



ENVIRONMENTAL BALANCE IN DESIGN AND CONSTRUCTION



**ELEMENT POWER IRELAND LTD.**

**ENVIRONMENTAL IMPACT STATEMENT FOR THE  
PROPOSED MAIGHNE WIND FARM IN COUNTY KILDARE  
AND COUNTY MEATH**

**VOLUME 2 – MAIN EIS**

**CHAPTER 11 – HUMAN ENVIRONMENT**

**MARCH 2015**



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## 11. HUMAN ENVIRONMENT

### 11.1 Introduction

The proposed development consists of the erection of up to 47 no. wind turbines with a tip height of up to 169m, access tracks, a sub-station, a permanent meteorological mast, borrow pits and associated works, temporary compounds as well as temporary minor alterations to the public road for the delivery of turbines to the site (turbine delivery route). The turbines are arranged in five wind farm clusters. The clusters are Ballynakill (10 turbines), Windmill (3 turbines), Drehid-Hortland (21 turbines), Derrybrennan (2 turbines) and Cloncumber (11 turbines). All clusters are connected via associated underground medium voltage (MV) cables which run predominately along the public road network linking back to a proposed sub-station on-site at Drehid. Here the power will be converted to AC up to a maximum voltage of 220kV for export to the Irish national grid via high voltage (HV) underground cables to either one of two existing substations located at Woodland, Co. Meath or Maynooth, Co. Kildare.

Whether the connection point to the national electricity transmission grid will be located at the Woodland or Maynooth substations will be determined by EirGrid plc, which is the statutory Transmission System Operator. Accordingly, the documentation submitted with this application for permission identified and evaluates 2 no. HV grid connection routes (which will operate at a voltage up to 220kV). The 2 no. HV grid connection cable routes included in this application will connect the proposed Maighne Wind Farm substation at Drehid to either one of two existing substations located at Woodland, Co. Meath or Maynooth, Co. Kildare. However, only one of these routes will be constructed following the identification of the preferred connection point by the Transmission System Operator.

There are a number of potential impacts from the proposed development on the human environment. These impacts include noise, visual, air quality, traffic and transportation, land use, health and safety and shadow flicker. The potential effects of the development on humans with respect to air quality, noise, shadow flicker, traffic and visual impacts are addressed separately in Chapters 5, 6, 12, 13 and 15 respectively. This chapter includes a description of the existing human environment and the potential impacts on this environment arising under the following headings:

- socio-economics i.e. the interaction of social and economic factors
- land use
- recreation, amenity and tourism
- the bloodstock industry
- health and safety
- material assets.

### 11.2 Methodology

#### 11.2.1 [Study Area](#)

The study area for this chapter was as follows:

- Towns and villages within 10km of the site were examined
- Local businesses within 5km of the site were examined
- Houses within 1km of the wind farm clusters
- Wind farms within 20km of the proposed clusters were examined
- Primary schools within 2km of the clusters and within 10km of the clusters were examined
- Secondary schools within 2km of the clusters and within 10km of the clusters were examined
- Hospitals within 2km of the clusters and within 10km of the clusters were examined
- Hotels within 2km of the clusters were examined
- Equestrian facilities (including studs, training yards and equestrian centres) within 5km of the proposed cluster were examined
- Amenities within 5km of the proposed clusters were examined
- Quarries and pits within 5km of the proposed clusters were examined
- Businesses, schools, hospitals and amenities adjacent to the HV cable routes were examined.

### 11.2.2 Desk Study

The Kildare County Development Plan 2011- 2017, Meath County Development Plan 2013- 2019, and Local Area Plans for Prosperous, Rathangan, Derrinturn, Enfield, Longwood, Dunshaughlin, Kilcock and Maynooth were reviewed for this Chapter.

As outlined in Chapter 4 EIA Scoping, Consultation and Key Issues, statutory authorities and other relevant bodies were consulted. Responses relevant to this chapter are discussed hereunder.

In response to the EIS Scoping Report, Fáilte Ireland recommended that the Fáilte Ireland 2011 publication titled '*Guidelines on the Treatment of Tourism in an Environmental Impact Statement*' be taken into account in preparing this EIS. This publication has been taken into consideration in this Chapter, as well as, responses received from the Health Service Executive (HSE). Key items raised by the HSE are public consultation with the local community, potential impacts on human beings, protection of groundwater, and potential impacts to mains water infrastructure, noise and air quality.

Kildare County Council's submission requested that the potential impacts to the economy, shadow flicker, noise and vibration, traffic and transportation, air and climate, water quality, archaeological, architecture and natural heritage, soil, geology and slope stability, landscape and visual assessment, amenity and recreation, aviation, cumulative impacts and community gain/benefit be assessed. Potential impacts on the economy, amenity and recreation and community gain/benefit are addressed in this Chapter. Other potential impacts are dealt with in Chapters 5 to 10 and Chapters 12 to 17 of the EIS.

## 11.3 Existing Environment

The proposed Maighne Wind Farm development is located primarily in North County Kildare, with only two turbines within the Ballynakill Cluster extending into County Meath. The turbines closest to the main towns and villages in the vicinity of the proposed development are as follows:

- Turbine T39 is approximately 4.6km northeast of Rathangan, Co. Kildare
- Turbine T26 is approximately 3km south of Carbury, Co. Kildare
- Turbine T47 is approximately 2.2km east of Derrinturn in Co. Kildare
- Turbine T7 is approximately 1.8km south of Longwood
- Turbine T11 is approximately 3.7km southwest of Enfield in Co. Meath.

The MV cables laid within the five clusters will connect via the local road network where they will be brought to the on-site substation in the northern section of the Drehid-Hortland cluster. From here there are two proposed HV cable routes that will enable connection to the Irish national grid. These high voltage cable routes will also be laid predominantly in public roads.

Route Option 1 extends from the Drehid-Hortland cluster eastwards along the local road, the L5028, onto the R407 and R158 to bypass Kilcock town, and subsequently along the R156 and the L6207 to Woodland Transmission Substation in County Meath. Route Option 2 extends from the Drehid-Hortland cluster eastwards along the local road, the L1010, to the Maynooth Transmission Substation in County Kildare.

### 11.3.1 Socio-Economics

County Kildare experienced population growth between 2006 and 2011 from 186,335 in 2006 to 210,312 in 2011<sup>i</sup> which represents a growth of 12.9%. The 2011 population of the County comprised 104,658 males and 105,654 females. Approximately 39% of people in employment in the county work outside of this area<sup>i</sup>. The largest industry in the County is commerce and trade, with professional services and manufacturing also key industries. The unemployment rate in 2011 in County Kildare was circa 1.1% which was lower than the State as a whole<sup>ii</sup>.

<sup>i</sup> [http://census.cso.ie/areaprofiles/areaprofile.aspx?Geog\\_Type=CTY&Geog\\_Code=06](http://census.cso.ie/areaprofiles/areaprofile.aspx?Geog_Type=CTY&Geog_Code=06)

County Meath experienced population growth between 2006 and 2011 from 162,831 in 2006 to 184,135 in 2011<sup>iii</sup> which represented a growth of 13.1%. The 2011 population of the County comprised 91,910 males and 92,225 females. Approximately 44% of the workers in the county work outside of this area.

The key industry sectors in the county are commerce and trade, professional services and manufacturing. The unemployment rate in 2011 in County Meath was circa 1% lower than the state as a whole<sup>2</sup>.

Enfield is the nearest large town to the proposed development, at approximately 2.8km from the Drehid-Hortland cluster. The 2011 population in Enfield was 2,929, which is an increase of 35.5% since 2006<sup>iv</sup>. The 2011 populations of Rathangan, Derrinturin and Longwood were 2,374, 1,541 and 1,378 respectively<sup>v</sup>. Rathangan is situated approximately 4.6km from the nearest turbine (T39) located within the Cloncumber cluster. Derrinturin is approximately 2.2km from the nearest turbine (T47), located within the Drehid-Hortland cluster. Longwood is circa 1.8km from the nearest turbine (T7) in the Ballynakill cluster. Population data for Carbury village, located 2.8km southeast of the Windmill cluster and 3.7km west from the Drehid-Hortland cluster, is not available.

Geodirectory data was obtained on house locations in the vicinity of the site and this data was supplemented by a detailed house survey which was undertaken in 2013 and updated in November 2014 by Element Power Ireland Ltd. A total of 618 occupied dwellings were identified within 1km of the proposed turbines.

There are no hospitals located within 10km of Maighne Wind Farm. In County Kildare, Naas General Hospital and the Anglesey Lodge Equine Hospital are located approximately 15.9km and 9.2km respectively from the Cloncumber cluster. St. Josephs Community Nursing unit in Trim, County Meath is located approximately 16.2km from the Ballynakill cluster.

There are two hotels located within 2km of the proposed wind farm. The Moyvalley Hotel and Golf Resort is located 1.15km south of the Ballynakill cluster and the Hamlet Court Hotel is situated at Johnstown Bridge, 1.9km north of the Drehid-Hortland cluster.

There are eight national schools within 2km of Maighne Wind Farm, located in Longwood, Clogharinka, Kilshanroe, Derrinturin, Ticknevin (Carbury), Johnstown Bridge and Timahoe West. There is one post-primary school located 2km from turbine T7, in the Ballynakill cluster, namely Scoil Naomh Fintina Vocational School which is situated next to St. Mary's cemetery in Longwood, County Meath. There are a number of national and secondary schools located greater than 2km from the proposed clusters, including Prosperous (2), Rathangan (4), Clane (3) and Enfield (3).

The Leinster Orbital Route (LOR), previously known as the Dublin Outer Orbital Route (DOOR), is a proposed motorway around the County of Dublin. The orbital route proposes to connect Drogheda, Navan and Naas with links to the N2, M3 and M4/M7. Transportation Objective RP 15 of Chapter 6 of the current Kildare County Development Plan (KCDP) states:

*"To co-operate with the NRA and other local authorities to provide the Leinster Outer Orbital Route (linking Drogheda, Navan, Trim and Naas) proposed in the Regional Planning Guidelines for the Greater Dublin Area and to protect zones along the key radial routes from Dublin where junctions with the proposed Leinster Orbital Route may be constructed in accordance with the NRA Corridor Protection Study and once a route corridor has been identified to preserve this corridor free from development."*

Transport Objective TP 4 of the KCDP states:

*"To preserve free from development, proposed public transport and road realignment /improvement lines and associated corridors where such development would prejudice the implementation of the National Roads Authority, County Council or public transport providers' plans (e.g. Irish Rail)."*

A Corridor Protection Study was issued to Meath and Kildare County Councils to identify zones along the key radial routes from Dublin where junctions with the proposed LOR may be constructed in future in order to protect areas from development which could compromise the deliverability of the proposed scheme.<sup>3</sup> The feasibility study for the proposed LOR has been undertaken, however no route corridor selection or preliminary design has been undertaken or progressed. It is not anticipated that this project will commence in the near future.

<sup>2</sup> [http://census.cso.ie/areaprofiles/areaprofile.aspx?Geog\\_Type=CTY&Geog\\_Code=11](http://census.cso.ie/areaprofiles/areaprofile.aspx?Geog_Type=CTY&Geog_Code=11)

<sup>3</sup> <http://kildare.ie/CountyCouncil/Planning/DevelopmentPlans/LocalAreaPlans/NewbridgeLAP2013-2019/SubmissionstoDraftLAP/21%20NRA.pdf>

There are a number of commercial and industrial facilities in the vicinity of the proposed Maighne Wind Farm development, namely Carbury Compost Ltd, Bord na Móna's Drehid Waste Management Facility, Allenwood Business Park, Monaghan Mushrooms, Clairstone Ltd, Moyvalley Meats, Brady's Family Ham, Doran Nurseries and Irish Industrial Explosives Ltd.

