbines.
- *Sudden movement of blades –frighten horses regardless of proximity* – as the turbines will start to rotate gradually, there will be no sudden movement. At normal operating mode, they will rotate at 10-18 RPMs, which does not constitute sudden movement.
- *Noise and vibration* – mechanical noise from modern turbines is almost undetectable with the main sound being the aerodynamic swoosh of the blades passing the tower. Although it is acknowledged that there are no known studies of the impact of turbine noise on horses, reference is made to studies of impacts from other noise sources on horses which were set out in 11.4.5 of the EIS, (Marshall Day Acoustics). It is reiterated that this found that there is little or no response to noise which does not occur suddenly. There will be no sudden noises and vibration levels will be below any threshold of human perception.
- *Shadow Flicker* – most equine facilities are outside the theoretical Shadow Flicker zone and as such, would not experience any impact. In respect of those facilities within the zone, the applicant now proposes to apply shadow flicker control systems, as described in S. 12.5 of the EIS, on the relevant turbines, in order to eliminate shadow flicker on any stables or gallops.
- *Impact during construction* – it is reiterated that there will be a requirement for mitigation to familiarise horses close to the wind farm with wind turbines during the construction phase, as set out in S. 11.5.4 of the EIS. It is further stated that impacts at a distance of 800m would be similar to those from agricultural activities in terms of noise, visibility, dust.
- *Omission of facilities from survey* – this is disputed.

- *ABP Refusal for Biogas/Biodiesel facility in Co. Tipperary – (Observation No. 52)* – note that the main perceived impact in this case on the equine industry related to air pollution with associated respiratory problems for horses.
- *ABP decision re Kill Hill Wind Farm, Cashel PL23.221656* – notes that closest equine facilities to 2 no. turbines were 533m and 415m. Despite objections from equine industry along similar lines to those raised in Maighne submissions, Inspector recommended refusal on grounds other than impact on equine industry, which was not considered justified. The board went on to grant permission for the wind farm.
- *Horses tend to acclimatise to changes in environment* – Horses, including thoroughbreds, show a high capacity to become accustomed to changes in environment such as proximity to busy roads, railway tracks, airports etc.

5.4.3 Aviation

- *Dept. of Defence submission* – in response to this submission made on behalf of the Irish Air Corps, the applicant has, as part of the RFI, engaged Wind Farm Aviation Consultants Ltd. (WFAC) to carry out a peer review of the Aviation report prepared by Osprey, (also an aviation consultancy firm), which is contained in the EIS.
- *No evidence to support objections by DoD/Irish Air Corps* – There is no basis in IAA or international regulation, guidance or best practice for the objections raised. In WFAC's view, the objections have no basis in accepted legislation and the turbines would only present a hazard to those pilots who do not follow the Rules of the Air or published IAA guidance, and intentionally fly with disregard for safety and approved procedures. The DoD's claim that the development will represent a severe constraint on IAC operations is not supported by extant Regulation and Guidance, or the case to support this claim has not been made. Nor does the existing Regulation/Guidance support the claim that the proposed development would be incompatible with the designation of the airspace.
- *The DoD objections are not commensurate with an understanding of the internationally accepted aviation requirements* – it is not accepted that tall obstructions near Air Corps navigation routes or in areas where their aircraft and helicopters train at low level present a problem for the Irish Air Corps. There is no supporting evidence that there will be any increased risk of collision to aircraft operating under the Rules of the Air, which is a legal requirement.
- *The proposed turbines will not present a hazard to any aircraft while pilots operate in accordance with mandated IAA Regulations* – SI72/2004 IAA

(Rules of the Air) Order 2004 states that the minimum heights that can be flown include “.....closer than 500metres (500ft) to any person, vehicle, vessel or structure,...” Thus, except in very remote areas, pilots will fly at a minimum of 500ft above ground level, as it is impossible to obey the above rule by simple visual observation alone. Pilots are required by law to plan their flights in such a way that they do not fly closer than 500ft to any person, structure etc. except when landing/taking off. Note the 500ft distance is measured in every direction.

- *Air Corps Obstacle Avoidance Criteria overly restrictive* – The Irish Air Corps’ understanding of Visual flight rules, weather minima, navigation and avoidance criteria seem confused. WFAC can find no evidence to support the criteria put forward by the Air Corps. The distances specified and the rules for flight seem to require better weather minima requirements for Air Corps pilots than even for amateur General Aviation pilots. Canalizing of GA traffic is considered to be an extreme view as the dispersed turbine layout would still permit legal flight under the Rules of the Air. The turbines will be marked on charts and become a well-known recognised feature of the area.
- *The planned turbines would have no effect on Baldonnel Aerodrome as they are outside of the Obstacle Limitation Surfaces as defined by IAA and ICAO document* – Upon completion of the wind farm, the turbine details should be submitted to the IAA for inclusion on the relevant aeronautical charts and lit in accordance with the requirements.
- *Surveillance Radar Approach* - No requirement to alter the Surveillance Radar Approach due to Derrybrennan, Cloncumber and Drehid-Hortland clusters. For Drehid-Hortland, the highest of the turbine tips will infringe the terrain clearance requirement by 6.23 inches. However, aircraft cannot fly with such accuracy. Thus there are two possible solutions. The Air Corps could require that there be no descent below 1900ft until inside 10 miles, or alternatively, the developer could excavate the turbine location by 6.23 inches. The developer has given assurances that there will be no infringement.
- *Turbulence* – good airmanship would dictate that if there are concerns regarding the wind direction and strength, with potential for turbulence, the aircraft should not be flown sufficiently close behind the turbine as to cause the pilot concern.
- *Safeguarding* – the development is well outside the recognised safeguarding distances for ILS equipment.
- *Dublin Weston Aerodrome* – no detail provided to justify objections made. The IAA did not list this airport as one in which the developer would have to ensure that the wind farm remained clear of the OLS or procedures.

- *Images in Flight Ltd.* – are subject to the same Rules of the Air as detailed above.
- *Precedent* – the development cannot be regarded as establishing any precedent for further development in the area or as acting as a catalyst for further development.

5.4.4 Public Consultation and Community Gain

- *Lack of public consultation* – It is noted that of the 820 submissions to the board, 575 referred to this issue. The response states that there were 2 no. public consultation days – one on 11th July 2013, and a Maighne windfarm public information day on 18th November 2014 in the Hamlet Court Hotel in Johnstown Bridge. These were attended by 48 and 77 people, respectively. It is stated that feedback was generally positive and issues raised are recorded in S. 4.4 of EIS. Issues include community gain proposals.
- *Lack of advertising of public events* – The Hamlet Court event was advertised in local newspapers and by notices in local businesses (16 no. listed page 87- 88 RFI and mapped in Appendix 19 RFI). In addition, 3 full page advertorials were placed in the Leinster Leader over a space of 3 weeks in Nov/Dec 2014.
- *Absence of active engagement with local community* - The applicant claims that there has been active engagement with the local community, the local authorities and the prescribed bodies, and that significant resources have been invested in a comprehensive public consultation programme. In particular, there has been positive engagement with 56 no. community groups. Details are set out in Section 4.4 and Table 3.8 of the EIS. Only one submission was made from the 56 community groups where engagement took place.

5.4.5 Cultural Heritage – including Response to DAHG

- *DAHG Archaeological requirements* – agrees to DAHG conditions and states that will implement these and the mitigation measures set out in EIS in full.
- *DAHG Architectural heritage – Board must be satisfied that no significant impacts on UNESCO World Heritage sites and that there would be no direct impacts on protected structures, national monuments, or the curtilage/attendant grounds of a protected structure, an NIAH site/feature or an ACA.* – Response in RFI – this has been evaluated in the EIS, Chapter 14, and where potentially significant impacts have been identified, mitigation has been proposed.

- *An Taisce – potential impact across a wide landscape area. Need in particular to consider impacts on Grand and Royal Canals and associated landscapes – together with cumulative impacts* – the RFI considers that the canals are industrial structures which had no regard for the landscape settings of the time. It is submitted that they have a technical and social interest and an immediate setting. Thus the proposed development would have no impact on their significance and will retain their historic, engineering and technical interest. It is acknowledged that the canals have changed their functions to one of amenity, but any impact would be indirect. Reference is made to the evaluation in Chapter 15 of the EIS. The cumulative impact, it is stated, has been addressed in the EIS (Chapters 14 and 15) and above in respect of Emlagh.
- *Dr Charles Mount – Inadequacy of Archaeological Heritage Assessment – failure to adequately assess this impact as no geophysical investigation or test excavations of turbine footings, access roads and construction compound – contrary to EPA Guidelines* – RFI states that the approach had been agreed with DAHG in advance. There are 9 areas where testing and/or geophysical survey is recommended. It is submitted that the mitigation measures and approach in the EIS (Chapter 14) are in accordance with the legislation and relevant guidance. Criticism is made of the list of general areas of archaeological potential (page 86 of Observer's submission) as it fails to include a critical clarifying statement. Due to the considerable level of alteration of the landscape through milling, afforestation and reclamation, it is considered that the potential for sub-surface features, previously unknown, to be found is quite low, or if identified, are likely to be heavily disturbed or truncated.
- *Dr Charles Mount – Inadequacy of Architectural Heritage Assessment – EIS relied exclusively on the Record of Protected Structures and on the National Inventory of Architectural Heritage sites which are not comprehensive and did not include field assessment of all upstanding structures* – this is disputed. The RFI, pages 93-94 sets out the methodology used in the EIS which was much more comprehensive than alleged. It is further submitted that the assessment in EIS Chapter 14, was very comprehensive.
- *Gaybrook decision* – it is refuted that this decision is of relevance or creates a precedent as the development proposal was related to a distinctive demesne landscape, whereby the proposed turbines would have been placed within a parkland setting associated with two demesnes, and would have had an impact on a combined setting. It is submitted that in contrast, no lands within the Maighne wind farm site are associated with a demesne or former demesne. Thus a comparison should not be made.

- *Thatched structure (No. 364) in Ballinakill – Observation No. 67* – although not a PS or on NIAH survey, it is recognised as having local significance. The R160 sub-divides the Ballinakill cluster and the cottage would be 800m from T3 on one side and 726m from T4 on the other side. It is acknowledged that there would be a visual impact, but it is refuted that its local significance would be affected.
- *Ancient routeways – Tara to Hill of Allen (Obs 201, 670)* – unlikely that these ancient routes have a material or physical expression other than the church sites that they connect. Only some sections are recorded on the RMP and in Kildare, the recorded routeways relate to bog crossings. It is considered that it is only where these routes have not been developed as a modern road that there is potential for the route to have survived. Cable laying along the modern roads will have no impact on the historic traditions regarding the origins of the roads.
- *Ancient and historic landscapes – various heritage assets (e.g. Carbury, Carrick Castle, Foxes Hill, Croppies Grave, St Finian’s Monastery, Clonard)* – As outlined in EIS methodology (S. 14.2), the archaeological monuments and protected structures outlined in chapter 12 of the CDP, which are within the scope of the study, were taken into consideration and fully assessed when compiling the archaeological, architectural and cultural heritage report and all have been assessed in the EIS. It is submitted that the landscape within which the proposed wind farm lies is one that has experienced change and alterations as each new generation adds their imprint to the area, and it is not a preserved ancient landscape. Reference is made to the introduction of the canals in the 18th century, to the railway in the 19th century and milling of bogs in the 1950s by Bord na Mona. Each of these changes has brought new infrastructure and changed the landscape. It is reiterated that an impact on setting will only occur if the change affects the contribution made by setting to the significance of a cultural heritage asset. It is submitted that turbines can be present in the vicinity of recorded features without causing adverse impacts on their significance.
- *Mass rock in Cloncumber cluster and archaeological structures in Ballyteague forest* – The Ballyteague mass rock is located some distance from the turbines in a clearing on the edge of a Coillte forest, which has altered this landscape. In penal times (mid-17th Century) this landscape would have consisted of open expanses of bog and wetland.
- *Williamstown House, Carbury – immediately to west of Windmill cluster – Observation 644 states that it would significantly impact on the setting and amenity of this property and no viewpoint has been provided to illustrate impact* – This is an 18th Century Palladian Mansion which is on low-lying

lands – detailed description provided on page 97 of RFI. It is reiterated that the assessment of setting and impact on same was carried out in accordance with published English Heritage guidance on the matter. It is noted that the Windmill cluster lies 1.2-1.8km to the west of the mansion in an appreciably distinct and separate landscape. It is stated that it lies outside the contained setting of the demesne and that it will not impact on the architectural and historic significance of the house or the layout of its demesne or the main vista from the house. The screening provided by the mature tree lined boundary to the west and the dense vegetation along the roadside means that there will be no significant impact on the setting or amenity of the property.

- *Balrennet house, Ballinderry House, The Haggard and Demesne, Teelough House, Cooldyna House* – the setting and historic context of these properties has been addressed in the EIS and no significant impact will occur.
- *Remains of a derelict cottage 400m from T47* – this is a 20th century cottage and it is submitted that it is of no cultural heritage merit. T47 will have no impact on this site. There is also a possible moated site located c 162m from T47. However, it is stated that the proposed development will avoid this site and that mitigation measures in the vicinity of the site have been approved by the DAHG.
- *Donadea Demesne* – this property has been examined in the EIS, Chapter 14, (pages 27 and 55).
- *Kilpatrick Bridge* – it is pointed out that the node upgrade at this bridge relates to a modern bridge and should not be confused with a bridge of the same name which appears on the NIAH list, but is located in county Westmeath (also a canal bridge).

5.4.6 Hydrology and Water quality – including responses to IFI, HSE, Meath Environmental Alliance, Kildare Environmental Alliance

- *Response to IFI submission* – The submission by Inland Fisheries Ireland (summarised above at 4.3.3 of my report) is largely reproduced at 3.10.1 of the RFI. This part of the IFI submission had contained detailed advice regarding matters such as stream crossings, culverts, SUDS, storage of oils/fuels etc. The Response generally reiterates the information already set out in the EIS (Chapter 9) and the relevant EIS appendices. It does not address the overall concern raised by the IFI that the proposed development relies on an outline CEMP rather than a full or finalised one. It should also be noted that this part of the response to the IFI issues relates to Hydrology

only, and that issues relating to Ecology in the IFI submission are addressed in 3.9.2 of the RFI.

- *Irish Water submission* – this was answered in the response to Meath Co. Co. (Sections 2.18 and 2.19 of RFI).
- *HSE submission* – this was answered in response to Kildare Co. Co. (Section 1.6 of RFI).

The responses to the remainder of the submissions can be summarised and grouped under the following headings

5.4.6.1 Groundwater flow regime

- *Lack of Groundwater monitoring and site investigation – concerns raised in several submissions (notably Observer 43, Observer 670) regarding minimal level of site investigation and examination of actual ground water flow regime as well as impact on GW flow/quality due to physical presence of turbines, tracks, possible changes to SW storage, infiltration, run-off patterns, reduction in forestry, disturbance from earthworks etc. Considered that EIS inadequate in terms of assessment of baseline hydrology and impact on GW flow/quality - Response generally reiterates approach taken in EIS. Considers that reasonable to assume that groundwater is expected to flow in the general direction of topography and surface water courses, and that in the absence of a surface water hydrological connection, it is assumed that there is also an absence of groundwater connectivity. It is stated that this is based on best scientific knowledge.*
- *Concern re increased risk of run-off with suspended solids and lack of groundwater monitoring – Response that drainage system of shallow swales/stilling ponds and diffuse outflows overland, which will be located in suitable areas, following detailed site/ground investigations will result in adequate drainage system for development. Considers that proposed development will not result in potential impacts on groundwater over and above current activities of grazing, arable, peat milling and forestry uses.*
- *Peat slippage – Observer 670 notes that Peat Stability Assessment considered that the risks of peat slippage are low and that the peat landslide risk before, during and after construction are negligible. Concern raised re these conclusions and lack of mitigation – Response reiterates conclusions of appraisal of peat slippage risk, which was only considered necessary in three of the clusters (Windmill, D-H, Cloncumber) and that best practice will be followed as outlined in 8.5.1.1 of EIS. Drainage proposals in chapter 9 also reiterated.*

- *Bog protection – concern re introduction of large amounts of concrete into bogland environment and impact on GW flow, GW storage, high water tables and need to protect Raised Bogs* – Response reiterates contents of EIs regarding drainage proposals for boglands (10.5.3). It is stated that it is proposed to avoid dewatering in order to protect the Raised Bogs (and also minimising impacts on water tables/gw storage/flow). However, where high permeability strata are encountered together with strong GW inflow, it is proposed to use groundwater cut-off techniques such as sheet piling. It is stated that the precise technique will depend on the results of the ground/site investigations, which will determine the detailed design.

5.4.6.2 Groundwater quality/water supply

- *Concerns in many submissions regarding pollution from earth moving, spills, leaks (of oil, fuel, building materials), use of vehicles* – Response states that no evidence of waste material was encountered during trial pits excavation. In any event, best practice measures will be employed as set out in Chap 8 of EIS (8.5.1.2) and the mitigation measures set out at 10.5.3 of EIS will also be implemented. In summary, it is reiterated that if contaminated material is encountered, the following measures will be employed:-
 - Contact L.A./EPA immediately
 - Establish Further cut-off drains
 - Test the material to establish composition/leachability
 - Cover the material in-situ to prevent infiltration by rainfall or SW
 - Excavate material under supervision and transfer to a licensed disposal facility for disposal
- *Impact on Trim Aquifer and proposed water supply for Broadford/Clogherinkoe – reference to proposal to pipe water from Kilmurray to a possible reservoir near Carbury to supply these townlands with pipework to be laid in R402 and concern re proximity of T11, T12, T13 to boreholes and impact on same* – Response states that the wind farm and the boreholes are in different water body catchments. Ballinakill and Windmill clusters are within the Trim Aquifer area, but the D-H (T11, T12, T13) cluster is in the Lucan Formation, which is a ‘Locally Important Moderately Productive Aquifer’. It is stated that this issue was also addressed in respect of the potential impact on the Johnstown Bridge SPZ earlier in RFI (Sections 1.6 and 2.1.8). It is further stated that there would

only be small sections of cabling on the R402 and that silt trenching techniques would be employed.

- *Concern re impact on private wells* – it is stated that this issue has been addressed previously in the RFI under 1.6.1.10.
- *Refusal of PL17.203601 – Proposed for large landfill close to Ballinakill refused by Board having regard to complex hydrological/hydrogeological conditions on the site* – Response states that the potential impacts of such a major landfill (220,000 tonnes p.a. over a 13 year lifespan) would have been significantly greater than the current WF proposal. In addition, that site was located in GSI R3 Zone which is deemed to be unsuitable for landfills, and the Board considered that the proposal was unsuitable due to the potentially inadequate mitigation proposed.
- *Dumping at quarry at Ardenew (near Longwood) – potential impact on ground water quality of area* – Response questions the relevance of this land-use (raised by Kildare Environmental Awareness Group) as it involved the dumping of offal waste in a quarry, which resulted in pollution of 10 wells in immediate area in 2001.
- *Proximity of site to Boyne River cSAC at Ballinakill in terms of conservation/protection of R Boyne* – Response refers to proposed mitigation measures set out in Appendix E1 of CEMP (App D of EIS) and in Chapter 8 and Chapter 10 of EIS, and as set out in the NIS, which will be implemented to prevent impacts.
- *Dissolved Organic Matter in run-off from excavated peat* – Response states that the Maighne WF site is particularly well suited to SUDS and treatment by swales, stilling ponds and diffuse outflows due to flat nature of landscape. In addition, filtration and use of silt traps etc. will, it is stated, mitigate any risk of dissolved organic material entering the watercourses.

5.4.6.3 Flooding

- *Location of several turbines within floodplains* – RFI states that site specific FRA undertaken, OPW floodmaps have been checked and the findings are reiterated, (Chap 9 EIS, 9.4.5). It is further stated that there would be no risk to turbines and no appreciable obstruction to flood flows. The approach taken is avoidance by design – all seals in the turbine towers have been designed such that there would be no water ingress. In terms of the foundations, these will be designed and built to take account of possible exposure to water and the ducts will be sealed. Note T40 in flood zone A but skirts the floodplain, as does access to T40. T46 has been stated as being in proximity to site of

historic flooding, but as the photograph is not geo-referenced, it is not possible to verify.

- *Flood events – increased risk of run-off with suspended solids* – the discharge from the shallow swales and stilling ponds will be via a diffuse outflow overland, which will be vegetated. Thus the retention time will be lengthened.
- *High water tables – Hortland – impact of extreme events* – it is acknowledged that in extreme events, drainage may be impeded, but it is stated that it will continue to operate once the flooding recedes and the additional retention time will facilitate settling of suspended solids.
- *Flooding of farmlands* – it is anticipated that the increase in run-off will be very low. Given that the wind farm is a ‘linear development’, the run-off will not be concentrated in any one location. FRA concludes minimal impact on flood risk to surrounding lands.
- *Deforestation and flooding* — acknowledged that felling of trees will increase rate of run-off, but given that clearing will occur within larger forest areas, this will result in minimal impact, which will be mitigated in any case. *Ballyteague forest* – much of the track within the forest is along the line of an existing track.
- *Pressure on canal systems* – wind farm is a ‘linear development’ and the canal system is also linear. This factor, together with the prediction that the magnitude of the increase in run-off will be so low, means that any potential impacts would not be concentrated in one/two locations and that there will be no increased pressure on the canal system.
- *Ballinakill area and Royal Canal – concern that RC burst its banks in the past* – Response states OPW floodmaps.ie has been checked and addressed in 9.3.3 of EIS. All incidents with hydrological links to Ballinakill have been examined (as have same with regard to other clusters). Flood identification and assessment was carried out and set out in 9.5 of EIS. It is accepted that T1 is in a floodplain but there is no potential impact of a risk to this turbine (avoidance by design).
- *River Slate/Cloncumber* – seven turbines on lands which drain to R Slate – T29, T30, T32, T35, T37, T38, T39 and I borrow pit. There are four further turbines which drain towards Cloncumber Stream, (a tributary of R. Slate) - T31, T33, T34, T36 and a temporary compound. However, it is considered that the increase in run-off would be very low, with no direct discharges to the watercourses, and that there would be no significant impacts, even in the absence of mitigation. FRA carried out at Agar Bridge (downstream of development) – found no perceptible increase in flood levels in R Slate at Agar Bridge due to proposed development.

- *Access track T47*- this would be made up of hardcore material with no significant degree of filling across lands. Drainage would be provided alongside tracks to prevent risk of flooding. Notes that water features have been recorded in chapter 9 and Appendix H1 of EIS and that minor drains will be crossed using 450mm pipes. Thus no significant impact of flood risk.
- *T45 – methodology* – Excavation and construction of T45 will be as per submitted drawings and in 9.6 of EIS. Any flooding will be confined to the excavation area and this will be prevented by controlled pumping and removal of waste water from the site. Thus there would be no increased risk from the methodology during an extreme rainfall event.

5.4.7 Landscape

5.4.7.1 Response to DAHG

- *Clarification on impact on views of Carbury Castle* – Response refers to views to/from castle in EIS (KEDR 3/4). States that castle is seldom seen in the same context as the wind turbines from the surrounding roads, and that when seen, they are at widely disparate angles or are substantially screened. As such, it is considered that the proposed development would not detract from views of the castle.

5.4.7.2 Response to Fáilte Ireland (Landscape) – submitted by AOS

- *Significance of Impacts – highest levels to North and South of site* – Point made and response similar to that made by CASS and corresponding response by applicant. Accepts that central clusters are located in a more robust landscape with broad scale land-use patterns and a high degree of screening with fewer sensitive receptors than the clusters to the north and south. However, disputes claim by AOS that these impacts are significant.
- *Erroneous designation of Canal Network as Medium Landscape sensitivity – KCC LCA categorises canals as ‘high sensitivity’* – Disputes that this is in error, but is based on a universal sensitivity category as set out in the GLVIA Guidelines. It is further stated that LCAs vary across jurisdictions, (e.g. in Meath canals are ‘Medium’ and in Kildare, ‘High’). Accepts that wind farm would not have a ‘Negligible Impact’ on canals, but disputes AOS statement that it would be a ‘Significant impact’. It is acknowledged that where clear views are available, the impact would be ‘Moderate’.

5.4.7.3 *Response to An Taisce (Landscape)*

- *Impacts on canal network* – Response – already addressed in RFI
- *Cumulative impacts – Emlagh* – already addressed in RFI.

5.4.7.4 *Response to Waterways Ireland*

- Noted that Waterways Ireland has no particular concerns and that it would like to see a portion of the community benefit be allocated to the canal amenity areas.

5.4.7.5 *Response to Observation No. 43 (David Mulcahy Planning Consultant – Donadea Against Turbines)*

- Disputes description of ‘Western Boglands’ given in Consultant’s report and states that the reference to the Eastern Boglands is erroneous as this LCA is not within proximity of the site. The Methodology used in the LVIA is also defended and reference is again made to the LVIA Guidelines (2013, 3rd Edition), which guided the LVIA undertaken as part of the EIS, and which it is asserted is the industry standard.
- *LVIA demotes sensitivity ratings* – although this has already been addressed in response to CASS, it is stated that in respect of Drehid Hortland, five of the VPRs were deemed to be ‘Moderate’, which is considered to be significant. Furthermore, the ratings were guided by the GLVIA and it is stated that reasoned judgements were made which involved a balance of a number of factors. The Planning Consultant’s analysis was described as being overly simplistic as it concentrates on visibility of turbines alone. It is considered that where clear views of turbines will be available, they will be well assimilated into the landscape.
- *VPRs are very limited, a number of roads with direct views are ignored and VPRs not taken from residential properties* – Response points out that although the dispersed layout means that there are a greater number of VPRs (63), most wind farms would only have 18-25 VPRs. It is submitted that the VPRs are adequately representative. The criticism that the EIS fails to include adequate ‘worst case scenarios’ is disputed. It is submitted that a clear and open view may not necessarily result in a higher visual impact than a more obscure/partially screened one due to the balance between visual exposure and aesthetic factors.

- *Impact on Newton Hills & Hill of Allen – protected views* – Impact considered in EIS, KEDR30, KEDR 41, and considered to be moderate or moderate-slight.
- *Screening effect overstated in EIS* – Disputes this as substantial screening available. Claim that screening confined to Spring, Summer and early Autumn is factually incorrect. RSA carried out during winter months, and most of photomontages also undertaken in winter. In response to claim that the screening effect of commercial forestry is reduced when forests are cleared, it is stated that there has been little reliance on these forests for screening. Emphasis on value of commercial forestry in EIS relates to its productive landscape character.
- *Lack of Community Consultation as recommended by Heritage Council* – it is pointed out that no observations received from Heritage Council. It is also stated that community consultation was carried out (as previously stated in RFI).
- *Local value and sensitivity ratings of landscape* – disregarded compared with the Landscape and Visual designations – this claim is disputed as is the claim that the value of the landscape is downgraded due to it not being ‘naturalistic’ and that the sensitivity ratings are based on ‘subjective judgement’. It is stated that the EIS recognises that residents ‘at home’ are amongst the most susceptible to visual change but that this must be balanced against the fact that the landscape is only of local importance. It is reiterated that the EIS found that one of the strongest values associated with the receiving landscape is a sense of ‘rural productivity’, which means that the WF would be more compatible with this type of landscape.
- *Relevance of a small number of turbines being visible from a location is questioned given the height (169m) and proximity to the road* – disputed.
- *Justification for tall turbines and widespread layout is inadequate mitigation as this intensifies the negative impact* - disputed as fewer and taller turbines considered to be valid mitigation, as supported by the 2012 Fáilte Ireland attitudes survey. The mitigating effect of a dispersed layout is also reinforced by the findings of the RSA carried out as part of the LVIA.
- *Contrast in scale between turbines and houses described as ‘slight’ is an underestimation of the impact* – this is disputed and has been taken out of context.
- *Complementarity with other land uses disputed* – Response reiterates the view that the scale and nature of the rural activities and land uses in the area allows for complementarity between the wind farm and uses such as forestry and peat extraction due to the large scale of these activities. In addition, these uses contribute to an ‘anthropogenic landscape of productivity’ which it

is considered is compatible with wind energy development. Claims of industrialisation of the countryside are disputed.

- *Need for preparation of broad scale capacity studies in advance of assessment of such applications for wind energy* – dismissed as proposal has been prepared in relation to current best practice and current environmental policy.

5.4.7.6 *Other issues raised under Landscape topic*

- *Value of Designated Scenic Views* – of the 24 assessed, 10 were found to be likely to experience a ‘Moderate impact’. It is submitted that this is due mainly to the ‘value’ of these views as a result of the ‘vastness of the landscape’ rather than any ‘naturalistic landscape character’ or presence of a distinctive feature.
- *Impacts on canal networks/waymarked routes* – Response states:-
 - No impact on the structure of the canals themselves;
 - The LCAs only include the width of the canals and not the surrounding landscapes, hence the high sensitivity rating relates only to the linear corridor
 - Designated views from bridges – only 2 of these were judged to be ‘moderate’. These views principally relate to the ‘axial views along the canal corridor’.
 - The RSA of the Canal network – only some sections likely to experience moderate impacts, which are generally confined to within 1km of Ballinakil and Cloncumber clusters. EIS considered that this merely ‘punctuates the journey...not a constant feature’. EIS also considered that canals are industrial structures. Notes turbines considered to be a ‘Prominent feature’ in approx. 3.4% of the entire combined length of waymarked routes (GC Way, RC Way, Barrow Way).
- *Justification for dispersed layout* – the RSA results indicated that the most common scenario is a view of less than 5 turbines at once. This means that for most receptors, the visual effects will be equivalent to a much smaller scheme. It is further stated that most views where the whole WF is visible are from elevated vantage points, but as these take in the vastness of the landscape, which is anthropogenic, this is considered acceptable. It is stated that the clusters result in clearly comprehensible and discrete spatial arrangements throughout the countryside.
- *Excessive height* – considers that it is consistent with the permitted WFs at Mount Lucas and Yellow River and with other European countries, e.g.

Germany. Maximising the yield is not the only reason for tall turbines, as the height versus density relationship was a critical factor in the design of the wind farm. It is disputed that the turbines, which are slender, are as visually dominating as buildings. It is acknowledged that the taller turbines would be more spatially dominant when viewed 'up close', but it is argued that they would allow for a greater sense of 'scheme permeability' and would occupy proportionally less of a view than a comparable scheme of smaller turbines.

- *Residential amenity impact of 47 turbines* – the RSA indicates that the impact would not be significant due to the high degree of screening and the fact that open views of 5 turbines or less would be available for most of the time. In addition, it is claimed that most houses are surrounded on 2-3 sides by vegetative screening.

5.4.8 Legal submissions

5.4.8.1 Public Participation – Aarhus Convention

- *Status of Aarhus Convention in Irish Law* – Clarification provided in High Court *Waterville Fisheries v A.L.A.B. (No. 3) 2014*. Needs to be made part of domestic law by Oireachtas. Certain provisions of AC have been implemented by EIA Directive including the following provisions:-
 - Public should be able to participate in decisions on the specific activities listed in Annex 1/Annex 2.
 - The public shall have access to a review procedure before a court of law or another independent and impartial body...to challenge the substantive or procedural legality of decisions
 - Procedure must be fair, equitable, timely and not prohibitively expensive.
- *Development consent and EIA needed* – before consent is given, projects likely to have a significant effect on the environment by virtue of their size, nature, location are made s.t. requirement for development consent and an assessment as to their effects on the environment. Thus EIA Directive provides for implementation of Aarhus Convention as part of development consent/EIA process.
- *Early participation* – public participation procedures (pursuant to EIA Directive) commence once the request for development consent has been made. The applicant has abided by these requirements in that 3 newspaper notices were placed (between 7th and 11th April 2015) and application was submitted on 9th April 2015. In addition, the documentation relating to the proposed development was made available at ABP offices, at KCC offices

and on a designated website. The period for receipt of observations was from 16th April-4th June. It is claimed that, as public participation had been initiated prior to the grant of any consent, the requirements of Article 6(4) have been complied with. Furthermore, it is submitted that public participation commenced at the earliest possible stage, which satisfies the requirements of the EIA Directive. Thus, there has been no breach of either EU or Irish law and the requirements of the AC have been fulfilled.

5.4.8.2 *Strategic Environmental Assessment*

- *Need for SEA for this project disputed* – Directive 2001/42/EC (SEA Directive) requires environmental assessment at a strategic level of plans and programmes, which in turn set the framework for those individual projects that fall within the EIA directive.
- *Maighne not a 'Plan' or 'Programme'* - It is acknowledged that Energy developments are included in the types of plans and programmes that should be the subject of SEA, but it is refuted that Maighne Wind Farm could be described as a 'Plan' or 'Programme', which need to be adopted by an authority.
- *Maighne is a 'Project'* – as Maighne Wind Farm falls within the definition of a 'Project', no SEA is required.

5.4.8.3 *Adequacy of EIS*

- *EIS inadequate is rebutted* – RFI page 200-201 contains rebuttal. It is claimed that the EIA Directive has been complied with and several judgements have been quoted to substantiate this point. These include judgements in Australia, UK and Ireland. It is submitted that the EIA Directive should not be interpreted as requiring developers to be overly pedantic about the inclusion of topics. Criticism is also made of the 'unrealistic and unduly legalistic expectations with regard to the comprehensiveness of the EIS'.
- *EIS is a 'departure point'* – It is stated that the EIS should be comprehensive but not definitive, as it is 'merely a departure point' in the process which will attract comment and submissions.
- *Requirements of EIS to contain 'data' were fulfilled* – it is noted that an EIS must contain data to identify and assess the main effects which the project is likely to have on the environment. The data in the submitted EIS is considered to be more than adequate and it is pointed out that the Directive does not define 'data' not is the information to be provided intended to be 'unlimited'. Article 5(1)(a) requires that information must be relevant to a

given stage of the consent procedure and to the specific characteristics of the project and of the environmental features likely to be affected. It is submitted that the EIS complies with these requirements.

5.4.8.4 *Precedents*

5.4.8.4.1 *General precedents*

- *Refusal of planning permission on grounds of visual impacts* – in each case raised by third party observers, the applicant claims that visual impact was not the primary reason for refusal.
- *Refusal of planning permission on grounds of deficiency of local roads* – in each case raised by third party observers, the applicant claims that deficiency in the road network was not the primary reason for refusal, and/or the property in question was not on the haul route for the WF. It is also stated that there is a fundamental difference between permanent local traffic and temporary construction traffic.
- *Settlement policies for rural areas* – there is a fundamental difference between settlement policies for rural areas and wind energy projects.

5.4.8.4.2 *Wind energy projects*

- *Each application should be assessed on its own merits* and are not directly comparable. Wind farm design will vary according to location and environmental constraints.
- *PL16.PA0031 Cluddaun WF Co. Mayo* – Reason for Refusal was not that it was widely dispersed. ABP was not satisfied that it would not adversely affect the integrity of the Natura 2000 sites in the vicinity due to the potential to impact negatively on surface water and ground water hydrology with regard to peat slippage and changes in morphology/flow of streams. Full appraisal of all potential impacts submitted in respect of Maighne.
- *PL04.243630 Ardglass WF Co. Cork* – disputes that reason for refusal was based on landscape impact. The principal concern of the Board was distance between 11 no. turbines and residential properties. Unlike Maighne, this was an upland area.
- *PL03.PA0025 Doonbeg WF Co. Clare* – reason for refusal was based on impact on residential and tourism amenity and adverse impact on protected habitats and cumulative concentration of wind farms. However, it is stated that the siting of turbines in Maighne was carefully undertaken to minimise impacts on residences.

- *PL19.242354 – Cloghan WF Co. Offaly* – this was refused on the grounds of being visually obtrusive and excessively dominant. It is claimed that the reason related to the open nature of the immediately adjacent lands and to the size and scale of the turbines (170m).
- *PL01.243364 – XXXXX* - it is claimed that the reason for refusal related to gaps in the information in the submitted EIS (geotechnical assessment, bat survey, local roads, residential amenity, surface water, etc., which is not relevant to the Maighne proposal.
- *PL25.237728 – Gaybrook* –it is submitted that the reason for refusal related to impact on a single 18th /19th Century demesne landscape, within which the proposed wind farm was to be located. However, it is pointed out that the Maighne WF is located some distance from such demesnes. In any case, impact on the demesnes is considered in the EIS.

5.4.8.4.2 Large Scale development projects

- *PL17.203801 - Landfill at Boolykeagh* – refusal on the basis of inadequate protection of the Boyne SAC and public water supply, which is not the case in the current proposal.
- *PL17.238669 – Telecom Mast Clonard* – 30m lattice mast located adjacent to the Royal Canal – it is claimed that this is not comparable to Maighne as it involved a single mast and was not a SID which related to the provision of really important renewable energy.
- *PL09.242523 – Timahoe wind monitoring mast* – this was refused on aviation grounds. Reference is made to the response set out at 3.3 of the RFI.
- *PL09.237777 – Combined Heat and Power plant, tougher, Newbridge Co. Kildare* – Refusal related to the Leinster Outer Orbital route. The applicant claims that this has been suspended by the NRA.

5.4.9 Policy issues

5.4.9.1 Need for the Project

- *National energy policy* – Response reiterates Chapter 1 of EIS. It is pointed out that there is a legal obligation to reduce greenhouse gas emissions and to diversify energy sources to avoid incurring fines.
- *Security of supply* – contents of chapter 3 of EIS reiterated. It is restated that 89% of energy needs are imported, which puts the country in a very vulnerable position with respect to any future energy crisis and fluctuations in

supply. It is reiterated that Ireland needs to reduce its dependency on fossil fuels in order to improve our financial autonomy and stability.

- *Environmental impact of fossil fuels v. wind energy* – the drawbacks of fossil fuels in terms of production of greenhouse gases and their effect on climate change are reiterated. Reference is made to an international panel on climate change which stated that renewable energy must be increased to 80% by 2050 in order to limit global warming to <2 degrees. Wind energy is the largest contributor to renewable energy in Ireland. Maighne WF would generate 125MW which would result in a net displacement of 190,000 tonnes of CO₂ p.a.
- *Legal and policy obligations* – Content of Chapter 3 EIS reiterated. Reference to Dir. 2009/28/EC, Promotion of Renewable Energy Directive which includes a mandatory national target for achieving overall share of energy from renewable sources of 20:20:20, (i.e. 20% reduction in greenhouse gas emissions; increase in renewable energy consumption to 20%; and 20% increase in energy efficiency), by 2020.
- *NREAP* – National Renewable Energy Action Plan – sets out how these targets will be achieved, i.e. 16% of overall energy from renewable sources and 40% of renewable energy from electricity generation, by 2020. Estimated that Maighne WF will contribute 3% of the NREAP target and would save €40 million in potential fines.
- *Progress to 2020* – SEAI states that Ireland only 60% of the way to meeting targets and is in danger of not meeting them. There is a likely shortfall of up to 1,500MW between the current build rate (3,470MW) and the likely 40% demand rate (4,000MW). It is pointed out that for every % point shortfall, there would be a potential for between 70-140 million euros in fines payable.
- *Economic impact of Maighne WF* – Reference to Cost Benefit analysis carried out by Poyry & Cambridge Econometrics, which it is stated would reduce fossil fuel imports by €700 million and CO₂ by 5.5 million tonnes. Applicant claims that this will lead to an increase in household disposable income. Employment nationally was stated to be 3,400 in ‘the sector’ in 2014. It is predicted that this would increase to 8,335 by 2020 if the 4,000MW target is achieved.
- *Local benefits of Maighne WF* – it is stated that it would create 225 construction jobs and 60 jobs (30 direct, 30 indirect) during the operational phase; that landowners payments would be paid to over 100 landowners; that commercial rates would total €1 million p.a.; and that there would be a community benefit scheme of €3.5 million over the lifetime of the project.

5.4.9.2 Policy vacuum disputed

- Reiterates broad policy support for Kyoto protocol, UN Framework on climate change etc.
- Reiterates comments made earlier in RFI re EU directives on promotion of RE and NREAP
- *Irish planning policy is dynamic and constantly changing* – P.A's and ABP cannot delay decisions on the basis that the revised guidelines have not been published or that a strategy/plan is not in place. Adopted plans/guidance must be relied upon. The DoECLG has stated that the WEPG 2006 is the only guidance that can be relied upon.
- *Ample support in currently adopted Plans/guidance* – there is ample support for the promotion of WE projects in the CDPs for Kildare and Meath, the RPG for the area and in the WEPG. These Plans include criteria to enable assessment and reasonable protection of residential amenity, landscape, natural and built heritage, economic and material assets and other development interests.

5.4.11 Rural Economy/Tourism

- *Rural diversification* – proposed wind farm is in accordance with the policies in the CDP which promote both rural diversification (chapter 5) and seek to support a balance between the various interests involved in rural activities (Chapter 10).
- *Equine industry and the rural economy* – respectfully submitted that the CDP facilitates the development of the equine industry which “may otherwise be more appropriately located in urban areas or employment centres.” It is submitted that it is not the intention of the CDP to place an effective buffer around equine establishments. It is not accepted that the equine industry and wind energy development are incompatible uses.
- *Tourism impact* – although there will be some impacts during the construction phase, these will be temporary and mitigated. The main impact during the operational phase will be visual. This issue has been addressed in the LVIA as part of the EIS and in the RFI at 3.15.2.
- *Tourism market* – it is acknowledged that Ireland's largest tourist market is Dublin and that the area is highly accessible to this market. However, it is considered that the policies in the CDP for Kildare support a diverse range of tourist activities and that the proposed wind farm is not incompatible with these activities or attractions.

- *Fáilte Ireland tourism attitudes survey* – it is acknowledged that tourists are sensitive to visual impacts, the Fáilte Ireland survey indicates that this relates primarily to coastal areas or areas of outstanding/iconic landscape vistas.

5.4.12 *Impact on individual tourist attractions*

- *Lullymore Biodiversity Trail* – nearest turbine is 2.6km away (Derrybrennan0). As the park is contained within a woodland setting, the proposed turbines are likely to be screened from most aspects of the park. Visitors will not be deterred.
- *Royal Canal Way* – this is a national Waymarked route managed by Waterways Ireland. The nearest turbine is T7 which is 270m from RC Way. Activities such as angling, walking, cycling, boating are not incompatible with wind farm. This combination has been actively promoted at some wind farms in Scotland and in Roscommon.
- *Barrow Blueway* – 112km shared use trail. Cloncumber is within 1 mile of the walking route. Does not accept any significant impact.
- *Donadea Forest Park* – 243ha of mixed woodland with many historical features, various walks and has been designated as a NHA. Proposed development is 1.99km distant. Although there may be glimpses of T40 from open areas, which would result in a slight visual impact, it is considered that the park would not be significantly affected by the proposed development. Park located between two VPRs, 07LC30 (moderate impact) and KEDR7 (imperceptible impact). It is unlikely that visitors would be deterred.
- *Wallaby woods* – family run open farm with camping, 16 acres of woodland and some water features. It is located less than 1km from the nearest turbine. However, it is unlikely that 1 or more turbines would be visible and that visitors would be deterred.
- *Kildare Maze* – near Prosperous. Ireland's largest hedge maze with assault courses, crazy golf and zip wire etc. The closest VPR is KEDR7 (6km from a turbine) and the closest turbine to the facility is 12.5km. The impact would be imperceptible.
- *Ireland's Ancient East* – this is a branding initiative by Fáilte Ireland, similar to the Wild Atlantic Way, and runs from Cork to Cavan. The assessment and conclusions of the EIS were reiterated (Chapters 11 and 14).
- *Ballyteague Forest* – this forms part of Lullymore forest and is owned by Coillte. It is stated that it has been assessed as part of the EIS in respect of the Cloncumber cluster. It was concluded that the construction impacts would be short term and that the operational impacts would be low.

Note - Responses in RFI to Noise, Shadow Flicker (including issues under the broad headings of Residential amenity and Health) and to Transport issues (including issues under the heading of cable routes) are summarised in the report by John Desmond, Senior Inspector.

5.5 Response to Submissions – Cumulative Impact with Emlagh Wind Farm

A Strategic Infrastructure Application for Emlagh Wind Farm in County Meath (PA0038) was submitted to the Board by the same developer, Element Power, with the same agent (Fehily Timoney). The application sought permission for 46 turbines. It is stated (section 4.2 of RFI for PA0041) that the nearest turbines within the Maighne Wind Farm would be some 34km to the south west of Emlagh. The applicant has provided a cumulative assessment of the two proposals in Section 4.2 of the RFI, which is assessed under the various topic headings in the EIS. It was concluded that the potential cumulative impact for both developments would be negligible.

The Board decided to refuse permission for Emlagh wind farm on the 11th January 2016. The reason for refusal was based on the serious injury to amenities of the properties in the vicinity, the interference with the character of the landscape and the inconsistency with the development objectives for the area, by reason of the scale, extent and height of the proposed windfarm which would visually dominate this populated rural area. It was further stated that the proposed development would not align with the Wind Energy Guidelines “as this guidance document did not envisage the construction of such extensive large scale turbines in an area primarily characterised as a hilly and flat farmland landscape and in such proximity to high concentrations of dwellings”

6.0 Further responses to Additional Information received on 24th September 2015 (RFI)

A further 143 submissions were received by the Board in response to the applicant’s RFI, of which 8 no. were new observations. These include submissions from each Planning Authority, and from the following Prescribed bodies:-

Dept. of Defence	Fáilte Ireland
An Taisce	HSE
Irish Water	OPW
Transport Infrastructure Ireland	

6.1 Response by Kildare County Council to Applicant's Further Information

6.1.1 Transport

- Dispersed layout increases potential impacts on the surrounding road network in terms of cabling and disruption to public roads, construction traffic and delivery routes.
- Although the revised grid connection will reduce amount of cabling along public roads, there will still be a significant quantity of cabling on these roads.
- Notwithstanding mitigation proposed, extensive cable-laying will have overall negative effect in terms of

- (a) condition of roads;
- (b) additional roads maintenance costs;
- (c) additional health and safety risks to road workers.

There is a Significant Body of Further Information still outstanding on following matters, which should be provided at application stage:-

Cable routes

In order to be able to assess the Safety and Capability of road network along cable routes, the following is required at application stage:-

- Test trenching of all roads along cable routes
- Topographical surveys of all roads along cable routes to ensure that cables, joint bays, etc. in best locations.
- Details of structures where direct drilling is required.
- All existing services within roads to be identified at application stage.
- Capacity of power generation of cabling to be identified.
- Traffic Management Plan for cable laying.

Haul routes

- TIA of Haul Routes required with particular attention to HGV movements within the towns of Derrinturn and Johnstown Bridge;
- Full structural assessment of Haul Routes required with pavement depth and subgrade quality;
- Detailed design for strengthening works on Haul Routes where required;
- A construction Traffic Management Plan to enable assessment of impact of proposed development on road network.

Turbine Delivery Routes

- Estimated load of turbine components and structural survey of TDRs.
- Proposals to upgrade a road or structure where shown to be structurally unsuitable.
- Landowners identified and agreements put in place where temporary works proposed on third party lands.
- Topographical survey of TDRs.
- Nodes and bends on TDRs, outside of those identified, need to be addressed

New entrances

- Topographical survey required covering full extent of sightline.
- Written agreement from third party landowners for hedgerow trimming/removal.
- Further details on proposed entrance to R414 from Derrybrennan cluster.
- Full detailed design of proposed entrances.
- Sightlines and entrance design at Dunfirth substation.

6.1.2 Water Services/Environment Section

- Development of scale and nature proposed requires a detailed drainage design.
- Details of foundations for T1, T29, T30 and T34 are required.
- Existing and proposed Finished Ground Levels of turbine sites and associated access roads are required.
- The construction of a wind farm as a water compatible development does not remove the need to consider the displacement of flood waters and the provision of compensatory storage.
- Clarification required regarding the discharge from the proposed diffuse drainage system stilling pond to surface water. If it is proposed to discharge to surface water, a Section 4 Effluent Discharge Licence will be required.
- Response to concerns regarding backfilling with cement unsatisfactory as merely submitted EPA Guidance Document 'Storage and Transfer of Materials for Scheduled Activities.'
- Concerns remain regarding potential adverse impact on surface waters during construction works, particularly as a result on siltation due to local peat ground conditions and an increase in ammonia concentrations.
- Private wells which are located close to access tracks and cable routes must be protected from contamination during construction, particularly shallow wells.

6.1.3 Environmental Health

- Turbine model not yet determined or specified. Environment Section concerned that decision will be made on planning application without the turbine model being determined.
- Noise condition recommended with Daytime 45dB/ Night-time 43dB (LA90, 10 min), with further restrictions on Cloncumber cluster (40dB) when wind speeds are less than 4.5m/s at 10m height. An annual noise survey was also a requirement and mitigation measures in EIS to be implemented.
- Noise levels during construction phase should be established by condition and should be monitored, and should include restrictions on hours of operation to protect noise sensitive receptors.
- A plan for controlling shadow flicker within 10 rotor diameters of any turbine and the investigation of associated complaints should be required as a condition of any permission.
- Johnstownbridge Well field is just one of four groundwater resources identified for the county and is therefore a scarce resource. The proposed cable routes pass through the inner and outer source protection zones. It would have been better to avoid development in the inner protection zone areas so close to the wells.
- Dust limits must be set by condition and a dust monitoring plan put in place during construction.

6.1.4 Architectural Conservation Officer

- ACO's observations are as his original report. For more detailed analysis, refer to Landscape Consultant's report.
- The use of wide angle lenses to give panoramic views could be the wrong format for the human eye. This would invalidate the applicant's visual impact study.
- Visual impact studies should be taken for minimum winter foliage.

6.1.5 Heritage Officer

- A separate impact assessment of the ecology of each cluster is both necessary and warranted in this case due to the size of each individual cluster, the non-contiguous nature of the clusters, the dispersed layout and the entire footprint of the development. The potential impacts at a cluster scale could be reduced/diluted when impacts are only considered as a single

site. The board should therefore satisfy itself that the scale and nature of the impacts have already been addressed.

- The amount of compensatory habitat to be provided to account for the loss of 97.94ha has not been addressed.
- The revised mitigation measures to replant trees are noted. However, details of the replanting, in terms of location, quantity or species, have not been provided and have not been assessed as part of the EIS.
- No details of protection of retained ecological features, e.g. Trees and hedgerows during construction.
- Additional mitigation measures to reduce bat mortality during peak bat active months are noted. However, every effort should be made to avoid this impact by omitting T11, T34, T42 and T43.
- No details of proposed landscaping plan submitted, including potential impacts on adjoining habitats. This plan should also be subject to Appropriate Assessment.
- NIS – the Board should satisfy itself that the NIS has been updated to take account of any changes to the proposed development as a result of the significant additional information and any other information requests.
- The Tourism Attitudes study does not address attitudes to wind farms in an Irish setting.
- Royal sites of Ireland (UNESCO world Heritage) – the assessment of the impact of the proposed development on the potential of Dun Ailinne is inadequate and was not prepared by an independent expert on WH nominations.
- Impact of Node upgrades on Protected Structures – Johnstown Bridge, Fear English Bridge, Agar Bridge, Canal Bridge (Node Ref. NKDERB004) – has not been carried out. The applicant proposes to delay the assessment of these protected structures until after permission is given. This is unacceptable. The Board should satisfy itself that the condition of these structures will not be negatively impacted by a grant of permission.

Heritage Officer recommended the following revisions

- Cloncumber cluster be omitted in its entirety due to the potential impact on the built heritage, the natural heritage (in particular, protected species), archaeological heritage and the tourism potential of the Barrow Blueway proposal.
- Turbines 11, 34, 42, 43 be omitted to avoid bat mortality in the vicinity of these turbines.

A list of conditions in the event of a grant was also proposed.

6.1.6 Landscape

A detailed report by CAAS Ltd., on behalf of Kildare Co. Co. is attached (Appendix 2) to the P.A.'s response, the main points of which are:-

- Kildare LCA – Claims that CAAS had oversimplified and selectively interpreted the LCA, and had relied upon a desktop review of the EIS - CAAS had prepared both the original LCA and the Review of Scenic Views for the Kildare County Development Plan in 2005. Thus CAAS is very familiar with these issues and areas.
- Reliance on GLVIA 2013 and professional judgement of experienced landscape professionals – CAAS report was prepared by Conor Skehan, co-founder/past president of Landscape Institute, who has extensive experience in the preparation of LCAs and Designated Viewing Point designations. He has also been on steering committees for the GLVIA, the EPA Guidelines on EIA and for the National Landscape Strategy. Thus the assessment has been carried out by an expert with a detailed knowledge of both the Kildare and Irish landscapes, and of LVIA.
- Methodology – there is a disparity between the evidence provided by the applicant and the contradictory assessment of the significance of this evidence in EIS. Clear evidence is presented in several instances as to magnitude and effect, which are then argued as being ‘not significant’ on the basis of opinion alone.
- Significance of impacts – statutory guidance indicates that many of the impacts arising should be classified as ‘Significant’. Criticism of the use of ‘Simple mathematical formula for determining landscape and visual impacts’ is rejected.
- Route Screening Analysis – The RSA is limited to views from roads and not the overall landscape, which is an important consideration for a development of this magnitude that affects landscape to such a degree over such an extensive area. Must also be aware of the potential for visibility when screening vegetation is removed, due to the scale of the development.
- Sensitivity of canals – disputes suggestion that the canals are not, or ought not to be, considered ‘significant’ or ‘sensitive’. The local and national significance of the canals is recognised in the KCC CDP (Grand Canal LCA 13/14, and Royal Canal Waymarked route) and by other bodies. Suggestion that only axial views along canal are of significance is inconsistent with statement that development will be a ‘prominent feature’ when viewed from over 12 km away.