Carbury Compost Ltd is located south of Derrinturn, off the R403 and is approximately 3.1km from the nearest turbine (T27) which is within the Derrybrennan cluster. Carbury Compost Ltd produces mushroom substrate (compost) at its facility. This facility is registered and licensed by the Environment Protection Agency (EPA) under Reg No. W0124-01.

Drehid Waste Management Facility is located within the townlands of Parsonstown, Loughnacush, Kilkeaskin, Drumond, Timahoe West, Coolcarrigan, Killinagh Lower and Killinagh Upper and Carbury in County Kildare. It is owned and operated by Bord na Móna Public Limited Company. This facility is registered and licensed by the EPA under Reg No. W0201-03 (Industrial Emission Licence). It is approximately 2.1km from the nearest turbine within the Drehid-Hortland Cluster (T47).

Allenwood Business Park is situated northeast of Allenwood village, is north of the Cloncumber cluster and is approximately 2.5km from the nearest turbine (T30).

Monaghan Mushrooms, Moyvalley Meats and Clairstone Ltd. are all located in the vicinity of the Windmill cluster. Monaghan Mushrooms merged with Carbury Mushrooms in 2004<sup>4</sup>. Their office is located approximately 3km to the nearest turbine and is situated within Carbury village. Moyvalley Meats is located off the L5005, in Taneragee, and is approximately 2.1km north of the nearest turbine. Moyvalley Meats is licensed with the EPA under Reg. No. P0192-02. Clairstone Ltd. is approximately 0.5km from turbine T24.

Brady's Family Ham and the adjacent Doran's Nurseries, are located approximately 1.2km north of Timahoe Cross Roads between the townlands of Cologmartin, Derryvarroge and Timahoe. The nearest turbine is T47 which is approximately 5km away and is located within the Drehid-Hortland cluster.

Irish Industrial Explosives Ltd is located in the townland of Clonagh, Co. Kildare and is licensed by the EPA, IPPC Reg. No. P0055-01. It is listed as an Upper Tier Establishment under COMAH<sup>5</sup>. It is situated northwest of the Drehid-Hortland cluster and is west of the Blackwater River. The Irish Industrial Explosives Ltd facility is approximately 0.9km to the nearest turbine.

As previously mentioned, there are two proposed HV cable routes, namely option 1 (to Woodland substation) and option 2 (to Maynooth substation). However, only one of these routes will be constructed following the identification of the preferred connection point by Eirgrid. There are a number of businesses, schools and residential properties, for example, in the immediate vicinity of these proposed HV cable routes.

The HV cable route option 1 will travel through Johnstown Bridge and bypasses both Enfield town and Kilcock town. Johnstown bridge has a number of established businesses and facilities including Saint Patrick's National School, Saint Patrick's Church, Service Stations, Hamlet Court Hotel and grocery stores. The main entrance to Johnstown House Hotel and Spa is from the Johnstown Road.

Saint Mary's National School is located within Enfield and it is approximately 0.4km from this proposed HV cable route. Access to Glen Abhainn residential estate, Enfield Business Park and Enfield Main Street is from the R402 along which the proposed cable route to Woodland will travel. Between Enfield and Kilcock, dwellings occur along the proposed cable route on the R148.

There are a number of facilities adjacent to the HV route as it enters Kilcock along the R148. These include Parkhouse Nursing Home at Pitchfordstown which is located to the west of Kilcock and has access off the R148. Kilcock town itself, has a number of local industries including a large distribution centre (Musgraves which supplies SuperValu and Centra stores across the country), educational and religious facilities. The town lies on the Royal Canal and has a population of 5,533<sup>6</sup>. From Kilcock the proposed route travels along the R125 with ribbon development along its boundaries. Mulhussey National School is located within Mulhussey townland and is on a local road between the R125 and the R156.

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<sup>4</sup> <https://www.monaghan-mushrooms.com>

<sup>5</sup> <http://www.hse.gov.uk/comah>

<sup>6</sup> <http://census.cso.ie/areaprofiles/PDF/ST/kilcock.pdf>

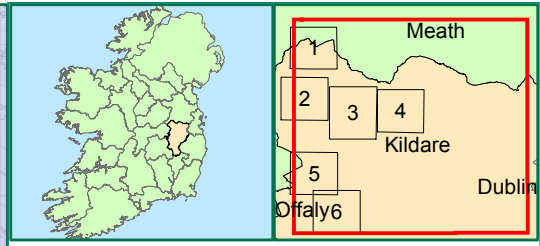
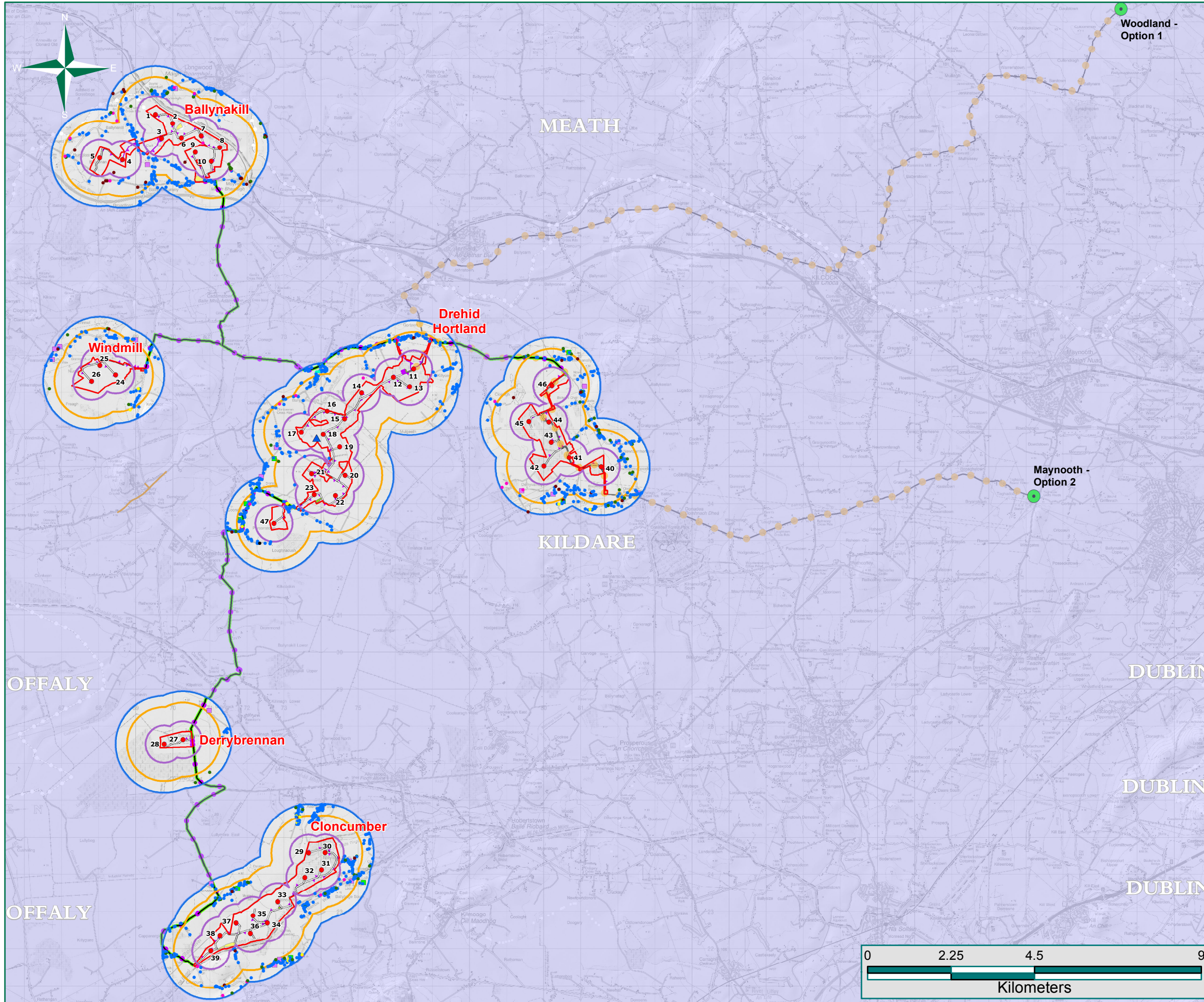
The HV cable route to Maynooth enters the public road south of the Hortland portion of the Drehid-Hortland cluster. From here the proposed cable route travels along a number of local roads through townlands including Donadea, Loughtown, Graiguelin and Taghadoe. Access to Donadea Forest Park and Callaghan Nurseries are from the L1010. Similarly, Connolly's Public House at Ballagh Woods and access to Loughtown Stud are on the L1010.

### 11.3.2 Land Use

According to the Corine 2006 landcover data, land use within the study area is varied and comprises a mixture of pastures (231), non-irrigated land (211), transitional woodland scrub (324), coniferous forest (312), non-irrigated land (211), peat bogs (412) and land principally occupied by agriculture with areas of natural vegetation (243). The lands around the site comprise similar land use types. Figure 2.2 indicates the various land uses.

The landscape of the study area is almost entirely rural in nature. The predominant land uses consist of pastoral farming and some tillage on sloping, fertile and well drained ground. In flat and poorly drained lowland areas the predominant land use is rough grazing interspersed with commercial conifer plantations and some areas of unmanaged scrubland particularly around bog fringes. There are extensive areas of peatland much of which has been harvested for fuel at commercial and domestic scale. The array of sites comprising this proposed wind farm are principally contained within these flat peatland and wet farmland areas. This is discussed in further detail in Chapter 15 – Landscape and Visual Impacts.





**Legend**

- Turbine Location
- Wind Farm Cluster Boundary
- Proposed Borrow Pit Location
- Proposed Compound Location
- Proposed Substation Location
- ▲ Proposed Met Mast Location
- Indicative Access Track
- MV Cable Route
- Cable Route (Internal to Windfarm Cluster)
- Irish Grid Connection Points
- HV Cable Route

**House Survey**

- Dwelling/Garage
- Commercial
- Agricultural Building
- Both Commercial and Residential
- Caravan/Mobile Home
- Community
- Derelict
- Under construction
- Equine Facility
- Planning Application
- 500m Buffer of Turbines
- 1000m Buffer from Turbines
- 1310m Buffer from Turbines