- Additional photomontages for Longwood – the photomontage evidence (RFI) provides evidence that the development will indeed be prominently visible from that settlement’s principal public spaces.

6.2 Response by Meath County Council to Applicant’s Further Information

- Protected Structures on Royal Canal and in Longwood village – Impact on these structures, including visual impact, has been assessed in EIS. Error of including Stoney’s Inn was acknowledged.
- Longwood ACA – additional photomontages – C.O. states that these indicate that few of the turbines in Ballinakill will intrude into the significant views, except for the view west along Main Street towards the former Garda Station (P.S.) It is noted that impact is found to be “moderate-slight”. C.O. considers impact to be moderate, but not slight, as the turbines would be an intrusive element in these views. Note that RSA indicates open or partially screened views for most areas in and around the town. Thus, even if not directly aligned with significant views of ACA, the turbines will be perceptible from certain viewpoints, and will have an impact on the character of the ACA.
- Royal Canal – in general, C.O. does not consider that wind farm will be incongruous to the character and setting of the Canal, which is itself an industrial structure. However, the Review of Protected Views for the MCC CDP 2013 considered View 56 along the Royal Canal at Boolykeagh to be sensitive to visible new development, and photomontage 06AH4 demonstrates that the Loughkeeper’s Cottage (P.S.) will be dwarfed by the scale of the proposed turbines in its vicinity. The Heritage Officer also considered that the proposal would be very imposing at this protected view and “would have a negative impact on how the canal is experienced and enjoyed at this location in the context of the RC Greenway and the recently restored Loughkeeper’s Cottage.
- Molerick NHA and Ballynabarney Fen pNHA - Clarification on whether indirect impacts were considered – H.O. confirmed that the applicant’s response was satisfactory.
- Drainage of wash-down areas and associated settlement lagoons – SEE Environment (Flooding) confirmed that response by applicant clearly sets out the process for construction and removal of settlement lagoons, which is deemed satisfactory. It was also confirmed that a revised Flood Risk assessment would not be required.
- Identification of all noise receptors and contour mapping – confirmed that applicant’s response is satisfactory.

- Cumulative effects of Shadow flicker within 1200m – applicant’s response is satisfactory.
- Clonguiffin Longwood Water Supply - Need for Hydrogeological assessment of impacts on boreholes from turbine foundations, borrow pits and cable ducting trenches – P.A.’s request for comprehensive hydrogeological assessment report on this and the “numerous domestic wells that exist throughout the area” was not complied with. Applicant had replied that the Ballinakill cluster overlies a different bedrock aquifer and groundwater body to the Longwood well and that the two areas are separated hydrologically by the River Blackwater. On this basis and in light of depth of excavations and no proposals to dewater the borrow pits, it had been concluded that there would be no impact. The P.A. response is that the Board should attach appropriate conditions to any permission to ensure that the Longwood supply and domestic wells are protected during construction.
- Water supply issues – MCC generally satisfied with response from applicant. Suggested conditions included that no water for construction shall be abstracted from a public water main without consent and that no concrete batching be allowed on site.
- Wastewater disposal – although applicant did not provide details requested, P.A. considered that response was satisfactory subject to appropriate conditions.
- Demonstrate compliance with SUDs – applicant’s response considered satisfactory subject to appropriate conditions.
- Bunded liquid storage areas - applicant’s response considered satisfactory subject to appropriate conditions.
- Cable routes within Meath – no longer any cables proposed in roads of County Meath.

6.3 Response by Prescribed Bodies to Applicant’s Further Information

6.3.1 Department of Defence

The Air Corps has responded with a comprehensive report which addresses, in detail, the points made by the applicant and by Wind Farm Aviation Consultants. The Air Corps response will be referred to in some detail in the assessment section of this report, but the following is a brief summary of the main points made.

- Experience, expertise and knowledge - Observations are based on the Air Corps’ extensive experience, expertise and working knowledge of the aeronautical environment in which the site is situated, including the legal

requirements, the detailed operational requirements of the services to be delivered, (including a variety of security related missions, Garda Air Support operations, inter-hospital medical transfers and Emergency Aeromedical services, as well as cognisance of the practical effects of weather in the area.

- Impact on operations to/from its base at Baldonnel and training activities – the Air corps remains of the view that the proposed development will significantly impact its ability to conduct operations to and from Baldonnel and conduct training in the area that has been established for that activity.
- Failure of FI response to address issues raised by DoD – rather than addressing the concerns raised by DoD, the response centres on a repeated argument that if aircraft operate within a minimum legal distance from the proposed turbines, then these obstacles to flight would have no effect.
- Sole reliance on ceiling and visibility – the FI submission suggests that the ability to fly in an area is only dependent on the ceiling and visibility. However, it is the nature of the terrain and obstacles that will determine the vertical extent beneath the cloud ceiling in which aircraft may fly.
- Visual Flight Rules – flight planning does not rely on whether a particular obstacle may be avoided legally but whether an obstacle-rich environment can be flown through safely or must be avoided altogether given weather forecast conditions, providing sufficient margin in respect of forecast accuracy and navigational error. While it might be legal to fly through a wind farm at minimum separation, this would probably be foolhardy and, in poor weather, reckless.
- Over-dependence on legal minima – WFAC report focusses on legal minima without adequately taking account of other aspects of “airmanship”. This is defined as an appreciation of the total flight environment that allows competent aviators to ensure that aircraft are not merely operated legally, but with appropriate margins. An every-day example is given to illustrate this of a car driver not merely having to obey the rules of the road, including obeying legal limits, but also must assess driving conditions and to match driving accordingly.
- Cancellation of flights due to obstacle-rich environment – Aircrew must assess weather and obstacle environment to determine an appropriate route, or in some case, determine that no safe route is available. Creating an environment rich in obstacles of significant vertical extent will result in cancelled flights, both training and operational. While cancellation of training flights may have financial/timetable consequences, cancellation of security related flights or flights for the purpose of saving life would have a much greater impact.

- Misinterpretation/misunderstanding of Irish Regulations – particularly SI 72/2004 – The “right-hand rule” and the “minimum height rule” are misinterpreted whilst several other legally binding regulations are ignored or misunderstood.
 - Right-hand Traffic Rule (SI 72/2004 11(3)(b)) is treated in the FI as a non-mandatory rule of thumb, whereas it is legally binding;
 - The Minimum Height Rule (SI 72/2004 Rule 3) states that an aircraft cannot fly closer than 150 metres (500ft) to any person, vehicle, vessel or structure or at a height less than 150 metres (500ft) above the ground or water. The WFAC report misquotes this distance as 500 metres.
 - Standardised European Rules of the Air (SERA) Regulations came into effect in Ireland in 2014, and seem to have been ignored completely. The over-reliance on the legal minima contained in SI 72/2004 rules is incorrect as no account is taken of the SERA rules, which differ for daytime and night time scenarios.
 - PANS OPS methodology and practice have been misunderstood by WFAC and the handling of these considerations is erroneous. The conduct of and necessity for ILS calibration flight checks did not seem to be appreciated by the consultants. However, the Air Corps welcomes the stated intention to ensure that Instrument Flight Procedures would now be protected.
 - VFR rules as quoted by WFAC are for flight above 3000 feet, which is not applicable in this case.
- Legal Safety requirements – for clarity, the applicable civil standard (outside built-up areas) is that contained within SERA, i.e. no closer than 150m (500ft) above an obstacle within 150m of the aircraft’s position. The rules require greater horizontal and vertical separation in built up areas where the risk of casualties on the ground may be greater. Thus the implications for the Air Corps are that otherwise useable airspace will be denied to it which will impact on operations negatively.
- Safety versus legal requirements - The DoD did not state that the obstacles would present a hazard since it is expected that the Air Corps pilots will exercise appropriate decision making before and during flight to ensure that the obstacle environment and weather enroute will permit the flight to be conducted safely. However, as a result, the flight may have to be aborted due to deteriorating weather, rerouted on a less efficient route, cancelled due to inability to fly a required route or being unable to meet the operational parameters of the route. Thus the potential impact on Air Corps missions on behalf of the State must be taken into account.

- Risk of Controlled Flight into Terrain (CFIT) – this is the cause of many aviation accidents whereby serviceable aircraft are flown into either an obstacle or the ground. It is recognised that parameters, above the legal minima, which are established by organisations, provide an additional and necessary safeguard against CFIT, which are important considerations in determining whether to undertake a flight.
- WFAC refers to some elements of UK CAA requirements but ignores others - The UK CAA considers that local experts should be recognised as understanding local implications and that [police] air support units such as GASU have particular operational requirements, which must be recognised.
- The WFAC response is argumentative and inadequate – it is lacking in knowledge/understanding of the Irish regulations and does not respond to the specific issues raised by DoE. It relies on the repetitive stance that there is no risk when aircraft is flown legally. The Air Corps believes that the report does not demonstrate the rigour necessary to overturn the considered and expert local assessment contained in the DoD submission.

In conclusion, the statement in the WFAC report that the impact on Air Corps Instrument Flight Rules operations will be mitigated by excavation and lowering the height of the turbines above ground level, the remaining effects of the proposal are such that they would have an unacceptable level of impact on air Corps operations and training. The Air Corps objection, therefore, still stands.

6.3.2 Fáilte Ireland

Fáilte Ireland would like the points in its original submission to stand for consideration by the Board.

6.3.3 An Taisce

An Taisce expressed the view that it would like to integrate its response to the RFI with its submission at the Oral Hearing.

6.3.4 HSE Environmental Health

- It is noted that a CEMP will be put in place. In addition, noise limits and dust limits should be established by means of condition together with appropriate monitoring programmes.
- It is noted that although the proposed turbine model has not been selected, the applicant has stated that the model will comply with the revised WEPG

when issued. The noise monitoring plan should include the Drehid substation.

- Shadow flicker mitigation measures are noted. It is recommended that a plan for controlling shadow flicker and investigation of associated complaints should be required as a condition of any planning permission.
- The mitigation measures for the protection of surface waters, (River Barrow and River Boyne, which are public drinking water sources), are noted.
- The measures for protection of Inner and Outer Source Protection Zones for Johnstownbridge well field are noted, as are the measures for the protection of both surface and ground waters from fuel/oil spills.
- Private wells along cable routes used as drinking water must be identified and protected from contamination during construction.

6.3.5 Irish Water

Irish Water requests that in the event of a grant of permission, that certain conditions be attached to any such permission. These relate to

- Agree a Construction Management Statement with IW prior to commencement of development to ensure that existing water services infrastructure is protected from any potential adverse effects. Of the proposed development.
- Agree to sign connection agreements where connecting to networks operated by IW, which will be subject to the constraints of the IW Capital Investment Programme.
- Diversion Agreements to be signed with IW prior to commencement of development where any IW asset is to be diverted.

6.3.6 Office of Public Works (new)

- OPW drainage channels - Distinction drawn between drainage channels maintained by OPW and those maintained by L.A. (map showing each attached to submission).
- Maintenance strips – OPW Drainage channels require a 10m maintenance strip along the edge of the channel, (measured from the top bank edge). This strip should not be planted or paved in any way which would prevent access for maintenance.
- Stream crossings - New culverts/bridges on any watercourses or changes to existing structures will require Section 50 consent from the OPW.

- History of flooding events – information available on www.floodmaps.ie with links provided to relevant information (e.g. photographs, reports etc.). The maps also have information on hydrometric stations, rivers, lakes, catchment areas, land commission embankments, drainage districts and benefitting lands.

6.3.7 Transport Infrastructure Ireland

- Leinster Outer Orbital Route – Provision for this route is made in both the current County Development Plans for Kildare and Meath. In addition, the Route is included in the current RPG for the GDA and in the NTA's Draft Transport Strategy for the Greater Dublin Area (2016-2035), which has been through a public consultation process since the authority's initial observation in June 2015.
- National road network and maintenance issues – the Authority notes that the applicants have acknowledged the requirement for future permits and licences as necessary. No further observations are made, other than the issues identified in the submission made in June 2015.

6.4 Response by Third Party Observers to Applicant's Further Information

The 134 submissions from the remainder of the third parties include much repetition of points previously made in the 820 no. submissions. The majority of these further submissions express concern that the applicant has generally failed to address issues or has addressed them in inadequate or incomplete manner.

6.4.1 Legal/process

- EIS is legally flawed – much of this issue involves reiteration of the points made regarding failure to comply with EU Directives and legislation, ECJ court judgements and the failure to transpose same into Irish legislation. It is pointed out that the RFI had clarified that the EIS had been prepared under the 2001 Regulations (and hence 97/11/EC), which means that it has not been prepared under 2011/92/EU and that the ECJ has already established that the 2001 Regulations are inadequate in terms of the requirements for EIA under Article 3, (C50/09). It is further noted that it is acknowledged that 2014/52/EU amends 2011/92/EU, but it is pointed out that this has not yet been transposed into Irish law. The Board cannot carry out EIA in accordance with Articles 4-11 of 2011/92/EC as the EIS was prepared under 97/11/EC, which does not contain the same mandatory information. Thus the

objection still stands that the EIS is legally flawed and that the application is invalid.

- Public participation – it is refuted that public participation had taken place “at the earliest possible stage”. The applicant’s account of the public participation process set out in Appendix 19 of the RFI is described as “disingenuous”. In addition, the cost and availability of the EIS and the RFI was considered to be unacceptable and contrary to the Aarhus Convention. This was due to the format of the digital copies and the lack of availability as zipped files, as well as the complexity of the material. The format also makes it difficult to find responses to individual observers.
- Grid connection – the status of the grid connection has still not been established, despite the revised proposal in this regard. Thus Maighne cannot be presented as a project that will connect to the National Grid. Hence the NREAP criteria still apply and the validity of the application has not been addressed. Furthermore, the issue of adequacy of the 110kV substation and its associated cables has not been addressed and it is not therefore clear if the proposed wind farm can be connected to the National Grid. Thus the objection still stands that the application is invalid.
- Alternative energy sources – this issue was not adequately addressed in the further information.
- Precedents – the references to planning precedents, particularly in relation to Board decisions, was not adequately addressed in the further information and/or the conclusions regarding the lack of relevance of such precedents is disputed.

242354 - it was considered that the landscape in which this development was to be sited was more similar to that in which Maighne is to be placed than that stated in the RFI, and as such, it was relevant to this proposal.

238609 - The refusal by the board for a telecoms mast adjacent to the Royal Canal is highly relevant given that it was refused on visual amenity and planning grounds, not on economic/energy grounds.

Other decisions – it is considered that several decisions had been made on the grounds of adverse impact on visual amenity and residential amenity, contrary to the applicant’s view. These included 143630, 243364, 240143, 239280.

6.4.2 Policy

- Policy vacuum – there are no current wind energy policies or strategies for either county which have been subject to public consultation and adopted by

local members. Thus the proposed development is developer-led and not Plan-led. As such, it does not address the requirements of Circular L20-13.

- SID Legislation – the further information does not address the issue of the purpose of SID legislation, which it is claimed was never intended for multiple infrastructure projects, such as this one.
- Windtake and legal consent – FI does not address these issues.
- Layout of wind farm – FI does not address failure to comply with grid layout set out in WEPG 2006.
- Leinster Outer Orbital Route – it is refuted that LOOR is not relevant or the ABP decision regarding Toghers Industrial Estate, (where permission was reused on these grounds), was not relevant given that the decision was made in 2011. The LOOR had the same status then as it has now. The proposal would therefore contravene Obj RP15 of CDP.
- Cumulative impact – Drehid Landfill – FI did not adequately address this issue in terms of the excessive industrial development in the area that would ensue, which would be contrary to the CDP policies for the area.

6.4.3 Visual/Landscape

- L VIA is subjective and self-serving – the EIS does not reference GLVIA (only the FI) and it is not statutory guidance and is not relevant to the Irish landscape. The RFI does not justify the visual impact on the landscape. It is general rather than specific. Wind energy proposals have been refused on the basis of visual dominance and impact on the landscape character, including a number of single turbine wind farms.
- Complexity of methodology – the methodology is not readily decipherable, resulting in judgements of impacts that are difficult to comprehend, are subjective and can be equally adjudged to be adverse or negative.
- CAAS Report - The submission by CAAS and the landscape description therein is supported.
- LCAs – criticism of Observer’s submission is refuted as direct quotes from the LCA were used i.e. “fertile lands with relatively high levels of local population and intensive land management”. The applicant’s references to “thinly populated” are disputed as these areas are largely confined to bogs within the ‘Western Boglands’, and not the entire WB LCA. The turbines are not proposed to be located in bogs, but on reclaimed farmland and forested areas adjacent to the bogs. The area is well populated and the population is increasing.
- Fundamental omission re Western Boglands – a critical landscape factor of the WB LCA is “allows vistas over long distances without disruption” and “is

inherently unable to allow development to be visually absorbed”. This has not been addressed in the FI.

- Impact on residential properties - this is not adequately addressed in the FI. Impact on residential amenity of large number of house situated between multiple clusters has not been assessed. There are plenty of planning precedents for wind energy development whereby visual impact was the reason for refusal. There is no hierarchy in the board’s reasons for refusal.
- Mitigation by cluster approach - is ineffective due to height of the turbines.
- Photomontages – are unrealistic and misleading. They are too few in number to be properly representative, (e.g. Longwood village – need view from Longwood Road). The use of a wide angle lens is criticised and comments made by P.A. are supported, (publication referenced – ‘Lenzs: Lenses for Landscapes’).
- Number of turbines visible – Even one turbine can result in a material change and visual dominance of the landscape. The statement that the visibility of 1-5 turbines is reasonable is rejected given the proximity and height of the turbines. The impact within 1-3km of a turbine is completely ignored, which is unacceptable.
- Impact on the Canals – any reasonable person would consider the canals to be ‘sensitive’. The designation as ‘medium sensitivity’ is rejected.

6.4.4 Cultural Heritage

- The FI response in relation to impact on a number of features is disputed – these include the Royal Canal, Williamstown House, Newbury Hall and other Protected Structures in the vicinity of Windmill cluster.
- Setting – it is disputed that heritage assets are not dependent on landscape setting. There has been no meaningful EIA of the likely impact on the setting of Williamstown House and Gardens, which is one of the finest in Ireland.
- Identification of archaeological impacts – FI has not addressed the issue of failure to carry out pre-development testing or geophysical investigation. Thus the potentially significant adverse impacts on archaeological heritage have not been adequately identified.
- Mitigation of archaeological impacts – Preservation by record is contrary to National Policy ‘Framework and Principles for the Protection of the Archaeological Heritage to preserve ‘in situ’ for the 9 areas of archaeological potential identified.
- EIA inadequate – assertion that any remains of national importance will be preserved ‘in situ’, which may necessitate a redesign or omission of

proposals, reflects the failure to adequately address archaeology and to design in order to avoid impacts.

6.4.5 Socio-Economics

- Impact on Equine industry - The adequacy of the FI is disputed and not all equine premises are included. The adverse impact of wind farms in close proximity to equine facilities on the equine industry is proven “beyond scientific doubt” in the BHS survey. There is no evidence in the FI to dispute this.
- Tourism attitudes survey – based on a much smaller turbine model and no information is given on the distances/proximity to turbines upon which the surveys are based.
- Assessment confined to certain tourist related businesses – the FI refers only to certain tourist related businesses and the predicted impacts are speculative and unsubstantiated. Thus the assessment does not respect the “human activities” as set out in WEPG.
- Future development not addressed – FI does not address the likely impact on future tourism development which leaves great swathes of land in limbo.
- Lullymore Heritage Park – the impact on Lullymore Heritage Park has not been adequately addressed in the FI.

6.4.6 Aviation

- Incidents in area – no account is taken of the list of aviation incidents in the area.
- Weston Aerodrome – the concerns of Weston Aerodrome were not addressed in the FI.
- SI 72/2004 – the minimum height that an aircraft can fly (to an obstacle, structure, vehicle etc.) is NOT 500m but 150m (500ft). The turbines being 169m exceeds this height by 19m.
- DoD report – is supported.

6.4.6 Drainage

- Turbines on floodplains – it is admitted by the applicant that some turbines will be located on floodplains, but the mitigation proposed to prevent flooding of the turbines (by means of seals) is not workable and may compromise the turbines and human safety.

- Groundwater contamination – concerns raised in TP Observations regarding GW contamination arising from wind farms in Scotland not adequately addressed in the FI. It is further noted that similar mitigation had been proposed in Scotland.
- Aquifer – no proof that the impact from the construction of the wind farm would be less than that from the Drehid Landfill. The scale and foundations would create pathways to the aquifer.
- Dissolved Organic Matter – if DOM is mixed with chlorine, drinking water becomes carcinogenic. The issue of Trihalomethanes is not adequately addressed in the FI. An external professional is required to adequately assess this issue.

6.4.6 Ecology

- Natura 2000 sites – inadequate assessment of Natura 2000 sites and failure to address the proximity to, and visual impact on, same. Molerick Bog and Mount Heavy Bog not adequately assessed.
- Concrete material – concern re amount of concrete required and possibility of piling not adequately addressed in the FI. Mount Lucas – 23 of the 28 turbines required piling.
- Invasive species – not addressed in FI.
- Marsh Fritillary – not adequately addressed in FI.
- Impact on Hares – hares are a protected species. The EIS merely accepts that there will be a detrimental impact on this species. This is unacceptable.
- Birds Directive – FI seeks to minimise the effect regarding the limited number of woodcocks (15 no.). Note there is no derogation for construction works under Dir 2001/147/EC.
- Deforestation/replanting – deforestation not adequately addressed in FI. Neither is the issue of where the replanting will occur. This is non-compliant with the Forestry Act.
- Original Bat surveys defective – it is acknowledged in the FI that the original bat surveys were invalid due to the low population numbers as a result of adverse weather conditions. However, it does not quantify by how much the population was reduced or whether species that would normally be present were missing.
- Precedent for refusal on grounds of impact on bats – ABP decision 243364 (Old Leighlin) was refused on grounds of the absence of a full bat survey.
- Eurobats Secretariat Guidelines – this guidance was dismissed by the applicant, yet internationally recognised guidance. The ESG requires 200m vegetation free buffer around turbines. This was dismissed on grounds of

being excessive and a 50m buffer was proposed instead. There is no scientific basis for this and it will result in increased bat mortality.

- Disputes assertion that the removal of coniferous/commercial forestry will have no effect on bat diversity/mortality – it is also disputed that there is a low collision risk with low flying bat species that feed along the woodland edge at Drehid and that the risk would be further reduced by the proposed 50m buffer zone. None of these assertions are backed up by evidence and it cannot be ascertained beyond “reasonable scientific doubt” that the proposed development would not adversely affect the bat population in the vicinity of the wind farm. Thus it would result in deliberate harm to a legally protected species.
- Protected Species – all bat species are protected species in Ireland. However, this is dismissed in the FI due to the abundance of bat species. However, it is emphasised that there has never been a full bat survey in Ireland, and as such, this assertion is without foundation.

7.0 SEVESO submissions April 2016

A further 17 submissions were received. These submissions have been summarised and addressed in John Desmond’s Report, Appendix 1

8.0 POLICY AND GUIDANCE

8.1 National Energy Policy

Since the coming into force of the binding targets arising from the adoption of the Kyoto Protocol there has been a considerable body of work invested in policy measures at International, European and National levels, which has resulted in a broad range of policy decisions and programmes aimed at combatting climate change. One of the initial responses of the Government was to issue an **Energy White Paper in 2007** entitled **Delivering a Sustainable Energy Future for Ireland 2007- 2020**. This established a strategic policy framework for the delivery of a sustainable energy future to ensure security of supply. It also set a target of 33% of electricity to be produced from renewable generation by 2020. A number of policies, plans and programmes were published in the following eight years. However, this policy framework has since been updated by a **new Energy White Paper on 16th December 2015**, entitled **Transition to a Low Carbon Energy Future 2015:2030**. Before summarising the key elements of this White Paper, the following is a brief summary of the main developments in energy policy formulation since 2007.

8.1.1 EU Directive 2009/28/EC

This Directive on the Promotion of the Use of Energy from Renewable Sources set out agreed new climate and energy targets of 20:20:20 by 2020 on an EU wide basis. Thus it required an overall reduction in greenhouse gas emissions (GHG) of 20% across the EU, 20% increase in energy efficiency and that 20% of the EU's energy consumption to be from renewable sources. It also required each member state to adopt individual targets and to submit to the EU Commission a National Renewable Energy Action Plan setting out how these targets would be achieved

8.1.2 National Renewable Energy Action Plan 2010

In accordance with Art 4 of 2009/28/EC, the NREAP 2010 set out Ireland's strategic approach to achieving its targets. The overall target (legally binding) for Ireland was set at increasing the share of energy consumption from renewable sources by 2020 to 16%. This would be achieved across three main sectors, Electricity, Heat and Transport. The Action Plan has set a target of 40% of electricity consumption to be from renewable sources by 2020. In accordance with the requirements of the directive, two updates of NREAP have been submitted (in 2012, 2014).

NREAP also set out the measures by which this would be achieved. It included 'Gate 3', which is a means of rolling out and implementing renewable energy grid connection offers (in batches) for up to 3,900MW of renewable energy. It was considered that this would enable the 40% electricity target to be met.

NREAP also included other measures such as 'REFIT' (Renewable Energy Feed In Tariff), which is a financial incentive scheme to encourage investment in certain types of renewable energy, including on-shore wind. The most recent scheme REFIT 2 operated from March 2012-December 2015 for up to 4,000MW.

8.1.3 EU Energy Roadmap to 2011-2050

The EU Commission issued an Energy Roadmap in 2011 with the aim of achieving a decarbonised energy sector by 2050. It set out a number of scenarios, each of which required a significant increase in renewable energy deployment. A new EU wide target for the reduction of GHG emissions was introduced as achieving 20% reduction by 2030 and a 80-95% reduction by 2050, (relating to 2005 levels).

8.1.4 Strategy for Renewable Energy 2012-2020

This strategy (May 2012) sets out the strategic goals and specific actions for the development of sources of renewable energy. It includes actions to accelerate the development of a wide range of renewable energy sources such as solar, ocean and bio-energy as well as wind, and also supports R & D and sustainable transport energy. It sets out 5 strategic goals and specific actions. Goal 1 aims to achieve progressively more renewable electricity from onshore and offshore wind power for the domestic and export markets.

8.1.5 Government Policy Statement on the Strategic Importance of Transmission and Other Energy Infrastructure, July 2012

This statement reaffirms the need for development and renewal of the energy networks, in order to meet both economic and social policy goals and supports and promotes the strategic programmes of the energy infrastructure providers, such as EirGrid's Grid 25 investment programme across the regions. The benefits are identified as securing electricity supply to homes, businesses, factories and farms; underpinning sustainable economic growth in the regions and enabling Ireland to meet its renewable energy targets. It is acknowledged, however, that there is a need for social acceptance and endorses the inclusion of community gain considerations into project planning and budgeting.

8.1.6 EU Climate and Energy Policy Statement – Growth Strategy to 2030

EU council in October 2014 agreed new legally binding EU wide targets for the reduction of greenhouse gas emissions by 40% by 2030 (relative to 1990 levels). Further more refined targets were agreed based on ETS and Non-ETS emissions. However, individual Member State targets have not yet been agreed.

8.1.7 Green Paper on Energy Policy (2014)

DCENR launched a public consultation process on the future of energy policy in Ireland for the medium to long term, from May to July 2014. Approximately 1200 submissions were received. The Department's website indicates that it has established the need for the following:

- A Renewable Electricity Policy and Development Framework in order to provide guidance, with a spatial dimension, to all stakeholders and a regulatory and financial framework for the delivery of a national energy system.
- A greater community involvement and in-depth community consultation on projects which affect them.

8.1.8 United Nations Framework Convention on Climate Change (2015)

The Paris Convention gave rise to new agreed targets to combat climate change. It is now intended to reduce GHG emissions from energy by 80-95% of 1990 levels by 2050 and to reduce these emissions further to zero by 2100.

8.1.9 White Paper – Transition to a Low Carbon Energy Future for Ireland 2015-2030

Published in December 2015, this is a complete update of energy policy from now until 2030. It is based on the following three 'pillars' *Sustainability, Security of Supply* and *Competitiveness*. It reaffirms the targets for 2020 as stated previously

(i.e. 16% overall renewable energy target and 40% target for electricity from renewable sources by 2020). It also incorporates the new targets agreed in Paris (2015) of 80-95% GHG reduction by 2050 and zero emissions by 2100.

The White Paper places strong emphasis on embracing new technologies and in radically changing behaviour to achieve a consensus approach by all stakeholder to the transition to a low carbon economy. There is an identified need to focus on citizens and communities as active participants and agents of change in order to achieve the ambitious energy transition goals. It is stated that it has taken account of the extensive consultation by DCENR following the Green Paper and that it will publish a Framework document on Renewable Electricity Policy and Development to underpin large scale development of projects for electricity from renewable energy sources, which will provide a spatial dimension. One of the Energy Infrastructure Actions is an expectation of developers to demonstrate an in-depth community consultation, public engagement and a thorough understanding of the concerns of affected communities.

8.1.10 Climate Action and Low Carbon Development Bill 2015

This Bill provides a statutory basis for the national objective of transition to a low carbon economy by 2050. It provides for a National Low Carbon Mitigation Plan which would specify the GHG mitigation policy for each Government department to transition to low carbon. It also makes provision for a 'National Climate Change Adaptation Framework', which would be a strategic policy framework across all departments, as well as 'Sectoral Adaptation plans', which would ensure the adoption of measures taken by Departments.

8.1.11 Grid 25 and Review of Grid 25

Grid 25 – A strategy for the development of Ireland's electricity grid for a sustainable and competitive future (2008) – outlines Eirgrid's strategy for upgrading the national electricity network up to 2025. Grid25 is considered to be essential to supporting growth in the regions and ensuring continued reliability and security of supply and allowing regions to attract new and support existing industry. Kildare and South Meath are located within the East Region. This area is described as having high levels of conventional generation as a result of the gas grid and proximity of Dublin Port. Up to 240MW of wind energy generation is expected to connect to the grid in this region.

Review of Grid 25 – 'Your Grid, Your Views, Your Tomorrow' – launched on 27th March 2015 by Eirgrid and sought public submissions on a revised strategy. Given the shifts in economic performance since 2008, it is stated that the strategy has been updated to take account of reduced demand forecasts for 2025 and beyond. In 2008 the demand was projected at 8,000MW but this was revised to 5,100MW in 2015. The new strategy is based on three key strands. These are a transparent engagement with communities; using new technologies; and a

commitment to making the existing grid work harder before new transmission infrastructure is introduced.

The revised strategy reiterates the need to upgrade the grid. It is stated that Ireland is on target to meet the requirements for 2020 by adding 4,000MW to the grid as part of Gate 3 offers, (of which there has been an 82% uptake). However, it is pointed out that the grid is not capable of accommodating this additional power and there will be a need to upgrade the network and for investment. It is further stated that Grid25 had assumed that the capacity would be constructed at brownfield sites close to load centres along the east coast. However, this is now considered unlikely and generation is now expected to occur in the west, south-west and south-east of the country.

8.1.12 Draft Strategic Environmental Assessment Scoping Report for a Renewable Electricity Policy and Development Framework (2016)

The Draft scoping report in connection with an SEA of the proposed Renewable Electricity Policy and Development Framework document outlines a process to identify potentially suitable land areas for large scale generation of on-shore renewable electricity, including wind. It has been published for consultation, with a closing date for receipt of submissions of 22/04/16. The purpose of the proposed Framework is to ensure that Ireland meets its future needs for renewable electricity, in a sustainable manner, compatible with environmental and cultural heritage, landscape and amenity considerations. It will set out policy in respect of environmental considerations, community engagement and in relation to potential, future export of renewable electricity, and will seek to broadly identify suitable areas where large scale projects (over 50MW) of this nature can be developed. It is stated that these can subsequently be incorporated into a revised NSS, Regional Guidelines and development plans, having regard to the considerations of amenity, heritage and efficacy. It would also supplement the guidance contained in the wind energy Development guidelines for Planning Authorities.

The existing system for planning permission, (including EIA), will remain unchanged for such projects, but the Framework will provide guidance to the Board, the P.A.s, developers and the public. An SEA is mandatory for the Framework policy and the draft policy will also be subject to a separate AA process. It is stated that *“following consideration of the submissions made in response to an initial consultation, the Minister has decided to formulate a Renewable electricity Policy and Development Framework (with a spatial dimension), replacing the previous approach.”*

8.2 National Planning and Development Policy

8.2.1 National Development Plan 2007-2013

The National Development Plan includes an Energy Program as a key element of its Strategic Economic Investment Priorities The main objectives of the Energy

Program is the achievement of security of supply, competitively priced energy and environmental sustainability both nationally and regionally over the period. The main focus of investment by EirGrid Plc., (the independent electricity Transmission System Operator and Market Operator of the wholesale electricity trading system), during the plan period is to improve the transmission network for electricity to accommodate increased usage, enhance security of supply and to allow increased connection of sustainable and renewable energy sources to the network.

8.2.2 *National Spatial Strategy 2002-2020*

Rural areas are recognised as having a vital contribution to make to the achievement of balanced regional development, which involve utilising and developing the economic resources of rural areas e.g. agriculture, tourism, forestry, renewable energy, enterprise and local services. The spatial policies for rural areas (3.5) seek to strengthen the rural economy by supporting traditional rural based sectors of employment as well as developing sectors such as tourism, enterprise and other sources of off-farm employment. Kildare and Meath are in the “Consolidating” area which radiates outwards from Dublin in Maps 1 and 2. The NSS acknowledges the importance of the environment as a resource base that supports a wide range of activities which includes energy use. It is stated that for such activities, the resources should be used in “sustainable ways that put as much emphasis as possible on their renewability”. It acknowledges the importance of the development of key electricity infrastructure in facilitating national, regional and local economic progress, and in this regard, the need to identify locations where additional new loads and electricity generation can be accommodated.

8.2.3 *Wind Energy Development Guidelines for Planning Authorities 2006*

These guidelines provide advice to the board and to planning authorities on wind energy development through the Development Plan and the development management process. They are intended to provide for consistency in the approach to wind energy development in terms of the identification of suitable locations for such development and in the determination of planning applications. It is stated that the assessment of such projects should be Plan-led with clear guidance on where wind energy development should locate and what factors will be taken into account.

The matters to be considered in a planning application are set out in Chapter 4. These include potential impacts on the built and natural heritage, ground conditions and drainage, visual and landscape impacts, local environmental impacts, (including noise, shadow flicker, electromagnetic interference), and adequacy of local access road network. It is stated that best practice would suggest that an integrated planning application that include grid connection information should ideally be submitted and that developers should be encouraged to engage in public consultation with the local community.

The potential environmental impacts arising from wind energy developments are discussed in Chapter 5. Guidance is given on matters such as noise, shadow

flicker, natural heritage, archaeology, architectural heritage, ground conditions, aircraft safety and windtake. Whilst a setback distance is not established, it is stated that noise is unlikely to be a significant problem where the distance to the residential property is more than 500m. In respect of noise, the recommended standard is a lower fixed limit of 45dBA or a maximum increase of 5dBA above background noise and nearby noise sensitive locations, apart from very quiet areas where the daytime level is limited to 35-40dB(A). A night time limit of 43 dB(A) is recommended. In terms of shadow flicker, the recommended standard is a maximum of 30 hours per year or 30 minutes per day for dwellings and offices within 500m. It is further stated that at distances of greater than 10 rotor diameters, the potential for shadow flicker is very low.

Chapter 6 provides guidance on siting and design of wind energy development in the landscape. This includes advice on siting, spatial extent and scale, cumulative effect, spacing of turbines, layout of turbines and height of turbines. Advice is also given regarding landscape character types as a basis for application of the guidance on siting and design. Chapter 7 addresses planning conditions.

8.2.4 Revised Wind Energy Guidelines

Proposed revisions to the Wind Energy Development Guidelines were published by the Department of Environment, Community and Local Government in December 2013. It was a "Targeted Review in relation to Noise, Proximity and Shadow Flicker". A consultation period was allowed up to the 21st February 2014. The proposed revisions involved:-

- Although the use of a defined setback of turbines from noise sensitive properties is not considered appropriate due to a lack of correlation between separation distance and wind turbine sound levels, it is stated that there should be a minimum separation distance of 500m between wind turbines and the curtilage of the nearest dwelling, for reasons of amenity, e.g. visual obtrusion.
- A revised absolute outdoor noise limit (daytime and night time) of 40 dB(A) to be applied within the curtilage of noise sensitive properties. These are defined as including dwelling houses, (including those for which planning permission has been granted but not yet built), nursing homes, hospitals, school, and places of worship.
- No shadow flicker at any dwelling which is located within 10 rotor diameters of a wind turbine. However, if shadow flicker is likely to occur, the developer would be required to mitigate this by, for example, shutting down the operation of the particular turbine for the period necessary to eliminate the shadow flicker. The 10 RD should inform the study area.

8.2.5 National Landscape Strategy for Ireland 2015-2025

The National Landscape Strategy was published by the Department of Arts, Heritage and the Gaeltacht in June 2015. The main objectives include the development of a National Landscape Character Assessment, which would provide a framework for the protection and management of change within the landscape in terms of its cultural, social, economic and environmental values. The aim is to seek to achieve a balance between the social, cultural and economic needs and the environment and the landscape. It is stated that a National LCA would ensure consistency between and within public authority functions and areas, would inform LCAs at a local level and would guide the development of landscape policy.

8.2.6 Regional Planning Guidelines for the Greater Dublin Region 2010-2022

The Key Planning and development Issues (1.6) includes Energy. The Guidelines describe the GDA as an area “which has the greatest level of economic activity in the State, but not necessarily the area with the greatest renewable generation potential”, and state that strengthening of the network will facilitate demand being met by renewable powered generators located mainly in the west of the country. The demand for electricity in the GDA is expected to grow by 80% by 2025 and will then represent 30% of the demand of the island. It is expected that up to 240MW of wind energy generation will be connected to the grid in this region

It is recognised (3.5.8) that significant reinforcement of the grid will be required involving improvements to the regional power infrastructure in order to maintain security of supply, to attract additional industry and to allow for connection of renewable energy sources to the grid. In Section 6.6.2, it is stated that the €800m pinpointed for the GDA (GRID25) will be spent on upgrading 450km of the existing network and building new circuits. It is considered that strengthening and investment in the network is of vital strategic importance to the GDA, as the primary demand centre in the country. The following recommendation is contained in Section 6.6.7 – Strategic Policy and Recommendations for Energy and Communications.

PIR 34 recommends that a study be undertaken on wind energy potential by local authorities jointly in the GDA focussing on suitable areas for larger wind energy projects...with the outcome regionally consistent new land-use policies and objectives.

8.3 Local policy guidance

8.3.1 Kildare County Development Plan 2011-2017

The County Development Plan designates all lands outside of settlement boundaries as unzoned white lands. Chapter 8 ‘Energy and Communications’ contains policies and objectives relating to Renewable Energy, including wind energy development. The CDP recognises that areas in close proximity to grid

connections and outside designated heritage sites may be suitable locations for the provision of wind energy. However, it is recognised that certain areas which may be suitable for large-scale renewable energy development, may also coincide with the county's designated sensitive and scenic areas. The following policies and objectives from Chapter 8 are relevant:

ER2 - supports initiatives for limiting greenhouse gas emissions through energy efficiency and the development of renewable energy sources.

WE1 - to have regard to the Wind Energy Development Guidelines for P.A.s 2006 in assessing all planning applications for wind farms.

WE2 - to encourage the development of wind energy in suitable locations in an environmentally sustainable manner and in accordance with Government policy.

WE3 – to ensure that the assessment of wind energy development proposals will have regard to certain matters such as

- the sensitivity of the landscape;
- the visual impact on protected views, prospects, scenic routes and local visual impacts;
- the impacts on nature conservation designations, archaeological areas and historic structures, public rights of way and walking routes;
- local environmental impacts of associated development such as access roads, plant and grid connections;
- the scale, size and layout of the project, any cumulative effects due to other projects;
- the impact of the proposed development on protected bird and mammal species.

ENO1 – to examine the possibility of designating appropriate areas of the county as being suitable for the production of wind energy.

The P.A. report on the current application provides some additional relevant information regarding ENO1. It is stated:

“As per objective ENO1 above, the Council commenced preliminary work to inform the preparation of a Wind Energy Strategy in 2013. Agreement to progress a variation of the County Development Plan 2011-2017 to include public consultation and involvement from prescribed bodies and the general public was agreed by full Council. However, in 2013, all Councils were advised by the DoECLG in circular PL2013 to defer the completion of such strategies until (1) the policy review of the said Department's Wind energy Development guidelines is complete and (2) until the DoCENR completes the 'Renewable Energy Export Policy and Development Framework'. The Council is awaiting finalised guidelines to facilitate completion of the Draft Wind Strategy. Once complete, and adopted as a variation to the CDP, the Kildare

Wind Energy Strategy will establish the detailed local planning policy framework for wind energy in the County and should inform planning applications in this area.”

Other chapters of the CDP which contain policies of relevance to the proposed development include Chapter 5 - Economic Development, Chapter 10 - Rural Development, Chapter 12 - Architectural and Archaeological Heritage and Chapter 14 – Landscape. The P.A. report on the application provides a summary of the main policies and objectives, including the designations affecting the site of the proposed wind farm development. These policies and objectives will be referred to where necessary in the assessment section of my report. However, the following is a brief reference to the relevant policies.

Chapter 5 Economic Development - Relevant sections relate to Sustainable Tourism (5.8, 5.9). Relevant policies include **ECD21** (to protect tourism amenities from inappropriate development) and **ECD22** (to promote certain tourism generating opportunities including equine, archaeological and architectural heritage). Furthermore specific policies relate to Inland Waterways, **ECD29** and **ECD33** (which seek to maximise opportunities for use of the canals and other waterways and to promote and develop the tow paths), and Sport and Recreation tourism, **ECD37** (to support the sustainable tourist related development of the Bloodstock and Equine industries).

Chapter 10 Rural Development – Rural areas are recognised as having the potential to harness renewable energy projects, subject to protection of landscape sensitivities, residential amenities, views or prospects, public rights of way, wildlife, habitats, SACs, protected structures, bird migration paths etc. (10.4.8).

Chapter 12 Architectural and Archaeological Heritage – Relevant policies include **PS16** (protection of the built heritage including historic gardens, stone walls, landscapes and demesnes and curtilage features); **CH1** (promote appreciation of landscapes and historical importance of traditional and historic gardens, demesnes and parks in Kildare); and **CH2** (to have regard to the historic gardens and designed landscapes in Kildare identified in the NIAH).

Chapter 14 Landscape – Relevant General Landscape Policies include **LA1** (Landscape sensitivity is highlighted as important consideration in design, type and location of development); **LA2** (protection and enhancement of the landscape); **LA3** (need for a LVIA including mitigation measures); **LA4** (retention of local landscape features including historic features/buildings, hedgerows, shelter belts, stone walls).

Landscape Policies (14.8.2) relating to **Lowland Plain and Bogland Character Areas** include recognition that

- **LL1** - the lowland landscape is composed of a number of working landscapes, which are critical resources for the economy;

- **LL3** – they include areas of significant landscape and ecological value, which are worthy of protection
- **LL4** – intact boglands are critical natural resources for ecological and environmental reasons
- **LL5** – cutaway and cut-over boglands represent degraded landscapes and/or brownfield sites which are potentially robust to absorb a variety of appropriate developments.

Landscape Policies (14.8.3) relating to **Upland Character Areas** include **LU1** which seeks to ensure that development will not have a disproportionate visual impact due to excessive scale, bulk or inappropriate siting and will not significantly interfere with or detract from scenic upland vistas when viewed from nearby (including scenic routes, settlements, viewpoints).

Landscape Policies (14.8.5) relating to **Water Corridors Character Areas** include **WC1** and **WC3** which seek to locate development in these LCAs towards existing structures/mature vegetation and to control development that would adversely affect the visual integrity of distinctive linear sections of water corridors and river valleys and open floodplains.

Landscape Policies (14.9.1) relating to **Scenic Routes** include **SR1** and **SR2** which seek to avoid development that would disrupt vistas or disproportionately impact on the landscape character of the area and thus affect the scenic and amenity value of the views.

Landscape Policies (14.9.2) relating to **Water Course and Canal Corridor Views** include

WV1 – to curtail any further development along the canal and river banks that could cumulatively affect the quality of a designated view

WV2 – to preserve and enhance the scenic amenity of the river valleys and canal corridors and the quality of the vistas available from designated views.

WV3 – to restrict development on floodplains of the rivers of the county.

WV4 – to prevent inappropriate development along canal and river banks and to preserve these areas in the interests of biodiversity, built and natural heritage and amenity by creating or maintaining buffer zones, where development should be avoided.

The overall aim of the Landscape Chapter is to ensure development does not disproportionately impact on **Landscape Character Areas**, **Scenic Routes** or **Protected Views**. The **LCAs** are set out in **Map 14.1** and the **Landscape Sensitivities** are set out in **Map 14.2**. There are 4 Landscape character types, namely Uplands, Lowland Plains and Boglands, Transitional Lands and River Valleys & Water Corridors. From these, there are 15 LCAs.

The Relevant LCAs are

- **‘Western Boglands LCA’** (Medium sensitivity) – parts of Cloncumber, Derrybrennan, Drehid-Hortland clusters. Forms part of Lowland Plains and Boglands LCT.
- **‘North-Western Lowlands’ LCA**, (Low sensitivity) – Ballinakill and Windmill clusters and small part of D-H cluster. Forms part of Lowland Plains and Boglands LCT.
- **‘Chair of Kildare’** (High Sensitivity) – part of Cloncumber cluster. Forms part of Uplands LCT
- **‘Grand Canal’** – designated as **‘Area of High Amenity’** due to its outstanding natural beauty and/or its unique interest value (14.5). Forms part of River Valleys and Water corridors LCT along with Royal Canal.

Designated Scenic Routes and Protected Views (including Hilltop Views) are identified in **Map 14.3** and **Tables 14.2** and **14.6**.

For **Ballinakill**, **Windmill** and **Drehid Hortland** clusters, the most relevant **Scenic Routes** are **SR20** and **SR28**, and include several designated/views of importance (many common to more than one cluster) such as

- Views of Plains of Kildare and West Central Boglands
- Views to/from Newtown Hills
- Views to/from Carbury Hill/Castle
- Views from Teelough Road junction with R402
- Views from Royal Canal RC10 (Shaw Bridge) and RC11 (Allen Bridge)

For **Cloncumber** and **Derrybrennan** clusters, the most relevant **Scenic Routes** are **SR8**, **SR17**, **SR19**, **SR38**, **SR39** and **SR40**, and include several designated/views of importance (some common to more than one cluster) such as:

- Views of Bogland Plains at Boston Hill
- Views of Kildare Plains and Boglands from Hill of Allen
- Views of Canal and River slate from R414 at Rathangan
- Views of Allenwood to Lullymore road
- Views of Lullymore to Rathangan local road
- Views of Ballynafagh Lake

Protected views to/from **Grand Canal bridges**

- GC12 Bond Bridge
- GC13 Hamilton’s Bridge
- GC15 Harberton’s Bridge
- GC16 New Bridge Littletown
- GC17 Skew Bridge Ballyteigue North
- GC18 Huband Bridge
- GC 19 Pim Bridge Newpark

- GC20 Pluckerstown Bridge
- GC22 Ballyteigue Bridge
- GC23 Glenaree Bridge
- GC24 Rathangan Bridge

The CDP identifies **Hilltop views** as of particular importance (14.6.8) due to the flat nature of the landform, with little variation in topography and predominantly low vegetation, which allows for extensive views to be gained from hilltops with vistas over wide distances. Similarly, from the lowland areas *“the eyes are drawn to the primary and secondary ridgelines that define the skyline throughout the county”*. As such, the CDP seeks to ensure that development does not interrupt the integrity of ridgelines as they perform important roles as dominant landscape focal points. Policy HV1 seeks to protect the upland LCAs and to ensure that development in the vicinity of the upland areas does not disproportionately affect views to/from the hills, or impact on the landscape character of the area as a whole.

Hilltop views from Chair of Kildare (just south of Cloncumber cluster) include

- Views from Hill of Allen
- Views from Grange Hill
- Views from Dunmurray Hill
- Views from Red Hill

8.3.2 Meath County Development Plan 2013-2019

Chapter 8 contains policies relating to Energy, including Renewable energy. Meath Co. Co. is committed to developing a more diverse range of energy sources (8.1.3). The relevant policies which facilitate energy production and in particular those from renewable sources include EC POL1, EC POL2, EC POL3 and EC POL4. Policy EC PLO13 seeks to ensure that the energy transmission infrastructure network follows best practice with regard to siting and design. Policy EC POL 20 encourages the development of Wind Energy with regard to Government policy having regard to Landscape Character Assessment and the Wind Energy Guidelines. Policy EC POL21 supports the preparation of a Study on Wind Energy potential by local authorities jointly in the Greater Dublin Area.

Appendix 7 contains the Meath Landscape Character Assessment. The 2 no. proposed turbines are located within the **Lowland Areas** and **LCA6 - Central Lowlands** - This LCA has a Landscape Value that is ‘High’, a Landscape Sensitivity that is ‘Medium’ and a Landscape Importance that is ‘Regional’. It is stated that the LCA has low potential to accommodate wind energy due to the high number of receptors but a medium potential capacity to accommodate single turbines because extensive views can be more easily screened by vegetation.

Protected Views – there are 2 Protected Views in the vicinity of the Royal Canal. No. 56 at Boolykeagh (Regional significance) and No. 83 at Blackshade Bridge (local significance).

Protected Structures – there are a number of Protected Structures within Longwood village (which is also an ACA) and forming part of the Royal Canal.

9.0 PLANNING ASSESSMENT

I have examined the file and the planning history, considered the current national and local policies and guidance and inspected the site on a number of occasions.

A second Inspector, John Desmond (Senior Inspector) was appointed by the Board to assist with the review of the 820 no. submissions made in response to the proposed development, together with the further information and additional responses to the further information (143 no.) and to carry out an assessment of the issues relating to residential amenity, (including noise, shadow flicker, property valuation and health) and those relating to transport (including haul routes, turbine delivery routes and cable routes). Mr. Desmond's report is attached at Appendix 1

A Consultant Ecologist, Howard Fearn of Avian Ecology, was also appointed by the Board to carry out a review of the Ecology chapter of the EIS and of the Natura Impact Assessment, including a review of the principal ecology matters arising from the submissions. The Ecologist's report is attached at Appendix 2

The Board decided on 10/02/16 that an Oral Hearing should not be held having regard to the comprehensive nature of the documentation available from all of the parties to the case, including the response from the applicant (24/09/15) to the observations received and the further submissions from observers.

I have assessed the proposed development including the various submissions from the applicant, the planning authorities, the prescribed bodies and the third party observers, as well as the reports from the second Inspector and the consultant Ecologist. I consider that the key issues in this case are as follows:-

- Principle of Development – need for development and policy framework
- Preliminary Legal and Other Matters
- Alternatives
- Aviation
- Landscape and Visual Amenity
- Cultural Heritage
- Residential amenity – Noise/Vibration, Shadow Flicker, Health & Safety

- Socio-Economic impacts – Tourism, Equine Industry and Agriculture
- Ecology
- Geology and soils
- Water quality/hydrology
- Roads and Transport
- Environmental impact assessment
- Appropriate Assessment

9.1 Principle of development

9.1.1 Energy policy framework

NREAP (the National Renewable Energy Action Plan) was adopted in compliance with Directive 2009/28/EC and sets the national targets for the share of energy from renewable sources to be consumed by 2020. The relevant targets for Ireland for 2020 are to increase the share of energy consumed within the state from R.E. sources to 16%, in addition to improving energy efficiency by 20% and reducing greenhouse gas emissions by 20%. Within these overall targets, the Government has set a target for each sector and the relevant target for electricity is 40% from R.E. sources. These targets are legally binding climate and energy targets, which Ireland must comply with, and NREAP was submitted to the EU Commission, (as required by the Directive), in order to set out how these targets would be achieved. The measures included 'Grid25', which provides the framework upon which to base the upgrading of the transmission network, 'Gate 3', as the means by which the grid connection offers would be rolled out and implemented, and 'REFIT', as a financial incentive to encourage investment in renewable energy, including wind energy.

Grid 25, when first published, had stated that the East Region would have a high level of conventional generation due to the gas grid and the proximity to Dublin Port, with wind resources being largely confined to the west of the country and to off-shore locations. It had been envisaged that capacity would be constructed at brownfield sites close to load centres along the East coast. However, the Draft Revision of Grid 25 (Your Grid, Your Views, Your Tomorrow, March 2015) now states that this is unlikely to happen and it is now expected that new generation will occur in the West, the South West and the South East of the country. Gate 3 had made provision for grid connection offers of up to 4,000MW of renewable energy, which it had been considered necessary to meet the 40% target. Although the peak demand and energy forecasts have been scaled back significantly since 2008, (8,000MW to 5,100MW, with the RE figures reduced to between 3,200 and 3,800MW), the Revised Grid 25 document states that Ireland is well placed to meet the 40% target. This document indicates that 82% of the Gate 3 offers have been taken up, with a further 11% under consideration. However, the major challenges now appear to be that the grid is not currently capable of accommodating the required amount of energy generated and will need upgrading

and investment. This will be achieved, according to the Grid 25 Revision document, principally by using new technologies (e.g. Smart Grid technology) and by making the existing grid work harder before new transmission infrastructure is undertaken. Smart Grid is described as an important element in managing increasing levels of variable energy from renewable sources, including wind generation, which would facilitate significant improvements in wind penetration levels.