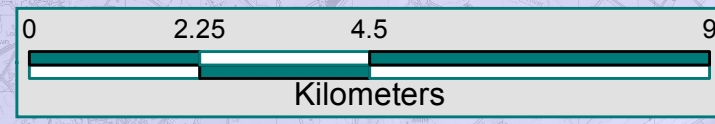
Date 19/03/2015

Name Of Client	Element Power Ireland
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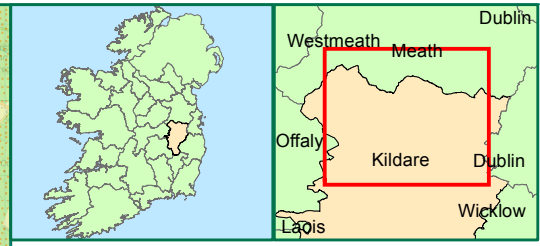
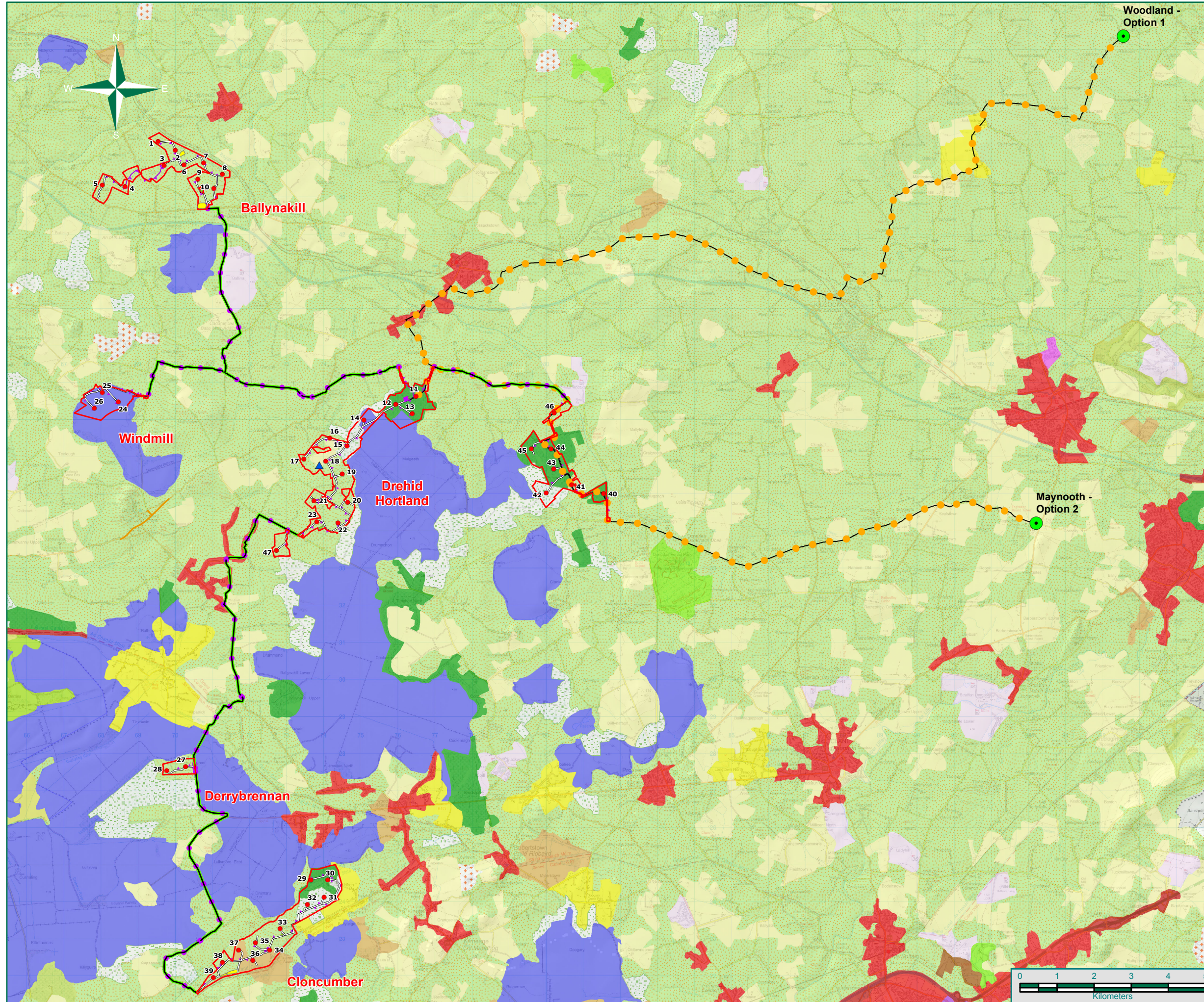
Name Of Job	Maighne Wind Farm
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Title Of Figure	Houses in the Vicinity of the Development Maighne Overview
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Scale Used	1:100,000 @ A3	
Figure No.	11.1.	Rev A



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**Legend**

- Turbine Location
- Wind Farm Cluster Boundary
- Proposed Borrow Pit Location
- Proposed Compound Location
- Proposed Substation Location
- ▲ Proposed Met Mast Location
- Indicative Access Track
- MV Cable Route (External to Clusters)
- MV Cable Routes (Internal to Clusters)
- Irish Grid Connection Point
- HV Cable Route

**Corine Landcover Type**

- 112 Discontinuous urban fabric
- 131 Mineral extraction sites
- 142 Sport and leisure facilities
- 211 Non-irrigated land
- 231 Pastures
- 242 Complex cultivation patterns
- 243 Land principally occupied by agriculture with areas of natural vegetation
- 311 Broad-leaved forest
- 312 Coniferous forest
- 313 Mixed forest
- 324 Transitional woodland scrub
- 412 Peat bogs

Date 26/03/2015

Name Of Client  
Element Power Ireland

Name Of Job  
Maighne Wind Farm

Title Of Figure  
CORINE Land Use

Scale Used 1:100,000 @ A3

Figure No. 11.2	Rev A
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### 11.3.3 Recreation, Amenity and Tourism

In 2013, approximately 381,000 overseas tourists visited the Midlands East region, contributing approximately €116.1 million to the local economy. In 2013, County Kildare received 168,000 overseas visitors and County Meath received 122,000 overseas visitors which generated €52 million and €39 million, respectively, in revenue to their respective Counties.<sup>vi</sup> The Great Plains of the Curragh, the Barrow Way, the Curragh Military Museum, the Bog of Allen Centre and Lullymore Heritage Park are amongst some of the main attractions that County Kildare offers tourists. The main tourist attractions in County Meath are the Tayto Park and the Boyne Valley which includes the UNESCO World heritage site at Brú na Boinne.<sup>7</sup>

The Curragh, which is located between Newbridge and Kildare Town and is approximately 10.6km to the nearest turbine, T36 in the Cloncumber cluster *“is the largest area of unenclosed natural grassland in the county and provides a valuable amenity area for the surrounding towns”*. *“Pollardstown Fen is the largest remaining calcareous spring-fed fen in Ireland. Covering an area of 220 ha, it is recognised as an internationally important fen ecosystem with unique and endangered plant communities.”*<sup>8</sup> The Pollardstown Fen is located to the north of the Curragh and is approximately 6.6km from the Cloncumber cluster site boundary.

There is a long tradition of horse racing in Counties Kildare and Meath with fixtures held regularly at Punchestown, Naas and the Curragh, Fairyhouse, Navan and Bellewstown. Fairyhouse regularly hosts National Hunt and Flat racing and is home to the Irish Grand National. Punchestown race course is home to the Champion Chase, the Gold Cup and the Champion Hurdle whilst the Curragh offers flat racing and is best known for hosting the Irish Derby. 10 of Ireland’s 12 Group One races are held on the Curragh track. Fixtures are held throughout the year at all race courses.

As well as horse racing, Punchestown hosts several music events, including the Oxegen festival. This has an average attendance of around 60,000 people a day, with around 50,000 of these camping on site for the four day festival, with the remaining visitors travelling to the site each day. Festivals also take place at Fairyhouse.

The Irish National Stud plays an active role in the development and promotion of Irish bloodstock and is one of the country’s leading attractions. The National Stud also houses the Japanese Gardens and the Horse Museum where the skeleton of the legendary steeplechaser Arkle can be seen. Sport-horse enterprises generate considerable employment in the counties, through to spin off industries such as tourism. The National Stud is situated approximately 11.2km from the nearest turbine, T39 in the Cloncumber cluster.

To the south of Maighne Wind Farm, in particular in the vicinity of the Derrybrennan and Cloncumber clusters is the Grand Canal. The Grand Canal was created to connect Dublin through the Midlands to the River Shannon. It begins at the River Liffey in Grand Canal Dock and is 131km long with 43 locks, five of which are double locks. At Sallins the Naas/Corbally branch diverts southwards while the Grand Canal continues west passing Caragh, Prosperous and Robertstown, in County Kildare, where the canal is at its highest elevation. The Barrow Way is 100km long and begins in Robertstown and it ends in St. Mullin’s, County Carlow. The Grand Canal Way and the Barrow Way are both designated as a National Waymarked Trail by the National Trails Office of the Irish Sports Council and are managed by Waterways Ireland. These amenities are best known for their walking and hiking trails together with navigational routes and fishing.

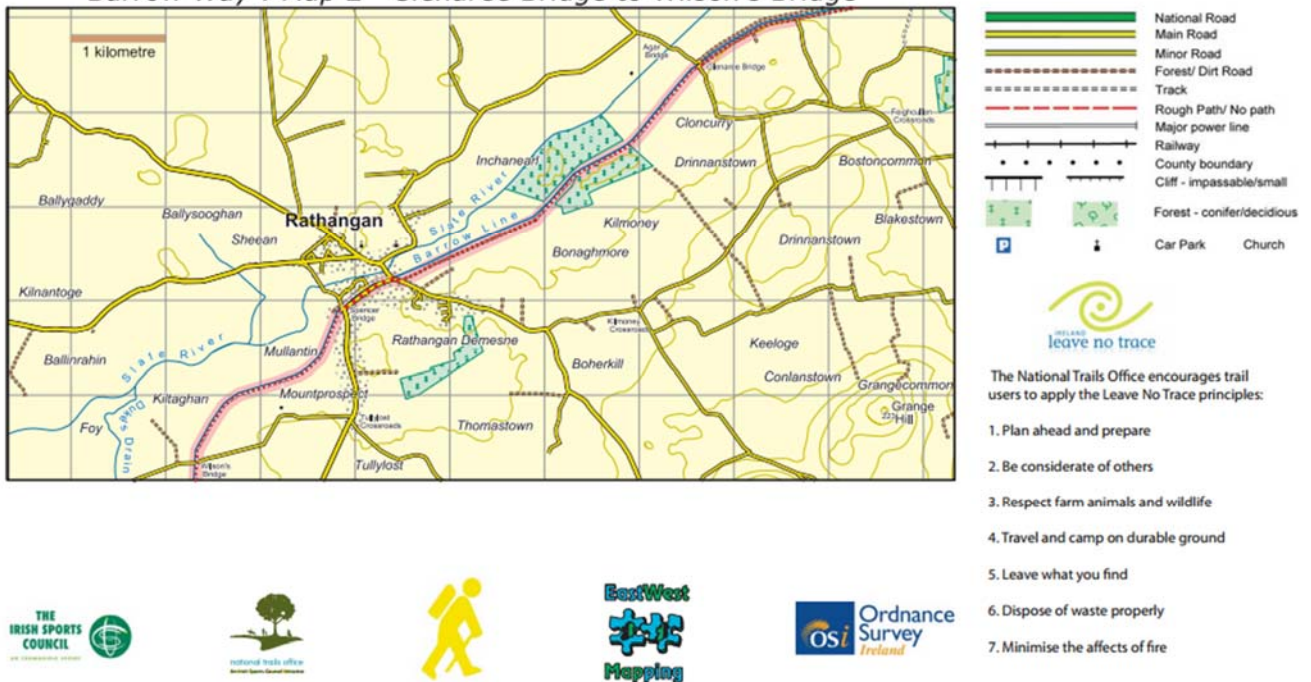
Plate 11.1 indicates the route of The Barrow Way (a feeder canal of the Grand Canal) as it passes Rathangan in County Kildare.<sup>9</sup> This section is located to the east of the Cloncumber cluster of Maighne Wind Farm. The nearest turbine (T39) is approximately 0.13km from the Barrow Way at this location.

<sup>7</sup><http://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/PressReleases/The-Grand-Tour-Driving-Routes-on-Dublin-s-Doorstep.pdf>

<sup>8</sup> <http://countydevelopmentplan.meath.ie>

<sup>9</sup> <http://www.irishtrails.ie/Trail/Barrow-Way/2/>

Barrow Way : Map 2 Glenaree Bridge to Wilson's Bridge



This map is made available from the National Trails Office/ Irish Sports Council, produced by EastWest mapping. The map is intended for personal use only and should not be modified, republished or transmitted in any form without the permission of the National Trails Office. The representation of a track or path on this map does not indicate a right of way. The map includes Ordnance Survey Ireland data made available for display under Ordnance Survey Ireland Permit No. 8658. © Ordnance Survey Ireland/ Government of Ireland.