The Government's White Paper (Transition to a Low Carbon Energy Future Dec. 2015) provides a complete update of Ireland's energy policy, with a longer time frame up to 2030. It is noted that the targets for 2020, as described above, are re-stated, but more stringent targets have been introduced for greenhouse gas emission reductions up to 2050 and 2100. These are based on the UNFCCC (Paris convention), 2015, targets of reducing GHG emissions by 80-95% (compared to 1990 levels) by 2050 and to zero by 2100. In addition to these targets, the White Paper acknowledges the significant challenges in the transition and places strong emphasis on embracing new technologies as well as changing behaviour in order to achieve the transition. There is a notable focus on the need to achieve "a robust consensus" across communities and sectors and by all stakeholders, particularly communities and citizens, who are referred to as "agents of change" and "active participants", as well as local and national state agencies. There is also an emphasis on the need to explore alternative renewable energy sources in addition to wind and to embrace a wide range of measures, over and above energy generation from RE sources, in order to achieve the ambitious goals in the transition.

9.1.2 Need for Development

From the foregoing, it is clear that Ireland's climate and energy policies not only support, but are heavily reliant on, renewable energy sources, including wind energy. As such, the proposed development, which would generate up to 125MW of renewable electricity is generally in accordance with these policies. The applicant has placed much weight on compliance with this policy framework and the need to achieve the legally binding targets in its justification of need for the development. A significant number of third party observers have, however, raised questions over capacity issues and the spatial dimension. In terms of capacity, it has been queried as to whether there is an outstanding need for generation of electricity of the scale proposed and, if generated, whether there is any capacity/need in the transmission system for this quantity of electricity. Reference has been made to the fact that Gate 3 has closed and as such, the applicant cannot apply to connect to the grid. Further concerns are raised by a substantial number of observers regarding whether the proposed development is intended for the domestic market or the export market.

Although it is not a matter for the Board to determine network capacity issues, it is noted that some of these issues are addressed to some degree in Chapter 7 of the new Government White Paper (2015), which states that the SEM (Single Energy

Market) is currently in the process of being reformed and will be replaced by a new regulatory framework, the I-SEM market, by 2017. This reform is in order to comply with new European rules and EU energy policy which seeks to establish the Internal-Single Energy Market with a view to achieving European wide security of supply, sustainability and competitiveness. Thus it is considered that regardless of Ireland's progress to date on meeting the established targets and whether the electricity generated would fulfil a demand at home or abroad, the need for the proposed development seems to be broadly justified on current energy policy grounds.

9.1.3 Land-use policy and energy-related policies with a spatial dimension

Current (adopted) energy policy with a land-use or spatial dimension is largely composed of the Wind Energy Guidelines for Planning Authorities 2006, the Regional Planning Guidelines for the GDA 2010-2022, Grid25 (2008) and the policies contained in the Kildare County Development Plan (2011-2017) and in the Meath County Development Plan (2013-2019). National energy policy generally acknowledges the need for spatial plans for wind energy development, or wind energy strategies. The NREAP submission to the EU Commission states that:-

“The [Wind Energy] Guidelines recommend an approach which seeks to identify within the development plan process, key areas where wind energy resources are good and capable of exploitation in a manner consistent with proper planning and sustainable development, having due regard to key environmental, landscape, technical and economic considerations. This approach is intended to facilitate a consistency of approach by planning authorities, both in identifying areas suitable for wind energy development and having regard to the potential impacts, inter alia, on nature and diversity.”

The Regional Planning Guidelines generally reflect the policy statements contained in Grid 25 to the effect that whilst Dublin and the East Region have the highest population density, level of economic activity and hence, demand, it does not necessarily have the “greatest renewable generation potential”. As such, it is anticipated that the strengthening of the network will facilitate this demand being met by renewable powered generators located mainly in the West of the country. Policy PIR34 recommends that a study be undertaken on wind energy potential by local authorities jointly in the GDA, *“focussing on suitable areas for larger scale wind energy projects.....with the outcome of regionally consistent new land-use policies and objectives”*.

However, no such strategies/plans have been adopted for the area in which the proposed wind farm is to be placed. Kildare and Meath County Councils (respectively) had embarked, in late 2013, on the development of Wind Energy Strategies for their respective areas, with the intention of varying their respective Development Plans to incorporate strategies which would have established a detailed local planning policy framework and identified suitable areas for the location of wind energy development. In the meantime, a Targeted Review of the

Wind Energy Guidelines, in relation to Proximity, Noise and Shadow Flicker, was published in December 2013 for consultation. Prior to adoption of any such local strategies, a Circular was issued by the Department of Environment, Community and Local Government (PL20-13) instructing all local authorities to suspend the development of such strategies pending the adoption of the Revised Wind Energy Guidelines, and the adoption of a Renewable Energy Policy & Development Framework document by the DoCENR. However, these revisions have not been adopted and the 2006 Guidelines remain in place. More recently, progress has been made towards the development of a 'framework document' in that the Draft Strategic Environmental Assessment Scoping Report for a Renewable Electricity Policy and Development Framework was published for consultation at the end of 2016. These policy documents, once finalised and adopted, will enable wind energy strategies with a spatial dimension to be adopted for the area as well as clearer guidance on the issues of proximity, noise and shadow flicker, which will inform the development of such strategies.

9.1.4 Policy Vacuum

Kildare County Council and the majority of third party observers have raised serious concerns regarding the grant of planning permission for a large scale wind energy development such as that proposed, in the absence of a wind energy strategy, (with spatial dimension), for the area *and* prior to the adoption of the revised WE Guidelines, as the current guidelines were considered to be outdated. Kildare Wind Energy Committee, in its observation on the current application, advised that this Sub-Committee of the Council had been formed in recognition of the perceived policy vacuum that currently exists in respect of wind energy development in the area. It was pointed out that large scale wind energy development proposals for the Midlands had emerged before local authorities in the region had had an opportunity to formulate strategies based on plan-led analysis. It was further acknowledged that at the time that the current Development Plan WE policies had been formulated, it had not been anticipated that there was a likely prospect of very tall turbines being erected due to the relatively low level of wind strength in Co. Kildare. Furthermore, it is pointed out that the current Development Plan policies are based on the 2006 WE Guidelines, which had been adopted at a time when the technology was such that turbines of the height now proposed had not been envisaged.

Thus it is contended, that a development such as that proposed, could not have been anticipated at the time of the adoption of either the current Kildare County Development Plan or the WE Guidelines, and given that the WES for the county is in abeyance pending the revision of the these guidelines and the adoption of an energy policy framework, the grant of permission for the proposed development would be premature, would be developer-led and would set an undesirable precedent for wind farms of such a scale and dispersed nature without due consideration of the impacts. The applicant, in response, believes that "Irish planning policy is dynamic and constantly changing" and that, as such, the Board cannot delay decision making on this basis as it must rely on current policy

guidance. In this respect, the applicant believes that there is ample support in current policy and guidance for the proposed development.

It is noted that a central plank of the WE Guidelines (2006) is the need for a 'Plan-led approach' to the assessment of individual applications for WE development, which involves the identification of areas considered suitable or unsuitable for wind energy development. Chapter 3 of the WE Guidelines sets out a step-by-step approach to the analysis of 'suitable areas' based on a sieve mapping analysis of key environmental, landscape, technical and economic criteria which must be balanced to identify the most suitable locations for WE development. It is stated that this should include an analysis of wind resources and sensitivity of the landscape, followed by an overlay of the information to enable optimal visual integration into the landscape and maximisation of the utilisation of WE resources. This, it is considered, should then be integrated with information regarding accessibility to the electricity transmission and distribution grids. This need for a Plan-led approach is reflected in the Regional Planning Guidelines for the GDA and in each of the County Development Plans, (RPG PIR34, KCC ENO 1, MCC ECPOL21).

The current guidance to which the Board must have regard is the Wind Energy Development Guidelines, 2006. However, it is clear that policies relating to climate and energy, and in particular, renewable energy, have continued to evolve since the current WE Guidelines were adopted in 2006, as have the development of the transmission network and technological advances in both the design and efficiencies of the management of the grid and of wind turbines. This rapid progression is reflected in the recently published White Paper and in the proposed revision to Grid25 and indeed, in the fact that a review of the Guidelines is underway. I would agree that these factors should not prevent the consideration of individual applications for wind energy development, but I would also accept that the state of flux in the policy framework is a material consideration. This is considered to be of particular relevance in the context of the introduction of such a large scale development, (in terms of both spatial extent and height of turbines), into an area which has hitherto not been associated with, or highlighted as being suitable for, wind energy development on such a scale. Thus I would accept that there appears to be somewhat of a policy vacuum at present, until such time as a strategy for the area is formulated, which in turn, is dependent on the finalisation of the revisions to the Guidelines and adoption of an Energy Policy Framework. However, progress on the Framework document and Revised Guidelines is underway.

In light of the foregoing, it is considered that the proposed development would be premature and would constitute developer-led and piecemeal development which would create an undesirable precedent which could undermine any future wind energy strategy for the area, and would be contrary to the proper planning and sustainable development of the area.

9.1.5 Compliance with land-use policies for the area

9.1.5.1 Regional Planning Guidelines for the GDA 2010-2022

The Regional Planning Guidelines for the GDA, (summary set out in 8.2.6 of this report), acknowledged that the area was “not necessarily the area with the greatest renewable generation potential” and it was envisaged that such development would take place in the west of the country. It was stated that the €800m pinpointed for the GDA (GRID25) would be spent on upgrading 450km of the existing transmission/distribution network and building new circuits. It is considered that a development of the scale and extent proposed was not envisaged for this area when these guidelines were adopted.

The overall RPG strategy is to develop multi-modal growth corridors linking major growth centres which would be served by very high quality road and rail links, in order to provide improved accessibility and interconnectivity within the region. The proposed Leinster Outer Orbital Route is one of two road proposals which is aimed at facilitating interconnectivity between the growth centres.

9.1.5.2 Leinster Outer Orbital Route

This is an orbital road proposal extending from Drogheda to Naas/Newbridge with intermediate links to Navan and other towns. Following a feasibility study of the LOOR as part of Transport 21, the NRA issued a Protection Corridor study to P.A.s. Although an exact route has not yet been chosen, objectives for the protection of the indicative route for the LOOR are included in both the current Kildare CDP (Chapter 6, RP15) and the Meath CDP (Chapter 6, TRAN POL 27, TRAN OBJ 21), and is also included in the RPG for the GDA. It is stated (4.6 of RPG) that a “*transport corridor and its route should be protected from encroachment.....to protect against.....erosion of the economic value of the corridor*”. It has also been included in successive transport strategy documents for the region.

The indicative route for the proposed LOOR travels southward from Navan and crosses the M4 near Johnstown Bridge from where it travels southward towards Newtown before joining the M7. Part of the indicative route travels through the Drehid-Hortland cluster area. The NRA in its submission had raised concern that the planning application (and the EIS) had failed to adequately address the potential impact on this proposed route and stated that it is of great importance to

ensure that any permission for a wind farm would not impact on the indicative LOOR route corridors.

The applicant, in its response (3.5.1 FI and Appendix 24, 24/09/15), acknowledged that a Feasibility Study had been developed in 2007, which had included a number of route corridors, one of which travels through the Drehid-Hortland cluster, (see *NRA Response Maps in Appendix 24 of FI*). However, the applicant noted that there were also some variants of the route (1, 2, and 3) and maps of these routes were also included. It should be noted, however, that it is unclear what the status of these variants is at present and whether they have been retained/alterd since 2007. Notwithstanding this, the main indicative route corridor identified runs through the NW end of Drehid cluster. It can be seen from NRA Response Map 1.3 (Rev B) that elements of the proposed development which are located within the route corridor include the following:

- Turbines T11, T13 and skirts the eastern edge of T12;
- Proposed new substation;
- Access roads and hardstands associated with above;
- Cabling associated with above;
- Temporary construction compound
- 2 no. Site entrances, one from the NW and one from the NE.

The applicant appears to dismiss the significance of the route protection on the basis that the LOR requires significant additional studies before a route can be chosen and that the proposed route runs through several designated sites. On this basis, it was considered unlikely that the route corridor would be chosen. However, Transport Infrastructure Ireland, (formerly the NRA), has reiterated the concerns raised by the NRA in its response to the applicant's FI. It is stated that the route is provided for in the relevant County Development Plans, the RPG and in the NTA's Draft Transport Strategy for the GDA, which it is stated, has been through a public consultation process since the authority's initial observation in June 2015. In the meantime, the status of the Leinster Orbital Route has been further updated in the recently published Transport Strategy for the GDA 2016-2035, (6th April 2016). It is stated at 5.8.1

"The Leinster Orbital Route.....would provide connections between these towns, currently poorly served by direct linkages, supporting their economic development and improvements in orbital public transport connectivity. While this project is not planned for implementation during the period of the Strategy, the finalisation of the route corridor and its protection from development intrusion is recommended."

It is clear, therefore, that the current status of the route is that it is included in the regional and local land use and transportation plans for the area and that it is a specific objective of both Development Plans to protect the proposed route, which runs through part of the application site. Thus this part of the proposed development is clearly in conflict with these objectives.

9.1.5.3 Kildare County Development Plan 2011-2017

Kildare CDP, (summary set out at 8.3.1 of this report), in the Energy and Communications Chapter (8), is generally supportive of renewable energy and wind energy with certain caveats. These include siting developments in “suitable locations in an environmentally sustainable way”, compliance with Government policy, including the WEDG, and ensuring that such development proposals would have regard to matters such as scale, size and layout of the project and cumulative impacts, sensitivity of the landscape, visual impact on designated/protected views/scenic routes, impacts on nature conservation designations/protected birds, mammals etc., impact on archaeological areas and historic structures, public rights of way and walking routes. Further policies and objectives are set out in Chapters 5 (Economic Development), 10 (Rural Development), 12 (Architectural and Archaeological Heritage) and 14 (Landscape). The Landscape Chapter includes the Landscape Character Assessment as well as details regarding the various designated scenic routes, protected views. As stated above, the Transport and Movement chapter includes policies and objectives relating to the LOOR as well as other transport issues including those relating to regional and local roads and aviation matters.

Consideration of how the proposed development accords with the various designations, policies and objectives of the Development Plan will be considered under the topic headings later in this report.

9.1.5.4 Meath County Development Plan 2011-2017

Meath CDP, (summary set out at 8.3.2 of this report), sets out the Energy policies in Chapter 8 which generally seeks to encourage the development of wind energy in accordance with government policy and with best practice having regard to Landscape Character Assessment and the WE Guidelines. As stated above, the Transportation Chapter also includes a policy and an objective relating to the protection and facilitation of the finalisation of the LOOR. Consideration of how the proposed development accords with the various designations, policies and

objectives of the Development Plan will be considered under the topic headings later in this report.

9.2 Preliminary Legal and Other Matters

9.2.1 Consultation and public participation

A sizeable majority of the third party observers have strongly criticised the level of public consultation carried out by the applicant regarding the proposed development, which it was considered was completely inadequate for a project of such size, scale and spatial extent. Most of the submissions felt that there had been little or no meaningful engagement with the local community and many considered that there should have been public meetings and consultation with landowners in the vicinity of each of the clusters of wind turbines proposed. Given that there are close to 1,000 homes located within 10 rotor diameters of a turbine, it was considered that the public consultation exercise was wholly inadequate and falls foul of the requirements of the Aarhus Convention. The level of pre-application consultation set out in the scoping section of the EIS was refuted by a large number of observers. A sizeable majority of observers sought an oral hearing owing principally to the perceived inadequacies in the consultation process.

9.2.1.1 Consultation process

The public consultation process is set out in Chapter 4, Volume 2 of the EIS and in Appendix B, Volume 3 (Section 1.5). The applicant considers that the consultation exercise undertaken went beyond that which was required under the legislation. However, it recounts a process which had been commenced approx. 3 years in advance of the planning application, the majority of which seems to relate to the 'Greenwire project'. There were two public meetings in July 2013 in Kildare and Offaly which related to Greenwire. A Community Liaison Officer was also employed and newsletters/brochures were issued amongst other means of publicising that project. It should be noted that whilst there was some degree of overlap between the two projects, the Greenwire project related to a much larger development site covering several counties. It also related to an export energy project which became very contentious.

The only public information day relating to the Maighne Wind Farm project took place on 18th November 2014 in the Hamlet Court Hotel at Johnstown Bridge, (from 4pm to 8pm), at which the current proposal was launched. A public information leaflet was also produced, but it is unclear how widely this was distributed.

Following this public meeting, three adverts were placed in the public newspapers circulating in the area advising that the application was to be lodged with the Board. Two of these adverts were dated 7th April 2015 and one dated 11th April 2015. The application was lodged on 9th April 2015. A dedicated website has been established which includes electronic copies of all of the documents submitted to the Board. It is noted that the third party observers have raised concerns about the very short timeframe in which it was necessary to familiarise themselves with such a large and complex project (7 weeks). It should be noted, however, that the 7 week period did not commence until 16th April 2015.

Given the scale of the project together with the considerable volume of material and complexity of the issues, it is considered that it would have been preferable for the applicant to have engaged in more meaningful and widespread consultation and discussion with the local community in advance of lodging the application. The Board had stressed the importance of public consultation in the pre-application consultation with the applicant. However, it should be noted that the applicant has complied with the statutory obligations in this regard.

9.2.1.2 Public participation

Since the application was lodged, the board has engaged in a comprehensive and detailed consultation process with all stakeholders which has resulted in the submission of 820 third party observations, a significant further information response from the applicant (24/9/15) and a further round of consultation with the public following this FI submission, which resulted in the receipt of a further 134 submissions. Subsequently, a further advertisement was placed in the newspapers relating to the issue of the proximity of the wind farm proposal to the Irish Explosives Factory, (a SEVESO site). This round of consultation related solely to this issue and a further 17 no. submissions were received (Appendix 1).

The nature and content of the submissions from all parties, (including the applicant, the two planning authorities, prescribed bodies, national and local interest groups and from individual members of the local community), has been extremely comprehensive and detailed, ranging from strategic issues, (from both a geographical/social/economic perspective and in terms of policy and procedural matters), to detailed local issues and has extended across the full range of topics and issues arising from the application. The points raised in the public submissions have been recorded in a spread sheet format, which is attached to this report as Appendix 3. In Section 4.0 of my report, I have summarised the main issues arising firstly, from each of the planning authorities, (4.1, 4.2); secondly, from the

prescribed bodies (4.3); and thirdly, from interest groups and individual observers under each of the topic headings (4.4). However, the issues raised by third party observers in respect of Residential Amenity, Noise, Shadow Flicker, Health and Transport are summarised in the Second Inspector's Report, (John Desmond). The applicant, (FI submission of 24/09/15), has addressed the issues raised in each of the planning authority submissions, followed by a response to the submissions by topic and by individual issues. I have summarised the points made in Section 5.0 of my report, apart from those relating to Residential Amenity (including Noise, Shadow Flicker and Health) and Transport (including Cabling), which are addressed in John Desmond's report. The responses to the Applicant's FI are summarised in Section 6.0 of my report in a similar format to that described above. The responses to the public notices regarding the proximity of the wind farm to the Irish Explosives Factory are summarised in John Desmond's report.

As can be seen from the foregoing, the consultation process that the Board has undertaken with the various stakeholders has been both detailed and rigorous. The widespread and comprehensive engagement of the community has added significantly to the understanding of the nature of the proposed development and the potential impacts on the local environment. It is considered that it has served to inform the assessment of the planning application, the Environmental Impact Assessment and the Appropriate Assessment of the proposed development in a meaningful and comprehensive manner. It was on this basis that the Board decided on 10/02/16 that the considerations arising could be satisfactorily addressed without the need for an oral hearing. It is considered, therefore, that the public has been afforded the opportunity to fully engage in public participation procedures as set down in the legislation.

9.2.1.3 Aarhus Convention and EIA Directive

Many observers made reference to the Aarhus Convention in the context of legal requirements in respect of public participation. Some considered that the public participation procedures involved in the current application failed to comply with the requirements of the Aarhus Convention, which many believed to have full force in Irish Law. It is further noted that many observers made reference to the EIA Directive and the "Public Participation Directive", (presumably 2003/35/EC) and to various European Court Judgements in respect of perceived failures to comply with the provisions of these directives in terms of the public participation process. Particular reference was made to Article 6(3) and 6(4) of the Aarhus Convention and in this respect, the failure to guarantee public participation at all stages of the decision making process, including early participation in conception of project,

(assessment of alternatives and choice of site); involvement of the public in pre-application stage; notification of the application; and setting of reasonable timeframes for involvement of the public.

The applicant in the FI submission (3.16.2) has responded to these concerns by contending that “the complaints based on the Aarhus Convention are fundamentally misconceived.” Reference is made to a recent High Court judgement, (*Waterville Fisheries v. Aquaculture Licenses Appeals Board & Minister for Agriculture, Food and the Marine*, [2014], I.E.H. C. 522), in which it is stated that the status of the Aarhus Convention (AC) in Irish Law was clarified by Mr. Justice Gerard Hogan. He pointed out that the AC is an international agreement, (which was negotiated under the auspices of the UN Economic Committee for Europe), which has been ratified by the European Union. He also stated that it has been transposed into certain key areas of EU environmental law, one of the most notable of which is the EIA Directive 2011/92/EU, (and hence into Irish law). Apart from this, it is pointed out that otherwise, the AC only forms part of Irish law to the extent that it has been determined by the Oireachtas. Hogan, J. states that the relevant Irish law is ‘The Environmental (Miscellaneous Provisions) Act 2011’, which gives effect to certain provisions of the AC. Thus it is clarified that the Aarhus Convention was not made part of Irish law but that the Oireachtas approximated Irish Law to the requirements of the AC by means of the 2011 Act (Part II). This related specifically to costs and the “modified costs rule”.

The EIA Directive 2011/92/EU merely restates and consolidates the 1985 Directive 85/337/EC and the three subsequent amendments made to the original directive. These amendments were contained in Directives 97/11/EC (expanded types of projects); 2003/35/EC (sought to align provisions of public participation with the AC on public participation in decision making and access to justice in environmental matters); and 2009/31/EC (amended Annex I and II). Thus, 2011/92/EU includes the provisions of 2003/35/EC, (referred to by some as the “public participation directive”). Directive 2011/92/EU includes, at Article 6, matters relating to public participation in decision-making procedures. Article 6(2) requires that the public shall be informed “early in the environmental decision-making process” of a number of matters including the request for development consent; the fact that EIA is required; where the information is available etc. Article 6(4) requires that the public be given “early and effective opportunities to participate in the environmental decision-making procedures...and entitled to express comments and opinions before a decision is made”. Article 6(6) requires that reasonable timeframes be given.

The applicant has argued (3.16.2 of FI) that public participation procedures pursuant to the EIA directive were commenced at the earliest possible stage, as this stage commences once the request for development consent has been made. The procedures undertaken, including the publication of notices, the making available of all application documents at the P.A. offices and on a dedicated website, were described. Thus it is claimed that there has been no breach of the public participation requirements of the EIA Directive as members of the public were given prior notice and provided with a period between 16th April and 4th June 2015 to make submissions to the Board, prior to the making of a decision by the competent authority. I would agree that the applicant has complied with the requirements of the EIA Directive and Irish law in respect of the public participation procedures, and that, as such, the requirements of the Aarhus Convention have effectively been met.

9.2.2 SID status

Many observations raised the issue of whether the proposed development should be considered as Strategic Infrastructure Development given that the SID process was instigated to facilitate fast tracking of major infrastructure development and was not intended to deal with a number of individual projects spread over a massive area. Some observers also considered that there was no justifiable need for the development, that there was already over capacity of output from wind energy beyond what would be needed to meet the country's renewable energy targets and that as the proposal is not part of Gate 3 (as project proposed after Gate 3 closed), the project cannot be considered as contributing to the 40% target.

The Inspector's report on the Pre-application determination (PC0186) considered the issue of whether the proposal constitutes a single project for the purposes of making a SID application. It was noted that the proposal had initially involved 55 turbines on over 20 individual sites across three counties, but that this had subsequently been reduced to 47 turbines across 7 sites (5 clusters) and confined to Kildare and Meath. Having regard to these refinements, and to the proposal that each cluster would be connected to a single substation, with a single onward connection to the national grid, it was considered that the proposal could be considered as a single project.

It was considered that the proposed development constituted a Class 1 development under the Seventh Schedule as it comprised up to 47 turbines with an output of 125MW, which exceeded the threshold. It is further noted that the Inspector's report (PC0186) considered that the proposed development would be

significant due to its scale and for the reasons outlined by the applicant. It was noted that the wind farm would be one of the largest wind farms to connect to the national grid and that it would make a significant contribution to the renewable energy targets and reduction of GHG. The issues relating to the need for the development and renewable energy capacity have been addressed under 9.1.2 above. The Board decided on 24th March 2015 that the proposed development comprises strategic infrastructure development, generally in accordance with the Inspector's recommendations and reasoning.

9.2.3 Need for SEA

A number of Observers considered that the application fails to comply with the SEA Directive and that SEA is mandatory for all energy development programmes and for those Annex I/II developments which set a framework for the future. The SEA Directive 2001/42/EC on 'The Assessment of the effects of certain plans and programmes on the environment' (known as the SEA Directive), relates to plans and programmes, and not to individual projects, such as that proposed. Thus there is no requirement to carry out SEA for the proposed Maighne Wind Farm development.

9.2.4 Inadequacy of EIS /Authority to carry out EIA

Other observations related to concerns that the EIA Directive, in particular Article 3, has not been properly transposed into Irish law (as established by CJEU C-50/09). It was stated that this judgement had ruled that Schedule 6 of the P & D Regulations 2001 is inadequate, as it merely sets out what information is to be contained in an EIS rather than what is required by Annex IV of the EIA Directive. It was claimed that the EIS is deficient as the applicant had stated that the EIS had been carried out in accordance with Schedule 6 of the 2001 P&D Regulations. It was further stated that it fails to identify, describe and assess the direct and indirect impacts on the environment with regard to the various aspects of the environment set out in the Directive. Some observers went on to assert that the EIS for the proposed development is defective as the 2001 Regulations 'have no purpose in law' due to the failure to comply with Article 3 of the EIA Directive, and that as the Review of the EIA Directive (2014/52/EC) will not be transposed until 2017, the Board has no authority to carry out EIA.

The applicant has addressed these issues in Section 3.16.4 of the FI (September 2015). It is submitted that the EIS has been prepared in accordance with the requirements of Directive 2011/92/EU, (a consolidated version of the 1985 Directive

with subsequent amendments), and with national legislation, (Part X of the P&D Act 2000, as amended, and Part 10 of the P&D Regulations 2001, as amended). It is contended that the EIS submitted as part of the application complies with every requirement of the EU and national legislation in relation to the contents of the EIS.

ECJ case C-50/09 (3 March 2011) held that Irish legislation had not adequately transposed Article 3 of the EIA Directive, which makes the Competent Authority (CA) responsible for carrying out an Environment Impact Assessment in relevant cases. The judgement clearly distinguished between the obligation to carry out an *Assessment* as opposed to gathering information, consulting, publicising etc. and *taking the results of such consultation and information gathering into consideration*. The emphasis was placed on the fact that Article 3 was a fundamental provision of the Directive and that the assessment of the direct and indirect effects, in accordance with the factors set out in Article 3, was the critical issue. The Irish legislation was found to be inadequate as, at that time, it merely required the applicant to submit an EIS; the public and prescribed bodies to be notified and their comments sought; the CA to consider whether the EIS contained the required information; and the CA to take account of the EIS and the relevant submissions prior to making a decision.

Ireland has since amended its legislation to address the issues which arose from this case. The amendments are set out in the Introduction to the DoECLG's 'Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment' (March 2013). These amendments include S172 of the P & D Act 2000 (as amended) which specifically requires the Board to carry out EIA in accordance with Article 3 of the Directive and S171A which defines EIA, a definition which is based on Article 3 of the EIA Directive. It is important to note that the EIS is just a part of the EIA process, which must be carried out by the Competent Authority, in this case the Board. Thus there is no basis for the assertions made in respect to the Board's authority to carry out EIA in this instance.

9.2.4 Grid connection – cumulative impact/project splitting?

The application, as originally submitted, had proposed to connect to the national grid via one of two options at either Woodland (NE of Kilcock) or near Maynooth. Each of these options would have involved underground cabling along public roads for considerable distances. These proposals generated a substantial level of objection from both Kildare County Council and from third party observers. The principal objections related to matters such as traffic safety, traffic disruption to homes and businesses, sterilisation/devaluation of property values, inadequate

capacity of road network to cope with construction works, long term damage to structural stability of roads (especially bog rampart roads), and operational difficulties regarding maintenance of services relating to other utilities contained within the road network. The proposed revision to the grid connection, (FI 24/09/15), involving the use of an existing 110kV substation at Dunfirth, was considered by the applicant to be likely to resolve most, if not all, of these issues. This substation is located close to the public road linking Drehid and Hortland clusters, and is within the red line boundary. Thus the applicant is no longer seeking permission to lay underground cables leading out of the site beyond Hortland and the underground cabling relating to the grid connection element of the proposed development is reduced to 2.3km along the public road.

A considerable number of observers had also raised concerns about the lack of firm assurances on the ability to connect the proposed wind farm to the national grid. Some considered that there was no justification in GRID25 for the proposed development in this location and queried whether the proposal constituted part of the 'Greenwire' project 'by stealth'. Many noted that there is no evidence that Maighne forms part of the Gate 3 approvals for connection to the grid and others queried whether the energy was destined for the domestic or international market. Whilst the latter question is not a matter for the Board in terms of the appropriateness of the destination of the energy generated, the matter of where and how the energy is connected to the grid is a significant matter for the Board. The O'Grianna Judgement (2014) established that the connection of a wind farm to the national grid is an integral part of the wind farm project.

The applicant addresses the revision to the grid connection in Section 4.1 of the FI. It is confirmed that the Transmission System Operator (TSO), Eirgrid, is *"currently processing a grid connection application in relation to Maighne Wind Farm."* It is further stated that *"the applicant is satisfied that there is sufficient capacity on the local 110kV circuits at the existing substation at Dunfirth to accommodate the electricity generated by Maighne Wind Farm"*. However, it should be noted that no evidence has been provided to substantiate these claims, and there are no submissions from the TSO on file. Furthermore, there is no evidence that the proposed development would be able to avail of a Gate 3 connection offer as this round of offers has closed.

The FI also *"evaluates and appraises the potential electricity transmission infrastructure upgrades required at Dunfirth to accommodate the power from Maighne WF"* and appraises the potential cumulative effects. However, no details are given of the proposed upgrades to either the substation or to the transmission

infrastructure to facilitate this development. Notwithstanding this, the FI at Table 4.1 provides “an appraisal of potential impacts” under various topic headings such as Noise and Vibration, Ecology, Hydrology, Human Environment and Landscape (not a complete list), as well as proposed mitigation measures. Thus, for example, it is stated that “the operation of an additional transformer at the site will give rise to additional noise during ‘typical’ operation. In order to mitigate this impact, noise reducing mitigation measures will be implemented on site, including noise reducing housing at the transformer.” However no details of any extension or alteration to the substation building or compound are given. In respect of Hydrology and Water Quality, it is stated “during each phase (construction, operation, maintenance and decommissioning) of the substation development, a number of activities will take place on site, some of which will have the potential to cause impacts on the hydrological and water quality regime at the site”. However, no details of what is to be constructed or the nature, extent, duration etc. of the construction works are provided.

The O’Grianna judgement made it clear that the construction of a wind farm and the connection of that wind farm to the national grid must be considered as a single project. Mr Justice Peart considered that where details of the route/design of the grid connection are not precisely known and the approval of the connection is a matter outside of the control of the developer, then the development is considered to be premature. It was acknowledged that the developer in that case was not in a position to include the details of the grid connection in the EIS, but considered that

“this does not mean that given more time and further contact with ESB Networks, it could not be achieved so that it could be included in an EIS which addressed the impact of the total project “at the earliest stage””.

He further stated that

“it seems to me that the fact that the developer is at the mercy of ESB Networks as far as the details of the plans for that connection to the grid is concerned, cannot absolve the developer from compliance with the Directive in every respect.....[and] it is difficult to see any real prejudice to the developer by having to wait until the necessary proposals are finalised by the ESB Networks so that an EIS for the entire project can be completed and submitted, so that a cumulative assessment of the likely impact on the environment can be carried out in order to comply with both the letter and the spirit of the Directive”.

It is a matter for Eirgrid to determine whether the connection of the wind farm to the grid at this location is appropriate and whether or not there will be a need to extend or alter the substation compound itself and/or the cables leading to/from the substation. It would appear from the applicant's further information submission that it is unclear at this stage whether approval to connect at this location is likely to be forthcoming and whether there is likely to be a need for further development works to facilitate such a connection. In the event that such a connection is not permitted, it is likely that the applicant will need to pursue alternative options for connection to the grid. In these circumstances, it is not possible for the Board to carry out an EIA of the entire project. On the basis of the information provided, it is considered that it is not possible to identify, describe and assess the direct and indirect effects of the whole project on the aspects of the environment as set out in Article 3 of the EIA Directive and on the interactions between them. As such a cumulative assessment of the likely environmental effects cannot be carried out for the entire project. Thus the proposed development is considered to be incomplete and premature in this respect.

9.2.5 Inadequate legal interest

Third party observers, and Kildare Co. Co. Transport Dept., have raised concerns that not all landowners have given consent and are unlikely to do so. This comment appears to relate mainly to locations where alterations may be deemed necessary to the public roads at entrances and/or nodes requiring temporary widening to facilitate delivery of turbines and other large loads. The substantive issues relating to the turbine delivery routes, haul routes, cable routes and site entrances have been addressed by the Second Inspector, John Desmond in his report. I will confine my comments in this respect to the issues raised regarding the need for adequate legal interest.

Reference has been made to the High Court judgement in respect of a wind farm, *McCallig v An Bord Pleanála* (IEHC 60, 2013), whereby lands were included within the red line boundary without securing the consent of the landowners in question. This judgement outlined what form of written consent should be secured from relevant landowners on the basis of a 'Good', 'Better' and 'Best' approach to the matter. The Court held in this case that any aspect of the decision of the Board which purported to grant permission in respect of or affect in any way the lands of the person who had challenged the decision to be void. It should be noted, however, that "a person shall not question the validity of any decision made or other act done by....a planning authority, a local authority or the Board" in the performance of a function under the Planning and Development Acts other than by

way of Judicial Review, (Sections 50, 50A and 50B P&D Act 2000, as amended). Furthermore the onus is on the applicant to ensure that there is sufficient legal interest in the lands to carry out the development, (Section 34(13) P&D Act, 2000 as amended), which states “A person shall not be entitled solely by reason of a permission under this section to carry out any development.

9.2.6 Precedent – legal/board

A significant number of Observers have made references to a number of legal and planning precedents. The applicant in response has stated, in general terms, that each case should be considered on its merits. However, substantive responses have also been given in the FI in relation to specific planning decisions, particularly relating to decisions of the Board. As the decisions referred to relate to a wide range of topics including visual impact, character of demesne landscapes, specific land uses such as land fill and equine related uses, etc., I will address any relevant precedent issues under the appropriate topic headings later in the report.

9.3 Alternatives

The issue of alternatives is addressed in some detail in the EIS, Chapter 1, Section 1.2, Volume 2, and in Appendix C, Volume 3 of the EIS. The consideration of alternatives commenced with a macro site search (countrywide) in respect of the Greenwire Project. The Midlands region was chosen mainly on the basis of proximity to a strong existing grid network with available capacity; the presence of a relatively low amount of environmentally sensitive sites and visually protected areas; and given that the elevated coastal locations along the west coast were less available due to existing/permitted wind farms and the constraints referred to above. In addition, the recent improvements in technology allowed for the development of wind farms on a commercial scale in low-lying areas with lower wind speeds by means of taller turbines with larger rotors. The Meath/Kildare/Offaly area was chosen on the basis of these factors as well as good accessibility of the area by motorway and regional road network; appropriate wind speeds; and availability of land banks. Although there were no wind energy strategies in place in Meath or Kildare, it was considered that these counties were generally favourably disposed towards renewable energy and due to the existence of ‘robust landscapes’ with low/medium sensitivity ratings.

Within the study area, alternatives were considered under the following headings:-

- Alternative sites and designs

- Alternative layouts/locations of turbines
- Alternative cable routes
- Alternative technology
- Do-nothing alternative

9.3.1 Alternative sites

Constraint mapping and further screening was applied which identified a number of available land banks. It is stated that this produced a number of potential sites which consisted of private land banks and areas of Bord na Mona Bog. Although the Bord na Mona bogs were considered to be potentially suitable, the EIS states that “these lands were not made available to the applicant”. The other areas considered are shown in Fig. 1.11 and comprise a fragmented and dispersed ranged of ‘sites’. It is stated that further constraint mapping and application of buffers and setbacks was carried out which produced the initial layout of 55 turbines on various sites in the ownership of 57 landowners.

9.3.2 Alternative layouts

The alternative layouts considered related principally to the layout of turbines within each of the proposed clusters, which principally related to the application of buffers and setbacks to achieve the optimum layout in terms of environmental impacts. However, the overall layout was also refined on the basis of issues such as proximity to the grid, access difficulties, impact of cabling on local road network and aviation concerns expressed by the Dept. of Defence. For example, the number of turbines and the number of clusters is stated to have been reduced on the basis of aviation concerns, and some turbines to be located in Offaly were removed due to distance from the grid. An evaluation of height versus density was also factored into the design of the layout. A Fáilte Ireland Study (2008) was referenced that people tend to prefer fewer larger turbines than the clutter effects of many smaller ones.

In addition, the issue of the ‘cluster approach’ as opposed to the ‘single site option’ was also considered. It was stated that *“while the layout may appear dispersed, a wind energy development such as this will be perceived as a series of small to medium sized developments rather than a sprawling singular one”*. The ‘single site option’ was raised by the Board in the pre-application meetings (PC00186). It was also raised as an issue of concern by Kildare County Council in its submission to the Board in respect of the current application. A number of observers have also raised this issue. Many of the concerns expressed regarding the dispersed nature of the development related to the visual impact arising from the spatial extent of the

development and to the impact on the road network due to the extent of cabling required to link the various clusters to the proposed on-site substation.

The applicant has responded to the concerns raised in the submissions regarding lack of alternatives considered, (mainly in respect of 'single site option' and cable routes), at 1.2.1, 1.2.2 and 3.1 of the FI received 24/09/15. It is stated that the 'single site option' was considered as part of the site designs, which comprised private lands and Bord na Mona lands. However, although considered by the applicant to be potentially suitable, the Bord na Mona lands were not made available to the applicant. The remainder of the response sets out the justification for the cluster approach which was centred on the view that this approach "allows the landscape to better absorb the development than would be possible with one large grouping of 47 turbines". It was further claimed that the "screening afforded by the prevalence of trees and vegetation and the restricted extent of many views of the wind farm" would result in close proximity views being limited to a small number of turbines from any one location.

Although the applicant states that this option was considered, no details of the proposed 'single site option' have been provided in either the EIS or in the FI response. The evaluation is, therefore, confined to the applicant's justification for the cluster approach. However, it would appear that the single site option was ruled out early in the site selection process due to issues relating to land availability. This is a legitimate consideration in the consideration of alternatives as part of the site selection process, as referred to the EPA's Guidelines on the Information to be Contained in Environmental Impact Statements (March 2002). The applicant addresses this point in response to the P.A's comments regarding a need for a 'masterplan for the developable area and the alternative lands examined' (1.2.1 FI), by stating that "the applicant only has authority for preparing a masterplan for lands within their control". It is considered, therefore, that whilst it would have been preferable to have seen a proper evaluation of a single site option, the applicant has fulfilled the requirements of the EIA directive in this respect.

9.3.3 Alternative cable routes

Alternatives to placing cables within the road network were considered including the use of overhead lines and the use of Bord na Mona infrastructure. However, the use of Bord na Mona infrastructure was described as "not forthcoming" and would also have necessitated the development of new roads within the bogs, with significant environmental impacts. However a commercial r.o.w and wayleave has been negotiated with Bord na Mona which would result in approx. 8km of cable/haul

routes being moved off public roads. A range of alternative routes were also considered during the application process with a view to minimising the impact on the public road network, which included the removal of some turbines, and utilisation of regional roads where possible. In addition, the proposed revised grid connection removes the two route options to connect to the grid at Woodland (which would have involved 28km of cabling along public roads) and Maynooth, (17km of public roads). It is considered that the alternatives concerning cable routes have been adequately addressed in the EIS and FI from the applicant.

9.3.4 Alternative technology

Alternatives were also considered regarding blade tip heights, (185m, 169m and 156m); turbine designs (will not be finalised until after permission is granted); and substations (AIS and GIS, but AIS was chosen on that basis it would have a lower visual impact, despite larger footprint). A number of types of renewable energy developments were also considered, as discussed below.

9.3.5 Alternative renewable energy sources

Many third party observers raised issues regarding a lack of justification for wind energy, which some believed to be inefficient and unproven in respect of decarbonisation. Similar concerns were raised regarding what was perceived as the Government's over-reliance on wind as a renewable energy source in terms of energy policy. Others raised the issue of the need for a cost-benefit-analysis of wind energy and the need for balance between such developments and social and economic needs. Many considered that the negative impacts of wind energy development on the landscape and communities outweighed the benefits to society and the environment. It was also argued that the applicant had failed to adequately address issues such as alternative energy sources as part of the application.

The applicant considered the alternative RE sources of Bioenergy, Off-shore Wind and Wave/Tidal development (1.2.18 of EIS). Two of the Bioenergy developments, Biogas and Biofuels, were dismissed as either having a low REFIT tariff or none. Off-shore wind was similarly dismissed. Wave and tidal development were considered to be commercially unviable at present as the technologies are still at the developmental stage, resulting in higher development and maintenance costs. Solid biomass was the only bioenergy development which was not ruled out for these reasons. However, this form of energy was also considered to be beset with technical difficulties and it was further considered that Irish policy is currently

focussed on the conversion of three existing plants. Thus none of the alternative renewable energy technologies were considered appropriate and on-shore wind was considered to be the most cost effective means of achieving Ireland's targets. It is considered that although an in-depth evaluation of alternative renewable energy options has not been considered in any great detail by the applicant, and it has not focussed on the cost-benefit-analysis approach, it would be unreasonable to expect the developer to carry out such an evaluation as part of the current application.

The Do-Nothing Scenario focussed on the need to meet Climate Change and Renewable energy targets. The Board, must have regard to national, regional and local policy, which supports on-shore wind energy as one of the principal, (albeit not sole), sources of renewable energy. As discussed previously, it is clear that the proposed development of a large scale wind energy development, such as that proposed, is generally consistent with the Government's energy policies. The applicant has also stated that the proposed development is consistent with the Development Plan policies for the two counties involved. However, I remain concerned that in the absence of a wind energy strategy for the area, which would establish the local policy framework and identify suitable areas for such proposals, the development of which has been temporarily stalled, means that the proposed development would be premature pending the adoption of such a strategy.

In conclusion, it is considered that the consideration of alternatives has been addressed in a reasonably comprehensive manner, although the evaluation of the alternatives considered has not always been particularly rigorous, or has not been presented as such.

9.4 Aviation

9.4.1 Receiving environment

The area within which the site is located is intensively used for aviation purposes by a number of public bodies and private organisations/businesses. The issue is considered in Chapter 16 of the EIS 'Telecommunications and Aviation', and in an Aviation Impact Assessment report by Osprey Aviation Consulting Services Ltd., contained in Appendix Q of the EIS. The applicant describes the receiving environment principally in terms of the number and location of aerodromes, the classification of the airspace and the restrictions or rules applying therein, and the main receptors that are likely to be affected by the proposed development.

Four aerodromes/airports are identified, namely Dublin International Airport (36km from the nearest turbine); Weston Aerodrome (20km); Casement Aerodrome (Baldonnel – Dept. of Defence, 24km); and Clonbullogue Aerodrome (13km). The former two were ruled out of the assessment primarily on the basis that the IAA had expressed the view that any operational difficulties could be managed/mitigated. Thus the only receptors that were subject to the assessment were Casement and Clonbullogue. These were identified as high sensitivity and medium sensitivity receptors, respectively. However, there are a number of other establishments in the area which have been identified in the observations from the Department of Defence and from third parties, which were not addressed in the EIS. These include existing aerodromes and/or landing strips at Kilrush, Trim, Millicent, Kilmurray, Allenwood (Robertstown) and Lullymore. In addition, Weston Airport includes a flight training school and there are microlight aircraft based at Clonard and Kilcock. Furthermore, there is at least one Hot Air Balloon business in Co. Meath ('Images in Flight') whose flights traverse the area.

The FI response (Sept. 2015) noted the observations from Dublin Weston Aerodrome and from 'Images in Flight' (hot air balloons). It was stated that the proposed development would not infringe on any other airport/aerodrome in the area. With regard to Weston, it was reiterated that IAA had not raised any concerns and it was considered that the objection from Weston had not provided any detail to substantiate the objection. With respect to 'Images in Flight', it was stated that this company was subject to the same 'Rules of the Air' as detailed in the WFAC report. Objections raised by 'Images in Flight' in respect of turbulence were also discussed in Section 8 of the WFAC report. Reference was made to the wind tunnel tests of airflows and computer generated images. However, it was considered that turbulence was unlikely to present significant issues for air navigation provided that official guidance was followed and that an aircraft is not flown too close behind the turbines, in accordance with good airmanship.

9.4.2 Classifications and restrictions on use of airspace

The airspace was described by the applicant as being classified as either Class C – Controlled Airspace, (subject to Air Traffic Control, with a base of 3,500ft and generally using IFR – Instrument Flight Rules); or Class G – Uncontrolled Airspace, (subject to a small set of mandatory rules and ATC not compulsory, applies from surface upwards). In general, pilots tend to fly in Class G using VFR (Visual Flight Rules), where navigation, traffic avoidance and obstacle avoidance is carried out visually from the cockpit, subject to weather conditions.

In addition to the classifications, to which certain restrictions apply under civil aviation rules and guidance, a substantial proportion of the airspace in the North Kildare area was also identified as being subject to military classifications. Firstly, MOA-4 is a large exercise and training area reserved for military training including aerobatic and air combat activities. The lateral extent of this airspace overlies all but the Ballinacill WF cluster and the vertical extent stretches from surface to 45,000ft. Secondly, overlying the area, there is a Military Restricted Area, EIR-16, which is divided laterally into sections with varying base restrictions (vertically). The restrictions for the area overlying all but the Ballinacill cluster range from 1000ft - 2,500ft amsl, above which civilian aircraft may not enter without prior permission from the Air Corps ATC.

9.4.3 Potential impacts

The focus of the description of the receiving environment and identification of potential impacts in the EIS was on the need/ability to comply with the Civil Aviation rules, regulations and guidance, (such as any safeguarding distances from aerodromes and height restrictions relative to potential physical obstructions), and any published restrictions. The emphasis was on obstacle avoidance and the applicant's basic premise was that flights under IFR would be directed away from obstacles and pilots flying under VFR were legally bound to plan routes in advance and to avoid obstacles. However, there were no references to the use of the airspace in the vicinity of the site by other users such as flying clubs, microlights, hot air balloons, civil aviation pilot training or helicopters and other small aircraft. It is clear, however, from the observations submitted, that the airspace is intensively used by such users. The Dept. of Defence pointed out that as a result of the intensive use of the area, civil aviation pilots tend to fly close to the base of EIR-16 from where permission is often requested to enter the restricted airspace due to for example, deteriorating weather conditions. Furthermore, it is highlighted that the large number of light aircraft and trainee pilots traversing the area results in a considerable volume of traffic in the low flying zones. These aspects of the receiving environment do not appear to have been taken into account in the EIS.

9.4.4 Further potential aviation impacts

The potential impacts identified by the applicant were largely confined to physical obstruction and radar clutter, although impacts such as turbulence and cumulative impact from other developments were addressed briefly in the EIS. However, it is considered that there are many elements of the nature of the airspace in the vicinity

of the site, and potential impacts arising, which do not appear to have been adequately addressed by the applicant. These can be summarised as follows:-

- *Disruption/hindrance of access to Casement Aerodrome at Baldonnel* – The DoD believes that the applicant has failed to recognise the strategic importance of Baldonnel. It has emphasised that this is the State's sole air force base from which all military operations and training are carried out including security matters, safety of life missions and support for the GASU and emergency services. It is necessary to be able to access all regions of the country day and night and to be able to carry out low flying missions. A mixed fleet of helicopter and fixed wing aircraft is operated from here and the GASU has its base here. I would agree with the DoD that the strategic importance of this site and the need for access to be available without undue disruption has been underestimated by the applicant. The potential impacts on disruption/hindrance of access are likely to be very significant.
- *The significance of the military designated airspace undermined* – the DoD has described this part of North Kildare as being ideally suited to training activities as it represents a fairly benign, obstacle free environment with a relatively flat topography. The DoD believes that an obstacle-rich environment such as that proposed would be incompatible with such training and would necessitate the relocation of the training area with additional costs. The area within 20NM of Baldonnel is stated as being the main area for Cessna and helicopter training, which is carried out beneath the bases of EIR16, typically at or below 1000-1500 ft. Given that MOA-4 stretches from ground surface upwards, I would share the concerns expressed that the introduction of an obstacle rich environment would seriously undermine the usefulness of this area, which has been specifically designated for these purposes. Thus the significance of such impacts would be considerable.
- *The strategic importance of the M4/N4 as a navigational route* – it is acknowledged that flights using VFR, and particularly flights during poor weather conditions, tend to use linear elements in the landscape as navigational routes. The DoD has identified the M4/N4 as one such route which is used as a guide, during all weather conditions, when carrying out missions between Dublin and the West/North-west of the country and between Baldonnel and Athlone, where the Emergency Air Service is based. There is a safeguarding of 3NM along this route. The DoD has also stated that aircraft following a linear feature in poor weather will typically be at 500-1000ft above ground depending on the cloud base. Thus the siting of a wind farm

cluster in close proximity, with 29 no. turbines within 3NM of the M4, would potentially undermine the usefulness of this route, which in turn, could adversely affect the success of safety of life missions. This was dismissed by the applicant as an excessive safeguard. However, the DoD has stated that the placement of these turbines, (many of which are considerably closer than 3NM), within this zone would impact on its security operations and would reduce its capacity to respond effectively to emergency tasks in poor weather. It is further stated that it would pose a hazard to aircrew navigating along the route and affect the ability to loiter, which is sometimes required. Thus the significance of such potential impacts would be considerable.

- *Impact on specific characteristics and requirements of military aviation* – The air corps stated that military aircraft, (and GASU aircraft), differ fundamentally from civil aviation flights carrying passengers or freight from point to point in that they often fly at low levels, (below 1000ft) and may need to loiter on missions. The introduction of a large number of tall turbines with a spatial extent spanning almost 30km into this airspace would result in a virtual wall of obstacles in an arc. It is acknowledged that the applicant has sought to design the layout such that there are gaps between the clusters. However, the layout is such that the charting of flights is likely to result in widespread avoidance of the airspace over the clusters, which will put increased pressure on the airspace between the clusters and outside of the wind farm site, essentially creating a barrier effect. Given that there are already vertical restrictions within the area, this additional constraint on the lateral extent of the useable airspace would be likely to increase air traffic congestion in the lower altitude space. This would be likely to have operational impacts for the Air Corps in terms of the planning and successful completion of missions. The DoD also pointed out that the route of PC9 air firing (weapons transfer for air firing training) from Baldonnell to Gormanstown, Co. Meath traverses through the area, and need to avoid populated areas. Such routes would need to be revised. The potential impact on military aviation, as opposed to civil aviation, has not been adequately considered.
- *The current intensity of use of the airspace below 1000ft* – given the intense use of this airspace by a range of aircraft, which is a recognised feature of the aeronautical environment in the vicinity of the site, it is considered that efforts to avoid the turbines would lead to ‘choke points’ and ‘canalisation’ of traffic, with an increased incidence of unauthorised penetration of the designated or restricted airspace by aircraft seeking to avoid turbines. This would increase the risk of collision and limit avoidance options for pilots. The DoD states that

“due to the bases of EIR-16, it is important to be able to route aircraft safely at lower altitudes and permit manoeuvre space for aircraft to exercise “see and avoid” with respect to other aircraft.”

- *The operational characteristics of pilot training* – it is considered that flying at low level altitudes and the inexperience of trainee pilots should be taken into account in the identification of potential impacts, particularly given the increased likelihood of manoeuvres below the restricted EIR-16 space, which overlies all but one of the WF clusters. A concern identified by the Air Corps is that there would be an increased incidence of unauthorised entry into EIR-16. Training requires a reasonably obstacle-free environment to allow for sufficient room for manoeuvring and for the necessity to switch from VFR to IFR in order to rise above cloud. The DoD states that the Allenwood area is regularly used for helicopter training from surface level (north of the Allenwood-Clane road) and that the axis Allenwood-Edenderry-Rathangan is routinely used for military low level fixed wing training. In addition to military training, the area is traversed by aircraft on civilian training. Thus, the operational characteristics of pilot training, which is prevalent in the area, do not appear to have been taken into account in the identification of potential impacts.
- *Impact on radar vectoring area for Baldonnel* – the applicant had identified a potential impact on the ‘Radar Vectoring Area’ for Baldonnel, in terms of the approach to Runway 11, from the Drehid-Hortland, Derrybrennan and Cloncumber clusters, which would necessitate mitigation in the form of the raising of the vectoring altitude by 100ft on the approach to the runway. However, the DoD has pointed out that this would adversely affect the surveillance radar approach to the runway and would, therefore, affect the ability of the Air Corps to carry out routine and specialist calibration flights. The DoD has expressed the concern that this could lead to the withdrawal of Instrument Flight Systems from Baldonnel which would have significant operational consequences. Furthermore, it is stated that the Radar Vectoring Area is used to provide ‘cloud break’ to military aircraft transitioning from IFR to VFR and any such alteration to the vectoring altitude would reduce the likelihood of a successful cloud break, which would also have significant operational consequences. The applicant has, however, indicated that as an alternative, the turbine base could be excavated by at least a further 6.23 inches. Although this has been welcomed by the DoD on the one hand, on the other hand, it is unclear whether this would be sufficient to address the vectoring issue, due to an apparent lack of understanding of ICAO PANS OPS

methodology and practice, (see response from DoD, dated 25 Nov. 2015, to WFAC analysis of DoD IFR submission – points 9.e.(2) and 10.k).

- *Turbulence* – the applicant has considered this issue but stated that whilst the effects of turbine-induced turbulence remains under assessment, a significant number of aviation stakeholders continue to operate within close proximity of wind farms. However, the DoD pointed out that the UK CAA guidance recommends an avoidance distance of 16XRD for downstream turbulence at or below a height half RD above the highest point. In response, the applicant considered that ‘good airmanship’ would dictate that where turbulence is anticipated, the aircraft should not be flown sufficiently close behind the turbine as to cause the pilot concern. Thus there would appear to be a potential impact which would further necessitate avoidance of the area around the turbine clusters, with consequent operational impacts for pilots.

Thus it is considered that the potential impacts of the proposed wind farm have not been fully identified or adequately addressed by the applicant.

9.4.5 Effectiveness of mitigation

Charting/notification - These measures merely address the prevention of avoidance of a collision but do not address the loss of navigability within the area. Avoidance of WF clusters as a solution ignores the operational consequences for Air Corps, as outlined above, including the cancellation of flights due to a combination of poor weather conditions and the obstacle-rich environment. The cancellation of training flights would have financial and timetable consequences for other air traffic, whilst the cancellation of security related flights or flights for the purpose of saving life would have much greater consequences.

Increasing the radar vectoring altitude – would adversely impact the surveillance radar approach and reduce the probability of carrying out successful cloud breaks. This would have safety and operational consequences for the Air Corps’ continued use of Baldonnell. As stated above, the applicant has in the FI response offered, as an alternative to altering the vectoring altitude, to lower the height of turbines by 6.23 inches, by excavating the turbine location. Although this and the statement that the developer is willing to ensure no IFR operational impact is welcomed by the DoD, it is still unclear as to whether there would remain a potential constraint on the ability to carry out successful cloud brakes and on ILS calibration flight checks, which in turn may have operational consequences.

9.4.6 Aviation Regulations and Guidance

In the FI response, the applicant has repeatedly stated that there is “no justification” for the DoD’s claims that the proposed wind farm will represent a severe constraint on the Air Corps’ operations or on those of the GASU, as these claims are not supported by “Extant Regulation and Guidance” and/or the case has not been made by the DoD to support the claims.

The applicant focusses to a great extent on adherence to legal minima, as set out in aviation rules and regulations and in published guidance, as well as the lateral and vertical extent of restrictions applicable within the military designated air spaces, and the ability to comply with same. The DoD accepts that pilots are required to plan their flights which must comply with the legal minima. However, in assessing the suitability of weather conditions en route, it is stated that the pilot must also consider the terrain and obstacle environment. In doing so, the pilot would have to rule out airspace for safety reasons that would otherwise have been available due to the presence of obstacles at low altitude. Thus the reliance on legal minima and on ceilings and visibility, exclusively, without addressing the nature and use of the terrain and of the airspace, is considered to be overly simplistic and results in too narrow a focus and, thus, in the exclusion of potential impacts. DoD gives an example of having to obey the rules of the road without taking account of the driving conditions.

The DOD has pointed out that in the FI response (Sept. 2015) the WFAC has misinterpreted the ‘Rules of the Air’ (SI 72/2004) on several occasions and selectively quoted other guidance from the UK. In addition, SERA, (EU Regulations), which came into effect in Ireland in 2014, has not been referenced at all by the applicant. WFAC has stated that the ‘Rules of the Air’ prohibits flying an aircraft within 500m of an obstacle, person etc., when it should have referred to 500ft, which is 152m. Other references seemed to relate to VFR rules for flights above 3,000ft, which is not applicable here. The DoD clarified that the current applicable SERA rules are that outside built-up areas, an aircraft may not fly closer than 150m (500ft) above an obstacle within 150m of the aircraft’s position, and that stricter rules apply in built-up areas. Furthermore, it is pointed out that SERA has introduced different requirements in respect of daytime and night-time flying. The obstacle clearance limit at night-time is 1000ft above an obstacle within 8km. The DoD noted that a large number of GASU missions occur at night and that, as such, the proposed development would potentially have a severe impact on the success of such missions.

9.4.7 Precedent and cumulative effect

The DoD had raised a concern regarding the implications of precedent in terms of the continued use of the area for military training and operations, should planning permission be granted for Maighne WF. The applicant, however, dismissed this by stating that the development cannot be regarded as establishing a precedent for further development in the area. Reference was also made in the Osprey Report to existing tall structures in the area and reliance was placed on existing wind farms close to airports in the UK. Reference is made to the Lagan Cement flue and the Tullamore radio mast, which it was stated demonstrated that aircraft could fly safely and maintain obstacle clearance. However, the DoD responded (June 2015) that these are isolated single objects and do not create the ‘wall’ effect that the 5 clusters create, and as such are not comparable. Furthermore, it is stated that should these objects be accepted as precedents, then surely Maighne would create a precedent for further wind farms or other tall structures in the area.

A considerable number of third party observers also referenced the Board’s relatively recent refusal of permission for a wind monitoring mast for the proposed development at Timahoe. This decision, PL09.243523, was made on 14/10/14 and related to a 100m high single mast. The following reason for refusal was given:

The proposed development by reason of negative impact which the mast would have on the air navigability of the area, would decrease the utility of the area for flight operations and training. Furthermore, the proposed development would indirectly cause an increased risk of airspace infringements, which would result in a risk to safety of air traffic. It is considered that the proposed development would endanger and interfere with the safety of aircraft and the safe and efficient navigation thereof, and would, therefore, be contrary to the proper planning and sustainable development of the area.

9.4.8 Conclusions on aviation

The subject site lies within an area where the airspace is intensively used for military and emergency flying, training of both military and civilian pilots, regular use of the airspace at low altitudes (for training and operational reasons), as well as civilian VFR and IFR flights. All of the proposed wind farm clusters, apart from Ballinakill, underlie the military operational and training restriction zones, and Ballinakill, together with several turbines from Windmill and Drehid-Hortland clusters, lie within 3 nautical miles of the M4/N4, which is a navigational route used

routinely for emergency and life-saving low altitude flights, particularly in poor weather conditions.

It is considered that the proposed development would adversely affect the air navigability of the area and would seriously compromise the future use of the area for military operations, including security, emergency and security of life missions, and would undermine the ability of the Air Corps to continue to utilise the area for military training purposes, for which the area is designated. The proposed mitigation measures are unlikely to address the potential impacts as they would not prevent the loss of navigability and avoidance of the area by pilots, with consequent operational difficulties. The potential impacts on air safety could be reduced by the proposed mitigation measures to some extent, but the introduction of such an obstacle-rich environment would be likely to result in increased incidence of infringements/requests to enter the restricted airspace and the alterations to the vectoring altitude would create additional hazards and operational difficulties.

It is further considered that the proposed development is likely to adversely affect the use of the area for other air navigation stakeholders, including the training of civil aviation pilots, hot air ballooning and microlighting. I would agree that the grant of permission for Maighne WF could also set a precedent for future development in the area involving tall structures or further wind farm development. It is considered that the cumulative effect of more than one such development is likely to have a significant impact on the air navigability and safety of the air navigation in the area. It is considered, therefore, that permission should be refused for reason(s) similar to that provided by the Board in respect of the proposed wind monitoring mast at Timahoe.

9.5 Landscape and Visual Amenity

9.5.1 The Character of the Landscape

The landscape within which Maighne wind farm is proposed to be placed covers a considerable area of land comprising over 1,200ha, which stretches approx. 30km north to south. In order to assess the landscape impact of the proposed development, the landscape character must first be identified, including the key characteristics of this landscape and their sensitivities to change, and then the value of the landscape and its individual components must be understood. A landscape may be valued for many and varied reasons, (according to the Scottish Natural Heritage Guidance – Landscapes, 2013), such as its landscape quality, scenic beauty, tranquillity or wildness, for its recreational opportunities, nature

conservation or its historic or cultural associations. How a landscape is valued is usually readily discernible from the local policy framework including CDP policies and objectives as well as the Landscape Character Assessments and sensitivities identified. In addition, however, important information can be gained from the condition or level of maintenance of the landscape, the way in which it is used and experienced from observations on site and from consultation with the public. All of these factors together combine to create a 'sense of place' and define a regional distinctiveness.

The Guidelines for Landscape and Visual Impact Assessment (2013) differentiate between the assessment of 'Landscape' and of 'Visual amenity' in that 'Landscape' is seen as a resource arising from an interplay of the natural, physical and cultural environment, and 'Visual amenity' as the inter-relationship between people and landscape and the "overall pleasantness of the surroundings that people enjoy". The GLVIA also describe 'Landscape' in the following terms

"Landscape is about the relationship between people and place. It provides the setting for our day-to-day lives...not just special or designated landscapes...it results from the way different components of our environment, both natural....and cultural...interact together and are perceived by us. People's perceptions turn 'land' into the concept of 'landscape'."

I have visited the site and surroundings on several occasions as part of the assessment of the application. The areas visited included the development site and views of the site from adjoining features such as the canals, (bridges and towpaths), hill tops, sites of historical/heritage interest, sites of nature conservation interest, forests, etc. As previously noted, the Board has received over 800 submissions from third party observers, which has helped to inform my understanding of the landscape and how it is valued by the people who live and work there. The overall impression I have gained is that the landscape is highly valued and well maintained, and appears to be used intensively by visitors and residents alike. As a rural area in close proximity to, and within easy access of Dublin, the area is in demand as a commuter county and also serves as a recreational area for day-trippers from the city as well as tourists.

The predominant land use is agriculture, with some commercial forestry and small scale extractive industries, and there are several worked bogs on the lands adjoining the study area. There is a substantial equine industry in the area with 22 stud farms within the study area and several equestrian-related businesses and

activities in the vicinity. There are a number of small settlements and a very strong presence of one-off housing throughout the entire study area, with many clusters and stretches of ribbon development. It is a settled landscape with a highly visible presence of heritage features spanning the ages from the Stone Age through to the present day. The heritage assets include a rich tapestry of archaeological sites and monuments, including a number of monastic sites, and a considerable number of country houses with demesne landscapes and designed gardens. These features, together with the canals, rivers, forests, visitor attractions and wide open spaces contribute to the attractiveness of the area to visitors.

The most striking feature of the area is the flat and expansive nature of the low-lying landscape, which is framed by a number of small hills, many less than 200m OD, which due to the surrounding terrain, appear as substantial landform features in the area. These include the 'Chair of Kildare', which is a series of hills including the renowned Hill of Allen, Dunmurray Hill, Boston Hill, Red Hill and Grange Hill, and the Newtown or 'Northern Hills'. The former are located just to the south of the Cloncumber cluster and the latter hills are located to the north-east of the Hortland cluster. In addition, Carbury Hill (142m OD) is a notable feature in the landscape with its fortified house (Carbury Castle), church and cemetery. This is located to the south of Windmill cluster, to the East of Drehid cluster and to the north of Derrybrennan cluster. The Canals and river corridors also contribute a strong visual and recreational presence to the area with several tow paths, walking routes and cycle routes. The low-lying and flat terrain provides for open and long vistas often with uninterrupted views which are available from both the uplands and the lowlands and in particular, along the canals.

In light of the foregoing, it is considered that the human element is of considerable importance in the assessment of both the landscape and visual impact of the proposed development on the character of this area. In addition, the heritage features and amenity value of the rural landscape, particularly relating to the canals as amenity focal points, and the importance of the Northern Uplands and the Chair of Kildare as defining elements in the skyline, all stand out as being highly valued features of the landscape which contribute to the sense of place and regional distinctiveness of this part of North Kildare and South Meath.

9.5.2 Wind Energy Planning Guidelines for Planning Authorities 2006

9.5.2.1 Landscape Character Type

The WEPG identifies six different landscape character types, two of which are 'Hilly and Flat Farmland' and 'Flat Peatland'. The applicant considers that the Maighne Wind Farm site falls predominantly within the Flat Peatland landscape with some elements of the Hilly and Flat landscape type. However, a substantial number of third party observers believe the reverse to be the case. Having familiarised myself with the site and area, I would agree that the area within which the site is located contains most of the key characteristics of the Hilly and Flat Farmland, but few of the Flat Peatland characteristics. In particular, the following key characteristics (Hilly and Flat) are considered to be relevant:-

- A working and inhabited landscape
- Intensively managed farmland;
- Patchwork of fields delineated by hedgerows varying in size;
- Farmsteads and houses scattered throughout with occasional villages.

In contrast, some of the key characteristics of the Flat Peatland landscape type are less relevant or prevalent in the landscape. These include sparse evidence of human habitation and being characterised by a sense of remoteness, with wet bogs in an undisturbed and naturalistic state. However, there are elements of this landscape type present within and in the vicinity of the development site, such as some bogs which are harvested for peat, coniferous forest plantations and sections of 'vast planar extent of peatland'. However, most of the bogs occur on the periphery of the site or outside of the site, mainly to the east and also to the SW of Drehid cluster.

The Guidelines indicate that in the Flat Peatland areas, wind farms may have a large spatial extent and tall turbines are most appropriate. In terms of cumulative effect, it is stated that whilst visibility of more than one WF might be acceptable, it is important that they are not seen to crowd or dominate the flat landscape and should be only faintly visible in the background. The guidance for Hilly and Flat Farmland is that the spatial extent should be quite limited in response to the scale of the fields and topographical features (such as hills) and that a sufficient distance should be maintained from buildings to avoid dominance by the wind farm. In terms of height, it is advised that turbines should not be tall and should relate to landscape elements. In relation to cumulative impact, *"it is important that wind energy development is never perceived to visually dominate"* and *"the full exposure of two*

wind farm developments might be excessive given the fact that it involves an inhabited landscape.”

9.5.2.2 Height/scale of turbines

The WEPG 2006 and the SNH Guidance 2013 each indicate that turbine height is critical in landscapes of relatively small scale or those comprising features such as houses, and that tall turbines generally appear out of scale and visually dominant in lowland and settled landscapes, which are characterised by the ‘human scale’ of buildings. Elements such as houses and trees also act as scale indicators, which means that where a tall turbine is viewed close to such a feature, the scale of the turbine can be accentuated. The WEPG states that in 2005, less than 60m to blade tip was considered ‘short’, 75-100m ‘medium’ and over 100m ‘tall’. Height and how the turbine is perceived in a particular landscape is also a function of distance. The CAAS report for Kildare P.A. indicated that objects tend to appear to be dominant at distances of less than a multiple of 10-15 times the height of the object, (1.69km – 2.5km in the case of the current application). Although the applicant has responded that this is an inappropriate ‘formulaic approach’, it is considered that it is appropriate as one of a range of assessment measures. Thus in terms of height, (as opposed to absorption capacity), the proposed development is inconsistent with the WEPG, as the proposed turbines are tall, (being amongst the tallest to date in Ireland), they are located in a settled landscape and are located in close proximity to a substantial number of residential properties, with almost 1000 homes within 1 km of a turbine. Thus they are likely to be visually dominant.

The guidance for ‘Hilly and Flat Farmland’ is clear that the turbines should not be tall, should not be dominant and should relate to the landscape elements. The only other tall features in the area are the hills which make up the Chair of Kildare (which range in height OD from 159m – Boston Hill to 233m - Dunmurray Hill), Carbury Hill (142m OD) and the Northern Hills (135-145m OD). These hills define the skyline of North Kildare. The SNH guidance indicates that wind turbines should be of minor vertical scale with respect to key features, generally about a third of the size. Thus the height of the turbines at 169m would potentially compete with the visual prominence of these defining features and are likely to appear as dominating structures in this flat, low-lying and settled landscape. Thus it is clear that the height of the turbines would be considerably taller than that envisaged by the WEPG and would be inconsistent with the guidance for ‘Hilly and Flat Farmland’ landscape types, which it is considered more accurately describes the site of the proposed development.

9.5.2.3 Spatial extent of wind farm

The WEPG also suggests a limited spatial extent for a wind farm in the 'Hilly and Flat Farmland' landscape type, whereby the turbines should relate to the landscape elements. The SNH landscape guidance similarly states that the scale and extent of a wind farm should not seem to overwhelm the distinctive character and scale of a (prominent) landform or of skyline, which is of critical importance in a flat and open landscape, where long distance views are important. It is considered that the guidance in relation to cumulative effect in both the Irish and Scottish guidance is relevant to the cluster approach proposed as part of the current application, as well as the cumulative effect arising from more than one wind farm development. Thus the visibility of more than one cluster at a time, combined with the frequency with which wind turbines are encountered as one moves through the landscape, would be likely to give rise to cumulative effects whereby the wind energy development becomes a dominant characteristic of the landscape. This scenario could result in the proposed clusters competing with the landscape's original focal points, create confusion and visual clutter and lead to the creation of a 'windfarm landscape'. It is considered that this is a realistic prospect in respect of the current proposed development. The applicant believes that the absorptive capacity of the landscape and the cluster approach with visual separation between the clusters will avoid this effect. The capacity of the landscape to absorb the proposed development will be examined in the following sections.

The cluster approach was favoured by the applicant over a single site approach for a number of reasons, one of which was the reduced visual impact arising from a number of smaller clusters with visual spatial relief between the groupings. The EIS places much emphasis on the height v. density argument, whereby options were considered with either a smaller number of taller turbines or the reverse. However, given that the 5-6 clusters fan out in an arc stretching from the Barrow Line of the Grand Canal just north of Rathangan and the Chair of Kildare northwards past Carbury Castle/Hill to beyond the M4 and into Meath, and eastwards to Newtownhortland, just south of the Northern Hills, means that the spatial extent is such that they would have a visual presence throughout North-Western Kildare. The Route Screening analysis indicates open views of turbines at 60% for 0-1km and 48% from 1-2km.

There are numerous instances where more than one cluster of turbines (either from within Maighne or in combination with other wind farms), would be visible from the same vantage point in the selected VPRs. For example, at Carbury Castle (10AH31, Map 58), Bostoncommon (KEDR13, Map 7) and the Hill of Allen

(KEDR41, Map 17) there would be 34, 36 and 47 nacelles visible, respectively, from distances of between 1.7 - 4km. At lower levels such as the Scenic Route from Rathangan to Allenwood (R414), via Lullymore, there would be 10-27 turbines visible (KEDR13, KEDR14) at distances of between 0.84 and 1.82km. Multiple turbines would also be visible from close range from various stretches or bridges of the Grand and Royal Canals, e.g. 19 turbines from Blackshade Bridge on the RC (MHDR34, Map 22), 21 turbines from Littletown on the Barrow Line (KEDR38, Map 14) and 15 turbines from Hamilton's Bridge (KEDR39, Map 15). Thus it is clear that the spatial extent would be large, notwithstanding the separation of turbines into 5-6 clusters, and would, therefore, be inconsistent with the WEP guidance for 'Hilly and Flat Farmland' landscape types, which it is considered, more accurately describes the site of the proposed development.

9.5.3 KCC and MCC Development Plan Policy – Landscape Character Areas

9.5.3.1 Meath County Landscape Policies

The two turbines located within Co. Meath (Ballinakill cluster) are located in the Lowlands Area LCA and in LCA6, Central Lowlands. This LCA has a Landscape Value of High, a Landscape Sensitivity of Medium and a Landscape Importance of Regional and has a low capacity to absorb wind energy development. Longwood Village is also an ACA and has a number of protected structures. There are two designated views along the Royal Canal at Boolykeagh and at Blackshade Bridge.

9.5.3.2 Kildare County Landscape Policies

The overall aim of Chapter 14 of the Kildare CDP is to provide for the protection, management and enhancement of the landscape and to ensure that development does not disproportionately impact on the LCAs, scenic routes, or protected views through the implementation of the policies and objectives of the Plan. The LCAs are set out in Appendix 3 wherein the character and value of each of the landscape types is identified together with the sensitivity of that landscape to development, (Maps 14.1 and 14.2). There are 4 Landscape Character Types, (Uplands, Boglands & Lowland Plains, Transitional Areas and River Valleys/Water Corridors), and 15 LCAs. The Landscape policies are set out in 14.8 and there are specific policies relating to each of the LCAs, (outlined above at 8.3.1 of this report). In addition, a limited number of Areas of High Amenity have been classified "because of the Outstanding Natural Beauty and/or unique interest value and general sensitive to development". The Grand and Royal Canal corridors have been designated as one of five Areas of High Amenity. In addition, there are a number of

Scenic Routes and Protected Views, as well as designated views from two landscape character types, namely Hilltop Views and Canals/Water Corridors.

The proposed wind farm is principally located within the Western Boglands LCA, (Cloncumber, Derrybrennan and Drehid-Hortland). This LCA is designated Medium sensitivity. The Ballinakill, Windmill and parts of D-H clusters are located within the North-Western Lowlands, LCA (Low sensitivity), but would be highly visible from the Northern Uplands LCA (High Sensitivity). Parts of Cloncumber are located within the Chair of Kildare LCA (High Sensitivity) and turbines would also be directly adjacent/within sections of the Royal and Grand Canals and Water Corridors LCAs, which are designated as high sensitivity. In general, High Sensitivity LCAs have limited capacity to accommodate development, Medium Sensitivity LCAs can accommodate development but with limitations of scale and magnitude and Low Sensitivity LCAs are generally more robust with a greater ability to accommodate change/development.

9.5.3.3 Sensitivity of the LCAs to development – capacity for development

A third of turbines would be located within the North-Western Lowlands LCA with the majority of turbines within the Western Boglands LCA, and just two turbines within LCA6 Central Lowlands (Meath CDP). LCA6 is Medium Sensitivity High Value and it is stated that the LCA has a low capacity to absorb wind energy development due to the high number of receptors.

The North-Western Lowlands is characterised by generally flat topography and smooth terrain, gently undulating around Carbury (rising to 142m OD), with long-distance visibility. Distant skylines include the Newton Hills to the NE and the Hill of Allen to the SE. The LCA description for these lowlands states that development can have a disproportionate visual impact due to the inherent inability to absorb development visually. It is also characterised by low vegetation, which also allows long vistas, with some shelter vegetation and mixed forests. Although the hedgerows provide some partial screening to low lying lands, the low vegetation proves unable to visually absorb development. Thus whilst this LCA has a low landscape sensitivity, which is mainly due to the low population density, the terrain and low vegetation means that it is limited in its ability to accommodate development. It is further noted that the location of the proposed clusters is such that one, (Ballinakill), is sited in very close proximity to a pocket of residential development and to the Royal Canal corridor, (designated as High Sensitivity), and the other, (Windmill), is sited in close proximity to Carbury Castle and Hill (a sensitive heritage focal point in the landscape).

The Western Boglands is so named due to the highly distinctive areas of bogland vegetation. However, it is important to note that the LCA also contains significant areas of pastureland as well as tillage. Western Boglands is characterised by flat topography, smooth terrain and low vegetation, which provide extensive, long-distance visibility, and is thinly populated. As a result of these factors, it is stated that development can have a disproportionate visual impact “due to an inherent inability to be visually absorbed by the planar terrain”. The proposed turbines are predominantly located on farmland, within this LCA, with a small number located within Coillte forests which have been planted on cut-away bogs. It was also observed that there are dense pockets of residential development around the Drehid-Hortland cluster (particularly the western part) and the Cloncumber cluster (particularly to the south). It is considered that the Medium Sensitivity is particularly relevant to the proposed development as it implies limitations on development in terms of scale and magnitude. Given the height, spatial extent and number of turbines to be accommodated in this flat and low-lying landscape, it is considered that the LCA would have limited capacity to absorb a development of such scale and magnitude.

The Western Boglands LCA also immediately adjoins a number of LCAs which are classified as High Sensitivity to development, namely the Upland areas of Newtown Hills and the Chair of Kildare and the Water Corridor areas of the Grand Canal and the Royal Canal. The Upland LCAs provide scenic views over the north-western plains of Kildare, the Royal Canal Corridor, the Central Plains and Boglands and the Grand Canal Corridor. These hills also define the skyline to the south and to the north-east of the development site and represent significant landforms and features of interest in the landscape. Thus the long distance and extensive views to and from these dominant focal points are of considerable importance in the landscape, particularly due to the flat topography of the surrounding smooth terrain. They are therefore classified as being unable to absorb development.

The Canal corridors are characterised by smooth terrain and even topography which generally progress into pasturelands and boglands. Long distance views of the canal corridors can be gained from the bridges, (a considerable number of which are Protected Views in the CDPs), and distant views can be gained of the surrounding upland areas. In addition, vistas can be obtained from the towpaths over long distances without disruption, particularly where the canal flows in a straight-line direction. It is stated that, as a result, development can have a disproportionate visual impact along these water corridors due to an inherent inability to be visually absorbed by the existing topography. As noted above, the

canal corridors are also designated as “Areas of high amenity”, due to their outstanding natural beauty, unique interest and general sensitivity to development.

The Ballinakill cluster is immediately proximate to the Royal Canal between Boolykeagh and Moyvalley Bridges, and is also situated between the River Blackwater and the River Barrow (where it crosses the RC). The entire Cloncumber cluster is located between the River Slate (along its northern boundary) and the Barrow Line of the Grand Canal (along its southern boundary). It stretches along the banks of the canal from Glenaree Bridge to Ballyteigue Castle, from where it is accommodated within Ballyteigue Forest. It is considered, therefore, that the relationship between the proposed turbines and the water corridors is of great importance in terms of the assessment of the capacity of the landscape to absorb the proposed wind farm development, and that the capacity is very limited.

9.5.4 Landscape impact

9.5.4.1 Landscape Sensitivity of the Study Area

The Landscape Sensitivity ratings in the EIS for the wider study area (5km-30km) were awarded ‘Very High’ (Hill of Tara), ‘High’ (Dun Áillinne, R. Boyne, Hill of Ward, Hill of Skryne, Croghan Hill and Rock of Dunamase) and ‘High-Medium’ for Trim Castle. The Landscape Sensitivity ratings for the Western Boglands LCA and many the main features of interest within the landscape of the central study area (5km), were awarded either a ‘Low’ or a ‘Medium’ Sensitivity rating in the EIS. The main landscape features included the Royal and Grand Canals, the Newton Hills and Chair of Kildare (views to/from) and many of the built heritage features. These were all down-graded in the EIS, (15.12.2), compared with the High Sensitivity ratings given in the CDPs, on several grounds which may be summarised as follows:-

- The “anthropogenic nature of the landscape” which was considered to be “robust” and “productive” without a high degree of distinctiveness or uniqueness and few elements of a “naturalistic environment”. Approx. half the turbines are located within cut-away bogs.
- There is a lack of distinctive features except for the Chair of Kildare, the Northern Hills and Carbury Hill. The low crest of hills was not considered to be distinctive in the landscape as the vegetation tends to limit views to relatively short distances, and the hills do not enclose the skyline.
- The High Sensitivity rating for the Chair of Kildare is disputed due to the extensive quarrying at the Hill of Allen, and there is extensive commercial forestry at Dunmurray Hill and Red Hill.

- The Canals are considered to be consistent with a productive character and given their “industrial” original purpose, they would have synergy with the wind turbines.
- There is not a high concentration of built heritage features or demesne landscapes and where they do occur, they do not strongly contribute to the landscape character.

However, the majority of third party observers and Kildare County Council strongly disagree with this sensitivity assessment. I would also disagree with the overall description of the landscape as “anthropogenic” and “robust”. It is considered that although there are some quarries and commercial forests present and that much of the land is in either agricultural production or has been milled for peat, the overall character of the rural landscape is substantially greater than this narrow description. The farmland (which comprises most of the site, with only a few turbines set within cut-way bogs and commercial forests) is very well maintained and attractively landscaped and includes over 22 stud farms. The Western Boglands deserves its ‘Medium’ rating as its flat topography, smooth terrain and low vegetation would place limitations of scale and magnitude on the development that could be absorbed. It is further considered that the demesne landscapes make a significant contribution to the character of the landscape in the central part of the study area, particularly around Carbury, Drenid and Dunfirih.

I would also disagree with the applicant’s statements regarding the value of the Chair of Kildare and the prominence of the hills in this flat and low-lying landscape. It is considered that these features form distinctive features which define the skyline and that they are highly regarded by the local population. They also have a historical significance and have gained a place in the history of the landscape over the ages. The Hill of Allen, for instance was said to be the home of Fionn Mac Cumhall and numerous observers have stated that it is part of an ancient pilgrimage route between Tara and Allen. Although the quarry on the north-western slopes of the Hill of Allen does detract somewhat from the views in that direction, the remainder of the view is so commanding and expansive that the ‘High’ rating is considered to be well deserved. The importance of these landforms is also clearly set out in the CDP and they are critical elements of the protected hilltop views and to many of the scenic routes.

The demotion of the Canals from ‘High’ to ‘Medium’ is also considered to be unjustified. The canal network is clearly very highly regarded by both the local population and by visitors to the area. This is reflected in the value attributed both locally and nationally to these water corridors, in terms of the many designations.

The amenity value appears to have been ignored and yet these water corridors form a central plank in the amenity offering of the area in terms of walking, cycling and boating. They are also considered to be very visually vulnerable due to the long vistas and straight line views available along the tow paths and from the many historical bridges, most of which are protected views.

9.5.4.2 Significance of Landscape Impact

The EIS concluded that the proposed development would have a 'Slight/Imperceptible impact on the features assigned with the 'Very High'/'High' Sensitivity rating, (i.e. Tara, Dun Ailinne, Croghan Hill etc.), due mainly to the distance and lack of intervisibility, and would have a 'Moderate-slight' impact on the features assigned with the 'Medium' sensitivity rating (i.e. Canals, Chair of Kildare, Northern Hills and Central Lowlands). The predicted impact on the flat farmland and urban area was considered to be Slight/Slight Imperceptible and on the remainder of the landscape, the impact would be Imperceptible. The main reason for the Moderate-slight impact was the elevated nature and higher sensitivity of the features (e.g. Hills). It was considered that the impact on the canals should be regarded as a 'worst-case scenario' only as there are only short stretches directly adjacent to the canals, and the water corridors are well enclosed by trees and tall vegetation. In addition, it was considered that the canals were created in the spirit of industry and hence there would be synergy with wind energy development.

I would disagree with the overall conclusions of the EIS on landscape impact. The significance of the impact is reduced on the basis of the importance or value of the landscape as perceived by the landscape professional who prepared the LVIA. Throughout the assessment, there is a failure to acknowledge or appreciate the true value of the landscape and quality of the sense of place that contributes to the regional distinctiveness of the area. These values and characteristics are recognised in the local policy framework and are clearly appreciated by the third party observers. As stated in 9.5.1 above, the essential characteristics include the high value and appreciation of the landscape expressed by the people who live and work in the area and by those who use it for recreational purposes; the settled and inhabited nature of the rural/agricultural character of the area; the rich cultural heritage of the area; the flat low-lying nature of the topography which facilitates expansive and long distance views; and the definition and relief provided by the low, yet prominent hills and by the water corridors.

Each of the LCAs is described as having either no capacity or has 'an inherent inability to absorb development', even the North-Western Lowlands and the

Western Boglands, due to the flat topography, the smooth terrain and the low vegetation. In addition, the Canals and the Hills surrounding the development site are particularly vulnerable due to the long range and expansive vistas available from these High Sensitivity LCAs. It is considered that the assertions that the landscape is 'anthropogenic' or primarily a 'working' or industrious landscape are unjustified. In particular, I do not accept the justification for downgrading the significance of the highly valued landscape features on the basis of the original industrial purpose of the canals or the presence of a number of quarries, peat extraction areas or commercial forests within the rural landscape.

Furthermore, it is considered that the reduction of the magnitude and significance of the impact is not justified on the basis of the distance and lack of intervisibility between important/sensitive landscape features and the proposed wind farm, or on the basis of the number of turbines visible from a particular vantage point. For instance, it is clear from a number of VPRs, such as the one from the Hill of Tara (MHDR17, Map 19), that notwithstanding the distance and lack of intervisibility with Emlagh, the cumulative impact of so many turbines, (from the Maighne clusters and from other wind farms to the west), in several different views from the Hill of Tara would be likely to alter the character of this highly sensitive landscape.

Similarly, the fact that 5 rather than 8 or 10 turbines are visible from a particular vantage point, is not sufficient justification for reducing the magnitude of the impact. This is considered to be particularly pertinent when the spatial extent is so large, that the frequency with which one experiences views of turbines, and clusters, would have a significant impact, particularly at the scale proposed and given the flat and smooth nature of the terrain. It is also considered that the visual dominance of the turbines, due to their scale and height, would cumulatively alter the character of the landscape to a 'windfarm landscape' and would adversely affect the integrity of the landscape character. The potential for vegetative screening is also very questionable, firstly given that the RSA shows that 60% of views within 1km and 48% of views within 2km are open views, secondly, because the vegetation merely screens views from roads, rather than the overall landscape, and thirdly, vegetation is unlikely to be very effective as a screening mechanism due to the height and visual presence of the turbines.

9.5.5 Visual Sensitivity of Receptors and magnitude of visual impact – how the landscape is experienced

9.5.5.1 Residential properties

The visual impact on the human environment may be assessed in terms of the key users of the landscape, such as residents, motorists, workers and those partaking in recreation or tourism. The impact varies with the location of the vantage point and the perception of the user. Thus the view from a residential property is quite different to that of a motorist or from a remote mountain top. The SNH landscape guidance differentiates between the perspective of local residents and that of tourists in the following terms:-

“A wind farm’s impacts on local residents require particular attention as, unlike visitors, they will experience a wind farm from different locations, at different times of the day, usually for longer periods of time, and in different seasons. Conversely, impacts on tourists and those taking part in recreation may be relatively brief, but their sensitivity to landscape change is regarded as high because their purpose is often to enjoy their surroundings.”

The EIS assesses visual impact on different receptors including local community views and on local population centres. However, it is considered that the impact on residential properties within 0-2km of the turbines, of which there are in excess of 1000 homes, has not been assessed in any great depth. In particular, the perspective from individual properties is significantly under represented. Given the height and scale of the proposed turbines relative to the flat topography, the number and geographical extent of the turbines, together with the proximity of many of the turbines to a substantial number of houses, it is considered that the potential impacts on residents living in the vicinity of the wind farm is likely to be considerable.

The CAAS report (on behalf of KCC) has commented on the “description of effects” in the EIS as being “appropriately comprehensive” on the basis that it was submitted that “no assessment of landscape impacts over such an extensive area could be reasonably expected to be comprehensive or exhaustive”. The CAAS report also noted from the TVI - Indicating Relative Intensity of Visibility, that the most significant effects would occur within a relatively limited – though still extensive – area around the project, with visibility decreasing with distance from the turbines. It was also observed that two of the zones of concentrated effects

coincided with areas of greatest population density and associated road networks, namely to the north (around Ballinakill) and to the south (around Cloncumber).

It should be noted, however, that the RSA is limited to views from roads and not from the overall landscape or from the perspective of residential properties. Furthermore, it is noted that although there is a reasonable number and spread of viewpoints (64 no. in total), they are all taken from roads, which may represent the perception of motorists, but which are not representative of the potential visual impacts on residential properties. It is further considered that they are not necessarily taken from the worst-case scenarios in this respect. Thus, for example, the VPR chosen may represent one of the open views from a particular road identified in the RSA, but there may be equally/more open views which coincide with a cluster of residential properties, a few metres/100m along the road. Some examples of this would be Allen Crossroads (KEDR11, Map 6), Bostoncommon and Feighcullen (KEDR13, Map7), Ballyteigue South (10LC32, Map34), Ballynamullagh near Kilshancoe (10LC12, Map 30), Drehid Crossroads (10LC13, Map 31) and R160 at Calf-field near Ballinakill (06LC17, Map 27).

From my inspections of the site and surroundings, it is considered that there are several small settlements or areas which are quite densely populated (for a rural area), which are in close proximity to the proposed turbines (within 2-3km), and which have not been included in the VPRs. A few examples would include :-

- Allenwood South - view to south towards Cloncumber, 500m-1km;
- Ballyteigue North – view west to Ballyteigue forest (note trees within forest appear to be approx. 20m tall with turbines rising out of forest at 169m);
- Drumsru - cul-de-sac with up to 20 properties running parallel to Cloncumber and within 1km of turbines;
- Kilshancoe - Drehid - Several cul-de-sacs running in a SE direction between Kilshancoe village and Drehid Crossroads - views of Drehid cluster – distances vary between 500m and 2km;
- Parsonstown - views to north and south of road with turbines less than 1km.

The CAAS report (5.4) indicates that in general, an object will appear to be very large or dominant at a distance of less than a multiple of 10-15 times the height of the object. Thus the proposed turbines at 169m are likely to be perceived as dominant at distances of between 1.7km and 2.5km. It is further asserted that the turbines if viewed (unscreened) at distances of 500m-1000m are likely to be perceived as profound – very significant, at distances of 1km-1.5km as very significant and within 2km as significant. This is reasonably consistent with the

analysis of the TVI mapping in the EIS wherein it was stated that an intensity of more than 500% would result in a visual presence of highly dominant or dominant and that the greatest degree of open views (RSA) were found to be within a distance of 0-2km of a turbine. It is clear from the TVI map (4A2) that there would be a substantial number of houses within the 500% zone of concentrated effects, including the residential areas referred to above.

The EIS states that there are 8 VPRs which relate to residential or community views. The sensitivity of these receptors has generally been rated as either Medium, Medium to Low or Low. The justification for the ratings is set out in respect of each VPR in Appendix M of the EIS. Although the reasons are variable and dependent on a number of factors, in general, it would appear that the professional judgement has rated the landscape as robust and resilient, or even degraded, and that views tend not to be vast or particularly unique. There are also a number of over-arching statements such as “approximately half the proposed turbines will be placed directly into the cut-away bogs with the remainder located within the marginal fringes of the bog”, (15.12.1). However, this misrepresents the situation as only three of proposed turbines are placed directly into the cut-away bogs, although approx. 14 are located within forestry areas, which are generally planted on former cut-way bogs. Other elements of the rationale include the productive nature of the wind turbines which are portrayed in a fairly benign manner. However, this analysis seems to be inconsistent with the value placed on the landscape by virtue of the CDP policies and designations for the area, including the Medium Sensitivity rating for the Western Boglands and the High Sensitivity rating for the higher ground overlooking the lowlands, as well as the observations of the overwhelming majority of third party observers. In addition, the analysis seems to ignore the fact that views from a substantial number of individual residences are likely to result in very significant localised impacts.

9.5.5.2 Designated/Protected Views and Scenic Routes

The Development Plans include a number of designated Scenic Routes and Protected Views. The EIS examines three types of designated views, namely Elevated Panoramic Vistas over plains from upland areas; Canal/River Views along the canal corridor where views extend further than other views over the lowlands; and Views of Prominent Hills or Landscape Features. The importance of the elevated views is downplayed generally on the basis of many hills being in private ownership, of being quite distant from the wind farm and whereby views are gained over an “anthropogenic and contemporary landscape”. Although the Chair of Kildare and the Newton Hills are seen as an exception, they are still seen as

existing within a broad-scale productive and extractive land use context. However, their prominence is also considered to be quite low due to screening by vegetation.

It is considered, however, that the panoramic vistas available from these elevated viewpoints are quite dramatic and allow for an appreciation and understanding of the landscape, which is difficult to attain from the lowlands. The elevated views from the uplands, as well as the prominence of these landforms in the landscape, mean that these features are also quite rare in the predominantly low-lying and smooth terrain and are therefore somewhat of a novelty. It is considered that the high sensitivity rating in the CDP reflects these characteristics and the very high value with which they are viewed by the people of North Kildare.

9.5.5.3 Features of heritage interest

The main features of heritage interest examined in the EIS are the canal networks, the hilltop heritage sites, Carbury Castle, Newbury Hall and Lullymore Heritage Park. As discussed previously, the sensitivity of the canal network was considered in the EIS to be 'Medium' rather than 'High', principally on the basis of being a robust industrial asset, which is strongly refuted by most observers, including Kildare Co. Co. The Canal RSA concluded that due to the extensive canal-side vegetation, the visibility of turbines along the canal network would only be significant where viewers are immediately proximate to the turbines. However, I have walked along the towpaths of several stretches of the canal network and have gained a different perspective. I formed the opinion that the vegetative screening is patchy and there are many long stretches where there are open views of the countryside in the vicinity of the proposed turbines. This factor combined with the widely-held view of the high amenity value of the canal network, together with the High Amenity designation and the High Sensitivity rating in the Kildare CDP, indicating a low capacity to absorb change, means that the visual presence of the turbines in such close proximity to the water corridors is likely to have a significant effect on the character and appearance of these vulnerable landscapes.

Although three turbines at Windmill are clearly visible from Carbury Castel/hill as well as clear views of Drehid-Hortland, Ballinakill and Derrybrennan clusters, it is claimed that due to the diverse and productive lowland landscape, the wind farm would not detract significantly from these views. It is further stated that there is little intervisibility between Newbury Hall (historical associations with Carbury Castle) and the proposed turbines due to the presence of vegetative screening. Lullymore Heritage Park is considered to be well screened by its woodland setting and

Cloncumber is considered to be partially screened from Lullymore cemetery/monastic.

9.5.6 Significance of Visual Impact

The significance of the visual impacts was based on a combination of the sensitivity of the receptor and the scale/magnitude of the impact, the results of which were set out in Table 15.13 of the EIS. It is noted that both the potential Sensitivity of the Receptor and the Scale/Magnitude ranges from Very High to Negligible, with 3 further rankings in between. The resulting Significance of Impact ranges from Profound to Imperceptible with the following 7 no. rankings in between – Profound-Substantial, Substantial, Substantial-Moderate, Moderate, Moderate-Slight, Slight and Slight-Imperceptible. The findings were that of the 64 VPRs, there were only two ‘Substantial-Moderate’ impacts and that the remainder were either ‘Moderate’ (16 no.), ‘Slight’ (19 no.) or ‘Imperceptible’ (11 no.) or in between these ratings, 8 no. ‘Moderate-Slight’ and 8 no. ‘Slight- Imperceptible’. Thus there were no impacts which were considered to be ‘Profound’, ‘Profound-Substantial’ or ‘Substantial’. The percentage breakdown is that 0% were found to be in the top three most significant impacts; 40% in the middle range and 60% in the low significance impact range.

As a general observation, the findings in Table 15.13 seem to be highly inconsistent with the evaluation of both the sensitivity of the numerous receptors and of the high degree of visibility afforded by the flat topography and low-lying lands, as set out in the earlier sections of the EIS and in the photomontages, and as discussed in the preceding sections of this report. The CAAS report on behalf of KCC also considered that over 50% of impacts are categorised as being in the lowest three classifications, which it considered to show a disparity between the evidence presented in the EIS and the assessment of significance of effects. It was stated that *“Clear evidence is presented in many instances as to magnitude and effect, which are then argued as being ‘not significant’ on the basis of opinion alone”*.

9.5.6.1 Residential/community impact

The finding of highest visual impact (Substantial-Moderate), relates to two residential/community VPRs, namely, the view of turbines in the Ballinakill cluster from the R160 at Calf field (06LC17, Map 27) and the view of Cloncumber cluster from Ballyteigue South (10LC32, Map 34). However, these are representative of residential receptors which would be located in very close proximity to these very tall turbines, (540m and 840m respectively to the closest turbine). It is considered that visual receptors in the form of ‘Residents at home’ should be awarded one of

the highest sensitivity ratings, as recommended by the GLVIA, yet the EIS rated these as 'Medium-Low' sensitivity. Given the proximity to several turbines with a hub height of 109m and a tip height of 169m, it is difficult to understand why the EIS rated the magnitude of impact as 'High', when it is considered that the turbines are likely to have an overbearing and overwhelming visual impact on the residential properties at these locations.

I note that in 06LC17, the turbine appears to be not much taller than the house, yet at such close proximity, it should appear to be much more visually dominant. In addition, it must be noted that the turbines are located on both sides of this road which is lined by residential properties on both sides. The viewpoint at 10LC32 gives the impression that the turbines are barely visible above the roofs of the houses. However, these houses will have direct views from their windows and gardens of the turbines at close range. It should also be noted that the viewpoints at Ballyteigue South are just representative of similar views for numerous properties along the same road and in the vicinity, as well as similar views of Cloncumber from communities such as Feighcullen, Bostoncommon, Ballyteigue North, Allenwood South and Drumsru.

It is noted that of the 16 no. 'Moderate' Impacts and 8 no. 'Moderate-Slight' impacts, there are a further 6-8 VPRs which are generally representative of community or residential views. It is considered that a similar analysis to that relating to the 'Substantial-Moderate' impacts, as set out above, is applicable to many of these. In particular, VPR Refs 10LC12, 10LC13, 07LC30, (Maps 30, 31 and 29 respectively), where there are views of turbines in the Drehid cluster at close proximity to residential properties. It is also acknowledged in the EIS that views of turbines from up to 2-3km would be likely to seem visually dominant. As stated previously, there are over a thousand residential properties identified as being within such proximity, and whilst many may benefit from screening by buildings or vegetation, it is also likely that there will be many instances where the impact would be very significant.

9.5.6.2 Hilltop views

The 'Moderate' elevated/hilltop views include views to/from Newtown Hills (KEDR2 and KEDR30, Maps 1 and 12 respectively), Carbury Hill and Castle (KEDR3 - Map 2, KERD4 – Map 3 and 10MR31 - Map 58) and the view from Bostoncommon towards Cloncumber (KEDR13, Map 7). Views from the Hill of Allen are also included at KERD41 (Map 17, from the tower) and from Allen Cross, at the foot of

the hill, (KEDR11, Map 6). The Newton Hills VPRs also coincide with views from Scenic Route SR20 and the Bostoncommon VPR coincides with SR8.

The hilltop view from the Hill of Allen is dramatic and expansive, notwithstanding the presence of a large quarry below. There are 47 turbines visible from this culturally and historically sensitive location, which intrudes severely into the elevated and panoramic view. It is considered that the significance of Moderate-slight is due to the downgrading of both the sensitivity of the receptor and of the magnitude of effect due to the presence of the quarry and what the applicant describes as the anthropogenic landscape. As stated previously, I would disagree with this analysis on the basis of the cultural significance and visual prominence of the Hill of Allen, which gives it a regional significance and as the view extends out well beyond the quarry.

It is considered that the effects on the views from Newton Hills and Bostoncommon, respectively, are likely to have a much greater magnitude than 'Medium', and hence be greater than 'Moderate'. It is difficult to understand the 'Medium-low' magnitude assigned to the effect on the views available from the top of Carbury Hill/Castle. There would be clear views of both Windmill and Drehid clusters from here which would be in close proximity to this very important and sensitive heritage feature in the area. In addition, views are available from the Scenic Route (SR28) which surrounds the hill. Although screening reduces the incidence of such views, the impact would still be considered to be very substantial. Given the height differential between the turbines (169m) and Carbury Hill (142m), the turbines would be incongruous and extremely visually dominant. It is considered that these turbines, combined with the Ballinakill cluster, the Hortland cluster and the Derrybrennan cluster (all of which are highly visible from the hill), would re-define the landscape around the castle to a 'windfarm landscape'. I disagree with the downgrading of the landscape value to an anthropogenic one and consider that the views of the farmland and demesnes in the middle and foregrounds, including clear visibility of Newbury Hall, together with the distant views of landmark features such as the Newton Hills contribute to an attractive and pleasant landscape which has synergy with the historic nature of the hill.

9.5.6.3 Impacts on Scenic Routes

In addition to the Scenic routes mentioned above, there are at least two other Scenic Routes (SR 38 and SR39), which have VPRs that are rated as having a 'Moderate' Impact. These are VPRs KEDR14 – Map 8 and KEDR15 - Map 9. These routes are along the R414 from Rathangan to Allenwood, via Lullymore. It is

considered that the views are highly scenic for long stretches along this road. The most scenic views are to the east and south of the road, which is towards Cloncumber, and comprise open and expansive vistas across plains with little or no obstruction towards Ballyteigue forest and the Slate River, with the backdrop of the Chair of Kildare hills. The proposed turbines would occupy a significant part of the view and would be very visually prominent as they would be as close as 840m and 1.8km. It is considered that Ballyteigue forest would not provide any screening and in fact the turbines appearing to rise out of the forest would seem incongruous and discordant. It is considered that both the magnitude of the effect and the sensitivity of the receptor have been rated much lower than seems justified.

There are quite a number of Scenic Routes affected by each of the clusters. There are 6 no. Scenic Routes affected by Cloncumber. These are SR8, SR17, SR19, SR38, SR39 and SR40. There are also 11 no. Protected views along the Grand Canal and Barrow Line. Scenic Routes SR38, SR39 and SR40 are also affected by Derrybrennan cluster. Scenic Route SR20 is affected by both Drehid-Hortland and Ballinakill clusters and SR28 is affected by both Windmill and Ballinakill.

9.5.6.4 Impacts on Protected Views - Canals

The Protected Views, which have been found to be likely to have a Moderate or Moderate-slight impacts, in addition to those which coincide with the Scenic Routes and heritage features as discussed above, are mainly those from bridges over the two canals. In Kildare these are from Glenaree Bridge (KEDR42, Map 18), from the New Bridge at Littletown (KEDR38, Map 14) and from Rathangan Bridge (10CP09, Map 42). It is considered that the view from Glenaree, which is in a very scenic rural setting with an attractive lock in the foreground, a strategically located building to the south and a forest alongside the canal to the north, is likely to have a magnitude greater than 'Medium'. The view is of 7 turbines in a staggered layout and the closest turbine would be only 560m away, with the remainder stacked behind. It is considered that the turbines would be incongruous and would detract from the quality of the view. The view from the bridge at Littletown is likely to be ameliorated by vegetative screening. However, a few hundred metres further west along the towpath, the view would be much more open along the Barrow Line. The Skew Bridge, which is adjacent to Ballyteigue Castle, is less than 1km to the west of New Bridge and the views from this stretch of the Barrow line and in the Lowtown area are very open with clear visibility of Cloncumber cluster stretching down to Feighcullen. There are several houses fronting onto the road running alongside the waterway too. It is considered that both the sensitivity and magnitude of the impact

from this part of the canal network are likely to be considerable and that this has not been adequately assessed.

In Meath, the Protected Views with a Moderate Impact include views from Blackshade Bridge (MHDR34, Map 22) and at Boolykeagh (06AH4, Map 54). The latter one was mistakenly called Boynedock in the original submission. It is considered that the magnitude of the effect at Blackshade Bridge is likely to be greater than 'Medium', given that there will be up to 19 turbines visible with the closest at 2.88km. It is considered that it creates a cluttered and discordant effect from this bridge, which is a protected view.

It is considered that one of the most severe impacts on the canal network is the view from Boolykeagh. This is taken from the viaduct close to where the River Boyne and the R160 cross the Royal Canal. Meath Co. Co. has designated it as Protected View 54 in the CDP. There is a renovated Lock-keeper's cottage on the southern side of the canal and the entrance to the canal towpath is at a carpark on the outskirts of Longwood village. This stretch of the canal seems to be extensively used for walking, cycling and boating. It is a very picturesque setting and has a tranquil rural ambience. Turbines T1 and T2 would be very close to the canal at this location (approx. 600m). In addition, the cluster follows the line of the canal in a staggered layout between Boolykeagh and Moyvalley Bridge to the south-east, with T6, T7 and T8 in close proximity. This is a very peaceful and attractive stretch of the canal which has long sections with little or no vegetative screening and would have open views of the turbines within the agricultural fields. It is difficult to understand why the magnitude of effect is judged to be Medium, when it is considered that the impact would be very severe. It is considered that the turbines would be highly visually dominant with no backdrop and would intrude into the Protected View to a significant extent. The sensitivity of the receptor is also misjudged in my opinion as it is clearly a highly valued local amenity which is also earmarked for a Greenway, giving it national and regional significance also. The canal networks are considered worthy of protection in both of the Development Plans for the area, with numerous protected views from bridges. Thus the Moderate Impact is highly questionable and is strongly refuted by third party observers.

9.5.6.5 Views from Longwood ACA

The EIS included just one VPR which was taken from the outskirts of Longwood, along the R160 road leading to Boolykeagh, (06CP12, Map 37). However, the Further Information submitted in September 2015 included an additional set of photomontages taken from Longwood Village ACA and the approach roads to the

settlement. It was concluded that there would be no full/open views of turbines and that partial views would be available only from two VPRs, namely from Main Street looking West (06CP12_F) and from 'The Green' (06CP12_G). It is considered that the impact on these views would not be overly intrusive. However, the impact on the view from the R160 is considered to be much more significant and would detract from the setting of the Architectural Conservation Area.