Plate 11.1: Map Extract of Barrow Way in County Kildare<sup>10</sup>

Plate 11.2 provides an overview of The Grand Canal Way and lists the main amenities associated with this navigational route, while Plate 11.3 indicates the route of The Grand Canal Way as it passes the townlands of Derrybrennan and Killinagh in County Kildare<sup>11</sup> which is the section of The Grand Canal Way that passes the Derrybrennan cluster. Both the Hamilton Bridge and the Kilpatrick Bridge traverse the canal close to the Derrybrennan cluster. Hamilton Bridge and Kilpatrick Bridge are located approximately 1.6km and 2km respectively from T27 of the Derrybrennan cluster.

<sup>10</sup> <http://www.irishtrails.ie/Trail/Barrow-Way/2/>

<sup>11</sup> <http://www.irishtrails.ie/Trail/Grand-Canal-Way/18/>

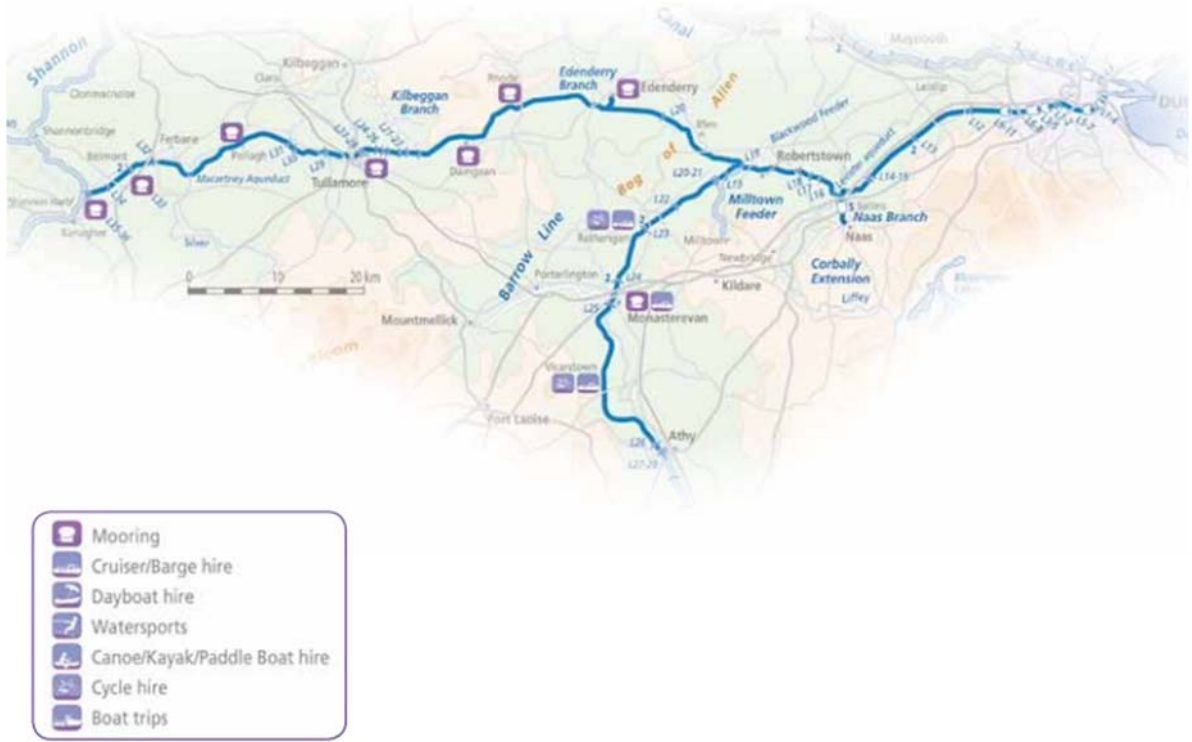


Plate 11.2: Map Extract of the Grand Canal Way in County Kildare<sup>12</sup>

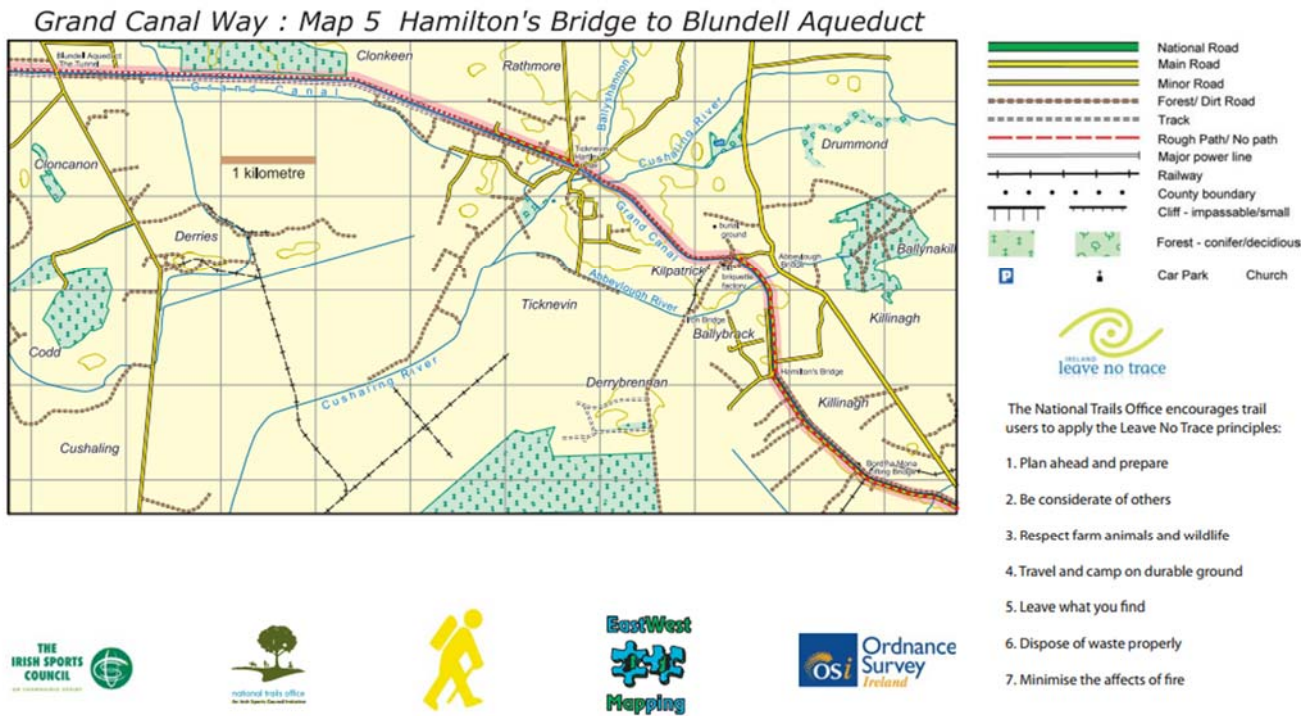


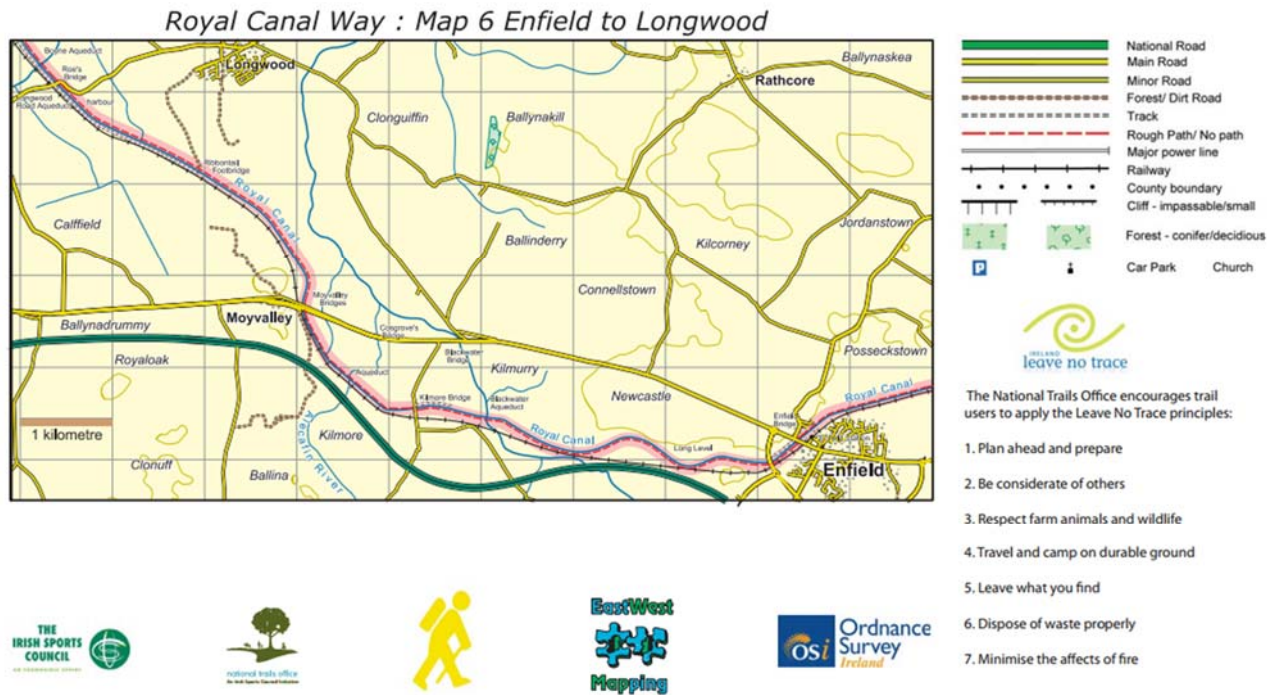
Plate 11.3: Map Extract of the Grand Canal Way in County Kildare<sup>13</sup>

<sup>12</sup><http://www.waterwaysireland.org>

<sup>13</sup> <http://www.irishtrails.ie/maps>

The third canal in the study area, the Royal Canal, Way is a National Waymarked Trail and is managed by Waterways Ireland. It is 144km in length and connects Dublin to the River Shannon west of Longford town.

Plate 11.4 below indicates the route of Royal Canal Way as it passes south of Longwood in County Meath. This section of the Royal Canal Way is located to the north of the Ballynakill cluster of the proposed development. The nearest turbine, T7, is approximately 0.27km from the Royal Canal Way. The proposed HV cable route to Woodland, in Co. Meath traverses the Royal Canal Way on the north-western side of Kilcock town. This section of the HV cable will be laid under the Canal at this location using HDD. Angling is the premier recreational activity on the Royal Canal with multiple hotspots and competitive stretches along its length. Similarly, boating, canoeing, cycling and walking are popular recreational activities throughout the Royal Canal Way.<sup>14</sup>



**Plate 11.4: Map Extract of the Royal Canal Way in County Meath<sup>15</sup>**

The Maignhe Wind Farm extends southwards from the town of Longwood in County Meath to Moyvalley, Cadamnstown, Derrinturn, Allenwood, Robertstown and Rathangan in County Kildare.

The towns, villages and parishes in the surrounding areas have sports, recreational and community facilities. The general area is drained by a series of rivers and streams, many of which are important for angling and water sports, including the Blackwater, the Slate, and the Boyne Rivers and their tributaries.

There are a number of sports and leisure facilities in the vicinity of the proposed development such as Rathangan GAA, Ballyteague GAA, Allenwood Celtic AFC, Carbury Hot Rod Track, and Saint Kevin’s G.F.C. There are also a number of golf clubs located in the study area. Knockanally Golf Club is situated on a 120 acre estate. The main entrance to this 18 hole golf course is on local road, L-1004 and is approximately 0.9km to the nearest turbine, namely T46 within the Drehid-Hortland cluster. The proposed access road to T46 is also from the L-1004. Moyvalley Hotel & Golf Resort is home to the Darren Clarke designed Championship golf course and is located approximately 1.7km to the nearest turbine (T10, Ballynakill cluster). Woodlands Golf Club is located approximately 6.2km from the nearest turbine (T30, Cloncumber cluster).