9.5.7 Conclusions re landscape and visual impact

The relatively low predicted impacts of the proposed development on both the landscape character and the visual amenity of the area are difficult to accept given the nature of the receiving environment and the scale, magnitude and spatial extent of the proposed development. It is considered that this low impact has been arrived at by a combination of undervaluing the sensitivity of receptors and the over-reliance on mitigating factors to reduce the magnitude of the impact, (such as vegetative screening, number of turbines visible from a vantage point, distance from turbines beyond 5km and lack of inter-visibility with other wind farms). It is considered that the relatively low receptor sensitivity may be partly due to the erroneous classification of the landscape character as 'Flat Peatland', which would have a more robust character than 'Hilly and Flat Farmland', together with the reluctance to accept the Medium Sensitivity rating of the Western Boglands and the High Sensitivity rating of the highly scenic canal network and of the visually prominent upland areas surrounding the development. Furthermore, it is considered that the impact on visual and residential amenity, in terms of both localised impacts from individual turbines and from the cumulative impact of clusters of turbines spread throughout the landscape, has been seriously underestimated.

It is considered that the Wind Energy Guidelines 2006 would never have envisaged the placing of a development of the scale, magnitude and spatial extent proposed in an inhabited and intensively used landscape, which is highly valued, where the visual presence of the very tall turbines would compete with and detract from the features of interest which combine to create the sense of place and define the landscape character of this part of North Kildare. It is considered, therefore, that a refusal of permission on these grounds would be consistent with the recent decision by the Board in respect of Emlagh Wind Farm (17.PA0038), which proposed a similar number of turbines at the same height in a similar landscape, and which stated:-

"...It is considered that a wind farm of the scale, extent and height proposed would visually dominate this populated rural area. Would seriously injure the

amenities of property in the vicinity, would interfere with the character of the landscape and would not be in accordance with the overall objectives of the Meath CDP....[and] would not align with the WEPG as this guidance document did not envisage the construction of such extensive large scale turbines in an area primarily characterised as hilly and flat farmland landscape and in such proximity to high concentrations of dwellings....”

The visual and landscape policies for the area, in both the Kildare and Meath County Development Plans, seek to protect and enhance the visual integrity of the landscape, which include designated scenic routes, protected views, hilltop and canal views, heritage sites and landscape features of both national and regional importance, as well as a significant density of residential development within 1km of the proposed turbines. It is considered that the proposed development would significantly alter the appearance and character of the landscape, would have a disproportionate adverse impact on the visual amenities of the area and on the visual integrity of the landscape, which would not be in accordance with either the policies and objectives contained in the County Development Plans or with the guidance contained in the Wind Energy Guidelines.

9.6 Archaeological, Architectural and Cultural Heritage

9.6.1 Receiving environment

The area within which the site is located, together with the surrounding landscape, comprises an extremely rich archaeological landscape which spans the ages. The EIS, Chapter 14, contains an extensive description of the receiving environment, which demonstrates this point, as it is over 70-80 pages of text. It is noted that the proposed wind farm would be located adjacent to the easternmost extent of the Bog of Allen and south of the Esker Riada, and consists mainly of a number of ‘islands’ within the bogland which represents good agricultural land. The archaeological evidence shows that the area has been densely inhabited since Prehistoric times with archaeological features dating from the Mesolithic period, the Neolithic period, the Bronze Age, the Iron Age, the Early and Late Medieval periods, the Early Christian period, the post medieval period, together with built heritage from the Georgian and Victorian (Industrial) periods and the 20th century. The ACO from Kildare Co. Co. stated in his report that there are 114 Protected Structures and 282 Recorded Monuments within a 3 km radius of the wind farm site and that there are 2 National Monuments within 5km, as well as a number of further National Monuments and UNESCO Candidate World Heritage sites within the wider

landscape area. The Protected Structures include many canal bridges and associated infrastructure as well as several Demense/Designed Landscapes.

The EIS states that the rich archaeological landscape includes extensive tracking systems across the bog, ('toghers' and gravel tracks), forming ancient roads to places of ritual and religious significance, refuge, settlement and strategic importance from prehistory onwards. These strategic sites include Carbury Hill, the Hill of Allen and Chair of Kildare in the close landscape and in the wider landscape, Dun Ailinne (seat of the Kings of Leinster) and the Hill of Tara (Ancient Capital and seat of the High Kings). Many of the tracks are recorded monuments and others are identified as potential archaeology. It is stated that there are 46 ringforts and 39 enclosures (essentially degraded ringforts) within or near the site. There is also an abundance of archaeological evidence from the Early Christian period including ecclesiastical monuments and monastic settlements, including a protected site at Lullymore (National Monument, 2.3km from Derrybrennan cluster) and one at Clonard (3km north of Ballinakill).

Evidence from the late medieval period include mottes, baileys, castles and tower houses, situated on dryland ridges overlooking the routeways and the bogs, the most notable of which is the ruins of the Jacobean Fortified house at Carbury Hill, (approx. 2km from Windmill). There are also numerous moated sites, (17 no within 5km), deserted medieval settlements (at Ardkill, Ballintine and Cloncurry), medieval churches (including one at Dunfirth). However, there are further tower house ruins at Mylerstown (1.5km from Windmill cluster), Ballyteigue Castle (adjacent to Cloncumber), Donadea (2km from Dredid-Hortland) and Newcastle. There are three medieval castles within 5km of the site, Grange Castle (5km to west), Carrick Castle (3.7km to west) and Donore Castle (3.7km to west).

There is an extensive range of 18th and 19th Century country houses in the vicinity of the site, many complete with landscaped demesnes and others forming parts of farm complexes, a considerable number of which are Protected Structures and/or NIAH listed. These protected structures/demesnes are sited in close proximity (1-2km) of Ballinakill, (Ballina, Garrisker and Ballinderry); Dredid-Hortland, (Newpark, Knockanally, Hortland, Donadea, Metcalfe); Cloncumber, (Bushfield, Feighcullen House); and Windmill, (Newbury, Williamstown, Balrennet, Ballinderry, Coolyna, Teelough and Haggard). The most notable of these are Newbury Hall and Williamstown House, (each of which is an 18th Century Palladian mansion designed by Nathaniel Clements, who designed Aras an Uachtarain, set in large demesne landscapes, and which are within 2km of Windmill cluster); and Knockanally House

and Demesne (within 1km of Hortland). There are also two ACAs, one at Longwood (within 2km of Ballinakill) and one at Rathangan (3.8km from Cloncumber).

The description of the receiving environment is reasonably comprehensive in terms of above ground or recorded features of archaeological and architectural interest. However, it is noted that concerns were raised by a number of third parties, (including Dr. Charles Mount who made a submission on behalf of Donadea Against Turbines, Appendix F), as well as by the Architectural Conservation Officer and the Heritage Officer from Kildare Co. Co. and Meath Co. Co., respectively, regarding the comprehensiveness of both the archaeological and the architectural heritage of the area. In particular, concern was raised regarding the failure to identify certain built heritage sites and the nature/extent of the potential archaeological impacts, as well as the inadequacy of the evaluation and assessment of the impacts on the known and unknown heritage assets. The applicant has addressed many of these concerns in the FI, the adequacy of which will be discussed in the following sections.

9.6.2 Archaeology

In terms of archaeology, it was considered that whilst the potential for the discovery of significant archaeological features was identified, as was the potential risk to such archaeology, little or no effort was spent on investigating the likely extent, nature or date of such potential archaeology. Specifically, the concerns related to the absence of any geophysical surveys or test excavations, which the applicant intends to carry out, in a limited number of locations, after the grant of planning permission for the development. A number of examples (in relation to the Drehid Hortland cluster) were cited by Dr Mount as follows:

Possible Medieval moated site close to T47 – notwithstanding the fact that the potential existence of this important monument has been identified from aerial photography, no geophysical survey or test excavation has been carried out to establish the extent of what is there and to devise suitable mitigation.

Afforested area beneath T11-T15 – the EIS identified that there is significant archaeological potential to discover tracks/gravel paths beneath the tree root system and deep into the bog in terms of the previous discovery of toghers, yet no test excavation or geophysical work undertaken.

Dry-Wetland interface at edge of Timahoe Bog – EIS acknowledges that there is evidence of a considerable number of known archaeological features within and in the vicinity of Drehid cluster, (14 no. RMPs within 1km), which indicates the

very high potential for further finds in this archaeologically sensitive location, yet no testing carried out.

The Heritage Officer (Kildare) echoed these concerns and identified approx. 30 RMPs that would be located in close proximity, (generally 500m-1000m), to various proposed turbine sites within/adjoining several clusters as well as to tracks, cable routes and the MV cable routes. Furthermore, it was noted that T33 would be located within the same field and within 60m of a known ringfort (KD017-004) and that there would be a construction compound within 114m of the same archaeological feature. The applicant acknowledges that there is potential for a direct impact on the subsurface archaeology in the vicinity of this ringfort and also that there would be a direct impact on the setting of the recorded monument including the physical dominance of the turbine over the RMP. However, there is no mitigation proposed or considered possible in terms of the impact on the setting. I note that there are no photomontages provided to demonstrate this impact. It is considered that this would result in an unacceptable impact on a recorded monument and no justification has been provided for the siting of T33 and the construction compound in such close proximity to this RMP. There is also potential for direct impacts on other RMPs including Sallymill, a trackway between Derrybrennan and Cloncumber, archaeology close to roads at the edge of the bog and at river crossings. It is proposed that these would be monitored.

It is noted that indirect impacts have been identified in respect of the visual impact on the setting of numerous recorded monuments within a 2km radius of the proposed development. These include 3 RMPs within 1km of Ballinakill, a medieval church and graveyard and 10 further monuments within 1-2km of this cluster; Mylerstown Church and Castle, 1.9km E/SE of Windmill; a large number of recorded sites within 1km of Drehid-Hortland (some of which are 500m distant) including at least 5 ringforts, a crannog, a medieval church and graveyard at Dunfirth and one instance in Drehid where a ringfort and souterrain would be surrounded by 5 no. turbines at distances varying between 293m and 785m. The potential impact on the setting of these and other recorded monuments is dismissed on various grounds such as vegetative screening, significant changes to the landscape surrounding the monument over time and, notwithstanding a visual change to the landscape, that the significance of the RMP, or the ability to understand or appreciate it in its wider landscape setting, would not be reduced by the proposed development. There is no evidence provided to support the opinions offered, such as photomontages, or detailed information on how the surroundings of the asset would have contributed to its understanding/appreciation. There is no analysis of how any key views or vistas to/from the monuments would change or

what the visual impact would be in terms of relative scale, visual dominance, and magnitude of change relative to the sensitivity of the setting. It is considered, therefore, that the assessment of the impact on the setting of a considerable number of these monuments is inadequate.

The applicant acknowledges the importance of these and other recorded sites, as well as the potential for direct impacts on the potential archaeology, by proposing that test excavation and geophysical survey work “will be carried out well in advance of construction” with a view to informing suitable mitigation in consultation with DAHG. The sites in question are limited to those turbines/associated tracks and cables which lie in close proximity to potential sites and recorded monuments, (T6, T47, T33 and T35), the Windmill turbines (T24-26) which are sited on cut-over bog, and the MV cable route/haul route at Lullymore West, which runs alongside a gravel track (RMP). In addition, a “cordoned-off corridor that has been archaeologically resolved prior to construction”, will be established and “preserved in situ and fenced during construction”. The only other forms of mitigation include monitoring of all earth works and the omission of turbines during the design stage (already completed). I would agree with the HO and the third parties that it is inappropriate to delay the carrying out of testing and survey work, and the design of the mitigation measures, until after the determination of the application and further consultation with DAHG. It is considered that this would not be in accordance with best practice in carrying out an EIA, as the potential archaeology that may be impacted by the proposed development would be unlikely to have been identified in advance, as required by the EIA Directive. This is particularly relevant in the current case due to the substantial evidence of the extremely rich archaeological potential of the area.

9.6.3 Architectural heritage

The ACO (Kildare) considered that the full range of features of architectural heritage that exists within the vicinity of the site had not been identified by the applicant and that it was unclear as to whether all of the heritage assets of the area had been evaluated in terms of the potential impact of the proposed wind turbines. The ACO report identified a wide range of historic houses and demesnes, in respect of each of the clusters, which it was considered had not been adequately addressed. The HO also considered that surveys of bridges on certain ‘Node Upgrades’ (along the haul and delivery routes) should be carried out in advance of the determination of the application. The perceived omissions included:-

Ballinakill :- Ballinakill House and Demesne and Kilmore House and Demesne;

Windmill :- Oldcourt House and Demesne;
Drehid:- Metcalf Park, Dunfirth House/Demesne, Mulgeeth House, Kilmurray/Hermitage House, Bloomfield House and Drehid House;
Hortland:- Hortland and Knockanally Demesne; Donadea Demesne; The Range, Range Cross roads; and Beechgrove House;
Windmill and Drehid-Hortland:- Drummin House and Demesne;
Derrybrennan:- Lullymore Lodge

The applicant responded to each of these suggested omissions in turn, which was summarised in Section 5.2.3 above, and will be discussed further in the following section.

The ACO (Meath) largely confined comments to the impact on the historic built heritage, to Protected Structures within the Longwood ACA and in the vicinity of the Royal Canal, which it was considered had not been adequately identified and to cultural heritage sites of international/national importance, and the likely impact on the Longwood ACA. The FI generally addressed the issues raised to the satisfaction of Meath Co. Co. and included a new set of photomontages for Longwood ACA.

9.6.4 Assessment of the ‘Setting’ of a heritage asset

9.6.4.1 The interpretation of setting

The ACO Kildare considered that the applicant had used a very narrow interpretation of ‘setting’ in respect of heritage assets and considered that it should not be confined to the curtilage. Attention was drawn to the definition of setting used in various policy guidance documents of relevance such as ‘English Heritage The Setting of Heritage Assets’; ‘Historic Scotland: Managing Change in the Historic Environment’ and the Kildare CDP. It was also suggested that a Historic Landscape Assessment should be carried out to facilitate a better understanding of the nature of the landscape. The ACO stated that in most cases, the interpretation of the setting was disputed and that in general, the concern related to the low importance assigned to the visual impact of the wider landscape setting of a site. The overall conclusions were that the proposed development would contravene polices PS16, CH1 and CH2 in the CDP, would negatively impact on the setting of Protected Structures and rural skyline character, on the historic designed landscape of demesne character and on views and prospects to/from Protected Structures.

The applicant, in response, states that the assessment of setting was carried out on a case-by-case basis in accordance with the guidance documents referred to in the P.A. submission. It stated that it took into account the property type, the significance of the property, the natural topography, views to/from the property and historical associations in establishing the contribution of setting to the significance of the site, and furthermore, that an impact would only occur if the change affects the contribution made by setting to the significance of the asset. Although this latter point is made in respect of the assessment of impact on the setting of many of the heritage assets (particularly the protected structures and demesne landscapes), it is generally not corroborated by any evidence, such as historical maps, photographs or documentary evidence, current photographs demonstrating the point, or photomontages.

Yet the end result is that no significant impacts have been identified on the setting of any of the 114 protected structures (or the 282 Recorded monuments) which are widely dispersed throughout the study area, despite the unprecedented height, scale and number of turbines proposed in a landscape which has hitherto not experienced this form of development. The justification for the lack of any significant impact offered tends to be based on distance from the turbine, (without a corresponding analysis of how this mitigates the visual impact in terms of dominance); limited views into/out of the main house or parkland, (by for example shelter belts, mature vegetation, but without any analysis of how the vegetation would screen/reduce visual impact on particular views); degraded/changed landscape settings; and a generic comment that part of the significance of these demesnes is their deliberate separation from the landscape within which they lie.

9.6.4.2 Guidance on the Setting of Heritage Assets

Guidance on the setting of a Protected Structure is contained in Chapter 13 of the Architectural Heritage Protection Guidelines for P.A.s (2011), which distinguishes between curtilage and attendant grounds. Curtilage is generally taken as the parcel of land immediately associated with the structure and attendant grounds generally lie outside the curtilage but are associated with and intrinsic to its function, setting and appreciation. It is stated (13.3.1) that “the designed landscape associated with a protected structure was often an intrinsic part of the original design concept, and as such, inseparable from the building.” More recent guidance on the issue of setting of a heritage asset is that its importance lies in what it contributes to the significance of the heritage asset (English Heritage, March 2015) and the way in which the surroundings of the asset contribute to how it is understood, appreciated and experienced (Historic Scotland, June 2016). These guidance documents also

provide a framework for assessing the significance of the asset and its setting. This includes advice from English Heritage on cumulative change as follows:

“Where the significance of a heritage asset has been compromised in the past by unsympathetic development affecting its setting.....consideration still needs to be given to whether additional change will further detract from, or can enhance, the significance of the asset. Negative change could include severing the last link between an asset and its original setting”

Thus it is considered that changes to the landscape setting that have occurred in the intervening years, are not necessarily adequate justification for lowering the significance of the impact.

The guidance on ‘setting’ also places emphasis on the importance of ‘views to’, as well as ‘views from’, an asset, relationships with other features and ‘a sense of place’ where the overall experience of an asset derives from a combination of factors including associative values attributed by the public. Thus in terms of the network of demesne landscapes associated with country houses in the study area, it is considered that an impact on setting would not necessarily be confined to views out of the property. It is considered that the landscape around Windmill, Drehid and Hortland is characterised to a considerable extent by the visual presence of demesne landscapes. These include Williamstown House, Newbury Hall, Donadea Demesne and Knockanally House and Hortland Demesne, which are exceptional examples of 18th century mansions with associated designed landscapes, and a network of smaller country houses, most of which are protected structures and many with demesnes and parklands, which are located in close proximity to the larger houses. There is also a network of country houses around Ballinakill and Cloncumber clusters. It is considered that the visual presence of either the mansions/house themselves and/or their elaborate entrances/driveways and walled/railed perimeters with mature planting, all contribute to the wider setting of this network of heritage assets, that are a defining characteristic of the area.

It is considered that the introduction of such tall turbines, which would be spread throughout this landscape, would significantly change how this landscape is experienced. SNH guidance on “Assessing the Cumulative Impact of Onshore Wind Energy Development” differentiates between two types of cumulative impact. ‘Combined Visibility’ is where the observer is able to see two or more developments at a time and ‘Sequential Visibility’ is where the features appear with regularity along a route. It is stated that cumulative effects can change the landscape character to such an extent that they create a different landscape character and

that two windfarms do not have to be intervisible, or even visible from a common viewpoint to have impacts on the landscape experience for those travelling through an area. I would, therefore, agree with the views of the ACO Kildare that the proposed development would have a negative impact on the setting of the heritage assets of the area and would be contrary to policies PS1, CH1 and CH2 of the Kildare CDP.

9.6.4.3 Setting of buried assets and lack of public access

The setting of buried assets, buried archaeology and sites of historic battles, where there are no visible traces, are also considered to be worthy of protection as “Its contribution is not nullified if the asset is obscured or not readily visible”, (English Heritage). The guidance further states that lack of public access, numbers of people visiting it, remoteness or challenging terrain should not be used to downplay the significance of an asset, as “the potential to appreciate the asset may increase once it is interpreted or mediated in some way or if access to currently inaccessible land becomes possible”. It is considered that the assessment of impact on the setting of recorded monuments and protected structures within and in close proximity to the site is wholly inadequate. As discussed in the Landscape and Visual Impact section of this report, the visual dominance of a structure which is 169m tall is likely to be very high at distances of up to 2-3km. It is considered that this issue has not been adequately addressed in the EIS or in the subsequent submissions from the applicant.

9.6.4.4 Setting of villages and towns

The setting of villages and towns, such as Longwood and Rathangan, each of which has been designated as an ACA, are also considered to be worthy of assessment. The applicant has included photomontages which address this issue. However, the conclusions in terms of the impact are disputed by planning authorities and by the third parties. In each case, the significance of visual effect was considered to be Moderate-slight, (Rathangan 10CP09, Map 42 and Longwood 06CP12, Map 37). It is noted that in each case the sensitivity of the visual receptor is either Medium or Medium-Low, which seems to be inconsistent with the ACA status of these villages. In the case of Rathangan, the magnitude is predicted to be Medium-low despite the fact that 6 nacelles would be visible at a distance of 4.5km. The viewpoint was taken from Rathangan Bridge, which is a prominent viewing point within the town and is an attractive and scenic feature in itself. Although there are some trees in the middle ground, it is considered that the impact is likely to be

more significant than that indicated in the EIS as the screening effect of the trees would be unlikely to be very effective.

In the case of Longwood, the magnitude was considered to be medium. However, the photomontage shows that there would be up to 16 turbines visible, the closest of which would be 1.4km from the edge of the village, and would be very visually dominant. The additional photomontages also indicate that there would be partial views and glimpses of turbines/blades from the Main Street and public spaces within the village. The Meath H.O. considers that the impact would be 'Moderate' and not 'Moderate-Slight' as stated in the EIS, and that the setting of the village would be adversely affected. Thus the sequential visual effect would give rise to a frequency of viewing of turbines which would alter the character of the landscape in terms of the setting of the village and would affect views out of the village from key locations. It is considered that these views would result in an adverse impact on the ACA.

9.6.5 National Monuments

There are two National Monuments within 2.5km of the site, (Lullymore and Carbury), and 3 further National Monuments within 5km of the site, (Grange Castle, Carrick Castle and Donore Castle), Table 14.34 of EIS. There are a further three National Monuments in the wider landscape setting, namely Trim Castle (16km to north), Hill of Ward/Talaghta (20km to the north) and Rock of Dunamase (30km to the south/southwest). There are also a number of other sites of archaeological or historical significance in the wider landscape such as Croghan Hill complex (20km to the west) and Kildare Round Tower (10km to the south). The history and significance of the sites is set out in the EIS (14.3.2.7/8) and most are the subject of photomontages.

9.6.5.1 Carbury Complex

Carbury is a very significant heritage asset in the area. It is described in the EIS as a multi-period archaeological site representing almost all phases of archaeological activity in the area and is viewed as a hilltop complex with excellent views over the surrounding countryside. The complex includes several recorded monuments including a castle, a fortified house, a designed landscape, a motte, mausoleum and graveyard, a church and graveyard and several mounds and barrows. There is evidence of activity from the Bronze Age through the medieval period up to the Elizabethan period, when the fortified house was abandoned in favour of Newbury Hall. This Palladian mansion was built in 1836 for the family who occupied the

castle and was designed to be visually linked with the castle. It is acknowledged that the historic relationship between Carbury, Carbury Village and Newbury Hall Demesne is significant and an important part of the setting of the site.

It is stated that the contribution made by the hilltop setting to the significance of the site is that it provides an understanding of the importance of the site from the Anglo Norman landscape and that it also has a ritual significance from the prehistoric period. The EIS includes an excerpt from Wilde (1849) which described the view from the summit as follows:

“a most commanding and extensive prospect, extending over the counties of Dublin, Kildare, Meath, Carlow, Westmeath, the King’s and Queen’s counties with the Hills of Allen, Carrick, Balrennet, Edenderry and Croghan, standing up”

Due to its elevated position, all of the 47 turbines would be visible from the summit (142m OD). The Windmill cluster (T24-26) would be the closest at approx. 2km to the north, with the Ballinakill cluster forming a backdrop and with the Drehid-Hortland cluster located approx. 4km to the east and south-east. The Derrybrennan and Cloncumber clusters are located approx. 7-11km to the south. There are four photomontages of relevance, one from the hill (with three views) and three from the surrounding landscape towards the hill (Maps 2, 3 and 53). The view from the hill is taken from the shoulder (10AH31, Map 58). It is acknowledged that there would be a Moderate impact, but it is considered that it “would not have visual dominance over it though it may be distracting”. I would strongly disagree with this assessment. The views at present are expansive and commanding with uninterrupted visibility for miles in every direction, which takes in several important landmarks and landforms, some of which have historical and cultural significance. The placing of turbines, which would have blade tips taller than the summit of the hill (142m OD), within 2km, 4km, 7km and 11km in every direction is more than a distraction from this important national monument. It is considered that the proposed development would introduce visually dominant structures into the landscape which would alter its character and would have a significant and adverse visual impact on the setting of the hill. It is further considered that it would fundamentally alter the understanding and appreciation of this historic asset.

In terms of the intervisibility with Newbury Hall, it is acknowledged in the EIS that Drehid-Hortland lies to the east of the demesne but the applicant considers that “the cluster lies separate and distinct from the house and its associated demesne lands” and that there would be “an adequate separation distance....to ensure that the turbines do not dominate over the scale of the property or its surrounding

demesne or disrupt an understanding between the hill and the house". A further photomontage is provided to demonstrate the impact on the view from the northern corner of the Newbury Demesne (10MR31, Map 53). The EIS accepts that blade tips will be visible between the houses and the vegetation to the north, but considers that the impact would be Moderate-Slight. The EIS states that although the wider distant views will be visually altered, it would not interrupt key associated views towards, Knockcor, Mylerstown and Newbury Hall and that the key elements which contribute to the understanding of Carbury would still be legible. However, on further examination of these views, and from observations around the perimeter of the demesne, it is clear that the vegetation within and on the borders of the demesne are not particularly dense or high. The house can be seen from many vantage points surrounding the estate and it is difficult to believe that the designed views of the castle would not be degraded by the presence of the turbines, (from various clusters), either within the same viewsheds or in sequential views from the same point. It is considered that the proposed development would adversely affect the setting of Carbury complex in terms of its intervisibility with Newbury Hall.

Further viewpoints from/near the Scenic Route SR28 surrounding the castle are provided (KEDR3 and KEDR4, Maps 2 and 3). As stated previously, (in terms of the LVIA), it is considered that these do not represent the worst-case-scenarios as clearer and more open views are available from the scenic route to the north and south of Knockcor, to the south of Williamstown House and from the realigned R402 at Ardkill. It is, therefore, considered that the proposed turbines at Windmill would intrude on views of the castle from the scenic route and the surrounding countryside and would further detract from the setting of the heritage asset.

9.6.5.2 Lullymore Monastic Complex

Lullymore is also a very significant heritage asset in the vicinity of the proposed wind farm. It is located approx. 2.3km to the southeast of the proposed Derrybrennan cluster, and approx. 2.7km to the north of Cloncumber. It contains several enclosures including a possible church, graveyard, field system, a bullaun, 3 cross-inscribed stones, 8 additional cross inscribed stones and an unlocated holy well. It is said to have been established as a monastery in the 5th Century by St. Erc and includes a monument of St. Patrick's footprint. The EIS states that there are extensive views from the site and that it has an air of tranquillity and peacefulness.

There is one photomontage (10AH34, Map 61) with two viewpoints. Viewpoint No. 1 is to the NW, from where the 2 turbines of Derrybrennan cluster would be visible through the trees and a further set of turbines (Drehid-Hortland) would be visible

through the gate to the north-northeast. The second Viewpoint, to the SE, indicates that the full range of turbines in the Cloncumber cluster is visible and visually dominant through the entire panoramic view. The EIS states that there would be an indirect visual impact and that the turbines would intrude on the sense of isolation, tranquillity and reflection experienced on site. However, it considers that the sense of enclosure would not be impacted and concluded that the overall impact on the setting would be slight. In the LVIA 15.3, it was concluded that the visual impact would be Moderate, which was based on Medium sensitivity and Medium magnitude. However, I would disagree as the sensitivity of the receptor as a National Monument and heritage asset of some significance should be taken into account and the magnitude seems to be much greater than Medium. It is considered that the proposed turbines would appear incongruous in the view from the cemetery and would detract significantly from the setting of the monastic site.

9.6.5.3 Other notable heritage sites (Donore, Carrick and Grange Castles, Croghan Hill, Trim Castle, Hill of Ward, Rock of Dunamase)

The three medieval castles of Donore, Carrick and Grange, (all National Monuments), are located at distance of 3.7km, 3.7km and 5km respectively from the proposed wind farm site. The EIS states that there would be distant views from Grange Castle and Carrick Castle, each of which is on an elevated site, but not from Donore Castle. However, it was considered that the proposed turbines would not be dominant or overbearing and that the key views and relationships would not be impacted. There is no photographic or mapping evidence to support this opinion nor were there any visual aids, such as photomontages.

Croghan Hill complex, a RMP, is described in the EIS as dominating an otherwise flat bogland landscape in Co. Offaly and has been the focus of human activity since the prehistoric period. It includes a number of monuments including a burial mound and possible hillfort on its summit, ecclesiastical remains, earthworks and cultivation ridges on its higher slopes and on the lower slopes, a ring barrow, Croghan Castle, a medieval church and a deserted medieval settlement (national monument). It is also famous for the discovery of a bog body nearby. The visual impact is portrayed in two views from the one VPR, (10AH03, Map 55). It is stated that the distance (20km) is too great for there to be an impact. However, it is noted that the turbines would be quite noticeable and that the views are very extensive to the north, east and south. The views to the north would take in Yellow River WF, Dryderstown WF and Croninstown WF, and the views to the south would take in Mount Lucas WF and Maighne WF. It is considered that there would be a

cumulative impact from here, even if the wind farms are viewed in different viewsheds, as it is a panoramic view stretching for miles in several directions over the surrounding landscape. Given its historic and ritualistic associations, it is likely that views of other landforms were important from this location. It is noted that the proposed wind farm would interrupt views of the Chair of Kildare and other landforms. It is considered that the 'slight' visual impact is an underestimation of the impact on the setting of this important heritage asset.

It is considered that the visual impact on the settings of the Hill of Ward, Tlaghta, (MHDR40, Map 24), the Rock of Dunamase (14AH1, Map 63), Trim Castle (07KV5, Map 64) and Kildare Round Tower (10AH32, Map 59), respectively, would range from slight to imperceptible due to the distances involved and intervening screening.

9.6.6 World Heritage sites/candidate sites

Brú na Boinne, World Heritage site, is located 40km from the closest turbine. The EIS considered that it would not be visible and that there would be no impact on this site. There are two candidate world heritage sites within the 30km ZTV of the proposed wind farm, which have been included in the UNESCO Tentative List as part of the Royal Sites of Ireland, Tara Complex and Dún Ailinne. Both sites are considered to be of international significance. These sites were perceived as royal places, inauguration and assembly sites, which are strongly linked to myth and legend and are associated with the transformation from paganism to Christianity. There are ten criteria that must be met for WH site status and the candidate site must meet one of these to be considered as a site of 'Outstanding Universal Value'. It must also meet the conditions of 'integrity' and 'authenticity'. The EIS includes an examination of the UNESCO nomination statements in respect of Tara and Dún Ailinne in Section 14.3.2.10.

9.6.6.1 Tara Complex

The Hill of Tara is located 25km from the closest turbines at Ballinakill and 46km from the furthest ones. It is the best known of the royal sites and was the seat of the High Kings. It includes 73 recorded monuments ranging from a Neolithic passage tomb to Iron Age ceremonial earthworks. It is likely to have been an important ritual site with several associated settlement sites in its hinterland. The excellent panoramic views from the summit are stated to make an important contribution to the significance of the site in the context of the ritual and ceremonial activities. The photomontage (MHDR1, Map19) depicts the view from the top. It is noted that the

Maighne WF would lie outside the Meath Co. Co. Landscape Conservation Area Buffer Zone and well outside the landscape setting of the hill. It is considered that the proposed development would not interrupt the intervisibility between sites surrounding the hill nor impact on the integrity or authenticity of Tara. The impact was considered to be slight.

9.6.6.2 Dún Áillinne

Dún Áillinne is described in the EIS as being intrinsically linked with the prehistoric landscape of the Curragh. It is located 18km to the southwest of the proposed wind farm. It is a hilltop enclosure dating from the Iron Age, a ritual site associated with the ancient assembly and was the Royal Seat of the Kings of Leinster. There are numerous monuments within the site dating from the Bronze Age and the Iron Age which have associations with a wider cultural landscape. The EIS also refers to a possible link with the Hills of Allen and Dunmurray and the Chair of Kildare as well as the monastic site at Kilcullen. It is also stated that there is a likelihood that the landscape is made up of many overlapping and linked sacred sites. Thus the understanding of the setting of the site requires it to be seen as part of the wider cultural landscape, with a historical and cultural significance, rather than a focus on its visual prominence in the landscape.

The EIS points out that the photomontage 11AH1 (Map 64), which was taken from the summit of Dún Áillinne, captures the 360 degree views available of the surrounding landscape and that the key archaeological and historic landscape element in this view is the Curragh plain, which an integral part of the site's ritual and social landscape. However, it is further pointed out that the Curragh lies beyond the large Ballysax Hill Quarry. It is stated that beyond the Curragh, from west to east, are the Red Hills, Dunmurray Hill, The Chair of Kildare, Grange Hill and the Hill of Allen, which have archaeological and folkloric associations with Dún Áillinne. It is considered by the applicant, that as the proposed wind farm lies beyond these hills in a separate and distinct low-lying bogland landscape, it lies beyond the key archaeological sites and landscape features that contribute to the significance of the Royal Site and to its present understanding as a sacred royal landscape. Whilst it is accepted that there will be an indirect visual impact on the distant views to the north, the magnitude of the impact is considered in the EIS to be low and the significance is considered to be slight.

9.6.6.3 Impact on Royal Sites/Tentative World Heritage Sites

The conclusions of the EIS, which were based on an examination of the criteria used in the assessment of the candidate sites, were that the impact on these sites would be low and not significant. DAHG noted the conclusions of the EIS but considered that it was a matter for the Board to assess the impact, including any potential impact on the Hill of Tara. However the Heritage Officer (Kildare) considered that

“The Board should engage an independent expert on World Heritage Nominations i.e. someone who has previous experience in assessing World Heritage Nominations to assess the potential impacts on this wind farm on the Royal sites of Ireland Serial World Heritage Nomination. Details of previous assessment experience should be included in the report. This assessment should address issues such as impacts on the Outstanding Universal Value including integrity and authenticity. Reference should be made to UNESCO Resource Manual Preparing World Heritage Nominations (UNESCO 2010). The Board should be satisfied that the granting of this permission will not negatively affect the potential designation of the Sites of Ireland as a UNESCO World Heritage Site.”

The Meath Heritage Officer also made the same recommendation as the Kildare Heritage Officer regarding the need for an independent expert on World Heritage Nominations to assess and advise on the impact. Both the Heritage Officer and the Conservation Officer (Meath Co. Co.) noted that the photomontage looking south from Tara reveals a significant number of turbines visible on the horizon. It was considered that the cumulative effect of these turbines and the (then proposed) Emlagh wind farm (which would have been visible on the norther horizon) should be taken into consideration when assessing the impact on Tara (Royal Sites of Ireland Tentative World Heritage Site).

Ireland currently has just two World Heritage sites, (one of which is located within 40km of the proposed wind farm), but is seeking the same status for a number of sites, including 4 Royal sites, (two of which are within 18km and 25km, respectively, of the proposed wind farm site). Given the extremely high sensitivity and significance of these sites, and that the photomontages indicate that a significant number of turbines (from Maighne and other wind farms) would be visible on the horizon, it is considered that expert advice on the potential impact on these sites would be advisable. The assessment of such potential impacts is a specialist area and it is considered that should the Board be minded to grant permission for the

proposed wind farm, that independent expert advice on World Heritage Sites be sought on this matter in advance of a determination.

9.6.7 Conclusions re archaeological, architectural and cultural heritage

It is clear from the foregoing that the landscape within which it is proposed to place the Maighne wind farm is exceedingly rich in archaeological, architectural and cultural heritage assets, which includes sites of international, national, regional and local significance. This includes two Tentative World Heritage sites within the zone of theoretical visibility (30km) and at least two National Monuments within 5km, as well as numerous protected structures and recorded monuments in close proximity to the site. In addition, due to the nature of the landscape and in light of the wealth of known sites and features, there is a significant potential for undiscovered archaeology in the area. It is further acknowledged that there would be the potential for direct impacts on certain sites of archaeological interest, (such as the ringfort adjacent to T33), and on recorded monuments in high risk areas, as outlined above, in the absence of mitigation. However, as no test excavations or geophysical surveys have been carried out, and given that it is the stated intention of the applicant to use the results of such testing to inform mitigation strategies, it is not possible to have any certainty that the proposed development would not adversely affect either known or unknown sites of archaeological significance.

Although it is accepted that there would be no direct impacts on the many protected structures in the vicinity of the site, it is considered that the potential indirect impact of a considerable number of these sites, in terms of the effect on the setting, has not been adequately addressed. I would have particular concerns regarding the potential impact on the setting of the National Monuments of Carbury Complex and Lullymore Ecclesiastical Complex, and on the setting of a number of protected structures and demesne landscapes such as Newbury Hall, Williamstown House and Knockanally House/Hortland Demesne, and on the setting of a number of Recorded Monuments, such as KD017-004. The potential impact on the internationally significant Royal Sites is considered to be unclear and should the Board be minded to grant permission, it is suggested that expert advice be employed to assist in the assessment of such impact.

It is considered, in light of the above, that the proposed development would have a significant and adverse visual impact on the cultural landscape of the area. In addition, given the significant archaeological and architectural potential of the area and risks to same, and the failure of the EIS and subsequent further information to fully appraise and assess the potential impacts on the cultural heritage assets of

the area, it is further considered that it is not possible, in the absence of a finalised mitigation strategy, to be confident that the proposed development would not have a significant impact on the archaeological, architectural and cultural heritage of the area. It is considered, therefore, that the proposed development would be contrary to the policies and objectives of the Kildare and Meath County Development Plans which seek to preserve and enhance the cultural and historical heritage assets of the area.

9.7 Residential Amenity

This topic is addressed fully in the report by the Second Inspector, John Desmond, dated 27th June 2016, on Residential Amenity, Noise and Vibration, Shadow Flicker, Health and Safety and Property Values and Sterilisation, Appendix 1. I have read the report and note the following conclusions reached by the Inspector :-

9.7.1 Noise and Vibration

9.7.1.1 Baseline noise assessment methodology conclusion

- I am satisfied that the baseline noise survey carried out by the applicant departs materially and significantly from the recommended methodology set out in the IOA Good Practice Guide, which the applicant purports to follow. In the case of Ballynakill cluster, the NMLs selected, being located along and/or directly exposed to significant traffic noise, do not reflect the background noise environment of a significant number of NSRs at most risk (being located proximate to the 500m contour distance) where background noise levels would reasonably be expected to be consistently lower than those selected.
- I am satisfied that the siting of monitoring equipment at each of the monitoring locations, in Ballynakill, being directly exposed to traffic noise (and noise from trees and vegetation and possibly from other local noise sources) is contrary to the Good Practice Guide and has resulted in elevated prevailing background noise from traffic, in particular. The resultant background noise levels therefore represent the worst case noise baseline at the NMLs, and cannot be taken as representative of the baseline noise levels of (areas of rest and recreation associated with) the majority of NSRs along the regional road network. This is similarly the case at many of the other NMLs, where monitoring equipment was located in proximity to trees and vegetation and possibly watercourses, contrary to the advice of the

GPG, which, in the absence of justification to the opposite, is likely to have elevated recorded background noise levels.

- In respect of Windmill, Derrybrennan and Drehid-Hortland (east) clusters, I am not satisfied that the number of NMLs is insufficient to characterise the background noise levels of the surrounding NSRs. And in the case of Derrybrennan, I do not consider the siting of the NML remote from the proposed site and remote from those NSRs to provide relevant background noise levels for the NSRs at most risk from noise impact arising.
- Accordingly, I would advise the Board that the baseline noise survey is inadequate, contrary to best practice and does not enable the Board to confidently determine the potential impacts arising, to apply appropriate noise limits under the WEG or to condition suitable mitigation measures to address or protect the residential amenities of the large number of properties in the vicinity.

9.7.1.2 Baseline Noise Data Results Conclusion

The noise monitoring results illustrate recorded background noise levels, plotted against recorded wind speeds for daytime (07.00-23.00) and night time periods (23.00-0700). In summary, the graphs show how background noise increases in line with increasing wind speed, reflecting the dominance of trees / vegetation as a main noise source in rural areas at higher wind speeds. The presentation of results generally accords with the approach outlined in the Good Practice Guide (and WEG 2006). At all sites, bar Cloncumber, the limit is shown commencing at 45dB(A)_{L90} and rising with increase in background noise to maintain 5dB over same. At Cloncumber, which is defined by the applicant as a low noise environment (<30dB_{L90}) the limit is selected at 40dB_{L90}, stepping up to 45dB_{L90} and subsequently rising to maintain 5dB over background noise levels as they increase.

As outlined above, I have reservations about the comprehensiveness of the noise monitoring of Drehid-Hortland (east), in addition to Windmill and Derrybrennan. I am not satisfied that the number and location of NMLs is sufficient to characterise the background noise environment of those areas.

9.7.1.3 Baseline Noise – wind speed survey conclusions

The methodology employed by the applicant to take account of the impact of wind shear, comprising the use of 10m mast with anemometer (with wind shear

corrections to determined standardised 10m wind speed) and the application of a generic correction factor is not justified for a development of the scale proposed, and results in uncertainty and is contrary to the recommended approach for large scale wind farm development under the GPG. In addition, the applicant's inconsistent use of wind speed references across the noise assessment and its appendices is contrary to the approach advised by the Good Practice Guide and results in unnecessary uncertainty and confusion in the results.

9.7.1.4 Noise Predicted impacts

It is stated (section 6.5.2.3) that the predicted noise levels include the effects of the five wind farms clusters (i.e. the cumulative effect of all the proposed turbines are taken into account). I consider the applicant's approach to prediction of noise source generation prediction to be robust.

The predicted noise emission levels at each NSR are detailed in appendix E11 of the EIS, with the mitigated emission levels in appendix E12 (both submitted as further information having been inadvertently omitted from the initial application documentation). The EIS (chapter 6) provides no actual evaluation or discussion of the significance, if any, of the likely noise impacts, in terms of potential level of exceedances and the likely frequency of same. This would be related to wind speed and direction. There is no discussion of any uncertainty in the results.

9.7.1.5 Mitigation of noise impacts

The proposed mitigation comprises running specific turbines at noise reduced modes. The turbines are identified in table 6.12, with the relevant noise reduced mode specified relative to the corresponding noise limit to be achieved, relating to turbine nos. T3, T4, T6, T9, T12, T14, T17-T21, T29, T39, T41, T43, T44. It is not stated in the EIS which turbines are to be run at reduced mode to mitigate the impacts on which specific dwellings and it is not feasible to determine this from the drawings and noise impact results. It may be the case that several turbines must run in reduced mode to protect one or a cluster of dwellings.

9.7.1.6 Wind turbine noise impacts - overall conclusions

- If taken at face value, the application of mitigation measures to comply with the WEG noise limits, as is proposed by the applicant, could be taken as sufficient to ensure that no significant noise impact will occur. However, as I

have detailed above, the applicant's noise survey is deficient and non-compliant with good practice methodology in a large number of respects such that I do not consider it can be relied upon.

- The number of NMLs would appear inadequate to characterise the background noise environment at Windmill, Derrybrennan and Drehid-Hortland (east), and has not been justified by the applicant. The location of NMLs, particularly in respect of Ballynakill would appear to be biased towards sites exposed to high levels of background traffic noise and not to take account of NSRs located away from heavy traffic noise influence. Similarly, the Derrybrennan NML does not appear relevant to the background noise environment of the NSRs most likely to be effected. The actual location of NMLs is not justified by the applicant. In addition, the specific siting of some monitoring equipment appears to have been such as to be contaminated by wind-generated vegetation noise. Any contaminated survey data is likely to have resulted in higher background noise levels being determined that are not characteristic of that experienced by the NSRs at most risk, and which may result in the imposing of higher noise limits than appropriate.
- The methodology employed by the applicant to take account of the impact of wind shear, comprising use of 10m masts, and its application of a generic correction factor, are not justified for a development of the scale proposed, results in uncertainty and is contrary to the recommended approach for large scale wind farm development under the GPG. The inconsistent use of wind speed references across the noise assessment (and appendices) is contrary to the GPG advice and further confuses matters, making the actual results difficult to decipher. The applicant's failure to state the wind speed reference used in its turbine noise predictions means that it is not clear that noise levels are based on maximum SPL of the turbines, creating further uncertainty.
- The approach to presentation of results, comprising the provision of tabulated data only, with no noise contour maps to illustrate the predicted impacts, is contrary to the recommendations of the GPG regarding provision of key information and restricts the level of interrogation of results for all parties. It is not evident from the tabulated data, or from chapter 6 of the EIS, as to where the predicted noise levels apply and it is therefore uncertain if proposed mitigated daytime levels apply to the entire external amenity

space associated with residential property, or at the nearest face of the dwelling or at the point location of the dwelling concerned.

- The actual assessment and discussion of the significance of impacts having regard to the resident population in the vicinity, the baseline noise environments, the likely noise levels and the mitigation measures proposed is, in my professional opinion, seriously inadequate for a development of this scale.
- Having regard to the uncertainties and apparent biases of the baseline noise surveys and the uncertainties arising in predicted noise levels at NSRs due to non-compliance with best practice methodology (GPG), I am of the opinion that the noise assessment and, in particular the predicted mitigated noise levels, cannot be relied upon. Having regard to the scale of the development proposed, the close proximity of same to a large number of dwellings, I consider the potential for significant adverse noise impacts on the large number of residential properties in the surrounding areas to be excessive. In the absence of an appropriately revised, accurate and justified noise impact assessment, I would advise that permission be refused in the interest of protecting residential amenities of the resident population.

9.7.1.7 Infrasound and Low Frequency Noise - Conclusions

- Neither the WEG 2006 nor in the GPG address the issue of infrasound or of LFN. The applicant addresses it under section 6.2.2.2 of the EIS, referring to the *UK Department of Trade and Industry (DTI) Low Frequency Noise Study, W/45/00656/00/00, The Measurement of Low Frequency Noise at Three UK Windfarms'* (by Hayes McKenzie). For the sake of clarity, infrasound and LFN are not one and the same. The DTI report explains that infrasound is noise at frequencies below the normal range of human hearing, i.e. <20Hz. Low frequency noise (LFN) is noise between 20Hz and 250Hz. This compares with the normal range of human hearing is between 20Hz to 20,000Hz. Therefore infrasound can be expected to be inaudible, whereas LFN can be typically be expected to be audible.
- I would conclude, [based on a review of a number of internationally recognised reports and The EPA Guidance Note on Noise Assessment of Wind Turbine Operations at EPA Licensed Sites (NG3), as set out in the Inspector's report], that the generation of infrasound is not an issue of concern for the proposed development.

- It is apparent that the potential for significant adverse impacts to arise from LFN generated by wind turbines remains an area of uncertainty. Given that the potential impacts from LFN generated by wind turbines remains uncertain, that the EIS provides insufficient details and evidence to enable an informed determination to be made on the potential for adverse impacts arising from LFN on the surrounding population, the scale of the population that would potentially be affected, and the nature of the potential impact in terms of interference with sleep, I consider the potential risk to be unacceptable and, on the basis of the precautionary principle, would advise that permission be refused.

9.7.1.8 Substation operational noise - Conclusions

- Whilst I consider the applicant's conclusion regarding 'achievable' and 'typical' modes to be reasonable, the noise emissions at 'high' mode are quite significant. The applicant does not define at what wind speed the substation would operate in 'high' mode, or what transition from 'typical' to 'high' entails relative to wind speed. The question arises as to whether the substation noise generation increases in tandem with background noise, or more rapidly. It may be that the 'achievable' operation mode (with 65dB_{L_{Aeq}} noise limit) would be necessary mitigation, but this is not clear from the detail provided. The applicant does not indicate whether or not it is feasible to implement the 'achievable' operation mode.
- Given the proximity of the proposed substation to dwellings in the vicinity, in the event that the First Inspector issues a recommendation to grant permission, I would advise that a condition be attached requiring implementation of the 'achievable' noise emission standard for the proposed substation.

9.7.1.9 Windfarm operational vibration

- Under section 6.2.2.3 the applicant states '*Vibration from operational wind farms is below the human threshold of perception such that no significant effects are expected. As such, this aspect of the operation of the proposed turbines is not discussed further.*' The WEG 2006 do not address vibration as a potential impact in itself and only refers to the fact that incorporation of anti-vibration techniques in modern turbine design has resulted in significant reductions in mechanical noise, and the use of anti-vibration sensors to

detect ice on the blades. I am satisfied that direct vibration impacts are not an issue.

9.7.10 Construction Noise and Vibration - Conclusions

- Section 6.5/1 of the EIS indicates that no detailed noise predictions were carried out for construction activities as the specific plant and schedule for construction activity were not known. The applicant considered only track laying and borrow pits have the potential to result in construction noise levels at residential properties, but that as track laying would not likely continue at above the noise limit for duration exceeding 1 month, no significant construction noise effects are predicted. The applicant provides no basis for this assumption, with no estimates for how long it would take to construct the internal tracks for the each of the sites having regard to the obvious different ground conditions. No information on the likely nature of the works, including excavation, deposition and compacting works, or the likely machinery that would be used and the likely generation of noise. And no identification of the particular NSLs that would be at risk over what estimated period. Whilst it may well be that no significant noise impact would result from the construction works (the finite period of construction works will clearly militate against same) the applicant has not provided basic information to enable the Board to carry out EIA of the potential significant impacts.
- The EIS includes a cursory assessment of noise impacts arising from the two proposed borrow pits. The details include the average SPL from the machinery (no maximum provided), with octave band centre frequencies (with no explanation of the significance of same is provided). It indicates that construction noise level will not exceed 65dB if the distance of the borrow pit to the received location is greater than 120m, which it states is '*the approximate distance from the nearest neighbouring dwelling to any of the proposed borrow pits*'. This is simply incorrect. The nearest dwelling (#441) to the Ballynakill borrow pit (no.2) is c.50m from the boundary of the pit, with two other (#418 and #419) within 70-100m to the southwest and #440 and #421 at c.120m. At Cloncumber two dwellings, #594 and 595 are within 100m of the proposed pit. The noise impact of these two borrow pits may therefore be significant, with consequential significant adverse impacts on residential amenity. The EIS does not acknowledge these dwellings within its self-determined 120m limit and does not assess the impact having regard

to the background noise context of the site and the characteristics of the proposed borrow pit sites and development concerned.

- I therefore consider the applicant's construction noise assessment to be inadequate. It would be inappropriate to issue a favourable recommendation in this context.

I would concur with the above conclusions in respect of noise and vibration.

9.7.2 Shadow Flicker conclusions

- In the theoretical worst-case scenario, assuming 100% sunshine and worse-case wind direction, a total of 506 no. buildings are at risk of shadow flicker in excess of 30 minutes per day, and a total 378 no. buildings are at risk of breaching the 30 hour limit (349 no. are at risk breaching both limits) within 1200m of a turbine. As the 30 year historical average sunshine levels for casement are 31%, the actual risk of shadow flicker per annum can be expected to be far lower scenario. However, it would seem that the risk of any of the 506 no. buildings receiving 30 minutes shadow flicker on any (at risk) day may remain relatively high.
- The applicant proposes to mitigate shadow flicker through the automatic shutdown (through turbine programming) of relevant turbines when conditions arise that generated shadow flicker in excess of the WEG limits at buildings within 1200m of a turbine. I am satisfied that this approach is appropriate and feasible to address the potential adverse impacts on residential amenities from excessive shadow flicker in accordance with the limits under WEG. A mechanism for receiving and dealing systematically with complaints would be essential to ensure that the mitigation measure is implemented appropriately.
- Health impacts arising from shadow flicker generated by turbines is an emotive issue, but is not an unreasonable concern, considering the scale and extent of the development and its proximity to a significant number of dwellings. However, based on the UK Department of Energy and Climate Change report '*Update of UK Shadow Flicker Evidence Base*', modern large-scale turbines do not appear to pose any significant risk to epileptic sufferers and do not produce shadows at a frequency that would risk inducing epileptic seizures.

- Although WEG does not acknowledge potential for strobing, it nonetheless, requires that matt non-reflective finishes be used on all turbine components which effectively addresses any potential risk of strobing occurring. The Board's standard condition on wind turbine colour does not specify a requirement for use of a matt non-reflective finish. Should a decision be taken to grant permission, the said standard condition should be attached and amended to take account of the WEG requirement in this respect.

I would concur with the above conclusions in respect of shadow flicker.

9.7.3 Health and Safety Issues - Conclusions

- I have addressed the issue of health and safety implications arising from infrasound and low frequency noise under the 'Noise' section above, and those arising from shadow flicker and strobing under 'Shadow Flicker, above. Additional health and safety concerns have been raised by parties in respect wind turbine structural integrity and associated potential impacts, and potential impacts from electromagnetic fields associated with the proposed cables.
- Whilst evidence has been submitted by many observers that blade throw, ice-throw, fire and structural collapse can and have occurred on windfarms, the applicant maintains that the health and safety record of the wind energy industry worldwide is exceptionally good. Almost no development or facility is without some safety risk. Accidents will happen. However, based on the information submitted by the applicant regarding the standard measures applied to mitigate safety risk, in addition to the report of the HSA, I am satisfied that the proposed windfarm development does not present an unacceptable safety risk to local residents or to the general public.
- In response to the appeal the applicant reiterates that the electric and magnetic fields associated with the operation of the proposed cables will fully comply with the ICNIRP and EU guidelines on exposure of the general public to ELF-EMF and as a result EMF will be insignificant in health terms. Accordingly, I do not consider ELF-EMF impacts to be of concern.

I would concur with the above conclusions in respect of health and safety issues.

9.7.4 Property values and sterilisation - conclusions

- It would seem plausible that the proximity of a dwelling to wind turbines would be a determining factor in property value, and that the larger, more prominent and more numerous wind turbines are within a development, the more likely there is to be significant factor. Property value is also likely to be impacted by the perception of noise associated with the wind farm, again this will be related primarily with separation distance. However, there are clearly contradictory findings in different research studies in this hotly contested and sensitive area and it is not possible for me to reach a determination on whether a permanent material impact will arise on residential property value in the vicinity based on the information at available to me. Given that the WEG 2006 do not refer to impact on property value but set standards in relation to minimum setback distance from and maximum noise impacts at residential properties, it may be reasonable of the Board to take the view that subject to compliance with the standards, the issue of permanent material impact on property value does not arise.
- Also, as noted, above in respect of proposed cabling works, the prevention of access to existing in-road services / utilities through the development of the proposed underground cable network would inhibit future development potential of lands affected and consequently would be expected to impact adversely on land value. I cannot determine whether the installation of the cable network would prevent access. The sterilisation of lands would be a particular concern where the proposed development impacted on zoned development land or on lands identified as within a settlement. This would not appear to be the case as regards the proposed turbines, but it is uncertain whether it may result from the proposed cable networks.

I would concur with the above conclusions in respect of property values and sterilisation.

9.8 Socio-Economic Impacts

9.8.1 Tourism

9.8.1.1 Receiving environment - tourism

The consultation process has revealed that the perception by the public is that the proposed wind farm would have widespread impacts on the tourism industry of

Kildare and Meath. The elements that would be affected were considered to be wide ranging and to include landscape, sites of historical and architectural interest including protected structures and landscape demesnes, archaeological sites including national monuments and world heritage sites as well as ancient routes through the area, activity elements such as walking routes, cycling routes, fishing, boating, horse riding, outdoor pursuits, nature walks, forests etc. Fáilte Ireland advised that tourism is a significant income generator for the area with 168,000 and 122,000 to Kildare and Meath, respectively, in 2013. It was also stated that the area has a diverse and robust tourist offering including a wide range of attractions, examples of which are itemised in its submission (summarised in section 4.3.8 of my report). The attractions highlighted by Fáilte Ireland emphasised the equestrian and military related attractions in and around the Curragh, the high level destination hotels and golf courses, and the walking and hiking trails centred around the canals, particularly the Royal Way, the Barrow Way and the Grand Canal Way, which are designated as National Waymarked Trails. These amenities are described, together with map extracts showing the routes, in Section 11.3.3 of the EIS. It is noted that T39 would be 130m from the Barrow Way, T27 would be 1.6km from Hamilton Bridge on the Grand Canal Way and T7 would be 270m from the Royal Way.

The planning authorities, Waterways Ireland, An Taisce and a great many third party observers in their submissions, made reference to a number of tourism and recreational amenity initiatives and key attractions in the immediate vicinity of the proposed wind farm, which would be adversely affected by the proposed development. The following are the items most mentioned in the 800+ submissions:

- *World Heritage Tentative Nomination sites* – P.A.s considered that these have not been included in the assessment of impacts on tourism potential of wider area.
- *Ireland's Ancient East* – including the ancient roadways through the area such as 'Sli Dala' and 'Sli Mor' (from Tara to Hill of Allen), Esker Riada – Edenderry to the Hill of Allen and the numerous recorded and national monuments in the area, as well as mass rocks/mass routes from penal times, sites of battles including 1798 etc. This initiative by Fáilte Ireland could rival the Wild Atlantic Way and provide significant new tourism potential to the area. Intended to achieve €950m boost to the economy over next 5 years.
- *Grand Canal and Royal Canal corridors* – considered by public to be key tourist routes and attractions linking Dublin with the Shannon region, with a rich diversity of amenities including features in close proximity to the water

corridors. These waterways are considered to be Areas of High Amenity with smooth terrain and long uninterrupted vistas over the countryside.

- *Barrow Blueway cycle and walking route* – along the Barrow Line (feeder of GC) from Lowtown to St Mullins in Carlow – has had significant investment as a sustainable tourism project linking communities – promotes an experience where visitors are truly engaged with the landscape, flora and fauna of the Blueway environment. Tranquillity and peacefulness highly valued attributes as well as unspoilt landscape along corridor and rich diversity of amenities such as architectural, historical and natural features in close proximity to walkway.
- *Royal Canal Greenway* – a walking and cycling route along the Royal Canal which has recently received Part VIII approval. This forms part of a national cycle route initiative which has identified the canal corridors as being potentially instrumental in delivering such a project.
- *Donadea Forest Park* – this former demesne, complete with a number of historic protected structures including a former tower house, walled garden etc. set in 243 ha of a ‘quiet sylvan setting’.
- *Lullymore Heritage and Discovery Park* – attracts 40,000 visitors a year to this restored bogland interpretive centre with an educational and tourism role. It showcases unspoilt bogland landscape, from which no other development can be seen, as well as ancient heritage settlements through the ages and has family friendly pet farm.
- *Bog of Allen Nature Centre* – key educational and tourism facility run by IPCC which relies heavily on access by buses. Located on narrow road where bus access will be severely disrupted during construction.

There were many other facilities, attractions and initiatives mentioned in the observations. The issues raised by third party observers are summarised in sections 4.4.8.1-5 above. I also visited a number of these including Donadea Forest and Lullymore Heritage Park. I would agree that Donadea Park is a significant amenity for the area and is a very attractive forest with recreational walks, a café and a number of historical features. However, it is considered that once within the park, there would be very little awareness of turbines in the surrounding countryside. Notwithstanding this, it is noted that there would be some glimpses of moving blades from within the park and there would be a considerable visual presence in the countryside surrounding the park.

Lullymore Heritage Park is a novel attraction which is carefully maintained, and includes a range of educational exhibits providing valuable information on the ecological and social heritage of the area, including the ecology of boglands. It is

notable, that once within the park, there are many unspoilt vistas over boglands which are quite unique and naturalistic, and which contribute to the understanding of the bogland landscape.

9.8.1.2 Potential Impacts on Tourism

The main concerns expressed by the planning authorities, prescribed bodies and various third parties regarding the above attractions were that the visual impact from the excessively tall turbines in close proximity to the attraction, particularly to the canals, the intrusion into views from the attractions which would be incongruous, the disruption of the peace and tranquillity associated with the various attractions and the impediment to access during construction would deter visitors from visiting the attractions and from coming to the area. It was considered that this could lead to impediments to continued or future investment in tourism initiatives/facilities and to large scale job losses in the area. Some observers considered that tourism is worth €300 - €400 per head of population in the area, and that tourism related employment is substantially greater than the small number of jobs that the wind farm would generate.

Fáilte Ireland is generally supportive of renewable energy projects, including wind energy. However, this is predicated on a plan-led strategy which would ensure that such development would be located to avoid or minimise disproportionate negative impacts on the receiving environment. It was acknowledged that the construction impacts would be temporary and could be mitigated, and that the impact of increased sustainable energy would be positive. Fáilte Ireland also considered that the impact on the more robust landscape in the central section of the site would be lesser in visual terms and that there would be a lower impact here on tourism amenity. However, the body expressed concern regarding the visual impact from the introduction of the turbines in the Areas of High Amenity Value at the northern and southern ends of the site, which are proximate to existing settlements, scenic routes and existing amenities, principally the canals and associated trails. The conclusions of the EIS in respect of residual impacts was disputed on the basis of the high amenity and scenic landscape status contained in the development plans with designated views and prospects along the tourist trails.

It was pointed out by Fáilte Ireland that the canals are identified as highly sensitive landscapes in the CDPs where development may have a disproportionate impact due to the straight linear nature of the canal corridor. It was further considered that these amenities are unique landscapes within Kildare and Meath and play a regionally important role as tourism and amenity features. Concern was expressed

that this role is likely to increase as the likely future land-use of the canals will be recreational and amenity, and with the development of the National Greenways Network. It was concluded that the landscape setting of the canals would change and that the impact would be for the duration of the lifetime of the development. This concern was echoed in the submissions by Meath Co. Co. and Kildare Co. Co.

The EIS refers to a Behaviour and Attitudes survey, carried out by Fáilte Ireland and Northern Ireland Tourist Board in 2008, which had indicated that most visitors are broadly positive towards wind farms on the island of Ireland. Despite the fact that almost half of the tourists interviewed had seen at least one wind farm on their holiday, most felt that their presence did not detract from the quality of their sightseeing. The largest proportion (45%) said that the presence of the wind farm had a positive impact on their enjoyment of sightseeing, with 15% claiming that they had a negative impact. Almost three quarters of respondents claimed that potentially greater numbers of wind farms would either have no impact on their likelihood to visit, or would have a positive impact on future visits to the island of Ireland. The EIS pointed to more recent research in Scotland, in 2011, which showed that 83% of those surveyed said a wind farm would not affect their decision about where to stay when on a holiday or short break in Scotland. It was also pointed out that wind farms have proven to be visitor attractions in their own right. The visitor centre at Whitelee Wind Farm in Scotland, which opened in 2009, attracted over 120,000 visitors in 12 months, with tens of thousands more estimated to have used the paths and cycle tracks built throughout the site.

However, Fáilte Ireland has pointed out that the 2008 survey was updated in 2012, and the key conclusions were that whilst there had not been a major change in the views towards wind farms since 2007, there was a marked polarisation of views. Any increase in support has been countered by a marked increase in the negative cohort, leaving more visitors undecided or neutral. It was also found that as in 2007, most wind farms were seen at a distance from a car but that more visitors saw turbines at closer proximity than on the horizon in 2012. Furthermore, the impacts on sight-seeing were less positive in 2012, with a sharp rise in both negative and 'no impact' views compared with 2007. Those on countryside breaks, not on activity breaks and those over 65 were found to be most negative about the presence of wind farms when sight-seeing. It should also be noted that there is already a wind farm sight-seeing visitor attraction at Mount Lucas, which is in the same general area as the proposed development.

The applicant in the FI response rebuts the claims made by Fáilte Ireland and the third party observers. It is acknowledged that there would be some impacts during

construction, but that these would be temporary and mitigated. It was considered that the main operational impact would be visual and that this has been addressed in the LVIA. It is also acknowledged that there would be an impact on the canals but does not consider that this would be significant. The high level of accessibility of the area to the Dublin market was noted, but it was considered that the proposed wind farm would not be incompatible with the diverse range of tourist activities and attractions in the area.

9.8.1.3 Likely impacts on tourism and amenity

I would agree with Fáilte Ireland and the planning authorities for the area that the potential impact on the canal corridors would be significant and adverse. This is mainly due to the high sensitivity and amenity value of these features in the area and the important tourism role that they play, the nature of the terrain and vistas available in the vicinity of the canal network and the close proximity of a number of proposed turbines to the two main canals/feeder lines and the associated trails. Furthermore it is considered that there would be a cumulative visual impact on these high amenity areas, which form part of scenic routes and designated views, which have been singled out as being of significance in the visual amenity and landscape character of the area, for which there are policies and objectives in the respective County Development Plans to preserve and enhance. In addition, it is considered that the impact on the setting of several tourist attractions, such as Donadea Forest Park and Lullymore Heritage Centre would be adversely affected by the cumulative visual impact of turbines in the vicinity of these attractions. It is further agreed that the impact on the future potential development of many of the tourism initiatives for the area, (such as the Greenway and Blueway projects and Ireland's Ancient East), could also be jeopardised. The close proximity of the area, and hence its high level of accessibility, to the Dublin market is also a critical factor. Having regard to the conclusions reached in respect the LVIA and Cultural Heritage above, (9.5.7 and 9.6.7, respectively), it is considered that the proposed turbines would have a significant adverse impact on the landscape character and the cultural heritage of the area, and a significant and disproportionate adverse impact on the visual amenity, which in turn would negatively affect both the existing amenity value and the tourism potential of the area.

9.8.2 Equine Industry

9.8.2.1 Receiving environment equine industry

A substantial number of observers, including the Irish Thoroughbred Breeders Association, raised concerns about the likely impact on the welfare of horses, especially thoroughbreds, and on the reputation of Kildare as the “Thoroughbred County”. The importance of the equine and thoroughbred industries to both the national and the local economies was emphasised in the submissions, stating that the contribution to the national economy in 2012 was €1.1 billion, the value of exports was €149 million in 2010 and the number employed in the industry was 14,000 in Ireland and 5,000 in Kildare. In addition, it is stated that there is a huge spin-off economy arising from the equine industry. It is also stated that several champion horses have been raised within 5km of the wind farm site. A significant portion of the investment in the industry, it is stated, is in the form of foreign capital, which is highly dependent on the image of the ‘clean, green rural idyll’ that is currently represented. In addition, many thoroughbreds are flown in to stud farms for only a short period of time, and hence the perception of the environment is a key factor in the continued success of the industry. It is stated that the international level of competition for this overseas investment capital is intense and would be severely undermined by the presence of such a large number of very tall wind turbines dispersed across the area, which would degrade the environment and result in a ‘flight of capital’.

The EIS has identified 22 stud farms in the study area and four equestrian centres (11.3.4), which are mainly located in the vicinity of the Drehid-Hortland and Cloncumber clusters. Four of the stud farms are identified as being within 1km of a turbine but none are located within the cluster boundaries, (Fig 11.3). However, many observers consider that this is a gross misrepresentation of the number of equine related facilities in the area. Some believe that there are 30 equine related facilities in the vicinity of the Drehid-Hortland cluster alone. It is noted that the Kildare CDP is very supportive of the equine industry and contains a number of policies in this regard, EQ1 and EQ5.

9.8.2.2 Potential impacts on equine industry

The potential impacts on the equine industry identified in the EIS were mainly confined to noise impacts. However, those highlighted by observers ranged from impacts on the welfare and safety of horses and horse riders to the reputational damage to the industry in the area. They included the visual presence of turbines,

including horses being startled by the sudden presence and/or the movement of the blades and consequently injuring themselves/riders; noise impact, including the effects of infrasound especially on thoroughbreds; and the impacts of shadow flicker. Thoroughbreds are stated to be particularly sensitive with a highly evolved 'flight response' and extremely sensitive hearing. It is noted that the applicant undertook an examination of the issues in respect of the equine industry at the request of Kildare Co. Co. The findings of the EIS, (11.4.5 and 11.5.4), which were based principally on the Australian 'Marshall Day Acoustics Study' and on a limited number of case studies, were not accepted by the majority of observers or by the Irish Thoroughbred Breeders Association.

The Marshall Day Study examined the impact of noise on horses (not confined to thoroughbreds) in three different potential behavioural settings. The first was in stables at the Melbourne Cup, where horses were exposed to concert music of 54-70dBA and little response was recorded. The second was the impact of low overflight of jet aircraft on breeding mares, where the horses were initially startled but adapted to the noise over time. The third was in respect of racehorses firstly in the vicinity of the main approach flight path to Christchurch International Airport (>90dBA), and secondly in respect of horses competing in the Melbourne Cup (70-90dBA). It was concluded that there was no evidence to suggest that there would be any significant impact on the bloodstock industry. However, third party observers disputed the relevance of this study to the current case as it was stated that there is no comparison between a wind farm and a music concert; visual stimuli were not included in the study; no control group was used and study was unscientific as no reference to type of horse used, (e.g. a 2 year old colt would be more 'jumpy'). It was further stated that many experienced racehorses never learn to cope with the noise and disturbance associated with events such as a parade ring.

9.8.2.3 Mitigation and residual impacts on equine industry

The mitigation proposed in the EIS related purely to construction impacts in terms of noise and disruption to access, which it was considered could be adequately mitigated. The applicant in the RFI reiterated that there is no published scientific research to indicate that wind farms have any ongoing effect on the bloodstock industry. A number of case studies were also cited in support of the proposed development. Firstly, a decision by the Board in respect of Mace Wind Farm in Co. Mayo (221313), which was developed on the site of a stud farm, where it was claimed that the interaction of horses and wind turbines was dismissed by the inspector as not being a significant issue. However, I note that this case related to a change in turbine type in respect of 3 no. turbines, which were to be increased in

height from 65.5m to 81m (blade tip) and the Inspector considered that in these circumstances, the interaction between the turbines and the horses was not a significant issue. The second case study related to Delabole Stud Farm in Cornwall (1991) where young horses are regularly broken in within 50m of a turbine (no height given); and the third case study related to Stag's Holt Stud Farm in Cambridgeshire, where no issues were found by the owners. The third parties have argued that these latter two examples are irrelevant as they do not relate to thoroughbreds and are not comparable to the current application.

Reference has been made in the ITBA submission in relation to a previous decision by the Board in respect of the potential impact of a development on the equine industry (225138) and to a case in the UK where the Secretary of State refused permission for a wind farm in the vicinity of 3 no. stud farms on the grounds on unacceptable impact on the equine industry. The Board's decision (225138) was to refuse permission for a biogas/biodiesel facility which would have been located in open countryside in an area of national importance to the bloodstock industry, alongside a major horse training establishment (Co. Tipperary), on the grounds of adverse impact on the equine industry. The Board had found that it was the policy of the P.A. and of the Government to support the equine sector and that the nature, scale and visual impact of a large scale industrial facility would have been prejudicial to the viability of the equine industry including undermining confidence therein. Although the relevance of this case in terms of the significant weight awarded to the equine industry is acknowledged, it is considered that the nature of the development is quite different to that of a wind farm.

The applicant, however, made reference, in its response to the submissions, to another Board decision, (221656), whereby there had been significant objection to a 19 turbine wind farm near Cashel in Co. Tipperary, on the grounds on impact on the equine industry. It is stated that despite two turbines being within 600m of the main gallops of the closest stud farm the Inspector had decided not to recommend refusal on these grounds, but on visual impact grounds. In this case, the Board granted permission for a revised proposal.

A second case referred to by ITBA related to a 9 turbine wind farm proposal in Cumbria, UK, (Ref no. APP/H0928/A/08/2093576), which was located in open countryside close to 3 no. stud farms. The Secretary of State agreed with the Inspector and attached significant weight to the potential adverse impacts from the effects of the visual presence of turbines (including movement of blades), shadow flicker and noise. I note that the turbines had a blade tip height of 115m. The Inspector accepted that most horses would eventually adapt to the presence of

turbines, but felt that there was an important distinction to be made in respect of thoroughbred horses. It was stated that

“These horses represent a significant investment. The horse racing industry is highly competitive and one where perception and reputation are significant drivers in choosing a trainer and a yard.....given the simple premise that owners of high value animals will perceive that there is a risk and will begin to take their business elsewhere, the long term prognosis, i.e. within the lifetime of the wind farm, would not be good in terms of the economic benefits they provide to the local economy.”

It is considered that this latter UK case has particular relevance to the current application. The overall area within which the proposed wind farm is to be placed is one which is internationally renowned for producing champion racehorses and for breeding thoroughbred horses. Although there may not be definitive evidence as to whether the welfare of horses and thoroughbreds in particular would be threatened by the presence of wind turbines, the potential adverse impact on the reputation of the area is very significant. Given that the current application involves 47 no. turbines at a height of 169m, which would be dispersed throughout the area occupied by such a large number of stud farms, and given the very great significance of the industry not just in Kildare but nationally, it is considered that the proposed development, by reason of the dominant visual presence and associated effects of noise and shadow flicker, would be likely to undermine confidence and be prejudicial to the viability of equine establishments in the vicinity, and would, therefore, have a potentially significant adverse impact on the equine industry.

9.8.3 Agriculture

Many third party observers raised issues regarding the potential impact of the proposed wind farm on agricultural activities and businesses in the area. The issues raised are summarised at 4.4.8.4 above. The main impacts identified included:

- Loss/sterilisation of agricultural lands;
- Impacts on the welfare and productive capacity of farm animals including livestock such as cattle, sheep, geese, goats, greyhounds;
- Impact of reduced light on crops – concern re dust accumulation, crops in Pollytunnels and glass houses;

- Impact on insects, pollination and crop growth – viability of crops dependent on insects for pollination, particularly bees, but no analysis of impact on flight paths or collision risks;
- Health and safety risks to farm workers (400m minimum distance recommended from turbines by manufacturers);
- Shadow flicker due to Ireland’s low-lying sun in the morning – effect on welfare of animals and farmers.

The EIS states that the wind farm will require land take for the access tracks, wind turbine bases and adjacent hard-standings and sub-station footprints for the operational phase of the development, but that this will be less than 2% of the proposed cluster areas. There will also be impacts on land use as a result of the construction of the proposed cable routes, but these will be temporary and mitigated. Some temporary or short-term land take along public roads will be necessary to facilitate the construction of the cable routes which will result in temporary disruptions for road users and pedestrians.

In terms of health and safety, it is stated that under normal conditions, access to the site and turbines is very safe for people and animals. There are no fences or barriers restricting access other than normal livestock fencing and livestock can continue to graze on the land during operation as normal. The EIS considered that proposed development would have a minimal impact on agricultural practices due to the small area of land being lost. However, it is not expected to have an adverse impact on livestock (cows or sheep) or horses in the surrounding area. It is stated that existing land-use, such as grazing livestock or crops can continue on the site as normal, and that there are numerous examples of wind farms with livestock coexisting and grazing routinely in the same fields as wind turbines. Thus it is predicted that there will be no adverse effect on farmers as a result of the proposed development.

9.8.4 Impact on general socioeconomic environment

Other businesses in the area also made representations as did many landowners, including many expressing support for the proposed development.

9.8.4.1 Potential impact on other businesses

Other businesses expressed concerns regarding disincentive to expansion of businesses due to uncertainty regarding sterilisation of lands; impact on workers from the noise and disturbance from turbines; disruption to businesses during construction and impact on communications; impact on welfare of employees and customers; and reliance on the tranquil rural setting. Some of the businesses that made direct representations include Mother Hubbard’s Restaurant on R148,

Longwood Play Group, Donadea Park Café, two separate Greyhound kennels; Rentes Plans nursery; Schram Plants nursery and an Artist Studio.

9.8.4.2 Community benefit

The support for the development was generally in respect of the predicted employment generation and community benefit that would be provided. The EIS pointed out that as part of the Community Benefit Fund, (11.4.2 of EIS), it is proposed to fund local projects, educational initiatives and local enterprise, employment and energy projects for nearby communities. The scheme will see more than €3.5 million spent on local projects and initiatives over the lifetime of the project. These include community projects, grants for third level education and local enterprise supports.

In addition to this, the developer is proposing a “Near Neighbour Fund” which would make grants available of up to €5,000 payable to all owner occupied homes located within 1 km of a permitted wind turbine. This grant of €5,000 can be used for either (Option A), directly as a contribution towards electricity bills or, alternatively, (Option B), as a series of grants for greener homes, such as improved insulation, windows and doors, heating systems, smart metering and controls, water harvesting and recycling, resulting in direct heating or water charge savings, reducing greenhouse gas emissions and/or home security systems. The grant approval for the participating homes would last until all monies to the value of €5,000 have been drawn down for Option A or Option B. The EIS claims that this initiative alone will see more than €2 million contributed directly to homes within 1km of a permitted turbine and is considered to be a significant positive impact on the socio-economic environment. (Further details of the Community Benefit Programme leaflet and the Near Neighbour Fund are included in Appendix J1 of Volume 3 EIS Appendices).

9.8.5 Conclusion re socio-economic impacts

It is acknowledged that the proposed development would result in a significant contribution to Ireland’s ability to generate renewable energy which would have a positive impact on the balance of payments and on the environment. Furthermore, the proposed development would contribute towards job creation and would result in lease payments to landowners, contributions to the economy from taxes and rates and would introduce the Community Benefit Fund and the Near Neighbour Fund, all of which would make a positive contribution to the local socio-economic environment. However, these benefits must be weighed against the potential adverse impacts arising from the proposed development on the tourism and equine

industries and on certain other businesses in the area, (as highlighted above), as well as the adverse potential impacts on the living conditions of a substantial number of residents living in close proximity to the wind farm clusters, as highlighted in the Residential Amenity section above (9.7). On balance, it is considered that the adverse impacts on such a substantial number of residents, business interests and on the local, regional and national economy outweighs the positive impacts arising from the production of renewable energy and the economic and social benefits that would accrue to a relatively small number of people in the community.

9.9 Ecology

This topic is addressed in the report by Avian Ecology, (Howard Fearn), dated 27th June 2016. This report comprises a comprehensive review of the applicant's submissions, including the EIS, (particularly Chapter 7 with cross referencing to Chapters 8, 9 and 10 and associated appendices); the AA Screening Report and NIS (and associated appendices); and the Further Information Response from the applicant dated 24/09/15. The report also reviewed the submissions from relevant prescribed bodies and from third party observers and conducted a number of visits to the site. The report is compiled under the following broad headings:-

1. A review of the adequacy of the NIS for the Purposes of Appropriate Assessment.
2. A review of the adequacy of the EIS
3. A review of the risks to Annex 1 and 'red listed' birds
4. A review of the risks to bats

The findings in respect of the Appropriate Assessment will be discussed under that section of my report below. The review of the EIS is discussed under the various headings used in the Ecology Chapter (7), namely, Designated Sites, Habitats, Mammals, Aquatic Ecology, Other Taxa and Cumulative Impacts, followed by a review of risks to birds and bats. I will briefly refer to the main findings as follows:-

9.9.1 Review of adequacy of EIS

The overall findings in respect of the EIS, in general, were that:-

- The baseline was clearly deficient as the surveys were not comprehensive, lacked detail and provided a broad qualitative view, often informed by qualitative judgement rather than a quantitative assessment and detailed

understanding of the site and surroundings. In particular, the scope of the surveys were limited temporally and geographically. It was, therefore, found that this lack of a robust baseline dataset substantially limits the credibility of the EIS findings regarding potential impacts and undermines confidence in the adequacy of mitigation measures and in the conclusions regarding residual impacts.

- The identification of impacts (pathways to impacts) was generally appropriate, but the extent or magnitude of impacts was generally not adequately considered or presented in a consistent or verifiable manner. There is no consistent assignment of significance ratings for each potential impact. Where uncertainty existed, this was not always acknowledged and it was unclear whether the precautionary approach was to be adopted in such circumstances.
- The assessment of impacts was found to be largely qualitative and supported by limited evidence both in terms of baseline data and peer reviewed research. Clear assessment methodologies, although sometimes referenced in the EIS, were frequently not followed in a consistent or clear manner and potential impacts were inadequately quantified or detailed. Thus the assessment of impacts was found to be unclear and inconsistently described and the assessment process cannot be easily followed or verified. Thus the assessment of impacts was considered to be deficient.
- Mitigation by design and avoidance, although considered to be a reasonable approach, the effectiveness of such mitigation cannot be easily verified. Other mitigation measures were often limited in detail, making it difficult to evaluate whether the proposed mitigation and habitat management measures are appropriate or likely to be effective, in terms of the possible nature, scale or duration of impacts on habitats and species.
- Residual impacts were generally considered in the EIS to be low (or negligible) and not significant. However, the level of certainty around assessment conclusions, in terms of providing confidence levels, was found to be absent, and in many instances the supporting evidence was found to be very limited. Thus, given the lack of a transparent and reasoned pathway which allows conclusions to be independently tested or verified and the failure to accurately or consistently follow the appropriate (or best practice) methodology for impact assessment, together with the deficiencies in the baseline data, it was considered that the conclusions regarding residual impacts generally lacked credibility.

9.9.1.1 Designated sites

There are a total of 36 designated sites within 15km of the proposed development, of which 10 are European sites. The main impacts of concern, (on the non-European designated sites, as the European sites are discussed in the AA section), related to direct impacts through pollution and proximity to NHAs and pNHAs and indirect impacts on downstream designated sites through pollution, in all phases of the development. No supporting rationale was found for the 15km buffer, although it was considered likely to be reasonable. In terms of direct impacts on four sites which were found to be in close proximity and/or hydrologically connected, it was considered that the evidence on which the conclusions on a lack of hydrological connectivity were made was very weak, and appeared to be

“Based on a 500m buffer only, with limited further support through EPA groundwater monitoring data from the Longwood Aquifer in Meath, (approximately 1.5km from the Ballynakill proposed turbine cluster). No detailed site investigations on hydrological connectivity have been completed. It therefore cannot be verified whether the consideration of these four designated sites is adequate.”

Similarly, hydrological connectivity was not clearly established in terms of a number of designated sites that were identified as being potentially indirectly affected by reason of hydrological changes, increased siltation, nutrient release and/or contaminated run-off through drainage channels and watercourses. The Avian Ecology Report also identified further potential impacts that had not been considered in the EIS such as

- the impact of compensatory planting on local hydrology and consequently on associated water dependent habitats or species;
- forestry clearance of 63ha which is likely to lead to high levels of runoff and pollution; and
- the significant threat to the aquatic environment arising from the potential for the introduction of invasive alien species, given that the survey effort to identify such threats was extremely limited.

The conclusion in the EIS, that there would be no, or negligible, adverse effects on the integrity of these designated sites was considered to be undermined by the deficiencies outlined above, and given that no statement of significance of effects was included. As such it was considered that there was no transparent or coherent assessment of the potential for significant effects in line with the referenced

guidance presented. Thus the potential impacts on these sites were not adequately identified, described or assessed.

9.9.1.2 Habitats

The baseline survey was considered to be very poor as it consisted of a walkover survey in 2013, with no further surveys to identify habitats. Although the classification of habitats was considered appropriate, the presentation and description was considered to be insufficient to allow detailed scrutiny. However, the identification of potential impacts was generally adequate. These were loss of habitat, pollution/changes to hydrology and facilitating spread of invasive species during construction and decommissioning. It was noted that the total loss of habitat would represent just 8% of the total site area and that it would generally be of low ecological value. There were just two habitats that were found to be of greater than local importance, namely raised bogs (international) and mosaic (county). However, there would be no direct impacts on these. It was also considered that the applicant's view that there would be no likelihood of habitat fragmentation was reasonable, given that no continuous habitat exists which connects the 5 clusters and that the landscape is fragmented anyway. However, the issue of invasive species was again considered to have been inadequately considered and that the potential impacts in this regard were poorly identified.

In terms of mitigation, the proposals for hedgerow and tree planting were considered to be deficient as the Habitats and Species Management Plan would not be designed until the CEMP was finalised, which would be post decision. Thus there are no details in the EIS on the proposals for reinstatement of habitats or replanting of trees lost, and as such, it is not possible to determine the effectiveness of these measures as mitigation or to quantify the overall losses and gains.

9.9.1.3 Mammals

The baseline was considered to be deficient as it was based on winter walkover surveys in 2012/13, but no further details are provided, and it was considered that the completeness cannot be verified as the surveyed areas are not mapped. The surveys were carried out in tandem with ornithological surveys and appear to be restricted to visual checks for tracks and other evidence. It is stated that "it is highly unlikely that all suitable habitat within each study area was systematically searched whilst the observer also looked for birds." It is further stated that "whilst the EIS contains a reasonable representation of the suite of mammal species likely to be present on and around the application site, the evidence presented to confirm this and to identify species distributions in relation to the development area is

inadequate.” In particular, despite the desk studies indicating the likelihood of the presence of several species protected under the Wildlife Acts, such as Red Squirrel, Irish Hare, Pine Marten, Hedgehog and Red Deer, these were not adequately surveyed. However, evidence of Badger and Otter were found.

Notwithstanding the deficiencies in the baseline data and the failure to complete surveys, the identification of impacts was considered reasonable, except for the consideration of impacts on resting mammals during tree felling, earthworks etc., which was considered to be deficient. Identified impacts related mainly to loss of habitat, reduced habitat quality and increased disturbance during construction, increased potential for road fatalities during operation and increased disturbance and road casualties during decommissioning. It was also noted that the applicant has given a commitment to pre-construction surveys and derogation licences, where required, and as such, it was considered that the potential for adverse impacts on mammal populations would be low.

9.9.1.4 Aquatic ecology

It is noted that the aquatic surveys were carried out by a specialist consultant. However a number of deficiencies were identified in the baseline surveys, which were carried out in Aug-October 2013. A 500m buffer was used in respect of watercourses, yet no rationale or evidence was provided of the appropriateness of this buffer zone limit. A total of 10 sites were selected for detailed evaluation in the two main catchment areas, but the Review Report found that the survey effort was extremely limited. Only streams which were identified on the 1:50,000 OS map were included with no justification for the exclusion of smaller streams, despite the likelihood that smaller streams are appropriate habitat for certain species such as River Lamprey. In response to concerns raised on this issue by the Inland Fisheries, the applicant dismissed the smaller streams/drains as being highly modified and physically degraded. However, the Review Report points out that there has been no attempt to qualify the term ‘lesser watercourses’ although it is acknowledged that these have potential as fisheries, or to carry out a quantitative assessment of these watercourses.

Electrofishing was carried out on just one watercourse, R. Figile, which was considered to be wholly inadequate given the extent and complexity of the aquatic environment. In addition, the survey effort was constrained by land access issues, as access to watercourse was only available within the land option areas and downstream of the site, and it is stated that in such circumstances, watercourse had to be observed from public roads/bridges. The Review Report considered that this would have substantially constrained the effectiveness of the surveys. It is noted that Freshwater Pearl Mussel was considered to be locally absent (on the

basis of NPWS data), but that Atlantic Salmon and White-clawed crayfish were likely to occur throughout. River Lamprey and Brook Lamprey were also found to be present at two clusters. A precautionary approach was adopted, which was considered to be reasonable. However, it would not be possible to assess impacts at a population level due to the lack of information on the local aquatic environment. Thus it was concluded that it would not be possible to determine the scale of the likely impacts on the aquatic environment and associated habitats and species.

The identification of impacts was considered to be adequate. The construction and decommissioning phases would give rise to potential impacts on water quality arising from increased pollution or changes to hydrology by reason of siltation, obstruction of watercourses, increased erosion, alteration to drainage and cumulative effects from peat extraction and agricultural activities. The operational phase would give rise to potential impacts of pollution from leakage of oils, illegal rubbish dumping, fish poaching and off road vehicles. However, it is stated that no attempt is made to quantify levels of pollution or the changes to hydrology, and as such the EIS is deficient as the evaluation is purely qualitative. It is further pointed out that the identification of impacts omitted/inadequately addressed the potential for hydrological changes arising from tree felling and replanting, the spread of alien species and in-combination effects of other operational works, other than wind farms.

Given the complex aquatic environment in which the site is situated, which includes a series of designated sites known to support sensitive and protected species, it was considered that the baseline must be clearly established prior to the design of mitigation to ensure that these measures can be effective. However, the proposed mitigation measures are inadequately detailed and are based on an outline CEMP, which has not presented the full extent and nature of the mitigation works proposed and whether these may lead to further potential impacts. Whilst it is considered that adequate mitigation of the impacts on the aquatic ecology is possible with good design, the very limited survey effort, which undermines confidence in the baseline, together with the lack of detail in the mitigation presented, means that the efficacy of the mitigation has not been adequately demonstrated. In light of these uncertainties, it was considered that the conclusions of the EIS that the residual impacts on the aquatic ecology would be 'slight negative', and reduced to 'imperceptible negative' following mitigation, cannot be relied upon.

9.9.1.5 Other taxa

A number of key receptors, which are protected species, were identified as being likely to be present, where a suitable habitat exists, but species studies were not undertaken. These include Smooth Newt, Common Frog and Common Lizard. However, it was considered that the assessment of impacts is limited in the absence of accurate baseline data. Given that these species are afforded legislative protection and valued as 'Nationally Important' in the EIS, an assumption of presence was considered to be inadequate for assessment purposes and the Review Report considered that the EIS is deficient in this respect. Although these species and a number of others, such as Irish Hare and Hedgehog are listed in Table 7.73 as 'Key Ecological Receptors' for assessment, the Review Report states that none of these species are considered or assessed thereafter in more than a cursory fashion. It was acknowledged that common frog and common lizard could be directly affected through habitat loss during construction, it was considered to be unlikely to be significant as most of the habitats were considered to be unsuitable. However, Avian Ecology considered that the habitats identified appear to be suitable for amphibians and/or reptiles, and pointed out that the possibility of these legally protected species being killed or injured has not been addressed. Thus it was considered that the EIS is inadequate in this respect. Furthermore, no mitigation was proposed in respect of these species.

Marsh Fritillary butterflies were not recorded and limited suitable habitat was identified. Nevertheless, this species was 'scoped-in' as a precautionary measure. Potential impacts were identified as loss or damage to habitats. The EIS proposed that potentially suitable habitat would be examined by a suitably qualified ecologist for larvae and that monitoring for presence would also be carried out, in consultation with the NPWS. This was considered to be an appropriate approach. However, details of further mitigation, which was proposed in the form of landscaping works to provide suitable habitat for butterflies, (including marsh fritillary), were not provided. Thus it was considered that the extent or likely effectiveness of these measures, compared with adverse effects, could not be determined. As such, the EIS was considered to be deficient in this regard as the mitigation measures were either unclear or inadequate.

9.9.1.6 Cumulative impacts on ecology (excluding birds and bats)

Other wind farms within 15km of Maighne WF site were the only other results presented from planning searches for assessment of cumulative effects. The Review Report considered that "It is subsequently unclear whether other developments were identified and considered or not, and so it is not possible to

determine whether the EIS fully considered cumulative effects beyond other wind farms.” It was, however, found that the identified wind farms would not result in any significant cumulative effects as they are located within different water catchment areas, which was considered to be a reasonable conclusion.

For other ecological receptors, cumulative effects are discussed in broad terms, rather than with specific reference to other plans or projects. Thus the potential for cumulative effects was considered not to have been quantified and it is not therefore possible to determine where impacts may be significant or otherwise. In this respect the EIS was considered to be lacking in detail and is deficient.

It was further considered that as the EIS did not consider the ‘in-combination’ effects of the 5 clusters which together comprise the proposed development, it was considered to be lacking an overall understanding of the site and surroundings. Whilst it was acknowledged there is no planning requirement to do so, it was considered reasonable to expect the EIS to include an in-combination assessment of these physically separate development areas, which would have allowed a comparison between individual locations and provided a more accurate and comprehensive assessment.

9.9.2 Birds – including Annex I and Red Listed

Avian Ecology’s review of the risks to Annex I and Red Listed Birds considered that the level of baseline data collated to inform an assessment of effects on ornithological features fell significantly below that recommended in guidance referenced by the applicant. Furthermore, the presentation of the data was considered to be such that it did not allow the reader to readily understand the information presented. It was therefore concluded that it was not possible to assess the veracity of the EIS conclusions of the abundance and activity level of ornithological features which may vary across the site, given the limitations of the survey effort and geographical coverage. It was further considered that the rationale for the identification of target species was unclear which led to significant doubt on the suitability of the range and extent of surveys to enable a robust assessment.

The field surveys included 3 no. winter walkover surveys, which fell significantly below that recommended in guidance of twice a month, October to March. Thus inadequate data was compiled in respect of foraging and roosting activity for non-breeding birds and waterbirds. Other surveys conducted included those for Countryside Birds, Breeding Wader Birds, Barn Owl, Breeding Merlin, Hen Harrier and Breeding Red Grouse. These were generally either acceptable in terms of methodology or it was unlikely that the type of birds would be affected by wind farms, generally speaking. However, it was noted that it was not established whether there was potential for the presence of other birds, such as Merlin, elsewhere and hence the local status was unclear. The survey for Hen Harrier was

also restricted to known sites, which were outside the application site boundary, and hence would be unlikely to be reliable in terms of potential within the site.

The Flight Activity surveys were considered to be grossly deficient as only two clusters were surveyed, Cloncumber and Derrybrennan, with no justification for the lack of flight activity surveys at the other clusters. Just 5 no. surveys were conducted, plus a spring passage survey, but no autumn surveys, which is when the Whooper Swan arrives in Ireland. The surveys were also technically deficient as the flight heights were not quantified/demonstrated and the location of the Vantage Points were not presented in map form. The Cloncumber flight activity survey was considered to be particularly deficient as there was just a single VP location, despite the diameter of the cluster being 5km, and the viewing arc was constrained by woodland, hedgerows. The guidance recommends that each turbine envelope is encompassed plus 500m and that no point within the study area should be more than 2km from a vantage point, with a viewing arc of 180 degrees.

Overall it was considered that the value of the development site and surrounding areas for ornithological features has not been adequately surveyed or quantified to allow a confident evaluation of impacts to be completed. Baseline information on the number and distribution of sensitive ornithological features and the level of flight activity within the development site was considered to be deficient and so the full extent of potential impacts posed by the development as a whole cannot be robustly determined. It was stated that in terms of direct impacts, it was not possible to quantify the habitat loss for any species and the magnitude of the collision risk was impossible to assess due to the inadequacies in the baseline surveys. In terms of indirect impacts, it was considered that the baseline surveys were so poor, both temporally and geographically, that it was not possible to ensure a robust assessment of displacement, disturbance or the barrier effect.

The outline of mitigation measures presented within the EIS and subsequent clarifications for avifauna including inherent design, pre-construction surveys for nesting birds and an operational monitoring strategy is acknowledged. Additional mitigation measures, which shall be considered in the event that monitoring results, contradict the conclusions of the EIS were also presented by the applicant. However, it was noted that no clear mechanism for enforcement or independent verification is proposed by the applicant, and so it remains unclear as to how and when any additional measures would be triggered and applied. The Review Report considered that such surveys and monitoring should not be used to supplement inadequate baseline information within the initial assessment, as appears to be the case here.

The EIS concluded that the residual impacts on whooper swan and general bird assemblage, with implemented mitigation measures, would be negligible. However it was considered that the EIS does not provide a transparent and reasoned pathway which allows this conclusion to be independently tested or verified. Furthermore, it was considered that the deficiencies within the EIS, particularly with

regard to data gathering, cannot easily be overcome without the need for further and more extensive survey work by the applicant, in clear accordance with applicable guidance.

9.9.3 Bats

The baseline survey effort was found to be well below that recommended in key guidance (BCT and BCIG), which it was considered, contributes to uncertainty over levels and distribution of bat activity and potentially undermines the conclusions regarding bat receptors, the likelihood of impacts and the appropriateness of mitigation. It was stated that inadequate detail was provided to comprehend the scope of the surveys or findings and in respect of dates and times of surveys, location of detectors and transections etc. which means that the data cannot be verified. Thus the reader is reliant on the conclusions of the author regarding the levels and distribution of bat activity. A total of 5 species were recorded, (including Liesler's Bat) but given the limitation of the survey, it is considered likely that more species may be present around the application site. In addition, it is considered that the bridges along the TRDs, haul routes and cable routes have not been fully or adequately assessed for bat roost potential. Further limitations identified included seasonal surveys rather than the recommended monthly surveys, confinement of surveys to ground level and a lack of acknowledgement of the prolonged and wet weather conditions in the winter preceding the survey. There is also increasing evidence that bats now tend to seek out wind turbines, meaning that the recordings during surveys are not necessarily representative of distribution and activity levels.

The identification and description of potential impacts was considered to be reasonable but the consideration of these impacts fell short of that required by the relevant guidance. For example, the consideration of tree felling in terms of direct habitat loss and fragmentation is inadequately considered as is the in-combination effects of the five clusters. The impact, duration and scale of impact are considered to be inadequately completed and significance to each potential impact has not been assigned. No definition of 'Minor Negative' is provided. The greatest risk to bat populations is identified as through deaths caused by interaction with the operation of the turbines. It is stated that although there are accepted difficulties in predicting risk due to the fact that bat populations are poorly understood, the EIS has created considerable uncertainty in this area and that no attempt has been made to quantify the predicted effects. The evaluation tends to be qualitative rather than quantitative, and conclusions cannot therefore be independently verified.

The mitigation measures, which principally involve the creation/maintenance of a 50m buffer zone around each turbine site, are generally in accordance with

standard practice. However, it is stated that insufficient detail is provided in respect of habitat restoration following forestry clearance, as the HSMP has not yet been designed and is reserved until post decision. It is stated that on this basis, it is impossible to determine whether the planned habitat restoration can adequately compensate for the loss of 63ha of forestry and further loss of habitats of local value. 'Curtailement', which involves increasing a turbine's 'cut-in speed' during active bat periods, is also proposed in circumstances where any turbine is relocated such that its blade tip is less than 50m from any treeline or hedgerow. This is acknowledged as an effective measure of reducing bat mortalities but is only proposed in respect of 4 of the 5 areas identified as having high bat activity levels. In addition, these measures are unlikely to be adequate mitigation for Leisler's Bat, which over-flies open areas and is not tied to vegetative habitats. Given the low level of survey effort, it is considered that the proposed mitigation for this species has not been demonstrated as being adequate.

The FI response to the Kildare P.A. request to omit T11, T34, T42 and T43 due to the perceived high risk of mortality, was to provide additional mitigation in the form of further curtailement. Monitoring of bat fatalities, although inadequately addressed in the EIS, was also subsequently clarified in the FI. It is now considered to be appropriate, although it is not clear what would constitute 'significant' levels of collision to trigger increased mitigation. Thus, overall, it was considered that the submissions did not provide an adequate assessment of the potential for significant impacts on bats and was considered to be clearly deficient. It should be noted however, that the KCC Heritage Officer remains of the view that these four turbines should be omitted.

9.10 Geology and soils

9.10.1 Geology of area

An appraisal of the geology and soils of the area was carried out principally by means of a desk study together with a site walkover, and a number of trial holes were dug at the location of potential borrow pits. The site walkover included a number of peat probes and gouge cores at the proposed turbine locations to confirm the depth, shear strength and classification of the peat across the site. Records were also made of the land use, peat depth, drainage features, geomorphology, slope, and any other features that could affect slope stability. On the basis of this information, where areas of peat instability were thought to be potentially present, a Peat Stability Assessment report was carried out. This analysis was carried out in accordance with published guidance

No areas of concern regarding ground/peat stability, steep slopes or unstable rocks were encountered at Ballinakill or Derrybrennan. Thus the only Peat Stability Assessment reports that were necessitated were in respect of Windmill, Drehid-Hortland and Cloncumber. The maximum peat depth was found to be 4m in both Windmill and Drehid-Hortland clusters, and in Cloncumber, it was 3.7m. The majority of the peat in each cluster was found to be highly decomposed with a moderate moisture content and a low shear strength, with a 'Low' to 'Very Low' risk of peat instability. The safety ratios were found to be above the minimum safety factor required for long term stability, including when an additional loading of 20kPa was added to model the effect of heavy traffic or a floating road. It was, therefore, concluded that the site is considered to be stable before, during and after construction.

In addition to ground stability/slope failure, other potential impacts identified included removal of material; soil compaction; an increased rate of run-off leading to soil erosion and sedimentation/siltation of water courses; erosion of exposed soil and rock; and localised contamination of soil. Various mitigation measures were proposed to address these potential impacts during the three phases of development, set out in 8.5.1/2/3 of the EIS. It is noted, however, that some of the mitigation measures include:-

- *A ground investigation will be carried out at each turbine (and other infrastructure) for detailed design. This would include trial pits, drilling and geophysical survey, as appropriate. This will inform depth of excavations, foundation type and size, and the construction method.*
- *An outline CEMP has been submitted to the board with this EIS. Prior to construction, a site-specific environmental management plan for construction will be prepared, which will incorporate all measures set out in the Outline CEMP, in consultation with the relevant statutory bodies, including the planning authority, Waterways Ireland and the NPWS.*
- *A suitably qualified person will be appointed by the developer to ensure the effective operation and maintenance of drainage and other mitigation measures during the construction process.*

The residual impacts on geology and soils were considered to be imperceptible following the implementation of the recommended mitigation measures.

9.10.2 Adequacy of assessment of potential impacts

Kildare Co. Council Environment Section sought further information regarding the proposed borrow pits and turbine foundations. The Water Services Section and

Roads Section also sought information on the extent of excavation for pads and the foundation depths. Information was also sought on whether it would be necessary to dewater the borrow pits with groundwater being pumped to stilling ponds, and on what the extent of excavation/volume of material would be required and to what extent would other quarries be relied on as sources of aggregates. Peat soils were highlighted as a concern due to the potential for leaching of ammonia due to excavation and it was considered that a geologist would be required to oversee excavations to ensure that appropriate measures would be taken to prevent soil erosion and slope failure associated with peat extraction.

The main issues raised by third parties related to the unique and complex geology of the area and to the perceived lack of site investigation as part of the EIS. The unique geology included references to geothermal springs, 'GSI hotspots', fault lines and evidence of a vast underground lake near Longwood. The Specialist Report by Donnachadh O'Brien (for Donadea Against Turbines) considered it to be unacceptable that no geotechnical information on soil stratification or peat depths, (beyond the range of a hand held shear vane test equipment), was obtained, and that no dynamic probing, standard penetration tests or soil sampling was carried out to enable an understanding of the allowable bearing capacities of soils. Thus it was considered that it was not possible to adequately assess the foundation formation levels for turbine bases or to assess whether piled foundations would be needed. Furthermore, it was considered that it was impossible to make a reasonable assessment of the extent of excavations required, whether dewatering would be required or the extent of soil removal from the site.

The applicant addressed these issues at 1.6.1.5-7 of the FI response. Details of the volume of materials to be extracted from each of the three borrow pits was provided, (which essentially reiterated that provided in the EIS at 2.46, 8.3.1.6 and 8.4.5.1.1). The total area covered by the borrow pits is proposed at 73,000m², extending to depths of 4-5m. These pits (2 at Ballinakill and 1 (in two parts) at Cloncumber), would be used to source 198,500m³ of the 292,500m³ of total aggregate required. The effective depth of each of the borrow pits (excluding topsoil) was stated to be 3m and the total volume of material, 218,355m³. However, to obtain the volume of aggregate needed (198,500m³), it would be necessary to excavate to a depth of 4-5m. It was stated that dewatering of the borrow pits would not be required. In terms of excavations elsewhere on the site, the estimated peat extraction at each of the clusters is discussed, together with the issues of soil erosion from earthworks and slope failure at 1.6.1.7. It is noted that there would be a total of 228,200m³ of peat extracted, 60% of which would be at the Drehid Hortland cluster.

The foundation design has not been finalised, as the turbine manufacturer has not yet been selected, but the “general arrangement for a typical turbine base” was provided, (Drawing no. LE14-731-04-140-A, and Appendix 13 of RFI). It was stated that a typical base would have a diameter of 25m and would be approx. 2m high, although the size will vary according to the manufacturer selected. The excavation for the foundation was estimated to be 3-4m deep. However, it is acknowledged (RFI 1.6.1.5) that

“The depth at which a suitable bearing stratum is encountered at each turbine location is determined following detailed site investigation, which is likely to include trial pit excavations, borehole drilling, dynamic probing and geophysical surveys. These investigations are carried out for the detailed designed stage to meet the requirements of the turbine manufacturer”.

Thus it is clear that, in the absence of detailed site investigations and final design of the turbine foundations, it is not possible to confidently assess the foundation formation levels for turbine bases or whether piled foundations would be needed. It follows that it is impossible to estimate the extent of excavations required, (or the extent of soil removal from the site), the volume of concrete that would be needed, (if piling is necessitated), or whether dewatering would be required. Given the substantial geographical extent of the site, together with the potential for the presence of complex geology in some areas and variable soil/ground/drainage conditions in others, as well as the reliance for mitigation on an outline CEMP and the engagement of a specialist geologist and a hydrologist, it is considered that the paucity of information on turbine bases, foundations, existing and proposed ground levels etc., is inadequate to enable a robust determination to be carried out of the full extent of potential impacts and the adequacy of proposed mitigation. As such, it is considered that the lack of detailed site investigation, combined with the lack of detail in terms of the proposed turbine (and foundation) design, as well as the outline nature of the CEMP, undermines the robustness of the conclusions regarding the residual soil/geological impacts.

9.11 Hydrology and Water Quality

9.11.1 Hydrology and drainage

During the construction phase, activities such as soil stripping, excavations and the temporary storage of material, have the potential to result in increased surface water run-off and sediment loading which could potentially impact local drainage patterns, cause siltation of the existing drainage network and result in localised

flooding. In addition, tree felling, along with the construction of new site access tracks, turbine hardstands and other new hard surfaces could result in a further increase in rainfall run-off from the proposed development. The drainage of the area is focussed on two main river catchment areas, one in each of the ERBD and the SERBD. The northern part of the proposed development, (Ballinakill, Windmill and part of Drehid-Hortland) drains to the R. Boyne catchment, which is located 800m (by hydrological connection), from Ballinakill. The southern part of the site, (Cloncumber, Derrybrennan and the remainder of DH), drains to the R. Barrow catchment, which is at a hydrological distance of 17.5km. The baseline data was based on a desk study and a field assessment, involving a walkover to establish the existing drainage pattern and any significant hydrological features. However, no field assessment of the groundwater flow regime, water table levels, distribution and flow were carried out.

The direct impacts were identified as an increase in surface water run-off, which was predicted as increases of 0.15% for the Boyne catchment and 0.03% for the Barrow catchment, respectively. These increases would arise from the changes in land use with increased impermeable ground conditions. The indirect impacts were considered to be localised soil erosion and consequent sediment release to watercourses via the drainage system, if unmitigated. No impacts were identified in respect of the groundwater storage/distribution/flow or changes to water table levels due to for example dewatering for turbine foundation construction. The potential impacts were considered to be minor and would reduce over time as vegetation re-established. Mitigation was proposed by means of drainage design. This involves a three stage process primarily, namely, swales, stilling ponds and diffuse outflows and the diversion of uncontaminated surface water from construction areas.

Kildare Water Services Dept. raised concern regarding the proposed drainage design as stated in the EIS (9.7.1) as follows:

“The conceptual site drainage has been designed to complement existing overland flow and existing bog, agricultural and forestry drainage. The drainage design will be developed in full at the detailed design stage..... The Site Drainage Management Plan will be finalised in accordance with this outline plan following the appointment of a contractor for the main construction works”

It was considered that the level of detail for the proposed drainage design was inadequate given the nature, scale and extent of the proposed development. This issue was also raised by the NPWS and by the IFI. The applicant in response, stated that the level of detail provided is considered comprehensive for a SUDs design, which is required by Objective SW20 of the Kildare CDP. The P.A. also expressed concern re proposal to backfill cable trenches with cement bound material. However, in response, mitigation measures are proposed regarding the delivery of CBM to the site to prevent pollution.

Third party observers also raised a range of concerns relating to lack of groundwater monitoring and site investigation (notably No. 43 and No. 670, summarised in 5.2.4 above). In brief, concern was expressed regarding the potential impact on the groundwater flow regime and storage and inadequacies in the assessment of baseline hydrology. Many observers also raised concern regarding the impact on GW flow from the introduction of large volumes of concrete into a bogland environment, particularly where there are high water tables. Others stated that water table levels fluctuate considerably throughout the area and expressed concerns about dewatering.