<sup>14</sup> <http://www.waterwaysireland.org/>  
<sup>15</sup> <http://www.irishtrails.ie/Trail/Royal-Canal-Way/28/>

Highfield Golf and Country Club and Edenderry Golf Club are located approximately 2.6km and 4.4km respectively from the nearest turbine (T26, Windmill cluster).

In addition to the above named amenities Lullymore Heritage & Discovery Park is a multi-award winning park set on 60 acres consisting of trails, gardens and exhibitions. A 9,000 year journey through landmark periods of Irish history can also be experienced here.<sup>16</sup> This popular tourist attraction is located between Allenwood and Rathangan and is approximately 2.6km from the nearest turbine (Derrybrennan cluster).

There are no public rights of way indicated on the Kildare County Development Plan 2011 – 2017 or on the Meath County Development Plan 2013 – 2019, however, there are private rights of way recorded on the land registry website throughout the proposed development. Turbary rights occur in the townlands of Mulgeeth and Allenwood South.

Coillte is a commercial company operating in forestry, land based businesses, renewable energy and panel products.<sup>17</sup> Coillte is a project partner working with the developer to enable the development of this proposed wind farm. 12 no. turbines are located within Coillte forests in the townlands of Drehid, Hortland and Cloncumber. These include turbines T11, T12, T13, T14, T29, T30, T31, T32, T40, T42, T43 and T44.

### 11.3.4 The Bloodstock Industry

There are a number of equestrian centres in the area. The Emerald International Equestrian Centre is located approximately 2km west of T45 and approximately 3km east of T19 (these turbines are within the Drehid-Hortland cluster), Ballyhagen Equestrian Centre (located between Carbury and Derrinturn) and Ballyteague Riding School which is located northeast of the Cloncumber cluster. Littleton Training Yard is located to the east of the Cloncumber cluster and is approximately 1.2km to the nearest turbine (T11).

There are 22 studs in the area. Four of these studs are located within approximately 1km of a proposed turbine location:

- The Stables in Drimsru is within 1km of T4
- Drumachon Stud is within 1km of T3
- Keelogue House Stud and Parsonstown Stud are within 1km of T14
- Riverside Stable Yard is within 1km of T5.

A survey of equestrian facilities in the study area was undertaken as indicated on Figure 11.3. There are no equestrian facilities within the wind farm cluster boundaries.

### 11.3.5 Health and Safety

Health and safety issues on farmed land are routine for such lands.

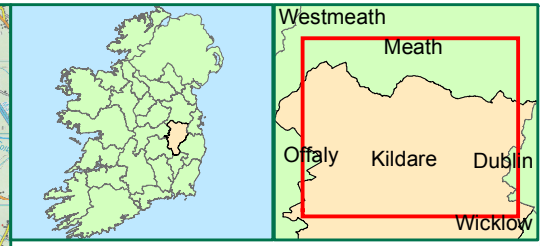
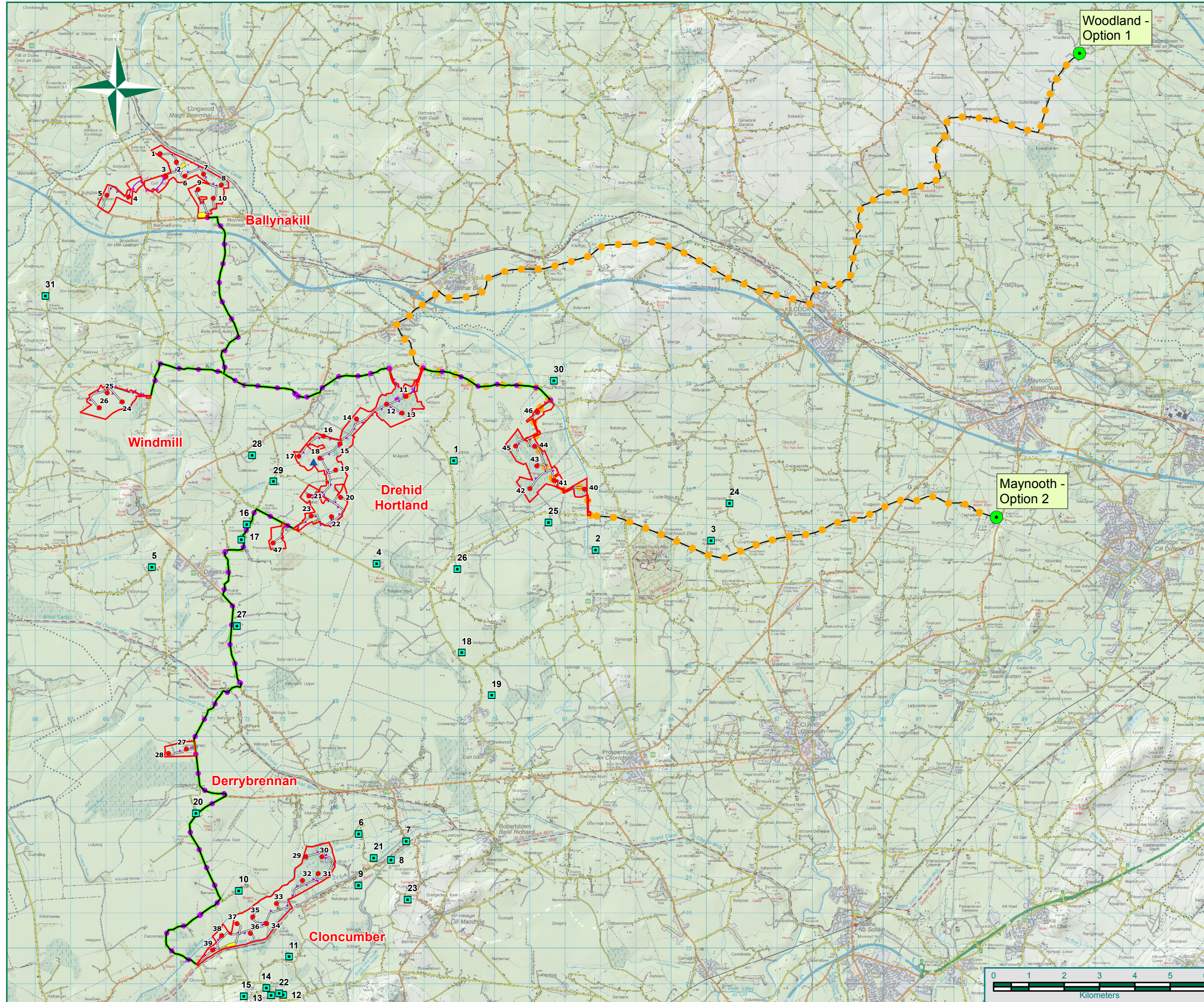
In addition, the proposed Windmill cluster is located on lands owned and operated by Clairstone Ltd., a private milling peat company.

Health and safety issues associated with Coillte lands are associated with the interaction of the public (who use the land for recreation) with commercial forestry activities. These issues are addressed in Coillte's forest management plans.

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<sup>16</sup> <http://www.lullymoreheritagepark.com/>

<sup>17</sup> [http://www.coillte.ie/aboutcoillte/about\\_coillte/](http://www.coillte.ie/aboutcoillte/about_coillte/)



**Legend**

- Turbine Location
- Wind Farm Cluster Boundary
- Proposed Borrow Pit Location
- Proposed Compound Location
- Proposed Substation Location
- ▲ Proposed Met Mast Location
- MV Cable Route (External to Cluster)
- MV Cable Route (Internal to Clusters)
- Irish Grid Connection Point
- Indicative Access Track
- HV Cable Route
- Equine Facilities

**Equine Facilities Index**

1, Emerald International Equestrian Centre	16, Parsonstown Stud
2, The Range Stud	17, Keelogue House Stud
3, Kilnamoragh Stud	18, Tallyho Stud
4, Drumachon Stud	19, Coolearagh Stud
5, Ballyhagen Equestrian Centre	20, Lullymore Equestrian Centre
6, Ballyteague Riding School	21, Ballyteague House Stud
7, Littletown Training Yard	22, Church Meadow Stud
8, Grangeclare Stud	23, Coil og Equestrian centre
9, Studfarm Ballyteague	24, Old Meadow Stud Donadea
10, Stables in Drimsru	25, Horse riding Derrycrib
11, Riverside Stable Yard	26, Riding School Timahoe
12, Misty Lodge Stud	27, Stud farm Derrinturn
13, Little Acres Stables	28, sweep stud farm
14, Feighcullen House	29, Tree View Stables
15, Cottage Rake Stud	30, Stables and Gallops
	31, Equestrian centre

Date	27/03/2015	
Name Of Client	Element Power Ireland	
Name Of Job	Maighne Wind Farm	
Title Of Figure	Equine Facilities	
Scale Used	1:105,000 @ A3	
Figure No.	11.3	Rev A
W: <a href="http://www.fehilytimoney.ie">www.fehilytimoney.ie</a> , E: <a href="mailto:info@ftco.ie">info@ftco.ie</a>		



### 11.3.6 Material Assets

In line with the EPA 2002 EIS guidance, material assets are considered to be resources that are valued and intrinsic to a specific place. Assets can be of human and natural origin and their value can be linked to either economic or cultural reasons.

Examples of natural assets are non-renewable resources (e.g. soils and minerals), assimilative capacities of air and water and renewable resources (e.g. hydraulic and wind resources). Man-made assets are considered to be heritage linked sites/ buildings, landscapes, buildings/ structures and infrastructure.

For the purposes of this assessment, the following material assets are considered relevant to the area:

- non-renewable resources (soils and minerals)
- renewable resources (wind exposure)
- utilities infrastructure.

#### *Non-Renewable Resources*

**Quarries, Pits and Mines** - According to the GSI there are a number of operational and disused quarries and pits in the vicinity of the site. There are a number of old quarries from OSI/GSI six inch mapping also dating back to 1833 – 1946 within the vicinity of the proposed development.

There are a number of older sand and gravel pits in the townland of Moneymore to the east of Longwood. In addition, there are a number of pits south of the Ballynakill cluster which are listed on the GSI website as being “section 261 lists, and planning applications 2004 – 2010”. These pits are located in the townlands of Clanard New, Ballyonan, Ballinig and Ballycowan.

Keegan Quarries of Mylerstown, Carbury has planning permission for a limestone quarry (County Council reference 03/2439, 06/2423). This quarry is located approximately 2.4km to the nearest turbine (T25) in the Windmill cluster. Kilsaran Concrete Ltd. operates a crushed rock quarry together with sand and gravel borrow pits and a readymix concrete batching plant in the townland of Ballykane Hill. The nearest turbine (T25) to Kilsaran Concrete Ltd at Ballykane is approximately 3.6km away and is within the Windmill cluster. Walsh Concrete has a sand and gravel quarry located approximately 0.9km north of T25 in Windmill. It is proposed to haul construction materials, if suitable, from both the Kilsaran Concrete and Walsh Concrete quarries.

There are two pits in the vicinity of the Drehid-Hortland cluster. The first is an operational pit in Collinstown which is 29,745m<sup>2</sup> and is located approximately 2km from the nearest turbine. The second pit is in Ballyamullagh which is 27,244m<sup>2</sup>, is located approximately 0.6km from the nearest turbine and is currently being restored.