The FI response generally reiterates the content of the EIS and states that it is considered reasonable to assume that groundwater is expected to flow in the general direction of the topography and surface water courses, and that in the absence of a surface water hydrological connection, it is assumed that there is also an absence of groundwater connectivity. The applicant reiterates that it is proposed to avoid dewatering in order to protect raised bogs in the area but that groundwater cut-off techniques would be used (such as sheet piling) where there was strong GW inflow combined with high permeability strata. However, it was acknowledged that the precise techniques would depend on the results of the ground/site investigations to inform the detailed design.

It is considered, therefore, until such time as the ground/site investigations are carried out and the turbine design is finalised, including the design of the foundations, there is an information gap regarding groundwater flow regimes across the site, including water table levels and the nature of the distribution, flow and storage of groundwater. The geography of the area is such that it is criss-crossed by a myriad of streams and drains and the land use comprises a mixture of farmland, worked bogs, forestry and drained bogland. Given the scale and type of development proposed and the nature and extent of the site, the likelihood is that ground conditions, (including soakage and water table levels), will vary considerably across the site. In these circumstances, it is considered inappropriate to delay ground investigations, turbine/foundation design and detailed drainage mitigation design until after determination of the application.

9.11.2 Water quality

9.11.2.1 Public water supplies

Concerns have been raised regarding the potential impact on public water supplies in the area. The HSE and the P.A.s have advised that the proposed wind farm is located in the catchments of both the R. Boyne and the R. Barrow, both of which are significant public drinking water supplies. The applicants have agreed that any incidents will be reported regarding the potential to pollute or cause an increase in PH or ammonia levels or silt. Meath Co. Co. requested that a hydro-geological assessment be conducted of the potential impacts on the (Longwood) public water supply boreholes at Clonguiffin and the numerous domestic wells in area. The applicant, (FI response 2.1.8), stated that the infrastructure at Ballinakill is at least 2.3km from the Longwood well and the associated SPZ, and that T7 is 2.8km from the well. In addition, the Ballinakill cluster overlies a different bedrock aquifer and different groundwater body to the Longwood well, and that the two areas are separated hydrologically by the Blackwater River and by the canal. It was, therefore, concluded that the proposed development would have no impact on the Longwood water supply and the P.A. agreed.

9.11.2.2 Johnstown Bridge Well Field

The well field is part of the proposed Ballyna Group Water Scheme. Although currently unused, it has the potential to be used as a drinking water supply and has been identified as such by Kildare Co. Co. It is made up of three areas, each with its own Inner Source Protection Zone and larger Outer Protection Zone. The P.A. and the HSE have expressed concern that the groundwater resource could be compromised by the location of 6 turbines and the proposed substation and associated tracks and cable routes within the well field protection zones. T45, tracks and cabling would be located within the Inner SPZ and T11, T12, T13, T43, T44, the substation and cabling would be located within the Outer SPZ. The P.A. considered that notwithstanding the proposed mitigation, the proposed wind farm infrastructure should be relocated to avoid potential contamination of this precious resource.

The applicant pointed out in the FI that no infrastructure is proposed within the 'Well Head Protection Areas' and that the outer limit of the Inner SPZ is 100-day travel time for groundwater to reach the well. It was concluded that, (with appropriate mitigation as set out in 10.5.11 of the EIS and 1.6.1.9 of FI), the proposed development would not present a significant risk to the well field. The mitigation

included the use of sheet pile cut-off walls during the construction of foundations for T44 and T45 within the Inner SPZ. However, the P.A. considers that, as this well field is just one of four groundwater resources identified in the County, it would have been better if the infrastructure for the proposed wind farm could have at least avoided the Inner SPZ for this scarce resource.

9.11.2.3 Private domestic wells

The HSE and the P.A.s have highlighted the considerable number of domestic wells in the vicinity of the development and the potential for contamination of these private wells, during construction. In particular, it was stated that there is a need to protect wells near the access roads and cable routes from contamination. Shallow wells are particularly vulnerable to changes in the water table, and it has been pointed out in the third party observations that water table levels in the area tend to fluctuate considerably, (by up to 20ft). As such, it is stated that no dewatering should be allowed of, in in close proximity to, private wells, and there is a need for safe fuel storage/management to prevent contamination.

The applicant stated (FI 1.6.1.10-11) that most of the private wells will be protected by the buffer zone associated with the curtilage of the private dwelling which it serves. However, mitigation is set out including a proposal to use sheet-piling to isolate excavations, where the depth is greater than 3m and the use of environmental controls to ensure appropriate and safe storage and use of concrete, chemicals and fuels.

9.11.2.4 Ecological sites and aquatic environment

In response to separate requests by the Heritage Officers in KCC and MCC respectively, further studies were conducted and reports submitted as FI, (1.6.1.12 and 2.1.4), in respect of the 'Raised Bogs' at Hortland Bog (350-550m from DH turbines T42 and T45); Haggard (Windmill) Bog (220-550m from T24, T25, T26); and Molerick Bog (2.94km from Ballinakill). A similar study was requested and carried out of Ballynabarney Fen (1.52km distant and within same sub-catchment as Ballinakill). In the case of Hortland and Haggard Bogs, it was considered that in the absence of a surface water hydrological connection, it was assumed that there would be no groundwater connection. However, it was acknowledged that improved drainage could increase flows from these raised bogs and hence it was proposed to provide a drainage design that would mimic the existing run-off characteristics, and that together with the separation buffers (350m and 220m, respectively), it would be highly unlikely that the proposed development would impact on the drainage of the

raised bogs. A similar conclusion was reached in respect of Molerick Bog and Ballynabarney Fen and Meath Co. Co. was satisfied with the response.

Kildare P.A. noted that the applicant had concluded that there would be a negligible impact on downstream ecological sites, but that this was dependent on the implementation of appropriate design and mitigation measures. However, it was considered that as the drainage design is only conceptual at present, with full drainage design post-decision, the concern remained regarding water quality issues in relation to these sites. For the reasons set out in 9.11.1 above, I would agree with this view.

It is stated in the FI that 228,200m³ of peat will be excavated. However, this is an estimate, which has been made in advance of the detailed site/ground investigations. Section 1.6.1.6 of the FI responds to the concerns raised by the P.A. and third parties regarding ammonia leaching from peat excavations, as a result of lowering of the water table. The response indicates that as the peatlands have been drained for milling, forestry and agriculture, the enhanced release of nutrients, including ammonium, is ongoing and is unlikely to be significantly increased by the proposed peat excavations, which it is considered is on a relatively small scale. Furthermore, the mitigation measures to remove suspended solids are considered likely to be effective in the reduction of nutrient concentrations also. However, the P.A. remains concerned about potential adverse impacts on surface waters particularly due to siltation and increased ammonia concentrations as a result of local peat ground conditions. For the reasons set out in 9.11.1 above, I would agree with this view.

The applicant's response to the mitigation proposals for backfilling of cable trenches with cement bound material was considered to be unsatisfactory by Kildare Co. Co. as it was stated that the applicant had merely submitted the EPA guidance document on the matter. Thus it was stated that concerns remained regarding the potential for pollution especially in the inner protection zone, notwithstanding the statement in the EIS that there would be no potential pathways to groundwater anticipated. It was further stated that the proposed holding tanks for run-off from excavation areas were inadequately detailed, and that private wells close to access tracks and cable routes must be protected during construction works. However, it is considered that these matters could be addressed by means of appropriate conditions.

9.11.3 Flood risk

The review of the history of flooding in the area, (9.3.3 of EIS), shows that 15 turbines (in Ballinakill, Windmill and Drehid Hortland) and the proposed substation would be located on 'benefitting lands'. However, the EIS considered that as these areas have been artificially drained since this classification, the PFRA mapping prepared for the CFRAMs is considered to be a more up-to-date and relevant source to reflect the zones subject to fluvial and pluvial flooding in the area. It was stated that the turbine hardstanding areas, associated tracks and the substation identified by OPW to be within 'benefitting lands' would, therefore, drain satisfactorily during normal storm events. It was acknowledged, however, that in an extreme event, drainage may be temporarily impeded, with temporary standing water occurring in the swales draining the hardstanding areas and access tracks. However it was considered that the drainage system would continue to operate as the flood event receded.

9.11.3.1 Potential flooding impacts

The potential impacts were identified in 9.4.5 of the EIS, as follows:

- Turbines in floodplain - There are four turbines located within the 'Indicative Floodplain' or 'Flood Zone A', namely T1 (Ballynakill) and T29, T30 and T34 in the Cloncumber cluster. Turbine T40 (Drehid-Hortland) is also shown to be within an indicative floodplain, but when examined further, it was considered to be more likely skirting the floodplain, due to the higher ground immediately to the west of the turbine location. It is stated that there is no flood risk to any turbines located in or near 'Flood Zone A' during a flood event. This is due to avoidance by design which will ensure no water ingress to the towers, bases or foundations.
- Substation - The proposed substation is not located in the indicative floodplain.
- Access tracks - The proposed access tracks to a number of turbines will cross an area identified in the OPW PFRA mapping as an 'Indicative floodplain' and therefore have the potential to obstruct flood flows. It is stated that this impact will be avoided by design to ensure that any stream crossings will be conveyed in culverts that are sized to take the 1 in 100 year flood flow with a 20% allowance for climate change.
- Pluvial flooding - Some small areas of the site were identified in the OPW PFRA mapping as being within an 'Indicative Pluvial Flooding Area'. However, EIS states that no particular hydrological features of note were observed during the site visits, in the areas of the site where development is proposed.

9.11.3.2 Flood Risk Assessment

A FRA was prepared for the site, to determine the impact of increased hard surfaces from this development on downstream flooding. The flood risk

identification and assessment is included in Section 9.5 of EIS. The conclusions were that the proposed development would have a minimal impact on flooding risk in the surrounding area. As part of the FRA, the increase in surface water run-off due to the proposed development was estimated within the catchments upstream of three bridge structures. The predicted increase in flood level at the structure at Roe's Bridge, (which conveys the Boolykeagh tributary of the River Boyne) was 30mm. There was no perceptible increase found at the structure at the River Blackwater crossing of a local road at Clonguiffin, nor at Agar Bridge, (which conveys the Slate River, a tributary of the River Barrow). The predicted increase at Roe's Bridge was considered to be of low significance, as the exercise undertaken did not take into account for any floodplain storage in the catchments which is evident from the indicative floodplain shown in Figure 9.2. The overall conclusion was that the impact of the proposed development on flooding risk in the surrounding area would be minimal and that the increased risk of flooding would be negligible.

Kildare Co. Co. Water Services expressed concern that that there should be no appreciable obstruction to flood flows due to access roads and turbine foundation design. Concern was also raised that it was proposed to place 4 turbines in a potential flood risk area, i.e. T1, T29, T30 and T34. For this reason, it was considered of great importance that the details of turbine foundation design and the FFLs – both existing and proposed - for the Turbine sites and access roads must be provided in advance of a determination on the application. It was further stated that, notwithstanding the identification of the development as a 'water compatible development', there is still a need to consider the displacement of flood waters and for compensatory storage to be provided for, if required.

Similar issues were raised by many observers as well as information offered on incidents of localised flooding and concerns regarding the impact of the proposed development on flood risk to properties in the surrounding area. These are summarised in 4.4.11.4/5 above. The objection from Donadea Against Turbines, (Observation No. 43, which included a specialist report from Donnachadh O'Brien Consulting Engineers), raised the issue of the absence of ground/site investigations and groundwater monitoring which, it was considered, prevents adequate hydrological assessment. Other issues of note raised include references by many observers to the high water table, particularly in the winter when it can be at ground level, the effects of the loss of areas of floodplain to access tracks and hard-standings, and inadequate consideration of the effects of intense rainfall events of existing drainage systems and of the discharge of water from holding tanks collected as a result of excavation flooding. It is also noted that the localised issues include many anecdotal references to the high water table and also to flooding in the vicinity of T40 and T47. These issues, amongst others on a similar theme, are

responded to by the applicant in the FI, Section 3.10, and summarised in 5.4.6 of my report above. However, the FI response generally reiterates and re-states the position taken in the EIS.

9.11.3.3 Adequacy of Flood Risk Assessment

The Planning System and Flood Risk Management Guidelines for Planning Authorities states that the Indicative flood zones, which are determined on the basis of probability of river and coastal flooding only,

“should not be used to suggest that any areas are free from flood risk, since they do not include the effects of other forms of flooding such as from groundwater or artificial drainage systems.”

It is considered that the focus of the EIS and the Flood Risk Assessment was on indicative flood plains, and specifically whether aspects of the development were sited within Flood Zone A; potential obstructions to flood flows from elements of the scheme including stream crossings; and potential impacts from increased surface water run-off. Thus the focus is primarily on identification of indicative floodplains and associated risk from fluvial and pluvial flooding. However, there is no evidence that the applicant has considered the risk from groundwater flooding. This is defined in the Planning System and Flood Risk Management Guidelines as

“Flooding which occurs when the level of water stored in the ground rises as a result of prolonged rainfall to meet the ground surface and flows out over it, i.e. when the capacity of this underground reservoir is exceeded.”

Given that, as previously stated, there has been no site investigations or ground water monitoring, and having regard to the anecdotal evidence of localised flooding and high water table levels, it is considered that the omission of an examination of groundwater flooding makes it difficult to have confidence in the conclusions on flood risk in the EIS. The knowledge regarding the ground water flow regime is based on a desk top study and limited field studies. Observation no. 43 states:

“There has been no recording of ground water levels across the site and this has significant impact on any hydrological assessment in a bog area where naturally high water tables occur. It is not possible to estimate the extent of dewatering required. Neither is it possible to assess the design of any swales and silt ponds during construction.”

I would concur with this view and I would also share the concerns of the Kildare P.A. regarding the failure to provide detailed information on the turbine foundation design and existing and proposed FFLs.

Where elements of the proposed development are to be located within Flood Zone A, the applicant considered that the justification test was unnecessary due to the water compatible nature of the development, which has been designed to withstand ingress of water. However, as pointed out by KCC Water Services, this does not obviate the need to address the related issues of displacement due to development within the floodplains and the potential need for compensatory storage. The applicant's response is to re-iterate the statement in the EIS that there will be no appreciable obstruction to flood flows in the flood plain as a result of new access roads and hard-standings, which will be mostly at grade with the existing terrain. It is considered that the information provided and upon which the flood risk assessment was based is inadequate, and as such, the EIS is deficient in this respect.

9.12 Roads and Transport

This topic was addressed in the report by the Second Inspector, John Desmond. I have read the report and note the following conclusions reached by the Inspector :-

9.12.1 Impact on physical road network – Conclusions

Direct impacts were considered in respect of physical impacts on the road infrastructure from the proposed cable works including cable trenching, cable placement and the reinstatement and upgrade of road network to accommodate turbine deliveries.

- The revised proposals omit the vast majority of HV cabling from the public road network and therefore significantly reduce the potential for adverse impacts on the road network from cabling works. 36km of MV cabling and 1.1km of HV cabling remain proposed within the public road and the potential for impacts remains significant, particularly so in the case of legacy (or bog) roads.
- I am satisfied the applicant's proposals for road reinstatement following trench works are appropriate, in the case of proposed Types 1, 2 and 3 designs. I am satisfied that the applicant's funding of a Resident Engineer to monitor the works on behalf of the County Council has the potential to ensure adequate

oversight of the trenching and reinstatement works, subject to the agreement of the required detailed with the Local Authority.

- I have serious reservations about the proposed Type 4 trench reinstatement plans for roads over peat due to risk of differential settlement over the carriageway. The Type 4 trench reinstatement plans are not stated to DTTS standards. The proposed cable works may have serious long term impacts on extensive areas of the network, including the L5006 and the L1004, with long term implications for maintenance cost of the network for the roads authority. In the absence of detailed investigative work demonstrating to the contrary, this would be of particular concern for the R414 (from Rathangan), which traverses an extensive area of cutover peat, and the L7004 which is on alluvium.
- No adequate details have been provided for proposed joint-bays. There is no indication of how many would be required (I estimate 60no.) or where and how they would be accommodated along the route. The EIS does not take account of the impact of joint-bays and communications chambers required along the cable route, nor does it take account of likely constraints to the location of the proposed infrastructure arising from topography or the location of inroad services and the implications of same on the factors of the environment. The EIS does not take account of the full length and width of cabling trenches proposed within the public road and does not take account of the full extent of potential impact on the road network. Concern also arises as to whether the EIS has taken due account of the full extent of potential significant indirect impacts on human beings (noise, dust, disturbance), on air (dust, etc.) and water (runoff) arising from the said cabling works. The EIS takes no account of the potential impeding of accesses to existing in-road services / utilities by other parties, which would be a concern where this would impede development of zoned lands and/or lands within settlements.
- Based on the foregoing, I consider there to be insufficient information on file regarding the nature and extent of the proposed development, specifically concerning details of the full extent of all cabling works (inclusive of joint bays), regarding the baseline environmental conditions, specifically concerning the nature and conditions of all roads concerned through appropriate investigative works, the location of existing in-road services / utilities and topographical survey details (where relevant). In the absence of the necessary information it is not possible for the Board to carry out a full assessment, or to carry out a proportionate environmental impact assessment

of the proposed development on the road network and existing in-road services / utilities as material assets, but also the possible impact on development land (in terms of access to services / utilities) and temporary impacts on businesses during works, and on human beings (noise, disruption), air (dust generation) and water (runoff).

9.12.2 Impacts on Traffic from Construction - Conclusions

Impacts were considered in respect of cable trenching works on the network capacity, impacts from additional construction traffic and impacts on the physical network from construction traffic.

9.12.2.1 Construction traffic impacts – cable routes

The applicant's assessment of the potential impacts of cable works on traffic is inadequate and insufficient to enable a determination of the realistic extent, nature and significance of impacts on road users. There is no assessment of the existing traffic capacity of routes concerned; there is no estimated schedule of duration of works on any particular route; there is no estimation of duration of works per km length; the assumptions underlying the overall estimated duration of cable works are not stated; and the assessment does not take account of the full extent of cabling works in terms of length and width of trenches or the provision of up to 60 no. joint bays and communication chambers in the public road.

The impact assessment does not justify the assumption that regional roads will be subject of lane closures having regard to absence of a topographical survey of the routes concerned and the failure to take account of the full extent of works. The assessment provides no estimate of the likely duration route diversions required, or the availability and suitability of alternative routes. The potential impacts are not quantified in terms of duration, the road users affected or the significance of routes affected. In my opinion the EIS fails to provide an adequate assessment of the likely significant impacts arising from cabling works but provides only general conclusion on impacts that are appropriate to the scoping assessment stage.

9.12.2.2 Construction traffic impacts – Additional construction traffic

- The existing road network is varied in the standard of its design, its capacity and its structural capability to accommodate traffic, ranging from motorway standard roads (M4), high capacity single carriageway, lower capacity roads and roads of poor structural condition. The applicant's assessment of traffic

impact is imparted without any reference to the actual capacity of the routes concerned, any capacity constraints that may exist (such as where these routes traverse settlements), the structural capability of the routes to accommodate the level of HGV traffic predicted particularly on legacy / bog road and/or where cabling works are proposed. There is no reference to the reduced capacity on the network (and on particular routes) from cabling works, which will exacerbate any impact from generated traffic during construction.

- The EIS provides a cursory overview of potential impact having regard to the predicted percentage increase in AADT, however AADT is of little relevance to the assessment of impacts on capacity. Of critical importance is the existing peak traffic flows (usually AM and PM) on the routes likely to be affected and the predicted level of traffic to be generated by the development on those routes at those critical times. This information is not provided by the applicant. There is no consideration of delays on specific routes, the length of delays and the period over which such delays would be expected to occur. There is no assessment of the possible and / or proposed diversion routes to accommodate traffic during road closures, the suitability of such routes and any potential impacts arising. There is no consideration of the significance of any of the routes affected – e.g. are they significant commuter routes, or do they provide access to particular facilities (schools, hospitals, employers, retail, etc.) or the particular road users and populations that would likely be affected during this extensive development over a prolonged period of time.
- There is no assessment of the effect of development traffic impacts in terms of the implications of the additional traffic on the road network as a material asset (general wear and tear and potential for structural damage on roads of poorer structural capability). Given the scale and extent of the proposed development, the nature of much of the road network which includes legacy / bog roads (including R414) there is a realistic risk of long term damage to the road network. Although it is generally reasonable to address this issue by condition, in this instance there is a risk of cumulative impacts arising with in-road cable trenching works overlapping the proposed haulage routes, the impact of which has not been adequately addressed in the EIS.
- There is no assessment of the impact of development traffic on human beings (general amenities, disturbance, etc.) in terms of the populations affected – e.g. the additional traffic traversing villages and rural settlements

- or on businesses located within the area. Given the scale and extent of the proposed development, the dispersed pattern of development accessing on to the county road network and the location of settlements along the regional network, the additional traffic has the potential to significantly impact on residential amenities for a significant period of time (over a period of at least 1½ years for residents of Johnstownbridge), in addition to increasing risk of road safety for all road users and for pedestrians (within the settlements primarily). I am satisfied that the applicant has not addressed these issues to any adequate degree and that the EIS is deficient.

- **Mitigation measures** – All of the 18 no. mitigation measures proposed under section 13.4.2 of the EIS are relevant to mitigating adverse impact on traffic during construction and after completion. I consider the proposed measures to be reasonable and can be regarded as a good practice approach that would be implemented as a matter of course. They will not be sufficient to prevent adverse impacts as such development will necessarily temporarily adversely impact on traffic flows during the period of construction, but they will reduce the level of impact. No mitigation measures are proposed to address the potential for locational specific impacts.

9.12.2.3 Traffic and Transport Assessment: Overall Conclusion

- In my professional opinion the traffic and transport assessment carried out by the applicant, forming part of the Environmental Impact Statement, is seriously deficient. There is no proper assessment of the actual impact on traffic flows on the network at AM/PM peak traffic times on specific routes, having regard to the generation of traffic by the development at those times, to the capacity of individual routes (including, in particular, pinch points, such as where those routes traverse settlements, where capacity may be restricted) and the reduced capacity of routes during cabling works. There is no consideration of likely disruption and delays that would result, having regard to the actual capacity and significance (e.g. commuter routes, access to facilities such as schools, hospitals, employers, retail, etc.) of the routes affected, or the suitability the possible diversion routes available and indirect impacts that may arise in such diversions.

- The implications of the additional traffic on the road network as a material asset (short term general wear and tear and potential for long term structural damage on roads of poorer structural capability), has not been assessed. Given the scale and extent of the proposed development, the nature of much of the road network which includes legacy / bog roads (including R414) there is a realistic risk of long term damage to the road network. In this regard, there is risk of cumulative impacts with cabling works along cabling routes, particularly on legacy / bog roads. I am not satisfied that the proposed mitigation measure comprising the proposed 'type 4' reinstatement on legacy / bog roads is sufficient to prevent / mitigate the potential for long-term structural damage of legacy / bog roads.
- The EIS assessment of impacts on the physical network and on traffic does not take account of the full extent (and width) of cabling trenches proposed, with inadequate information provided regarding the location, number and scale of joint bays and communication chambers necessary on the cable route. The EIS assessment is based on inadequate information regarding the location of existing in-road services, both generally on the road network and specifically within any route, and the topography along the cable routes and the implications for siting of cables and associated bays / chambers within or adjacent the carriageway. The assumptions regarding duration of the cable construction works, upon which the applicant's assessment of impacts are based, are unsupported and unclear. There is insufficient information on file to carry out an informed assessment of likely significant impacts on the physical road network, on network capacity / traffic flow and on road users. However this may also have implications for the assessment of impacts on human beings (extent and duration of noise, dust and disruption), air (dust) and water (runoff).
- Given the scale and extent of the proposed development, the dispersed pattern of settlement along much of the county road network and settlements along the regional network, the potential construction traffic generated has the potential to significantly impact on amenities for a significant period of time (e.g., over a period of at least 1½ years for residents of Johnstownbridge). There is no adequate assessment of the impact on human beings arising from physical works to the network and from generated traffic, or on economic activity in terms of restriction on access to businesses. Similarly, that the additional traffic and diversions on the network may be likely to increase risk of road accident on the network

for all road users, including pedestrians, but this has not been addressed adequately in the EIS.

- According to the '*Traffic and Transport Assessment Guidelines*' (TII/NRA, May 2014) 'a TTA is a comprehensive review of all the potential traffic impacts of a proposed development, with an agreed plan to mitigate any adverse consequences. In my professional opinion the assessment carried out by the applicant does not accord with the said guidelines.

9.12.3 Turbine Delivery Routes - Conclusion

- The application is not accompanied by the written consent of the relevant landowners to make the application in order to carry out the development concerned, including the accommodation works adjacent the public road network identified in the ELS Report (Appendix K of the EIS) to the standard as set out in the judgement of Herbert J in *McCallig v An Bord Pleanála* (24/01/13). The ability of the applicant to implement the proposed development, in its entirety, in accordance with the submitted drawings is therefore in question. In addition, the full extent of the works required to accommodate the proposed turbine delivery have not been identified through the carrying out of a detailed topographical survey, noted as necessary in the ELS report, and much of the identified accommodating works are not contained within the redline (or blue line) application boundary.

9.12.4 Vehicular entrances - Conclusions

- The detail of the proposed entrances are inadequate to enable the proposed sightlines to be determined vis-à-vis the applicable standards and to determine the full extent of modifications necessary, including on third party lands, to achieve the line of sight indicated by the applicant. No details have been submitted of the proposed entrance to the R414 from the Derrybrennan Cluster.
- The applicant has not demonstrated that it has sufficient interest in lands over which the indicated sightlines traverse to carry out the necessary works to achieve and permanently maintain the indicated line of sight. The KCC report indicates that the written agreement of 3rd party landowners to tree / hedgerow trimming necessary to achieve sightlines is required. Such written agreements would have to apply to all necessary works on third party lands.

The aforementioned standard for written consent set by Herbert J. in *McCallig v An Board Pleanála* may be appropriate in this regard.

- I am satisfied that the relaxation (para.7.7.e refers) in the TD.41/42 standard availed of by the applicant in respect of proposed entrance junction 9, in particular, but also in respect of proposed entrance junction 7, is neither applicable nor justified in the context of the proposed entrances. I am also of the opinion that the relaxation in the said standard under para.7.1 is not applicable to the proposed entrance junctions 1 and 2, being entrances to rural roads not urban roads. Regardless, the said relaxation of standard has been improperly applied in measuring sight distance to the right hand side of entrances, whereas the relaxation only be applied to the left hand side. Therefore, notwithstanding the predicted low levels of operational traffic, the proposed entrances, through failure to meet the required road design standards, will endanger public safety by reason of a traffic hazard. However, excluding risks associated with turning movements to/from the proposed entrances not shown to meet national standards, the level of traffic arising from the operations of the proposed windfarm would not, in itself, have a deleterious impact on the overall road network, in terms of network capacity.
- Subject to confirmation that the proposed entrances will be restricted to use for operational purposes related to the subject wind farm, and subject to the undertaking of an appropriately detailed topographical survey and the submission of accurate drawings showing the achievable sightlines and detailing the realistic extent of works and maintenance (such as of vegetation) required to achieve and maintain same, it may be feasible to accommodate at least some of the proposed entrances without resulting in a traffic hazard.
- I do not consider the proposed access to the R414 from Derrybrennan to be warranted other than during the construction period, given the existing access to the public road (indirectly to the R403) available to the north and the potential for the proposed access route to provide access to extensive lands adjoining the private access road serving the proposed Derrybrennan Cluster. The entrance has not been assessed by the applicant regarding compliance with DMRB TD41/42.
- Having regard to the foregoing, based on the information submitted with the application and the further information submitted subsequently, it is evident

that some of the proposed entrances will not comply with the required standards (NRA/TII TD.41/42) and that insufficient information in terms of survey drawings, detailed proposal drawings and relevant documentation (including written agreements) has been submitted to demonstrate that the proposed entrances can comply with same. In the absence of demonstrable compliance with the relevant national road standards, it must be concluded that the proposed development would endanger public safety by reason of a traffic hazard and should therefore be refused.

9.12.5 Other transport related issues

9.12.5.1 Leinster Outer Orbital Route

The proposed development encroaches on the route option identified in the NRA's LOR Feasibility Study, would prejudice the future development of the LOR, is premature pending the determination by the planning authority, or the road authority, of a road layout for the LOR and would be contrary to the proper planning and sustainable development of the area. This issue can be resolved by condition through the omission of proposed turbines T11 and T13 and the relocation of the proposed substation should the Board be mindful to grant permission for the proposed development.

9.12.5.2 Access tracks to T21 and T22

The proposed access tracks extending beyond the obvious needs of the proposed development, including up to the site boundary in the case of T21 and T22, raising concerns that the subject development proposal may directly facilitate future development within and beyond the site. This may have implications in terms of the consideration of possible specific cumulative impacts and in-combination effects under EIA and AA, respectively, which have not been addressed in the EIS and NIS submitted by the applicant. Should the Board decide to grant permission, the extended sections of track should be omitted by condition.

10.0 ENVIRONMENTAL IMPACT ASSESSMENT

10.1 Introduction

The application was accompanied by an EIS as is required for such applications under S37A of the Planning and Development Act, 2000 (as amended). The submitted EIS is laid out as follows:-

Volume 1 - Non-Technical Summary
Volume 2 - Main Report

Volume 2a - Figures Associated with the Main EIS chapters
Volume 3 - Appendices to Main EIS
Volume 4 - Landscape and Visual Maps and Photomontages

The EIS describes the site and the proposed development, including the size, layout and design of the proposal, the policy and legislative context, the need for the development and the consideration of alternatives. The effects of the proposed development on the environment are assessed under the following headings:

- Air and Climate
- Noise and Vibration
- Ecology (Flora and Fauna)
- Soils and Geology
- Hydrology
- Water quality
- Human Environment :-
- Shadow flicker
- Traffic and Transport
- Archaeology, Architectural and Cultural Heritage
- Landscape and visual Impact
- Telecommunications and Aviation
- Interrelationships, interactions and cumulative effects

In terms of each of the aforementioned headings, the EIS provides a description of the existing environment, the likely significant impacts relating to each of the three stages of the development (construction, operation and decommissioning), the mitigation measures proposed and the residual impacts. The likely significant cumulative effects and interactions between the impacts were also considered.

10.2 Likely Significant Direct and Indirect Effects

I have, together with John Desmond (Senior Inspector) and Howard Fearn (Avian Ecology), reviewed the application documents, including the EIS, the written submissions, the further Information from the applicants and the observations on the further information. There is a large degree of commonality between the significant issues identified and assessed under the planning assessment above and the likely significant direct and indirect effects on the environment. The Environmental Impact Assessment set out below should, therefore, be read in conjunction with the general planning assessment at 9.0 above, and will be cross-referenced accordingly. As with the planning assessment above, this EIA takes account of the further information, where relevant, as contained in the submissions

made by the applicant and in the observer submissions. In accordance with the requirements of Article 3 of the EIA Directive, the assessment is carried out under the following headings:

- Human beings, flora and fauna
- Soil, water, air, climate and the landscape
- Material assets and cultural heritage
- Interactions between the foregoing.

10.3 Human beings

This issue was considered under six headings in the Human Environment Chapter (Ch. 11) in the EIS, and under several other chapters, namely Air and Climate (Ch. 5), Noise and Vibration (Ch. 6), Shadow Flicker (Ch. 12) and Visual Amenity (Ch.15).

10.3.1 Human beings: Socio Economic

The likely positive significant impacts identified include employment, (225 short term and 25 long term direct and 25 indirect); Lease payments to landowners; Community Benefit Fund; Near Neighbour Fund; and income from taxes and rates for the area. In addition, the proposed development would make a substantial contribution to Ireland's renewable energy generating capacity and hence would be beneficial in terms of the country's balance of payments and avoiding fines for failing to meet climate change targets.

The likely negative construction impacts identified include disruption to traffic during cabling works, which could affect businesses along the route, diversion of pedestrian and traffic flows, nuisance from noise and dust and visual impact during the course of the works. However, these were stated to be temporary impacts. Mitigation measures include maintenance of access during construction, preparation of a Contractor's Noise and Vibration Management and Control Plan and the employment of good construction/environmental site management practices. Adverse operational impacts identified in the EIS were mainly confined to property values, which it was considered would not be significantly affected. Overall, it was considered that the socio-economic impacts would be beneficial on a local, a regional and a national level.

However, as pointed out in 9.8.4.1 and 9.12.2 above, no assessment has been carried out on the impact on businesses regarding the restriction of access during construction and cabling works, disincentive to expansion and uncertainty regarding sterilisation of lands. Furthermore, inadequate information has been provided regarding cabling works in that potential impacts are not quantified in terms of

duration, the road users affected or the significance of routes affected. Thus the EIS fails to provide an adequate assessment of the likely significant impacts arising from cabling works and construction traffic on human beings. The positive impacts in relation to employment must also be weighed against the likely losses in employment arising from impacts on tourism and other businesses. I am not satisfied, therefore, with the conclusions of the EIS that socio-economic impacts are not likely to be significantly adverse as a result of the proposed development.

10.3.2 Human Beings: Visual impact

The potential impacts on landscape character and visual amenity are addressed in Chapter 15 of the EIS and in the photomontages and FI. The EIA on this issue will be discussed below, but given the high density of population within the 1300m contour of wind turbine sites, it is also considered necessary to raise the issue here under potential impacts on Human Beings.

Visual impact is a function of how visible a development is within its landscape context and the magnitude of change of this visibility. It is considered that the key receptors are residents, motorists, workers and those participating in recreation or tourism. As stated in 9.5.5.1, although the EIS assesses visual impact on different receptors, including local communities and settlements, the assessment of the potential impact on individual or groups of residential properties within 0-2km of a turbine is considered to be grossly under-represented. It is considered that given the substantial height and scale of the turbines, their proximity to such a large number of houses (over 1000 within 0-2km), the high level of visibility within the landscape due to the flat topography with long and expansive vistas, and the number of turbines and their geographical spread over a very wide area, the proposed development would result in a significant and profound impact on the visual resource.

It is noted that the cluster approach formed a critical part of the applicant's design approach which incorporated mitigation by means of breaking up the intensity of the development with a view to reducing its impact. However, as noted previously, the sensitivity of a residential receptor is particularly high given the frequency with which the development would be viewed. It is considered that the wind farm would become a pervasive feature which would be an ever-present feature throughout the area, resulting in a high frequency of visibility as members of the community go about their daily lives, travelling to and from work, school, shops etc. It is therefore considered that the proposed development would result in a cumulative adverse impact on a very considerable number of human beings, and as such would have a significant, long term and profoundly negative visual impact on human beings. I am

not satisfied, therefore, with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of visual impact as a result of the proposed development.

10.3.3 Human Beings: Land use

The impacts identified related to land take, which was estimated to be less than 2% of the total land area of the clusters. I am satisfied with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of land use as a result of the proposed scheme. However, the controversial related issues of the potential impact on property values and the potential sterilisation of lands as a result of impediments to access is less certain, as discussed at 9.7.4 above. Thus it is considered that it is not possible to identify or assess the impacts on property values and sterilisation based on the information available and before the board.

10.3.4 Human Beings: Recreation, Amenity and Tourism

The EIS recognised that whilst there may be a short-term negative impact to recreation, amenity and tourism during the construction phase of the development, the residual impacts once operational would be very low. During the construction phase of the proposed wind farm, there would be potential impacts to recreation and amenity users in the vicinity of the site from increased construction traffic and dust nuisance. Potential construction impacts from the cable routes include full or partial closure of the access roads to the amenities and sports and recreational facilities, while the cables are being installed. There may be disruption to access routes and walking paths, which are adjacent to the rivers, streams and canals being crossed by trenchless means, while the trenchless crossings are being constructed. However any disruption would be mitigated where possible by maintaining access for people throughout, and where this is not possible, in minimising the impact, as well as clearly communicating the timing and scope of works to the local community. It was not however, accepted that the proposed development would result in a critically adverse visual impact on the landscape (as discussed in Ch. 15 of the EIS). However, I disagree with this conclusion as stated in 10.3.2 above.

The impact on tourism, recreation and amenity has also featured significantly in the submissions from the P.A.s, Fáilte Ireland and third party observers (as discussed at 9.8.1 above). Fáilte Ireland sees tourism as a significant income generator for the area, which has a diverse and robust tourist offering, with very high levels of accessibility to the Dublin market. The potential impact of the proposal on the canal

corridors has been singled out due to their High Amenity status, their national and regional importance and the key role that they play in terms of tourism and recreational amenity in the area. It is considered that the scale and height of the turbines in close proximity to these features would alter the landscape setting of the canals and would have a significant adverse landscape and visual impact, and would undermine future investment in projects such as the Barrow Blueway and the Greenway projects. There would also be a cumulative visual impact, as the impact on the scenic routes and designated views, of which the canal corridors form a critical element, would be adversely affected. The proposed development would also have a significant impact on the setting of many tourist attractions in the area, including several features of heritage value, such as Carbury Castle and Lullymore Monastic Complex, and could therefore undermine the efforts of Fáilte Ireland's new initiative of Ireland's Ancient East. It is considered, therefore, that the proposed development would significantly affect and jeopardise both the existing tourism and amenity value and the future tourism potential of the area.

I am not satisfied with the conclusions of the EIS that no additional significant direct or indirect impacts are likely to arise in respect of Recreation, Amenity and Tourism as a result of the proposed development.

10.3.5 Human Beings: Bloodstock industry

The identified construction impacts in the EIS principally related to noise and disruption to access, which it was considered would be temporary and mitigated. I am satisfied that this would be the case and that they could be adequately mitigated. The operational impacts, however, were confined to noise with heavy dependence of the findings of the Marshall Day Study regarding the impacts of noise on horses which were examined in 3 scenarios. It was concluded that on the basis of scientific research, there would be no significant impact on horses or the bloodstock industry.

However, as discussed in 9.8.2, the EIS (and subsequent Further Information) failed to acknowledge the important distinction between the general equine industry and the thoroughbred horse industry, in terms of the latter's highly competitive and reputation-dependent nature, and one which is heavily dependent on foreign direct investment. It is considered, however, that the proposed development, by reason of the dominant visual presence and associated effects of noise and shadow flicker, would be likely to undermine confidence and be prejudicial to the viability of equine establishments in the vicinity, (of which there are at least 22 stud farms), and would, therefore, have a potentially significant adverse impact on the equine

industry. I am not satisfied, therefore, with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of the bloodstock industry as a result of the proposed development.

10.3.6 Human beings: Health and Safety

The EIS makes it clear that the proposed development will be designed, constructed, operated and decommissioned in accordance with all health and safety legislation, and that the risks during the operational phase will be negligible. The substation and cables will also comply with ICNIRP and EU guidelines for EMF. In terms of additional potential impacts highlighted by observers, it is accepted that potential impacts relating to structural integrity (e.g. blade throw) and strobing effects of shadow flicker can be adequately mitigated and that infrasound is considered to be unlikely to give rise to any significant impacts, based on international research.

However, the potential impacts relating to Low Frequency Noise (between 20Hz and 250Hz, which is within the audible human hearing range), remain uncertain. John Desmond considered, (as summarised above at 9.7.1.7, with a detailed discussion on the evidence available provided in his report at 2.2.17-2.2.24), that having regard to EPA guidance on the matter and more recent research than cited in the EIS, and as insufficient evidence was contained in the EIS to enable an informed determination on the impacts to be made, the precautionary principle should apply, particularly given the scale of the development proposed, the very high level of population that would potentially be affected, (located between 500m and 1310m), and the potential for LFN to interfere with sleep. I would agree and am not satisfied with the conclusions of the EIS regarding the potential impacts on residential amenity arising from LFN.

10.3.7 Human Beings: Noise and vibration

Construction noise impacts have been identified in the EIS as occurring above 65dB LAeq over the daytime week hours. However, no detailed noise predictions have been carried out as the type of plant and schedule of works is not yet known. The only activities examined in any detail are the proposed track laying and borrow pits. However, the track laying is not considered in any great detail as it is assumed that time taken for track laying would not exceed the duration limit of 1 month, and as such, no significant impacts are predicted. However, John Desmond (2.2.43) considers this to be unjustified and not evidence based and as such, it is not possible to determine the likely significant effects on any NSLs. Similarly, in respect

of the borrow pits, an assumption is made that the noise level of 65dB_{LAeq} will not be breached given that a distance of 120m would be maintained. However, this has been found to be incorrect as there are several dwellings within this self-determined limit. It was, therefore, concluded that the construction noise assessment is inadequate.

The potential operational impacts have been identified in the EIS on a cluster basis with exceedances of the noise limits from wind turbines at nearest residential properties at Ballinakill (25 no.), Drehid-Hortland East (10 no.) and Cloncumber (97 no.), with further exceedances at non-residential properties, (see John Desmond Report 2.2). The data regarding Drehid-Hortland West had been inadvertently omitted from the EIS, but was provided as FI, with a large number of residential properties likely to experience exceedances. The proposed mitigated levels were Daytime - 45dB_{LA90} at all clusters except Cloncumber, which would be 40dB_{LA90}, and Night time – 43dB_{LA90} at all locations. The residual impacts, following mitigation, predicted that there would be no significant impacts at any of the clusters.

However, as highlighted in John Desmond's report, (2.0-2.47, with conclusions on the baseline given at 2.31 and 2.47, and summarised at 9.7.1 above), it is clear that the baseline noise survey is inadequate in that the survey results are likely to have been either biased or contaminated. Thus it may have resulted in higher background levels than appropriate, and does not comply with best practice guidance. Accordingly, it is not possible to determine with any confidence the likely significant impacts or to determine the appropriateness of either noise limits or of mitigation measures. In addition, the potential impacts were not referenced to any wind speed, which is likely to underestimate the max. noise emission limits experienced at the NSR. In addition, as no contour maps have been provided for either the baseline data or the predicted levels, (as recommended in GPG and as requested by the P.A.s), it is very difficult to determine the likely increases in noise levels above background for individual properties. Thus the noise assessment and, in particular the predicted mitigated noise levels, cannot be relied upon.

Having regard to the scale and spatial extent of the development proposed and the close proximity of turbines to a substantial number of dwellings, it is considered that the potential for significant adverse noise impacts on a large number of residential properties in the surrounding areas would be excessive. In the absence of an appropriately revised, accurate and justified noise impact assessment, John Desmond advised that permission should be refused in the interest of protecting residential amenities of the resident population. Thus I am not satisfied that the

principal potential impacts have been identified in respect of noise and vibration impacts, or that the mitigation measures proposed are appropriate. Furthermore, it is not possible to be confident, as concluded in the EIS and FI, that no additional significant adverse impacts are likely to arise in respect of noise and vibration on Human Beings as a result of the proposed development.

10.3.8 Human Beings: Shadow flicker

The EIS acknowledged that there would be 994 dwellings located within 10 rotor diameters of a wind turbine, and that there would be potential for the guideline limits to be exceeded at 42 dwellings. However, this would be mitigated by using an automatic shutdown system of relevant turbines when adverse conditions arise. It is considered that the mitigation proposed is likely to be adequate to address the potential adverse impacts on residential properties. However, a system for logging and addressing any complaints should be included in any such mitigation. I am satisfied, therefore, with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of shadow flicker as a result of the proposed development.

10.3.9 Human Beings: Air and climate

The main negative potential impacts arise during the construction phase. These include dust from earth moving, excavation and movement around the site. However, I am satisfied that such impacts could be adequately addressed by means of mitigation as proposed. I would also agree that the impacts arising from emissions from traffic and plant machinery are likely to be low and temporary.

Positive impacts were also identified in terms of the displacement of emissions of greenhouse gases from other less clean forms of energy generation. I would agree that this would assist Ireland meeting its renewable energy targets and obligations and would indirectly assist in the battle against climate change. I am satisfied, therefore, with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of air and climate as a result of the proposed development.

10.3.10 Human Beings: Traffic and Transport

This issue was addressed under 10.3.1 above (impact of cabling and construction traffic on human beings). Traffic and transport as a material asset will be discussed below.

10.4 Flora and Fauna

Designated sites :- There are 36 designated sites within 15km of the proposed development, of which 10 are European sites, (see 9.9.1.1 above). The main potential impacts, (on the non-European designated sites, as the European sites are discussed in the AA section), related to direct impacts through pollution and proximity to NHAs and pNHAs and indirect impacts on downstream designated sites through pollution, in all phases of the development. Avian Ecology considered that the identification of four sites with the potential for direct impacts, (due to proximity or a hydrological connection to the development site) did not appear to be based on detailed site investigations, and as such, was based on limited evidence. Hydrological connectivity was equally vague in respect of the indirect impacts identified, and as such, it was considered that the number of designated sites that may be affected is unknown. In addition, the EIS failed to consider potential impacts arising from hydrological changes associated with forestry clearance, compensatory planting and the spread of invasive species. Thus the potential for harm to nationally important designated sites was not adequately addressed in the EIS.

Habitats :- The baseline survey is considered to be very limited and inadequate, apart from the surveys of Hortland Bog, Windmill Bog and Molerick Bog (Priority Habitat Raised bogs) and Ballynabarney Fen. The proposed development will result in the direct loss of habitat, but this would represent only 8% of the total site area and is mainly classified as of low ecological significance. The identified raised bogs, which are of international significance, would not be directly affected. Indirect impacts were also considered to be unlikely to occur by reason of marginal drainage or drawdown from open ditches. However Avian Ecology considered that this conclusion was not supported by either evidential studies or the Peat specialist's report. Habitat fragmentation was unlikely to occur due to the lack of continuous habitat between the clusters. Concern was expressed regarding the absence of final confirmatory detail on re-instatement of habitats and enhancement measures which would not be provided until the Habitat and Species Management Plan was finalised in the final CEMP, as it was impossible to quantify overall losses and gains or to determine the effectiveness of the future measures. Given that 63 ha of forestry, not all of which is commercial, and substantial areas of scrub, hedgerow and treelines would be permanently or temporarily lost, this was considered to be inadequate. Thus the conclusions of the EIS of 'slight residual impacts' were not supported by evidence and the efficacy of the mitigation measures could not be established. Avian Ecology concluded that whilst impacts on habitats would not be significant with the implementation of adequate and robust

mitigation, on the basis of the information currently before the Board, it was not possible to substantiate this conclusion.

Mammals :- The baseline is deficient as the survey effort was extremely limited. The methodology is also unclear and surveys are insufficiently detailed. Although there is a reasonable representation of the suite of mammal species likely to be present, the evidence is inadequate to confirm this or to identify species distributions. The presence of several species protected under the Wildlife Acts, Identified impacts related mainly to loss of habitat, reduced habitat quality and increased disturbance during construction, increased potential for road fatalities during operation and increased disturbance and road casualties during decommissioning. The identification of impacts was generally considered to be reasonable apart from the consideration of impacts on resting mammals during tree felling, earthworks etc. Mitigation was generally considered to be adequate, but where it was uncertain, a commitment was given to pre-construction surveys and derogation licences, where required. As such, it was considered that the potential for adverse impacts on mammal populations would be low. The residual impacts were therefore accepted, notwithstanding the limited baseline and failure to complete accurate surveys.

Aquatic ecology :- As stated in Avian Ecology report (5.4.44 – 5.4.53 and summarised in 9.9.1.4 above), the baseline is grossly deficient and the survey effort was extremely constrained. The limited selection of the watercourse baseline was unjustified and sampling surveys were extremely limited. Notwithstanding this, a precautionary approach was adopted in respect of annex II species Atlantic Salmon, White Clawed Crayfish and River and Brook Lamprey, as it was assumed that they would be present. However it would not be possible to assess impacts at a population level due to the lack of information on the local aquatic environment. The assumptions about macroinvertebrate communities were considered reasonable. The identification of potential impacts is considered to be adequate and includes increased pollution, changes to hydrology due to siltation, obstruction of watercourses, increased erosion, alteration to drainage and cumulative effects from peat extraction and agricultural activities. The operational impacts include pollution from leakage of oils, illegal rubbish dumping, fish poaching and off road vehicles.

However, the evaluation is purely qualitative and no attempt is made to quantify levels of pollution or the changes to hydrology. Furthermore the identification of impacts has not adequately addressed in terms of the potential for hydrological changes arising from tree felling and replanting, the spread of alien species and in-combination effects of other operational works, other than wind farms. The

mitigation measures are also inadequately detailed and based on an outline CEMP, which is inadequate given the complex and sensitive aquatic environment and the severely constrained baseline and failure to identify all potential impacts. As such the EIS is deficient as it would not be possible to determine the scale of the likely impacts on the aquatic environment and associated habitats and species.

Other taxa :- Baseline data is again deficient. Specific surveys were not undertaken for 'Nationally Important' and legally protected species such as Smooth Newt, Common Frog and Common Lizard. Other species likely to be present include Hedgehog and Irish Hare. The survey effort for Marsh Fritillary was also inadequate. Although a precautionary approach was adopted in terms of assumed presence where suitable habitat exists, the assessment is limited due to the absence of accurate baseline data. Potential impacts include direct habitat loss, increased disturbance and reduced habitat quality. However, the assessment of impacts was considered by Avian Ecology to be grossly inadequate and was carried out in a cursory fashion. Thus the assessment of impacts on the species identified, including Marsh Fritillary, Common Frog and Common Lizard was inadequate and the EIS was accordingly considered to be deficient. The mitigation measures are also unclear and inadequate, particularly in respect of species that are afforded legislative protection. The conclusions of the EIS that the residual impacts as 'not significant' cannot therefore be accepted as there is insufficient evidence upon which to base such conclusions.

Birds :- the baseline data in terms of the scope and extent of surveys fell significantly below that recommended in the guidelines and the identification of target species was unjustified. A detailed critique of the baseline surveys is provided in Section 6.4 and 6.5 of the Avian Ecology report. In particular it was found that inadequate data was compiled in respect of foraging and roosting activity for non-breeding birds and water birds, the flight activity surveys were grossly inadequate as only two clusters were surveyed and these surveys were technically deficient. As such it was not possible to rely on the EIS conclusions regarding abundance and activity level of ornithological features or to determine the full extent of potential impacts or to enable a robust assessment of the impacts. The identified potential impacts are direct habitat loss, disturbance and displacement due to reduced availability of suitable habitats and/or barriers to flight paths (the barrier effect), and collision risk resulting in death or injury.

However, due to the paucity of information, it is not possible to either quantify the habitat loss for any species or to assess the magnitude of collision risk. The baseline surveys were also so poor, both temporally and geographically that a

robust assessment of the indirect impacts of displacement, disturbance and the barrier effect could not be carried out. The mitigation measures include inherent design, pre-construction surveys (nesting birds) and a monitoring programme with additional mitigation measures if required. These were considered reasonable but it was unclear how such mechanisms would be triggered and applied and they would be inappropriate where used to supplement inadequate baseline surveys, (as possible here). The EIS concluded that the residual impacts on whooper swan and general bird assemblage, with implemented mitigation measures, would be negligible. However this conclusion cannot be independently tested or verified and the deficiencies with regard to data gathering cannot easily be overcome without the need for further and more extensive survey work in clear accordance with applicable guidance.

Bats :- The baseline survey effort was found to be well below that recommended in key guidance, in terms of scope, timing and use of technical equipment, resulting in uncertainty regarding levels and distribution of bat activity, likely significant impacts and appropriateness of mitigation, (see section 7.4 of Avian Ecology report). 5 no. species were recorded, (including Leisler's Bat), but given the limitation of the survey, it is considered likely that more species may be present around the application site. The determination of bat roost potential was also constrained by the inadequate assessment of structures such as bridges along the TDRs, cable and haul routes. Potential direct impacts include loss of habitat (including roosting and foraging sites) or through fragmentation; death or injury through collision or barotrauma. Indirect impacts include off-site road widening to facilitate access involving tree and hedgerow removal/trimming; strengthening/alteration of bridges and culverts.

The identification and description of potential impacts is reasonable but fails to adequately consider direct habitat loss from tree felling or the in-combination effects of the five clusters. The greatest risk to bat populations is through deaths from collision but no attempt has been made to quantify the predicted effects. The evaluation in the EIS tends to be qualitative rather than quantitative, and conclusions cannot therefore be independently verified. Mitigation is proposed in the form of a 50m buffer, which is in accordance with standard practice, but proposals for habitat restoration are inadequately detailed (as will be contained in HSMP). Thus the adequacy of compensatory habitat for forestry clearance cannot be assessed. Curtailment would be an appropriate mitigation measure but is only proposed at 4 of 5 areas identified as having high bat activity levels, and is unlikely to address impacts on Leisler's Bat, which overflies the open areas. Given the low level of survey effort, it is considered that the proposed mitigation for this species

has not been demonstrated as being adequate. Monitoring of bat fatalities is appropriate, although clarity is required regarding 'significant' levels of collision to trigger increased mitigation. The EIS does not provide an adequate assessment of the potential for significant impacts on bats and is considered to be clearly deficient. It should also be noted that the KCC Heritage Officer remains of the view that four turbines should be omitted.

Cumulative effects :- an assessment of cumulative ecological effects was confined mainly to other wind farms in the general area, which were found to be located in different water catchments, and as such, would not result in any significant cumulative impacts on ecological receptors that are statutory designated sites. However, the potential for cumulative effects for other ecological receptors have not been quantified as they are merely discussed in broad, qualitative terms. As such, the EIS is lacking in detail and is deficient. Furthermore, the 'in-combination' ecological effects of the 5 clusters has not been considered and thus it is not possible to gain an overall understanding of the site and surroundings and to compare findings for different locations within the site. Although the applicant states that this was not a planning requirement, it would have provided for a more accurate and comprehensive assessment.