There are a number of quarries and pits within the vicinity of the Cloncumber cluster, namely Flanagan Concrete, Arkil, Roadstone Allen, Hanlon Concrete, Kilmeague Pit and Baherhill Pit. Flanagan Concrete is an operational quarry with a ready mix and concrete batching plant, sand and gravel pit, and concrete block production facility. It is located approximately 0.8km southeast from the nearest turbine (T39). Arkil Ltd located in the townland of Drinnanstown South is an operational limestone, sand and gravel quarry. It is located approximately 2.3km southeast from the nearest turbine (T39). Roadstone Allen has a crushed rock quarry (Andasite) located approximately 3.7km east of the nearest turbine (T34) within the Cloncumber cluster. This quarry is locally known as Allen Quarry as it forms part of the Hill of Allen. According to Irish Mythology the Hill of Allen was the seat of the hunter-warrior Fionn Mac Cumhall and the Fianna. Extensive quarrying at this site has changed the profile of the hill. Hanlon Concrete operates a sand and gravel pit to the west of Robertstown. It is located approximately 3.7km from the nearest turbine. Kilmeague Pit, which is located 3.7km southeast of the nearest turbine, T31 which is within the Cloncumber cluster, is closed and to be restored. Baherhill Pit, which is located approximately 4.5km from the nearest turbine, is used for sand and gravel extraction.

**Bord na Móna Turf/Peat Extraction** - Bord na Móna is a majority state-owned company. 95% of its shares are owned by the state and held by the Government, whilst the employees hold the remaining 5%. Bord na Móna was established as a statutory body by the Turf Development Act of 1946.<sup>18</sup>

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<sup>18</sup> www.bordnamona.ie

It primarily operates in the townlands of Parsonstown, Loughnacush, Kilkeaskin, Drumond, Timahoe West, Coolcarrigan, Killinagh Lower and Killinagh Upper, Carbury, Drehid, Hortland and Derrybrennan which are in the vicinity of the Deerybrennan, Drehid-Hortland and Cloncumber clusters. They also operate a waste management facility south of the Drehid--Hortland cluster.

*Renewable Resources*

The wind speeds at the site have been assessed and it has been determined that the site has sufficient wind speeds to be economically viable for a wind farm.

There are a number of existing and permitted wind farms/turbines in the vicinity of the proposed development. The closest are in counties Westmeath and Offaly as outlined below which indicates the locality is viable for wind development:

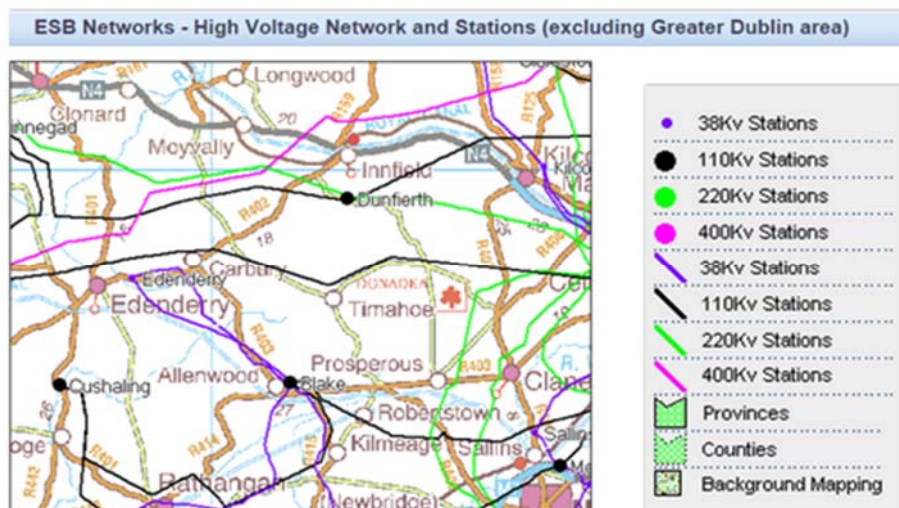
- Crowinstown Wind Farm, a 3 turbine permitted wind farm at Devlin, Co. Westmeath. Crowinstown Wind Farm is located approximately 19.7km north-north-west of the proposed development
- Dryderstown Wind Farm, a 1 turbine permitted farm at Devlin, Co. Westmeath. Dryderstown Wind Farm is located approximately 20.8km north west of the proposed development
- Mountlucas Wind Farm, a 28 turbine existing wind farm at Derrylesk, Co. Offaly. Mountlucas Wind Farm is approximately 17km west of the proposed development
- Yellow River Wind Farm, a 32 turbine permitted wind farm at Rhode, Co. Offaly. Yellow River Wind Farm is approximately 10.5km west of the proposed development.

*Utilities Infrastructure*

There is existing electricity transmission infrastructure in the vicinity of the Maighne Wind Farm development. This includes an 110kV line which traverses the southern portion of the Drehid-Hortland cluster in the vicinity of the proposed site entrance.

The distance from this line to the nearest turbine is approximately 0.28km (to T23) and 0.44km (to T40) respectively. An 110kV line also runs north of the Windmill cluster and is approximately 0.3km from the nearest turbine, T25.

Plate 11.5 below indicates the existing electricity infrastructure in the vicinity.



**Plate 11.5: Existing Electricity Infrastructure in the Vicinity of the Proposed Development**

There is a significant new high capacity electricity interconnector proposed between the electricity networks of Ireland and Northern Ireland known as the North-South 400kV Interconnection Development (formerly known as the Meath-Tyrone 400kV Interconnection Development). The proposed North-South 400kV interconnector includes approximately 140km of overhead electricity interconnection development. It will run from a proposed substation at Turleenan, Co. Tyrone, to the existing Woodland 400kV substation, in Co. Meath which is also the proposed connection points for the HV cable route from the Maighne Wind Farm development. The preferred route is in fact some 18.4km from the nearest turbine T46 in the Drehid-Hortland cluster,

There are a number of foul and combined sewers in the area concentrate around the larger towns and settlements such as Clonoff, Johnstown Bridge, Newtown, Kilcock, Derrinturn, Allenwood and Rathcoffey.

While the Cork–Dublin high pressure gas transmission pipeline runs through counties Kildare and Meath, the pipeline does not traverse the proposed Maighne Wind Farm development. Responsibility for the gas pipeline infrastructure lies with Gas Networks Ireland. According to Gas Networks Ireland there are no pipelines planned or under construction within the site boundary of this proposed development.<sup>19</sup>

Potential impacts to the relevant material assets arising from the proposed wind farm development are discussed further in Section 11.4.5.

## 11.4 Potential Impacts

### 11.4.1 Do Nothing Impact

If the proposed wind farm is not constructed, it is likely that the land will continue to be largely used for agricultural uses for the foreseeable future including grazing, peat extraction/milling, arable and forestry uses. The impact on the soils and geology would remain largely unaltered as a result.

### 11.4.2 Socio-Economics

There are numerous factors which affect the socio-economic profile of areas in the vicinity of the proposed development. These include education levels, travel characteristics, tourism, industries and other economic activity in an area.

Relevant construction impacts include temporary diversions to pedestrian/traffic flows, nuisance (such as noise) and the visual impact of construction works.

In terms of the effect on businesses along the proposed cable routes, the construction phase will lead to temporary pedestrian/traffic diversions, which may decrease footfall in some areas along the cable routes in particular. All of these impacts will be temporary given the duration of works outside or adjacent to properties. A positive impact arising from the construction phase will be the direct employment of construction workers.

There is likely to be a good improvement in Ireland's balance of payments<sup>20</sup> once 40% of electricity is sourced from renewable energy, most of which is expected to come from wind energy. The proposed Maighne Wind Farm development is expected to represent approximately 3% of the MW required to achieve this 40% target. The Sustainable Energy Authority of Ireland (SEAI) Annual Report for 2012 indicated that renewable electricity was 'estimated to have saved as much as €300 million in fossil fuel imports' by meeting 20% of Ireland's total electricity needs for the year<sup>vii</sup>. No single wind farm can be said to make a significant contribution to this achievement, but the cumulative effect can be expected to be high.

Maighne Wind Farm will result in lease payments to the landowners, on whose land the turbines will be located. Direct and indirect employment will be created for both the construction and operational phase. There will also be contributions to the economy in the form of taxes and rates.

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<sup>19</sup> <http://www.cer.ie/>

<sup>20</sup> Monetary transactions, including exports and imports, between Ireland and the rest of the world.

The design, construction and operation of the proposed wind farm will provide employment for technical consultants, contractors and maintenance staff. Up to 225 staff<sup>21</sup> could be employed on site at certain stages of construction. The employment of tradespeople, labourers, and specialised contractors for the construction phase will have a direct short-term, positive impact on the local economy, bringing significant benefits to local service providers and businesses with a direct and indirect financial benefit to the local community.

The operational phase will present an opportunity for mechanical-electrical contractors and craftspeople to become involved with the maintenance and operation of the wind farm. According to the EU Renewable Energy Council, 0.4 jobs are created per MW of total installed capacity in operations and maintenance of the wind farm, as well as jobs created by other activities related to installed turbines<sup>viii</sup>. Based on this estimate, the proposed development could be expected to create approximately 25 direct and 25 indirect long term operational jobs. People working on the construction or operation of the wind farm who live outside the area will spend some of their income in local shops and accommodation during their time in the area.

According to the Irish Wind Energy Association, there were over 3,400 jobs directly related to wind energy in Ireland at the end of 2013, with more people joining the sector in 2014<sup>ix</sup>. These jobs comprise a mix of development, construction and operation jobs reflecting the current stage of development of the industry. In 2010, the EU wind energy sector employed a total of 238,154 people<sup>x</sup>. According to the European Wind Energy Association (EWEA) the wind industry is growing faster than the EU's economy as a whole and this will remain the case over the next two decades. As such the wind industry will continue to be a driver for economic growth over the next twenty years and it is expected that employment will have increased by a factor of three.<sup>22</sup>

Rates in the region of €800k to €1m per annum for the proposed wind farm will contribute significant funds to Kildare and Meath County Councils to improve services, facilities and infrastructure in the general area which will benefit people living in the area. Alternatively, this revenue may provide the local authorities scope to reduce rates for local businesses and/or property taxes for local residents. Meath County Councils' annual rates are currently in the region of approximately €18m per annum, whereas Kildare County Council's annual rates are currently in the region of circa €48m per annum.

#### 11.4.2.1 Community Benefit Scheme

As a result of a number of consultations with members of the public and with groups representing the local community in the surrounding area of the proposed Maighne Wind Farm the developer is proposing a community benefit programme which will provide direct benefits to the wider community in a tangible way, if Maighne Wind Farm is granted permission. This will 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. The Community Benefit Programme leaflet is included in Appendix J1 of Volume 3 EIS Appendices.

In addition to this, the developer is proposing a "Near Neighbour Fund" which would see grants made available of up to €5,000 payable to all owner occupied homes located within one kilometre of a permitted wind turbine. This maximum amount of €5,000 can be used directly for one of two options: Option A to contribute towards electricity bills or Option B to avail 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 lasts until all monies to the value of €5,000 have been drawn down for Option A or Option B. 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 on the Near Neighbour Fund can be seen in Appendix J1 of Volume 3 EIS Appendices.

<sup>21</sup> Based on figures generated from Wind at Work - Wind Energy and Job Creation in the EU, European Wind Energy Association (EWEA), January 2009

<sup>22</sup> [http://www.ewea.org/uploads/tx\\_err/Green\\_Growth.pdf](http://www.ewea.org/uploads/tx_err/Green_Growth.pdf) (April 2012)

#### 11.4.2.2 Property

The effect of the proposed development on house prices was raised by some attendees at the public open evening event. The applicant has taken certain measures to negate or mitigate against the potential impact of turbines on property which include the following:

- Ensuring a separation distance of 500 metres between the centre of a turbine and any dwelling
- Sited the turbines in low lying areas which lessen the visual impact
- Any noise emanating from turbines will meet the levels recommended in guidelines for noise

It is noted from a literature review that the reports prepared to date suggest that the presence of wind farms does not devalue residential property. For example, a 2007 report from the Royal Institute of Chartered Surveyors (RICS) and Oxford Brookes University found no clear relationship between the proximity of wind farms and property prices. Indeed, the report highlighted the views of local estate agents that proximity to a wind farm was, “simply not an issue”.