Conclusion Flora and Fauna :- Given the insufficient and severely limited nature of the baseline data across all ecological receptors, and in particular, the lack of evidence in the form of site investigations to substantiate the conclusions regarding the absence of hydrological connectivity and the abundance and activity levels of a range of species, including Annex I and Red Listed Birds, Bats and a number of legally protected mammals and other taxa, combined with the inadequate level of detail contained in the mitigation measures currently before the Board, I am not satisfied that the proposed development would not be likely to give rise to significant adverse impacts on the ecological interests of the local area or on the conservation objectives of any site designated for conservation interest. I am not satisfied, therefore, that the conclusions of the EIS are adequate and that no additional significant impacts are likely to arise in respect of flora and fauna as a result of the proposed development.

10.5 Soils and Geology

Potential impacts include ground stability, slope failure, removal of material; soil compaction; an increased rate of run-off leading to soil erosion and sedimentation/siltation of water courses; erosion of exposed soil and rock; and localised contamination of soil. Various mitigation measures were proposed to

address these potential impacts during the three phases of development, set out in 8.5.1/2/3 of the EIS and discussed in 9.10 above. The residual impacts on geology and soils were considered to be imperceptible following the implementation of the recommended mitigation measures. However, detailed site investigations have not yet been carried out and the final turbine make/model, including the design of the turbine foundation, has not been determined.

Thus it is not possible to determine the foundation formation levels for turbine bases or whether piled foundations would be needed, or to estimate the extent of excavation/soil removal required, the volume of concrete needed or whether dewatering would be required. Given the substantial geographical extent of the site, together with the potential for complex geology and/or variable soil/ground/drainage conditions, as well as the reliance for mitigation on an outline CEMP and the engagement of a specialist geologist/hydrologist, it is considered that the level of information currently before the Board is inadequate to enable a robust determination on the full extent of potential impacts and adequacy of mitigation and, therefore, undermines the robustness of the conclusions regarding the residual soil/geological impacts. I am not satisfied, therefore, with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of soils and geology as a result of the proposed development.

10.6 Water – Hydrology and Water Quality

Hydrology: - The direct hydrological impacts were identified as an increase in surface water run-off, (0.15% for the Boyne catchment and 0.03% for the Barrow catchment), due to changes in land use with increased impermeable ground conditions. The indirect impacts were identified as localised soil erosion and consequent sediment release to watercourses via the drainage system, if unmitigated. No impacts were identified in respect of groundwater storage/distribution/flow or changes to water table levels due to dewatering for turbine foundation construction or borrow pits. The potential impacts were considered to be minor and would reduce over time as vegetation re-established. Mitigation was proposed by means of drainage design. This involves a three stage process primarily, namely, swales, stilling ponds and diffuse outflows and the diversion of uncontaminated surface water from construction areas.

However, as discussed at 9.11.1 above, the baseline data is considered to be deficient as it was based on a desk study and walkover survey only, with an absence of detailed site investigations and finalised turbine foundation design, and an information gap regarding groundwater flow regimes across the site, including

water table levels and the nature of the distribution, flow and storage of groundwater. Given the nature and spatial extent of the site with variable ground and drainage conditions, together with the land-use mix involving large areas of bogland and the complex drainage environment in the surrounding area, it is considered that the level of information currently before the Board is inadequate to enable a robust determination to be carried out of the full extent of potential impacts and the adequacy of proposed mitigation of the scale and type of development proposed. As such, it is considered that the lack of detailed site investigation and proposed turbine foundation design, combined with the absence of information on the groundwater drainage characteristics, as well as the insufficiently detailed mitigation measures (outline CEMP), undermines the robustness of the conclusions regarding the residual hydrological impacts.

Water Quality :- Potential impacts to water quality include increased SW run-off, increased suspended solids and silt laden run-off, eutrophication from increased nutrients due to soil movement/excavation, increased risk of contamination from chemicals, concrete, fuels etc., increased risk to ground water of lowering the water table; and increased risk of dewatering the bogs leading to a possible loss of ground, ecological damage and disruption to groundwater supplies. Sensitive receptors include surface waters, private groundwater wells, source protection zones for water supplies and public drinking water supplies, as well as ecological sites with a hydrological connection to the development site. The EIS has identified the above potential impacts and the associated activities during each phase of the development that would pose risks, and has proposed mitigation measures, accordingly.

The potential impacts on the Johnstown Bridge SPZ, private wells and the raised bog priority habitats are discussed at 9.11.2 above. However, as discussed at 9.11.1 above, the absence of detailed site investigations, information regarding the groundwater flow regime and detailed mitigation design proposals, it is difficult to be confident that the proposed development would not pose undue risks to sensitive receptors such as vulnerable aquifers, the SPZ and a considerable concentration of private wells in the vicinity of the site.

Flooding :- The EIS concentrates on the risk to the development, which is defined as 'water compatible', with little attention to the displacement of floodwaters or the possible need for the provision of compensatory storage. The FRA, as discussed at 9.11.3.1/2 above, is primarily focussed on identification of indicative floodplains and associated risk from fluvial and pluvial flooding, with no evidence that the risk from groundwater flooding to the surrounding area has been considered. Given the lack

of detailed site investigations or ground water monitoring, and having regard to the bogland area where naturally high water tables occur, it is considered that an adequate hydrological assessment, including an estimate of the extent of dewatering and an assessment of the adequacy of design swales, silt ponds etc., has not been carried out. It is considered, therefore, that this omission makes it difficult to have confidence in the conclusions on flood risk in the EIS.

I am not satisfied with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of water as a result of the proposed development.

10.7 Landscape impact

Landscape and Visual Impacts are addressed in Chapter 15 of the EIS and associated appendices, and are discussed in detail at 9.5 above. I have also addressed visual impact on human beings at 10.3.2 above. The following section should be read in conjunction with these sections.

Landscape is about the relationship of people and places and Landscape Impact Assessment is concerned with evaluating the change in landscape character that may result from a proposed development. Direct effects can occur through removal, alteration or addition of key features or defining characteristics, including changes to the character or views of landscape elements such as skylines or other features of significance. The EIS has successfully identified the key features and defining characteristics of the landscape, with reference to LCAs, Scenic Routes, Protected Views etc., which include elements such as the Newton Hills, the Chair of Kildare, Carbury Hill and Castle, the Royal Canal, the Grand Canal and the associated feeders. However, the sensitivity and importance of these elements within the landscape is continually played down, without adequate justification in my opinion, and in contravention of the status assigned by designations in CDPs and the high regard with which the elements are held by the public, (as evidenced by the third party submissions). In particular, the downplaying of the significance of the canals as industrial structures, with an inference of a utilitarian nature/purpose, runs contrary to the national and local significance applied to these highly valued features.

The evidence provided to illustrate and support the assessment of impacts is comprehensive and generally robust. However, the photomontages are too few in number, do not always represent the worst-case scenarios and the use of panoramic views tends to distort the way in which the development would be

viewed by the human eye. In addition, whilst the RSA provides another dimension to how the wind farm would be experienced in the landscape, it is limited to views from public roads, which is by no means representative of the overall landscape, and is overly reliant on the screening effect of vegetation, which is considered to be unreliable. The assessment again downplays the significance of the likely impacts, which in a great many instances would have been expected to be of a much greater magnitude than that assigned by the applicant. Examples include the views to/from hilltops including Carbury Castle/Hill, the Royal and Grand Canals, Scenic Routes such as R414 at Barneran, all of which are singled out for protection in the Development Plans. The magnitude of the impact is reduced by means of professional opinion, which seems to be based on matters such as the 'anthropogenic' nature of the landscape, the presence of vegetative screening and the number of turbines visible and their proximity. However, it is considered that there is an over-reliance on professional opinion in the EIS assessment, without adequate evidence-based justification.

The main form of mitigation is the design and layout of the wind farm which has resulted in the cluster approach, with 47 no. Turbines of 169m blade tip height across 5 clusters. Although there is some merit in the argument that this approach dilutes the intensity of the proposed development, the EIS has failed to assess the cumulative visual impact of so many clusters of very tall turbines within a relatively small and homogenous area, which is composed of a flat landscape that is enclosed by the Newton Hills and the Royal Canal to the north and by the Chair of Kildare and the Grand Canal to the south. Thus the opportunity to view these turbines from numerous vantage points throughout the area, and the frequency with which they would be encountered, is not adequately addressed in the EIS. It is considered that the proposed development, because of the scale and magnitude of development, the visual dominance of the turbines and the extensive area over which they would be visible, would be likely to alter key features and defining characteristics of the landscape and would add new defining characteristics to the existing landscape. Thus it is considered that the proposed development would interfere with the integrity and result in a profound change to the landscape character of the area, which would be long term, significant and adverse. I am not satisfied, therefore, with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of landscape as a result of the proposed development.

10.8 Material Assets

10.8.1 Archaeology, Architectural and Cultural Heritage

The subject site lies within a sensitive archaeological, architectural and cultural heritage environment, with an extremely rich historical and cultural landscape spanning the ages, as described at 9.6.1 above. The Study Area incorporates sites of international, national, regional and local significance including a diverse range of Recorded Monuments, (including National Monuments and UNESCO World Heritage tentative sites), Protected Structures, (including many within designed/demesne landscapes and ACA settings), and an acknowledged rich potential for undiscovered archaeology. The EIS includes a comprehensive description of the above ground and recorded heritage assets, as discussed in 9.6 above. However, it fails to adequately identify and/or describe some of the built heritage and the nature and extent of the potential archaeology and provides an inadequate evaluation of the known and unknown heritage assets.

There is potential for direct impacts in the absence of mitigation on certain sites of archaeological interest, (such as the ringfort adjacent to T33), and on recorded monuments in high risk areas, (such as alongside roads and at the interface of the bog), as outlined at 9.6 above. However, mitigation strategies are deferred pending the outcome of test excavations and/or geophysical surveys which will inform such strategies. It is not possible, therefore, to have any certainty that the proposed development would not adversely affect either known or unknown sites of archaeological significance. Thus it is not possible to carry out a full EIA of the potential impacts on unknown/sub-surface archaeology. Direct impacts on the setting of the RMP KD017-04, which is located within 60m of proposed T33 and 114m of the proposed construction compound, has been identified, but not assessed, and there is no proposal for mitigation of this impact, which is considered to be profoundly negative and significant.

The potential for indirect impacts relates principally to visual impacts on the setting of heritage assets, particularly in respect of the setting of the National Monuments of Carbury Complex and Lullymore Ecclesiastical Complex, and on the setting of a number of protected structures and demesne landscapes such as Newbury Hall, Williamstown House and Knockanally House/Hortland Demesne, and on the setting of a number of Recorded Monuments, such as KD017-004. The potential impact on the internationally significant 'Royal Sites' is considered to be unclear, and it is considered that a determination on this issue cannot be made in the absence of expert advice on UNESCO World Heritage sites. The impact on the setting of a

range of heritage assets is dismissed or downplayed on the basis of professional judgement regarding whether the change would affect the contribution made by the setting to the significance of the asset. However, in many cases, this judgement is not supported by evidence and little attention is paid to the effect of the visual dominance of the turbines to the assets, which as stated in the LVIA, would be very high at distances of up to 3km. The impact on setting is also downplayed on the basis of the screening effect of vegetation, visual changes to the landscape that have occurred over time and the accessibility of the asset. However, these judgements are again generally not supported by evidence and/or are contrary to guidance on the matter. It is considered, therefore, that the proposed development would have significant direct and indirect negative impacts on known architectural, archaeological and cultural heritage assets, and in the absence of further information, it is not possible to rule out significant impacts on unknown archaeology and on the Tentative UNESCO World Heritage sites in the wider landscape.

I am not satisfied, therefore, with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of material assets (archaeology, architectural and cultural heritage) as a result of the proposed development.

10.8.2 Traffic and transport

The potential impacts in terms of traffic and transport are set out in Chapter 13 of the EIS and are as discussed above at 9.12, (See also John Desmond's analysis of Traffic and Transport impacts at Section 1 and overall conclusions at 6.1.0). These include direct impact on the physical structure and stability of the road network from cable trenching works and alterations to the network to facilitate deliveries and haulage. Indirect impacts include damage to the road network from deliveries, road safety issues relating to increased traffic (especially HGVs) and those associated with new/altered site entrances, and disruption and disturbance to residents, businesses and visitors to the area due to road works.

However, the extent and nature of the cable trenching works was inadequately described and there were significant deficiencies in the baseline survey of road structure conditions, the location of services within the road and the topography of the route. The issue of the lack of detailed site investigations was again found to be an impediment to the assessment of impacts. Furthermore the assessment did not adequately address the R414 in the reinstatement plans, the impact of the road works on road users or the capacity of haulage routes, particularly at peak hours, or the constraints on same or the significance of routes. Thus it was concluded by the

Inspector that the EIS (and FI) has failed to provide an adequate assessment of the likely significant effects of traffic and transport and that there is insufficient information provided upon which the Board can carry out an EIA of the impacts on the road network.

I am not satisfied, therefore, with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of material assets (traffic and transport) as a result of the proposed development.

10.8.3 Aviation

The subject site lies within an area where the airspace is intensively used for civilian and military flying at low altitudes, including training and emergency operations. The wind farm clusters underlie military operational and training restriction zones, and three of the clusters lie within 3 nautical miles of the M4/N4, which is used as an emergency navigational in poor weather conditions. The EIS has focussed on compliance with civil aviation rules/guidance and on obstacle avoidance. The assessment was based on likely impacts on the DoD (Baldoonnel) and Clonbullogue aerodrome only, as the EIS appears to have excluded a number of receptors from the assessment on the basis of a lack of objection/detailed objection. The potential impacts, as identified in the EIS and the further potential impacts identified by the Dept. of Defence (Air Corps) and other third parties, are summarised at 9.4 above. The identified impacts were generally dismissed on the basis of professional judgement that adherence to the rules of the air and appropriate standards and guidance, would ensure that no air navigation or safety issues would arise.

The potential impacts identified by the Air Corps include

- Access to Baldoonnel - Disruption/hindrance of access to the sole air force base in the country, which is also the base for GASU/emergency flights, and for which unimpeded access is required at all times, with consequent operational, security, safety of life and air safety impacts;
- Military operational flights - Interference by obstacle-rich environment with specific aspects of military operational flights such as necessity for low altitude flights, loitering, helicopter flights etc. with consequent operational impacts;
- Military designated space - Undermining the usability of the military designated airspace and of the navigational route represented by the M4

corridor due to need to avoid the obstacle-rich environment with consequent operational impacts;

- Canalisation - Increased pressure on the intensively used unrestricted airspace between the obstacles and the restricted airspace resulting in 'canalisation' of traffic/creation of 'choke points', resulting in the creation of a barrier effect and increased collision risk, with consequent operational and air safety impacts;
- Pilot training - Interference by the obstacle-rich environment with the utility of the area for pilot training (civilian and military), helicopter pilot training, with consequent operational and air safety impacts;
- Use of Runway 11 – the need to raise the radar vectoring altitude would interfere with the ability to carry out specialist calibration flights and to carry out successful cloud breaks, which would have serious implications for the operation of Instrument Flight systems and consequent operational and air safety impacts;
- Turbulence – the need to avoid turbines due to potential for turbulence would further restrict the use of the area with consequent operational impacts.

It is considered, therefore, that the proposed development would adversely affect the air navigability and air safety of the area, would seriously compromise the future use of the area for military operations, including security, emergency and security of life missions, and would undermine the ability of the Air Corps to continue to utilise the area for military training purposes, for which the area is designated.

The proposed mitigation measures are unlikely to address the potential impacts as they would not prevent the loss of navigability and need for avoidance of the area by pilots, with consequent operational difficulties. The potential impacts on air safety could be reduced by the proposed mitigation measures to some extent, but the introduction of such an obstacle-rich environment would be likely to result in increased incidence of infringements/requests to enter the restricted airspace and the alterations to the vectoring altitude would create additional hazards and operational difficulties. The proposal to increase the excavated depth for the turbines is not adequately detailed, and given the uncertainty regarding turbine model, turbine foundation design and whether the measures would be adequate to avoid raising the vectoring altitude for the runway, this mitigation measure is unlikely to address the identified impacts. The proposed mitigation measures would also be unlikely to address the likely adverse significant effects on the use of the area by other air navigation stakeholders, including the training of civil aviation pilots, hot air ballooning and microlighting. Thus the proposed development would

have significant adverse impacts on the air navigability and safety of the area, with particularly profound impacts on the operations of the Air Corps.

I am not satisfied, therefore, with the conclusions of the EIS that no additional significant impacts are likely to arise in respect of material assets (air navigability and safety) as a result of the proposed development.

10.9 Interactions, interrelationships and cumulative impacts

These matters are addressed in Chapter 17 of the EIS. It is stated that

“Direct, indirect, cumulative, and interactive impacts were considered during the siting of turbines to minimise impacts on landscape and visual, the human environment, geology and slope stability, flora and fauna, hydrology, water quality, shadow flicker and archaeological, architectural and cultural heritage. Other factors and constraints such as the requirements of County Development Plans were also considered. The remaining interactions and inter-relationships, after the optimisation of the layout design with respect to the various aspects of the environment are discussed, where relevant in each section and in this chapter.”

10.9.1 Interactions and inter-relationships

Table 17.1 provides a matrix showing the key interactions and inter-relationships between the key environmental aspects of the proposed development, together with further detail and examples of the diverse range of interactions and interrelationships between the key environmental aspects. I would agree that the main interactions and inter-relationships have been identified and described.

It is noted that the human environment has the most interactions with other aspects of the environment. These include air and climate, traffic and transport, noise and vibration, shadow flicker, water quality, hydrology, landscape and visual, cultural heritage and telecommunications and aviation. I consider further principal potential interactions derive from the related impacts of flora and fauna and water (quality/hydrology); geology (soils and slope failure) and water; traffic and noise; and landscape/visual and cultural heritage. The EIS states that it has considered these interactions and inter-relationships throughout the appraisal, firstly through the design of the turbine layout and cable routes to avoid impacts where possible and also in the definition of suitable mitigation measures to minimise the impacts. All of these matters have been discussed and assessed previously above.

I am satisfied that the EIS has incorporated the consideration of a wide range of interactions and interrelationships between impacts in the design of the project and the mitigation measures, and that the principal potential impact interactions have been identified either in the EIS, the observations, the FI or the assessment above. I am not satisfied, however, that the effects on the environment would not be adverse in respect of many of the impacts as discussed previously.

10.9.2 Cumulative Impacts

As discussed under 9.2.4 above, it is a matter for Eirgrid to determine whether the connection of the wind farm to the national grid at this location is appropriate and whether or not there will be a need to extend or alter the substation compound itself and/or the cables leading to/from the substation. It is unclear whether approval to connect at this location is likely to be forthcoming and whether there is likely to be a need for further development works to facilitate such a connection. In the event that such a connection is not permitted, it is likely that the applicant will need to pursue alternative options for connection to the grid. In these circumstances, it is not possible for the Board to carry out an EIA of the entire project. On the basis of the information provided, it is considered that it is not possible to carry out a cumulative assessment of the environmental effects of the whole project as required by Article 3 of the EIA Directive. Thus the proposed development is considered to be incomplete and premature in this respect.

A review of the potential for cumulative impacts from other wind farms and other developments in the area and the proposed scheme was also undertaken. It was found that there is no potential for cumulative impacts due to the location of the other wind farms within separate waterbody catchment areas, to the distances between developments and to the mitigation measures proposed incorporating good construction and environmental site management practices, which will be temporary in nature. However, as discussed previously, not all cumulative impacts have been identified or adequately addressed and the in-combination effects of the 5 clusters has not been adequately considered in respect of a number of the aspects of the environment including flora and fauna, landscape and visual and cultural heritage. Thus I am not satisfied with the conclusions of the EIS that there is no potential for cumulative impacts to arise during construction, operation or decommissioning of the project.

10.10 Assessment of Alternatives

The assessment of the consideration of the range of alternatives in the EIS was addressed in 9.3 above, when it was concluded that the consideration of alternatives has been addressed in a reasonably comprehensive manner, although the evaluation of the alternatives considered has not always been particularly rigorous, or has not been presented as such. The alternatives considered included the do-nothing alternative; alternative locations; alternative sites and designs; alternative layouts and location of turbines; alternative cable routes; and alternative technology, including alternative renewable energy generation options as well as different technologies available in respect of wind turbines. The consideration of the alternative of the single site option, as requested by the Board and the P.As, was not as in-depth as it might have been. The cluster approach appears to have been chosen mainly on the basis of land availability issues and the incorporation of mitigation of visual impact into the design. I am satisfied, however, that the applicant has fulfilled the requirements of the EIA Directive in respect of the consideration of alternatives.

10.11 Adequacy of Environmental Impact Statement

The EIS is considered to be deficient in a number of key areas across several of the aspects of the environment considered.

Baseline data:- this was clearly deficient across a number of aspects of the environment, (including flora and fauna, noise and vibration, soils and geology, water quality and traffic and transport), as the surveys were often not comprehensive and lacked sufficient detail to allow for an informed assessment. The scope of the surveys was often unduly restricted, both temporally and geographically, and was frequently informed by qualitative judgement rather than a quantitative assessment and detailed understanding of the site and surroundings. The methodology was frequently set out but not followed. The absence of a robust baseline data set substantially limits the credibility of the EIS findings regarding potential impacts and undermines confidence in the adequacy of mitigation measures and in the conclusions regarding residual impacts.

Identification of impacts:- In general, potential impacts were identified in terms of typical impacts that are likely to arise and the potential pathways to impacts. The identification and description of impacts in some topics was very detailed and comprehensive, but in others the description was inadequate. For example, the extent and magnitude of the impacts was generally inadequately considered or was

not presented in a consistent or verifiable manner. The assignment of significance ratings for each potential impact was also generally inconsistent and the justification was often vague, particularly in respect of flora and fauna. Where uncertainty existed, this was not always acknowledged, and it was not clear whether the precautionary approach was to be adopted in such circumstances. Thus the identification and description of impacts is considered to be deficient in a number of areas.

Assessment of impacts:- was found to be largely qualitative and supported by limited evidence, both in terms of baseline data and peer reviewed research. The sensitivity of receptors and significance of impacts were frequently dismissed or downplayed on the basis of professional opinion or qualitative statements, which were unsubstantiated by evidence. Clear assessment methodologies, although sometimes referenced in the EIS, were frequently not followed in a consistent or clear manner and potential impacts were inadequately quantified or detailed. Thus the assessment of impacts was often found to be vague and poorly evaluated. The assessment process cannot, therefore, be easily verified and as such, the assessment of impacts is considered to be deficient.

Mitigation:- The deferral of the carrying out of detailed site investigations, site surveys or geophysical surveys until after determination of the application, where such investigations are intended to inform the mitigation measures is contrary to the requirements of the EIA Directive. It also erodes confidence in the credibility of the EIS findings in respect of residual impacts. Mitigation by design and avoidance, although considered to be a reasonable approach, the effectiveness of such mitigation cannot be easily verified. Other mitigation measures in the EIS, particularly flora and fauna, were often limited in detail, making it difficult to evaluate whether the proposed mitigation and habitat management measures are appropriate or likely to be effective, in terms of the possible nature, scale or duration of impacts on habitats and species.

Residual impacts :- were generally considered in the EIS to be low (or negligible) and not significant. However, the level of certainty around assessment conclusions, in terms of providing confidence levels, was found to be absent, and in many instances the supporting evidence was found to be very limited. Thus, given the lack of a transparent and reasoned pathway which allows conclusions to be independently tested or verified and the failure to accurately or consistently follow the appropriate (or best practice) methodology for impact assessment, together with the deficiencies in the baseline data, it is considered that the conclusions regarding residual impacts generally lack credibility.

Cumulative impacts :- as discussed previously (9.2.4 and 10.2.2) in the absence of adequate information on the connection of the proposed wind farm to the national grid, or the need to extend/alter the existing substation and associated cables at Dunfirth, it is considered that a cumulative assessment of the likely environmental effects for the entire project cannot be carried out. Furthermore, I am not satisfied that all of the cumulative impacts have been identified or assessed in respect of the aspects of the environment that are likely to be affected.

11.0 Appropriate Assessment

11.1 Appropriate Assessment Screening

This section should be read in conjunction with the report from Avian Ecology dated 27th June 2016, (Appendix 2). The proposed development and the receiving environment are described in Section 3 of that report and the review of the NIS for the purposes of appropriate assessment is contained in Section 4 of that report. The proposed development lies within 15km of 36 no. designated sites of which 10 no. are European sites. These are:-

- River Boyne and River Blackwater cSAC, (site code 002299)
- River Boyne and River Blackwater SPA, (site code 004232)
- Ballynafagh Bog cSAC, (site code 000391)
- Pollardstown Fen cSAC (site code 001396)
- Ballynafagh Lake cSAC (site code 001387)
- Rye Water Valley/Carton cSAC (site code 001398)
- The River Barrow and River Nore cSAC (site code 002162)
- Mount Hevey Bog cSAC (site code 002342)
- The Long Derries cSAC (site code 000925)
- Mouds Bog cSAC (site code 002331)

11.1.1 Identification of European sites

The location of these sites is shown in Figure 7.1 Appendix 6 of the Appropriate Assessment Report, attached to the EIS. Avian Ecology reviewed the reasoning behind the selection of sites in Section 4.3.3-4.3.14 and concluded that the applicant had adequately identified the European Designated sites for which screening for likely significant effects is required. The issue raised by the NPWS regarding hydrological connectivity is addressed in Section 4.3.8-9 of the A.E. Report. The conclusions were based on a review of both the NIS material and

Chapters 8, 9 and 10 of the EIS. It was accepted that the 15km buffer was appropriate in this instance, in terms of hydrological connectivity, due to factors such as dilution via spatial separation from European sites and prevention based on an illustrated and quantitative maximum extent of the hydrological connectivity with the development site. Furthermore, the 15km zone was considered by A.E. to be appropriate for any European site without hydrological connectivity, based on the unlikely presence of mobile qualifying interests beyond this distance.

On the basis of the information contained in the NIS screening report and the professional opinion contained in the Avian Ecology report, I would agree that, notwithstanding the lack of clarity around the issue of groundwater hydrological connectivity, identification of the European sites which may be affected by the proposed development is reasonable in this instance.

11.1.2 Conservation objectives

It is noted in the A.E. report that the version and date of the conservation objectives are not quoted in the NIS, but the FI of September 2015 provided the most up-to-date versions for five of the European sites (those subject to Stage 2 assessment), but not for the five that were screened out. However, it was considered that this is not a material limitation and that the correct qualifying interests for each of the European sites had been identified.

11.1.3 Likely significant effects of the proposed development

It was determined during the screening process that none of the identified European sites would be impacted in terms of direct effects by the proposed development, alone or in combination with other plans or projects, principally due to the separation distances. This is considered to be appropriate. The likely significant effects would be indirect and are set out in Table 5.2 of the NIS and in 4.3.23 of the A. E. Report, which may be summarised as follows: -

Construction

- Potential siltation of R. Blackwater and tributaries; of tributaries of the R. Barrow (such as R. Figile, R. Slate); and of the Rye Water River, upstream from Rye Water cSAC due to construction works. In the absence of mitigation, these effects were considered to be likely and potentially significant.

- Potential for eutrophication due to contaminated run-off entering the R. Blackwater and tributaries, the tributaries of the R. Barrow within 15km buffer and the Rye Water River during construction works. In the absence of mitigation, these effects were considered to be likely and potentially significant.
- Potential pollution of the River Blackwater and tributaries, R. Barrow and tributaries and Rye Water River resulting from wet concrete operations, fuel spillages/leaks or leaking of foul effluent. In the absence of mitigation, these effects were considered to be likely and potentially significant.

Operation

- Potential for changes to water due to a (low) increase in run-off from a storm event, resulting from the change in land use and an increase in impermeable ground conditions. In the absence of mitigation, these effects were considered to be likely and potentially significant.

Decommissioning

- Potential impacts similar to the construction phase.

The identification of indirect likely significant effects in the NIS is considered reasonable. However, Avian Ecology has identified a number of additional likely significant effects, which have failed to be included in the assessment:-

- Potential for changes to hydrology as a result of tree felling resulting in an increased rate of run-off and the risk of downstream flooding or sedimentation due to erosion. In the absence of mitigation, these effects were considered to be likely and potentially significant.
- Potential for changes to hydrology as a result of tree planting/replanting resulting in changes to run-off and water quality. In the absence of mitigation, these effects were considered to be likely and potentially significant.
- Potential for displacement and disturbance to qualifying species interests as a result of tree planting/replanting. In the absence of mitigation, these effects were considered to be likely and potentially significant.
- Potential for spread of alien invasive species resulting in threats to native flora and domination of banks of watercourses, which could lead to bank erosion and sedimentation of watercourses.

11.1.4 Conclusions of Stage 1 Screening

The NIS concluded (5.4) that, by virtue of no identified pathways for direct and/or indirect effects, and without the inclusion of mitigation measures, the following European sites located within 15km of the development site have been “screened out” of the Appropriate Assessment process:

- Ballnafagh Bog cSAC;
- Mount Hevey Bog cSAC;
- Mouds Bog cSAC;
- Pollardstown Fen cSAC; and,
- Long Derries cSAC

A finding of No Significant Effects Report in respect of these sites is included at Appendix 2 of the NIS. It was not entirely clear from the NIS, however, whether the screening out of these sites on the basis of a lack of a hydrological connection had included adequate consideration of groundwater connections. This matter was raised by the NPWS in its submission of 22/06/15. The applicant’s response (FI Sept. 2015) confirmed that groundwater connectivity had been included in the consideration, which it was stated was based “on best scientific knowledge, following examination and analysis, carried out by a water quality expert”. It would appear that the consideration of groundwater connectivity was based on the desk study and site walk over, and not on site investigations or any groundwater monitoring programme. It is noted, however, that three of the sites that have been screened out are located upstream of the proposed windfarm (Ballynafagh Bog cSAC, Pollardstown Fen cSAC and The Long Derries cSAC). The other two sites, Mount Hevey Bog cSAC and Mouds Bog cSAC are each located 5.4km from the proposed wind farm site and it is stated that they are not hydrologically connected. Given the distances involved combined with the absence of a surface water hydrological connection, it is considered that the decision to screen out of these sites has been made on the basis of best scientific knowledge.

Following a review of all of the material before the Board, Avian Ecology concluded (4.3.45/) that:-

On the basis of the evidence provided on behalf of the Applicant by a water quality expert, it is considered that the justification for screening out the above European sites is demonstrated and that a precautionary approach has been

adopted. No further consideration for these European sites (as detailed in paragraph 3.3.42) is required.

I consider this conclusion to be reasonable on the basis of the information on the file and the Avian Ecology Report (27/06/16), which I consider to be adequate in order to issue a screening determination that the proposed development, individually or in combination with other plans or projects would not be likely to have a significant effect on the above named European sites, in view of the Conservation Objectives for these sites. However, it is considered that, in the absence of mitigation, there remains a possibility of likely significant effects on the remaining 5 no. sites, and a Stage 2 Appropriate Assessment is, therefore, required.

11.2 Appropriate Assessment (Stage 2)

The following five European sites have been included in the Natura Impact Statement (Stage 2 AA).

- River Boyne and River Blackwater cSAC (002299);
- The River Boyne and River Blackwater SPA (004232);
- The River Barrow and River Nore cSAC (002162);
- The Rye Water Valley/Carnton cSAC (001398); and,
- Ballynafagh Lake cSAC (001387).

A Review of the NIS (Stage 2) is contained in Section 4.4 of the Avian Ecology Report.

11.2.1 Conservation objectives and qualifying interests

The Conservation Objectives and Qualifying Interests for each of the selected European sites is set out in Section 6.2 (Table 6.1) of the NIS. In each case, the Conservation Objectives are to maintain or restore the favourable conservation condition of the Annex I habitat(s) and Annex II species for which the cSAC has been selected. The Qualifying Interests for each of the sites is as follows:-

River Boyne & River Blackwater SPA (004232) – Kingfisher. Site is of high ornithological importance as it supports a nationally important population of Kingfisher (Annex I listed). European site is 840m distant from proposed development site.

River Boyne & River Blackwater cSAC (002299) – River Lamprey, Atlantic Salmon, Otter, Alkaline Fens and Alluvial Forests. The site is one of Ireland’s premier game fisheries. The R. Boyne is also designated as a salmonoid water under the EU Freshwater Fish Directive. European site is 800m distant from proposed development site.

Ballynafagh Lake cSAC (001387) – Shallow Alkaline lake with emergent vegetation. The Blackwater feeder connects the lake to the Grand Canal and is included in the designation. The QIs are Alkaline Fens, Desmoulin’s Whorl Snail and Marsh Fritillary. The Blackwater Feeder is also of particular conservation significance for populations of two rare snail species, *Vertigo Moulinsiana* and *Pisidium Pseudosphaerium*. European site is 5.5km distant from proposed development site.

Rye Water Valley/Cartron cSAC (001398) – Petrifying Springs, Narrow-mouthed Whorl Snail and Desmoulin’s Whorl Snail. The conservation significance of the site lies in the presence of several rare and threatened animal and plant species and the presence of petrifying springs (Annex I habitat). European site is 13.62km distant from proposed development site.

River Barrow and River Nore cSAC (002162) – very large sites which spans 8 counties between the Slieve Bloom Mountains and the sea and Waterford. The QIs are

Estuaries	Desmoulin’s Whorl Snail
Tidal Mud Flats & Sandflats	Freshwater Pearl Mussel
Salicornia Mud	White Clawed Crayfish
Atlantic salt meadows	Sea Lamprey
Mediterranean salt meadows	Brook Lamprey
Floating River Vegetation	River Lamprey
Dry Heath	Twaite Shad
Hydrophyllous Tall Herb Communities	Atlantic Salmon
Petrifying Springs	Otter
Old Oak Woodlands	Killarney Fern
Alluvial forests	Nore Freshwater Pearl Mussel

The European site is 13.5km distant from the proposed development site. Connectivity with the R. Barrow is via the R. Slate which flows southwards from Cloncumber and joins the R. Figile and then to the R. Barrow. The site is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species and high conservation value for populations of bird species.

11.2.2 Likely significant effects of the proposed development

The potential impacts on key species and habitats and on the integrity of the European sites are considered in Sections 6.3 and 6.4 of the NIS. There are no direct effects given that the proposed development is not located within any of the

designated European sites. The potential effects arising from the construction phase (which are stated to be similar for the decommissioning phase) identified with regard to the above European sites (and as stated in the NIS) largely arise from the possible release of suspended solids and/or silt laden run-off into watercourses, with the potential for significant indirect impacts downstream of the development.

- River Boyne and River Blackwater cSAC - Reduction in water quality (key element of site) leading to reduction in species density and reduced foraging potential for aquatic species such as River Lamprey, Atlantic Salmon and Otter. This in turn could lead to reduced numbers or reduced breeding success for these qualifying interests. As the cSAC is less than 1km downstream of the proposed development, there could be indirect impacts via water quality on these qualifying interests, in the event of siltation or pollution of watercourses.
- River Boyne and River Blackwater SPA - Reduction in prey densities for Kingfisher as a result of changes in water quality (a key element of site), for which the site has been designated. Changes to water turbidity and water quality could reduce prey availability of breeding Kingfisher. This in turn could lead to a decline in breeding numbers or reproductive success for this qualifying interest. As the SPA is less than 1km downstream of development, there could be indirect impacts via water quality on this qualifying interest.
- Rye Water Valley/Cartron cSAC - Reduction in water quality (a key element of site) and consequent impacts on Vertigo Snails, and a consequent reduction in area of Petrifying Springs habitat, each of which is a QI of the cSAC. It is stated in the NIS (6.3) that this site is c.7km from the proposed development at its closest, and that whilst no direct impacts are predicted, potential impacts due to the trenchless crossing of the Rye Water on the HV route west of Kilcock may occur. It is also noted that part of the site overlaps the Royal Canal at Louisa Bridge which is also crossed using trenchless techniques west of Kilcock. However, the Board should note that the HV route no longer forms part of the proposed development. Otherwise, it is stated that the conservation interests of the site are unlikely to be affected due to their location and hydrological separation from the Rye Water, and as such, it is included on a precautionary basis.
- Ballynafagh Lake cSAC - Reduction in water quality (a key element of site) within the portion of Ballynafagh Lake which overlaps The Grand Canal at the confluence of the canal and the Blackwood Feeder. It is stated in the NIS (6.3) that the portion of the cSAC overlapping the canal is not suitable habitat for the conservation interests of the cSAC, but is included on a precautionary basis due to works upstream of the canal.
- River Barrow and River Nore cSAC - Reduction in water quality (key element of site) and foraging potential for mobile aquatic species such as River Lamprey, Atlantic Salmon and Otter (all QIs), in the event of a large release

of sediment during construction. This in turn could lead to reduced numbers or reduced breeding success for these qualifying interests. However, it is pointed out (NIS 6.3) that the cSAC is located 13.5km downstream of the proposed works (crossing of the River Slate on MV cable route at western side of Cloncumber cluster).

The NIS considers that only construction works associated with the proposed development, as well as decommissioning works, (to a lesser extent as the infrastructure will be in place), have the potential to result in a decline in water quality. This is considered to be reasonable. However, the A.E. Report considers that the NIS is deficient in that consideration has not been given to the potential for a deterioration in aquatic habitat as a result of invasive species spread nor to the true extent of hydrological effects following tree felling and replanting. I would agree that insufficient consideration has been given to the likely significant effects arising from these works, which have been inadequately detailed in the application.

It is also pointed out in the A. E. Report that, whilst the NIS states how the integrity of three of the European sites may be impacted during construction works, namely R. Boyne and R. Blackwater cSAC, R. Boyne and R. Blackwater SPA and the R. Barrow and R. Nore cSAC, it does not do so in respect of the Rye Water Valley/Carton River cSAC or the Ballynafagh Lake cSAC. I would agree that the potential impacts on the qualifying interests and/or integrity of these two European sites has not been clearly addressed in the relevant stages of the NIS. I note that in Section 5.3.2 - 'Description of likely impacts of project on Natura 2000 sites', subheading 'Size and Scale', of the Stage 1 Screening report, the following information has been provided on Ballynafagh Lake cSAC

Ballynafagh Lake cSAC, which includes the Blackwood Feeder to the Grand Canal does have a hydrological connection to the development as part of the site overlaps the canal at their confluence. Proposed works in or near the canal, upstream of the site therefore have the potential to impact indirectly on lands within the cSAC boundary. It should be noted however that these waters are within the free flowing section of the Grand Canal, are separated from the feeder and are not suitable habitat for any of the conservation interests of the Ballynafagh Lake cSAC (Marsh Fritillary or Desmoulins Whorl Snail) nor do they constitute habitats for which the site has been selected (Alkaline Fens).

Notwithstanding this, it was decided to include the cSAC on a precautionary basis for the following reason:-

“Due to the downstream hydrological connection to Ballynafagh Lake cSAC where it joins the Grand Canal and both the proximity of borrow pits to the Grand Canal at Cloncumber and upstream works at the canal crossing at Derrybrennan, the potential impacts are not screened out on a precautionary basis.” (5.3.4).

It is noted that the NIS has not considered the potential impacts on the qualifying interests or on the integrity of either the Ballynafagh Lake cSAC or the Rye Water

Valley/Cartron cSAC any further, despite the inclusion of these sites in the Stage 2 Appropriate Assessment. The potential impacts on the Rye Water Valley/Cartron cSAC are possibly of less significance now, given that the HV cable route through Kilcock has been omitted. However, there is no indication as to why it was not considered further in the NIS. Thus I would agree with Avian Ecology which considered that the NIS is deficient in this respect as it is not clear why any likely significant effects on these European sites have not been considered.

11.2.3 Mitigation

In respect of mitigation, the A.E. Report notes (4.4.11/12):-

The final CEMP will be developed further at the post-planning and construction stages by the Applicant and on the appointment of the main contractor to the project. Any adjustments to the CEMP will however, be carried out on the basis that they do not increase the impacts as addressed within the EIS. Therefore it is not clearly demonstrated that the mitigation measures have been ‘developed in light of best scientific knowledge’ as the measures have not been fully developed or designed, leaving a level of uncertainty regarding the effectiveness of measures proposed.

As such, whilst it is acknowledged that adequate mitigation may be achievable and that contamination of the receiving water environment as a result of the proposed development leading to significant adverse impact on biota could be avoided, it is unclear as to how this will be fully achieved. As such, doubt remains as to whether there would be a likely significant effect on the integrity of a European site.

I would agree with these conclusions and would draw the Board's attention to the submissions from the NPWS and from Inland Fisheries Ireland which raised these concerns. It is considered that the concerns raised by these statutory bodies have not been adequately addressed. I would have particular concerns regarding the need to conduct further consultations with each of these bodies after the determination of the application in order to finalise the design of the mitigation measures. Furthermore, the design of the turbine foundations is still to be finalised, which adds a further level of uncertainty.

11.2.4 Conclusions on Appropriate Assessment

The following conclusions were reached by Avian Ecology:-

- The NIS does not adequately consider the full magnitude and pathways for hydrological effects in relation to those potentially arising from forestry clearance and replanting, and the possible spread of alien invasive species. Whilst mitigation at a later stage may be implemented (as contended by the Applicant in September 2015), the effectiveness of this has not been

adequately demonstrated and this potential pathway for effect is not adequately explored in the NIS.

- Whilst extensive mitigation is proposed which may adequately mitigate those potential adverse effects identified in the NIS, sufficient detail is not presented. The measures proposed do not provide appropriate levels of mitigation with respect to impacts arising from forestry clearance, forestry replanting and the possible spread of alien invasive species.
- Impacts arising in combination with other plans or projects have not been adequately assessed in the NIS.
- It cannot therefore be ascertained that the potential direct and indirect effects of the project on the conservation objectives of the European sites, taking account of mitigation, has been adequately evaluated in the NIS based on best scientific knowledge, either individually or in combination with other plans or projects.

It was, therefore, considered, on the basis of the information provided with the NIS and with consideration to subsequent clarifications provided by the applicant, that it had not been adequately demonstrated that the proposed development individually, or in combination with other plans or projects, would not adversely affect the integrity of the identified European sites in view of these sites' conservation objectives. A more detailed review of the adequacy of the NIS is contained in Section 4.5 of the Avian Ecology Report.

I consider these conclusions to be reasonable. On the basis of the information provided with the application, including the NIS, the Further Information provided by the applicant and the Avian Ecology Report (27/06/16), and in light of the above assessment, I am not satisfied that the proposed development, individually or in combination with other plans or projects would not adversely affect the integrity of the following European sites:

The River Boyne and River Blackwater cSAC (site code 002299);

The River Boyne and River Blackwater SPA (site code 004232);

The River Barrow and River Nore cSAC (site code 002162);

The Rye Water/Carton cSAC (site code 001398); and,

Ballynafagh Lake cSAC (site code 001387)

in view of the Conservation Objectives for these sites. In such circumstances, the Board is precluded from granting permission.

12.0 RECOMMENDATION

I recommend that permission be refused for the reasons set out below:-

1. Having regard to the commitment by the Government to adopt a framework document containing a national wind energy strategy with a spatial dimension, to the commitment of the Planning Authorities in the Kildare and Meath County Development Plans for the area to adopt a wind energy strategy for their respective areas on foot of the adoption of such a framework document, and to the provision in the Transport Strategy for the Greater Dublin Area (2016) and in the current Development Plans for the Kildare and Meath for a Route Protection Corridor for the Leinster Outer Orbital Route, which travels through Drehid-Hortland cluster, it is considered that the development of a large scale wind farm, with a blade tip height of 169m and 47 no. turbines spread over an extensive geographical area, would, in the absence of a wind energy strategy for the area, be premature pending the adoption of such a strategy and would constitute piecemeal development which would create an undesirable precedent and would undermine any future wind energy strategy for the area. The proposed development would, therefore, be contrary to the proper planning and sustainable development of the area.
2. On the basis of the information lodged with the application and the further information on the 24th September 2015, and having regard to the recent legal ruling (O’Grianna v. An Bord Pleanála), it is considered that, notwithstanding the proposal to connect the wind farm to the existing substation at Dunfirth, inadequate details have been provided to demonstrate that the proposed wind farm can be connected to the national grid at that point, and in order for the Board to assess the environmental implications of each proposal and to complete an Environmental Impact Assessment of each element of the proposed development, having regard to the cumulative effects. The proposed development would, therefore, be premature and would be contrary to the proper planning and sustainable development of the area.
3. The site lies within an area where the airspace is intensively used for civilian and military flying at low altitudes, including training and emergency operations. The wind farm clusters underlie military operational and training restriction zones, and three of the clusters lie within 3 nautical miles of the M4/N4, which is used as an emergency navigational route in poor weather conditions. The proposed development, by reason of the blade tip height, the number of turbines and the geographical spread of the wind farm clusters,

would introduce an obstacle-rich environment which would have a significant negative impact on the air navigability and utility of the area for flight operations and training purposes. Furthermore, the proposed development would indirectly cause an increased risk of airspace infringements into the restricted zones and consequent canalisation of traffic, which would result in an increased risk to the safety of air traffic and would constrain military operations in an area for which the area is designated. It is considered, therefore, that the proposed development would endanger and interfere with the safety of aircraft and the safe and efficient navigation thereof, and would be contrary to the proper planning and sustainable development of the area.

4. The site is located in an area which can be described as falling within the Hilly and Flat Farmland landscape character type as defined in the Wind Energy Planning Guidelines, 2006 and which is identified in the relevant Development Plan as being principally within the Western Boglands and Northern Lowlands LCA (Kildare) and LCA6 Central Lowlands (Meath) and is highly visible from the Northern Lowlands LCA, the Chair of Kildare LCA and the Water Corridors LCA, (all rated as High Sensitivity), each of which is described as having an inherent inability to visually absorb development and where limitations are applied in terms of the scale and magnitude of development that can be absorbed. Having regard to the flat and expansive nature of the low-lying landscape, wherein the key, defining features of the uplands and water corridors are both visually prominent and vulnerable to the effects of development due to the long range and expansive views available to and from these key features, it is considered that the excessive height, number and spatial distribution of the wind turbines would result in a visually dominant development which would have a prominent presence throughout Northwest Kildare and would therefore alter the defining characteristics and degrade the integrity of the landscape character of the area. The proposed development would, therefore, contravene the landscape policies and objectives contained of the current Kildare and Meath County Development Plans, respectively, and would be contrary to the proper planning and sustainable development of the area.
5. The site lies within a sensitive archaeological, architectural and cultural heritage environment, with an extremely rich historical and cultural landscape spanning the ages, incorporating sites of international, national, regional and local significance including a diverse range of Recorded Monuments, including National Monuments and UNESCO World Heritage Tentative Sites, Protected Structures, including many within designed or demesne landscapes

and ACA settings, and an acknowledged rich potential for undiscovered archaeology. Having regard to this rich cultural landscape and to the close proximity of the proposed turbines, their excessive height and the high level of visibility of the turbines from many of the cultural heritage assets, it is considered that the proposed turbines, by reason of their visual dominance and the extensive area over which they would be visible, would have a significant adverse impact on the setting of several Recorded Monuments, including a number of National Monuments, and of several Protected Structures and their demesne landscapes. Furthermore, the Board is not satisfied, in the absence of the results of geophysical surveys and test excavations, that the proposed development would not adversely affect subsurface known and unknown archaeology. The proposed development would, therefore, be contrary to the proper planning and sustainable development of the area.

6. The area in which the proposed wind farm is to be located is a settled and intensively used landscape with a high density of residential properties within the 1300m contour, has a significant tourism resource which is highly accessible to the Dublin market and includes a number of Designated Scenic Routes and Protected Views as set out in the current County Development Plans for Kildare and Meath. Having regard to the height and scale of the proposed turbines, their visual dominance and proximate siting to a very large number of residential properties and tourist attractions, including the National Waymarked Trails along the canal corridors, the extensive area over which the turbines would be visible in this flat, low-lying landscape and the frequency with which they would be encountered, it is considered that the proposed development would be an intrusive and pervasive feature in the landscape and would have a significant and adverse impact on the visual and residential amenity of the area. The proposed development would, also detract from the existing tourism and recreational amenity and undermine the tourism potential of the area and would, therefore, be contrary to the policies and objectives of the Kildare County Development Plan to preserve and enhance such amenities, and to the proper planning and sustainable development of the area.
7. Having regard to the high density of residential properties within the 1300m contour as shown on Figures 11.1-11.6, Vol. 2A of the EIS and to the uncertainties contained in the Noise Impact Assessment particularly in respect of the following

- the deficiencies in the baseline noise survey, which was not carried out in accordance with good practice methodology and is therefore unlikely to be representative of the background noise environment of the Noise Sensitive Receptors most at risk;
- the inadequacy of the assessment of the significance of predicted noise emissions on the resident population in the vicinity;
- the insufficient level of detail provided in respect of the nature and duration of the construction works and excavation works;

the Board is not satisfied, on the basis of the information available and that contained in the EIS and Further Information received on 24th of September 2015, that the proposed noise limits at the NSRs would be adequate, that the predicted mitigated noise impacts can be achieved, or that the proposed development would not have significant adverse impacts on the residential amenities of a substantial number of properties in the vicinity of the site. The proposed development would, therefore, seriously injure the residential amenities of properties in the vicinity and would be contrary to the proper planning and sustainable development of the area.

8. The site lies within an area which is internationally renowned for producing champion racehorses and breeding thoroughbred horses, and within which there are at least 22 existing stud farms and related equine establishments, which together make a significant contribution to the national and local economy, and it is the policy of the Government and of Kildare County Council to support the equine sector. Having regard to highly competitive nature of the thoroughbred horse breeding industry and to the height, scale and spatial extent of the proposed development, it is considered that the dominant visual presence and associated effects of noise and shadow flicker would be likely to undermine confidence in and be prejudicial to the viability of equine establishments in the vicinity, and would, therefore, have a potentially significant adverse impact on the equine industry. The proposed development would, therefore, be contrary to the policies and objectives of the current Kildare County Development Plan and to the proper planning and sustainable development of the area.
9. Having regard to the substantial spatial extent of the site, to the complex and variable geological and hydrological environment, to the proximity of the proposed infrastructure works to public and private drinking water supplies, and to the uncertainties contained in the hydrological and geological assessments carried out by the applicant, and in particular to the following :-

- Absence of detailed site/ground investigations;
- lack of a final design of turbine foundations, together with existing and proposed ground levels, which creates uncertainty regarding whether there would be a need for piled foundations, dewatering and the extent of excavations and volume of concrete required;
- Absence of ground water monitoring data;
- Deficiency of the water quality baseline survey data,
- Failure to consider the hydrological impacts of ground water flood risk,
- Reliance on a CEMP which is outline in nature and dependent on the outcome of further consultations with external bodies and detailed design of mitigation measures

The Board is not satisfied, on the basis of the information available and that contained in the EIS and Further Information received on 24th September 2015, that the proposed development would not have significant adverse impacts on the hydrology, hydrogeology and water quality of the surface and ground water environment and on the flood risk potential of the surrounding area. The proposed development would, therefore, be contrary to the proper planning and sustainable development of the area.

10. Having regard to the sensitive ecological and complex aquatic environment, and given the insufficient and severely limited nature of the baseline data across all ecological receptors, and in particular, the lack of evidence in the form of site investigations to substantiate the conclusions regarding the absence of hydrological connectivity and the abundance and activity levels of a range of species, including Annex I and Red Listed Birds, Bats and a number of legally protected mammals and other taxa, combined with the inadequate level of detail contained in the mitigation measures proposed, the Board is not satisfied that the proposed development would not be likely to give rise to significant adverse impacts on the ecological interests of the area or on the conservation objectives of sites designated for conservation interest. The proposed development would, therefore, be contrary to the proper planning and sustainable development of the area.
11. Having regard to the nature, structure and condition of the existing road network serving the development, which includes substantial sections of substandard legacy roads, to the deficiencies in the visibility splays achievable combined with the insufficient interest in the necessary lands to achieve

adequate sight lines required to facilitate road widening for access to the site, to the extensive cable trenching works proposed, and to the inadequacies and insufficient level of detail provided by the applicant particularly in relation to the extent of proposed cabling works, the location of existing utilities within the road, the condition of the existing road structure and the existing carrying capacity of the roads, the Board is not satisfied on the basis of the information available including that provided in the EIS and Further information received on 24th September 2015, that the proposed development would not have significant adverse effects on the traffic flow and carrying capacity of the roads and on the structure of the road network. The proposed development is, therefore, likely to give rise to undue obstruction to road users and increased risk of traffic hazard during construction works and to potentially increased maintenance costs to the local authority. The proposed development would, therefore, be contrary to the proper planning and sustainable development of the area.

12. The Natura Impact Statement lodged with the application and the Further information submitted by the applicant contains insufficient information to enable the Board to undertake an Appropriate Assessment of the potential effects of the proposed development on several European sites in the vicinity of the site in view of their Conservation Objectives, namely the River Boyne and River Blackwater cSAC (site code 002299), the River Boyne and River Blackwater SPA (site code 004232) and the River Barrow and River Nore cSAC (site code 002162). In particular, the failure to consider the potential hydrological effects arising from forestry clearance, replanting and the possible spread of alien invasive species and the failure to develop and design detailed mitigation measures until after the determination of the application leaves a significant level of uncertainty regarding the effectiveness of such measures. In light of such, the Board cannot be satisfied that the proposed development, alone or in combination with other development, would not adversely affect the integrity of a number of European sites, in light of their conservation objectives. The proposed development would, therefore, be contrary to the proper planning and sustainable development of the area.

Mary Kennelly
Senior Planning Inspector
4th August 2016