In 2006, research from the Edinburgh Solicitors’ Property Centre (ESPC), focusing on property sales near Crystal Rig Wind Farm in the Scottish Borders, found no evidence of a negative impact on the price of property in nearby areas. The ESPC study found that prices in the town of Dunbar had risen from below the regional average over the previous four years, during which time the wind farm was built, and that since the wind farm began operating, property price inflation in Dunbar has continued to exceed that achieved across East Lothian. Based on this information it is assumed that there will not be a significant impact on property prices in the vicinity of the proposed development.

A 2014 UK study<sup>xi</sup> entitled ‘The Effect of Wind Farms on House Prices’ carried out by the Centre for Economics and Business Research (CEBR) and commissioned by Renewable UK (previously BWEA) concluded that *‘there is no evidence to suggest that there was a long-term negative impact on house prices, either during the period of construction or post completion of the wind farms.’*

A US government-funded study ‘The Impact of Wind Power Projects on Residential Property Values in the United States’ carried out in 2009, recorded the sale price of approximately 7,500 homes in nine states and then devised mathematical models to reveal how, all other things being equal, proximity to a wind farm affected their value. It found that homes less than 1.5 kilometres from a wind farm sold for no less, on average, than homes 8 kilometres away. Similarly, home values tended to remain stable long after wind farms were erected. The most recent comprehensive piece of research on wind turbines, commissioned by the US Government and published in 2013 states that *‘Across all model specifications, we find no statistical evidence that home prices near wind turbines were affected in either the post-construction or post-announcement/pre-construction periods.’*<sup>xii</sup> This survey was carried out collecting data from 50,000 homes in nine different states.

For some people in a community where a wind farm is planned there can be a perception that there will be a significant negative impact overall on their quality of life. This perception is exacerbated by the existence of exaggerated claims widely available on the internet. There are a number of studies that have been completed by independent bodies to consider perceptions of living near a wind farm. New research conducted by the Chartered Institute for Environmental Health (CIEH) and the University of Ulster<sup>xiii</sup> reveals that while communities in Northern Ireland have pre-conceived concerns of living near wind turbines, there is in fact little or no impact on residents with 85.6% of respondents confirming that they were not adversely affected by the wind farm location.

Overall, it is concluded that the socio-economic impacts will be beneficial on a local, regional and national level.

#### 11.4.3 Land Use

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, albeit this will be less than 2% of the proposed cluster areas.

There will be temporary impacts on land use as a result of the construction of the proposed cable routes. 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.

#### 11.4.4 Recreation, Amenity and Tourism

The 2006 Wind Energy Development Guidelines (DoEHLG), state that “*Wind Energy developments are not incompatible with tourism and leisure interests, but care needs to be taken to ensure the insensitively sited wind energy developments do no impact negatively on tourism potential. The results of survey work indicate that tourism and wind energy can co-exist happily*”.

The survey work referred to in the guidelines is the Sustainable Energy Ireland’s (SEI’s) Attitudes towards the Development of Wind Farms in Ireland (2003).

It has been suggested that wind farms could be considered by some tourists to spoil the scenery. Equally, it has been suggested that wind farms help foster images of a clean environment for tourists. Both anecdotal and the statistical evidence show that the latter is the more common view. The most conclusive evidence to date comes from a study by Fáilte Ireland on “Visitor Attitudes on the Environment”. In 2008, Fáilte Ireland, in association with the Northern Ireland Tourist Board (NITB)<sup>xiv</sup>, surveyed both domestic (25%) and overseas (75%) holidaymakers to Ireland to determine their attitudes to wind farms. The survey results indicate that most visitors are broadly positive towards the idea of building more wind farms on the island of Ireland. A sizeable minority (one in seven) were negative towards wind farms in any context.

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.

In 2011, Fáilte Ireland’s guidelines on tourism and environmental impacts stated in Chapter 4 titled ‘Project factors affecting tourism’ that ‘*some types of new or improved large scale infrastructure – such as roads – can improve the visitor experience – by increasing safety and comfort or can convey a sense of environmental responsibility – such as wind turbines.*’<sup>xv</sup>

More recent research has been undertaken in Scotland. In 2011, Visit Scotland produced a Wind Farm Consumer Research report<sup>xvi</sup> 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.

Also, against a backdrop of increased wind farm deployment, Visit Scotland’s latest statistics showed the number of visits to Scotland last year and the amount of spending by visitors both increased while their ‘Scotland National Visitor Survey 2011<sup>xvii</sup>’ made no mention of the issue of wind farms affecting tourism in Scotland.

Wind farms have also 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. The visitor numbers at Whitelee have increased year on year since opening in 2009.

In relation to the amenity of canals within the area, Chapter 15 – Landscape and Visual concluded that “*Unlike the elevated character units the canal network is generally well enclosed by tall vegetation that lines its tow paths. Where turbines are not visible beyond the immediate corridor of the canal they will have little impact on the character of the canal. Furthermore, the canals were created in the spirit of industry and intended to pass through landscapes that contain the various productive and extractive land uses to which they served. Therefore, it is not considered that the proposed wind turbines would conflict with the essence of the canal network, even where they occur in close proximity or influence the character of the surrounding landscape*”.

The Irish Parachute Club (IPC), at Clonbullogue Airfield in County Offaly, is located approximately 12km from the nearest turbine, namely T39 within the Cloncumber cluster which is of sufficient distance as to not pose any risk.

During the construction phase of the proposed wind farm there may be potential impacts to tourist traffic in the vicinity of the site from increased construction traffic and dust nuisance on the road. These impacts will be temporary in nature.

During the construction phase of the proposed wind farm, there will 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 will 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. A sample of amenities, businesses and services that potentially could be impacted temporarily by the construction of the cable routes are:

- Bord na Móna turf extraction operations and industrial railway parallel along the R404 in the townlands of Drumsu
- Access to Carbury Compost Ltd. along the R403
- Access to Carbury Hot Rod Track along the R403
- Access to Brady's Family Ham and Doran's Nurseries off the L1010, north of Timahoe Cross Roads
- St. Conlath's National School, Derrinturn, and Derrinturn Village if approached from L5023
- Access to Moyvalley Hotel and Golf Resort on the L5006
- Timahoe National School if approached from the L5025
- Dondea Forest Part if the L1010 is accessed from L5025
- Access to and from Kilcock via the L5028, R407, R148, R158, R125 and the R156
- Access to Johnstown House Hotel and Spa from the Johnstown Road
- Access to Mulhussey National School which is located within Mulhussey townland and is on a local road between the R125 and the R156
- Johnstown bridge has a number of established businesses and facilities including Saint Patrick's National School, Saint Patrick's Church, Service Stations, Hamlet Court Hotel and grocery stores Access to Glen Abhainn residential estate, Saint Mary's National School, Enfield Business Park and Enfield Main Street is from the R402
- Parkhouse Nursing Home at Pitchfordstown which is located to the west of Kilcock and has access off the R148
- Access to Callaghan Nurseries is from the L1010
- Access to Connolly's Public House at Ballagh Woods is from the L1010
- Access to Loughtown Stud is from the L1010.

Once Maighne Wind Farm is operational, the potential for negative impacts on land use is minimal.

Both the construction and operation of the Maighne Wind Farm have the potential to have a negative impact on residential amenity arising from the construction activities and potential visual impacts following completion.

Any impacts on air quality arising from construction activities which could potentially have a negative impact on the amenity of the area are discussed in Chapter 5 Air Quality and Climate Change. It is considered that the proposed development may result in slight residual impacts arising from fugitive dust emissions during particular construction activities, however, these will be temporary in nature and will not result in any permanent residual impacts. Further detail in relation to potential traffic impacts is provided in Chapter 13 Traffic and Transportation.

Impacts on peat stability, surface waters or water quality could potentially have a negative impact on fisheries or other amenities in the surrounding area, however, as a result of the mitigation measures to be applied, the wind farm is expected to have a negligible to low impact on the receiving environment. These impacts are discussed in Chapter 8, Chapter 9 and Chapter 10 of this EIS.

Potential impacts to residential amenities are addressed separately in Chapters 6 - Noise and Vibration, 12 Shadow Flicker and 15 Landscape and Visuals respectively.

### 11.4.5 The Bloodstock Industry

The assessment of any potential effect of turbines on the horse or bloodstock industry was requested by Kildare County Council in its scoping response.

There is no reference to wind turbine effects on bloodstock activity in the Wind Farm Planning Guidelines and there is no published scientific research known to the applicant that suggests operational wind turbines have any ongoing effect on the bloodstock industry.

Similarly while there is no published scientific research specifically relating to the impact of turbines on horses there has been research into the effect of noise on horses. In 2014 Marshall Day Acoustics published Summary of Research of Noise Effects on Animals<sup>23</sup>. Marshall Day assesses specifically the impacts that varying levels of noise have on horses. Marshall Day Acoustics examine horses in three differing potential behavioural settings, as outlined hereunder.

#### *Horses in Stables*

It was found that horses in the stables at the Flemington Racecourse Australia, the home of the Melbourne Cup, showed little response when exposed to significant noise levels coming from Australia's largest touring music concert being held on site in 2008. Huybregts (2008) report commissioned by the Victoria Racing Club on the concert is described as follows:

*"A case study by Huybregts from Marshall Day Acoustics observes that horses in stables exposed to  $L_{Aeq, 15min}$  of 54-70 dB generally show little response to music noise unless the noise is particularly impulsive.....Huybregts (2008)"<sup>xviii</sup>.*

#### *Breeding Mares*

Horses have been observed on how they react to the low overflights of jet aircraft. LeBlanc et al. (1991) studied the effects of simulated aircraft noise over 100 dBA and visual stimuli on pregnant mares shortly before parturition. They specifically focused on any changes in pregnancy success, behaviour, cardiac function, hormonal production, and rate of habituation.

Marshall Day (2014) summarises Le Blancs research as follows:

*"Le Blanc et al (1991) found that birth success of pregnant mares was not affected by F-14 jet aircraft noise. While the 'fright-flight' reaction was initially observed, the mares did adapt to the noise."<sup>xix</sup>*

#### *Race Horses*

Marshall Day Acoustics assessed the impact on race horses as follows;

*"Race horses are known for being high-strung. However, Marshall Day Acoustics have observed horses grazing in paddocks directly under the main approach path of the Christchurch International Airport where noise levels are in excess of 90 dB ( $L_{Amax}$ ) during an aircraft flyover. Although these horses are arguably "used to" the noise, there was generally little recognition by them of an aircraft passing, let alone any sign of disturbance. This tends to support the conclusions by Le Blanc et al (1991)".*

In Huybregts (2008) it is also observed that during the Easter Festival (2006) and Melbourne Cup (2007) race days themselves the race horses were exposed to and competed in average noise levels of between 70 dBA  $L_{Aeq}$  and 90 dBA  $L_{Aeq}$ .

A copy of these report are included in Appendix J3 and Appendix J4 of Volume 3 EIS Appendices.

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<sup>23</sup> [http://www.epa.govt.nz/resource-management/NSP000033/NSP000033\\_BoD\\_Volume\\_4\\_31\\_Siiri\\_Wilkening\\_\(10\\_March\\_2014\)\\_Summary\\_of\\_research\\_of\\_noise\\_effects\\_on\\_animals.pdf](http://www.epa.govt.nz/resource-management/NSP000033/NSP000033_BoD_Volume_4_31_Siiri_Wilkening_(10_March_2014)_Summary_of_research_of_noise_effects_on_animals.pdf)



In conclusion, having assessed the existing scientific research there is no evidence to suggest that the wind farm will have a significant impact during the operational phase of the wind farm.

#### 11.4.6 Health and Safety

The proposed wind energy development will be designed, constructed, operated and decommissioned in accordance with the following:

- Safety, Health & Welfare at Work (Construction) Regulations 2013
- Safety, Health & Welfare at Work Act 2005
- Safety, Health & Welfare at Work (General Applications) Regulations 2007.

#### *Potential Health and Safety Impacts during Construction*

Aspects of the development will present health and safety issues, as follows:

- potential impact on construction health and safety
- traffic safety during the transport of oversized loads to the site along the turbine delivery route
- lifting of heavy loads overhead using cranes
- working with electricity during commissioning
- working at heights
- general construction site safety (e.g., slip/trip, moving vehicles etc.)
- substation construction
- electrical cables.

A Safety and Health Management Plan covering all aspects of the construction process will deal more fully with these and other related issues. This has been prepared on a preliminary basis at the procurement stage and is included in the Outline Construction and Environmental Management Plan (CEMP) contained in Appendix D of Volume 3 EIS Appendices. It will be further developed at construction stage.

Health and safety issues on farmed land are routine for such lands. Access may be restricted to certain parts of the site during the construction phase of the project. For instance no access will be available to construction compounds or the proposed turbine areas. Access to other areas of the site will be agreed on a one-to-one basis to cater for each individual's requirements.

The proposed Windmill cluster is located on lands owned and operated by Clairstone Ltd. a private milling peat company. It is proposed that turbines positioned within these lands will only be constructed in previously milled areas removing the requirement for access for Clairstone employees and machinery in those specific areas. Any local access arrangements will be agreed in advance with Clairstone Ltd.

#### *Potential Health and Safety Impacts from Wind Farm Operations*

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 proposed development is expected to have a minimal impact on agricultural practices on the lands due to a small area of land being lost, however, it is not expected to have an adverse impact on livestock (cows or sheep) and horses in the surrounding area. There are numerous examples of wind farms with livestock co-existing and grazing routinely in the same fields as wind turbines. Existing land-use, such as grazing livestock or crops can continue on the site as normal, therefore, there will be no adverse effect on local residents or farmers as a result of the proposed development.

Access to the turbines is through a door at the base of the structure. This will be locked at all times.

It is not anticipated that the workings of the turbines will present a danger to the public. The wind farm is designed to last a minimum of 30 years and the turbines are equipped with a number of safety devices to ensure safe operation during their lifetime.

In addition, the rigorous statutory and engineering safety checks imposed on the turbines during design, construction, commissioning and operation will ensure the risks posed to humans are negligible. 24 hour remote monitoring and fault notifications are included as standard in the Turbine Operations and Maintenance Contracts. In addition to scheduled maintenance, the maintenance contracts will allow for call out of local engineers to resolve any issues as soon as they are picked up on the remote monitoring system.

The health and safety record of the wind energy industry worldwide is exceptionally good. Wind energy has a better safety record than any form of power production.

While the equipment within the high voltage substation does present a potential hazard, the substation will be enclosed by palisade fencing and equipped with intruder and fire alarms in line with ESB and EirGrid standards.

A common complaint from the anti-wind movement is that inaudible sound waves (or infrasound) emitted by operating wind turbines causes people living close to wind farms to get sick. Symptoms range from anxiety, to nausea to migraine, heart disease, sleep deprivation and tinnitus. A study by the Massachusetts Institute of Technology (MIT) and published in the November 2014 edition of the Peer reviewed *Journal of Occupational and Environmental Medicine* finds that living in close proximity to wind farms does not harm human health, but rather causes annoyance in certain people.

The study's author considered a number of case studies in Europe and the US to assess the impact of infrasound and quality of life for the populations close to wind farms. One case study in northern Poland, identified as the largest study of wind turbine noise, showed that those living next to wind farms reported the best quality of life and those living further than 1.5km scored the worst. The report concluded that living in close proximity to wind farms does not result in the worsening of, and might even improve, the quality of life in that particular region.

Similarly in July 2012<sup>24</sup>, Health Canada announced its intention to undertake a large scale epidemiology study in collaboration with Statistics Canada. The study was titled "Community Noise and Health Study" with the objectives of the study including:

- *"Investigate the prevalence of health effects or health indicators among a sample of Canadians exposed to WTN using both self-reported and objectively measured health outcomes*
- *Apply statistical modelling in order to derive exposure response relationships between WTN levels and self-reported and objectively measured health outcomes; and*
- *Investigate the contribution of LFN and infrasound from wind turbines as a potential contributing factor towards adverse community reaction."*

The study concluded that:

- Self-reported sleep, self-reported illnesses and self-reported perceived stress and quality of life were not found to be associated with wind turbine noise exposure; and,
- Annoyance towards several wind turbine features was found to be statistically associated with increasing levels of wind turbine noise.

#### *Potential Health and Safety Impacts from Proposed Cables*

The potential impact of Extremely Low Frequency (ELF) and Electric and Magnetic Fields (EMF) on the human environment was examined by John McAuley from Compliance Engineering Ireland (CEI) for the proposed development cables connecting the turbines to the substation and from the wind farm to the grid connection point. This assessment is included in Appendix J2 of Volume 3 EIS Appendices.

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<sup>24</sup> <http://www.hc-sc.gc.ca/>

The assessment found that the current scientific consensus, as expressed most recently by the World Health Organization (WHO), is that research does not suggest that ELF-EMF causes any health effects at the levels typically encountered in our environments. Authoritative scientific organisations have not recommended exposure limits at these levels or steps to reduce our exposures.

The electric and magnetic fields expected to be associated with the operation of the proposed cables fully comply with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and European Union (EU) guidelines on exposure of the general public to ELF-EMF.<sup>25</sup>

#### 11.4.7 Material Assets

##### *Non-renewable Resources*

The construction of the wind farm will impact on natural resources such as aggregates which will be sourced from on-site borrow pits as well as quarry and pits in the area.

Existing tracks have been used where possible and the layout was designed to minimise the length of new track required in order to reduce the requirement for such stone material. In addition, it is likely that a small amount of granular material may be required to maintain access tracks during operation which could impact the source quarry or borrow pit.

##### *Renewable Resources*

The project is intended to capture the renewable wind resource at the site and is located within an area determined as having excellent wind resources for this wind farm development. There will be no impacts on the renewable energy source.

It is considered that the proposed development will have an overall positive impact in terms of carbon reduction and climate change. It will assist Ireland in meeting its national mandatory target to supply 16% of its overall energy needs from renewable sources by 2020 which is driven by the requirements for a reduction in greenhouse gas emissions along with energy security and competitiveness.

There will be a negligible impact on the renewable forest resource at the site as the Irish Forest Service Guidelines require that any trees felled for wind farm purposes are replanted at another unplanted location. The proposed development will require the felling of forestry within and around the wind farm infrastructure to accommodate the construction of some turbine foundations, hard stands, crane pads, access tracks and substation. The estimated area of infrastructural tree clearing required for the proposed wind farm will be approximately 63ha. Tree felling will be the subject of a Felling Licence from the Forest Service and will include the provision of relevant replant lands to be planted in lieu of the proposed tree felling on the site, therefore the overall impact will be neutral.

##### *Utilities Infrastructure*

Utilities such as overhead power lines or telephone lines or underground services may require diversion or be temporarily disrupted during the construction of the wind farm or cable trench. This has the potential to impact on nearby dwellings and commercial/industrial activities. Potential impacts on telecommunications are discussed in Chapter 16.

The construction of the cable trenches, predominantly in roads, will physically impact on the roads concerned and while all roads will require re-surfacing, some roads may require to be completely rebuilt. Importation of materials and equipment for Maighne Wind Farm will increase shipping traffic at the ports being used and increase freight on the motorway, national primary route and regional road network.

Once Maighne Wind Farm development is operational, the potential for negative impacts on material assets is minimal.

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<sup>25</sup> EMF study for cables associated with the Maighne Wind Farm by Compliance Engineering Ireland Ltd

The direct effect of electricity generated by wind on an ongoing basis relative to electricity generated by oil, gas or other fossil fuels is an offset in the quantity of fossil fuels required for electricity generation.

## 11.5 Mitigation Measures

### 11.5.1 Socio-Economics

Rates paid by the developer will contribute significant funds to Kildare and Meath County Councils which are used to improve the services available to the people of the county.

The proposed community benefit scheme will provide funding for local community schemes and accordingly, may enhance the local community interaction. The Near Neighbour Scheme will also provide those living closest to the wind farm with additional benefits (refer to section 11.4.1 for details).

All works in public roads will require a road opening licence. The timing and sequence of the works in order to minimise impacts on road users and local communities will be specified by the respective local authority and will inform the preparation of a Traffic Management Plan.

### 11.5.2 Land Use

The proposed cable routes will be progressed in a sequential manner, with separate crews laying sections of the cables, the land take will be restricted to the fenced off working area. In all instances the minimum amount of land necessary will be taken and provisions will be made for redirecting traffic.

Upon completion of the construction phase and permanent re-instatement of the cable trenches to pre-construction condition or as agreed alternatively with the relevant local authority for sections in the road, the resultant impacts on land use will be negligible. During the operation of the proposed development, potential impacts on land use from the cables will be limited to the unlikely event of damage to the cables which would require localised excavation.

The risk of third party interference, however, with the cable is minimised as the cable routes (outside of the clusters) have been selected to pass through areas of high regulation which require a road opening licence which will control third party interference. In addition a marker tape will be placed above the cable and a concrete based backfill will be used in the trenches.

### 11.5.3 Recreation, Amenity and Tourism

Regular updates will be provided to the local community in relation to the construction programme. This will be co-ordinated by an appointed liaison officer. During the operation of the wind farm, a dedicated telephone number and email will be set up and will be posted on an information noticeboard at the entrance to the each cluster.

The proposed development will not result in a critically adverse visual impact on the landscape, as discussed in Chapter 15 of this document.

### 11.5.4 The Bloodstock Industry

#### *Mitigation Measures during Construction Phase*

During the construction phase the developer will engage in comprehensive communication with the local community detailing construction activities so that people working with horses are aware of all such activities, in particular:

- the Traffic Management Plan
- road closures and alternative routes
- construction period and construction methods

Other mitigation measures will be provided by the developer such as:

- providing day-to-day updates for construction activities to the operators of these facilities in close proximity to works
- no blasting shall be used during the construction works
- any other activities that could lead to startling of horses in close vicinity to the construction works will be communicated with the owners of the equestrian facilities
- The developer will engage the services of an equestrian expert who can advise on other recommended measures during the construction period.

These measures should ensure that horses will not be affected by the construction activities and will become accustomed to the wind turbines over a period of time.

### *Case Studies of Wind Turbines and Horses*

The scientific research supports the conclusion that horses exhibit adaptation, acclimatisation, and habituation after repeated exposure to noise and visual stimuli. Marshall Day (2014)<sup>xx</sup> supports the view that noise has minimal effects on animals;

*"Once animals become habituated to noise, especially when it is steady and associated with clearly non-threatening activity, they suffer very little adverse response."*

In terms of providing evidence of how horses exhibit an adaptation and habituation to operational wind farms there are already examples of existing wind farms being located on or near stud farms, equestrian centres and horse-riding trails in the UK and Ireland.

The currently operational Mace Upper wind energy scheme in Co. Mayo (planning reference 00/1954 and 06/2476) is on an estate that operates an equestrian centre. An appeal to An Bord Pleanála (PL16.221313) was made in which the issue of the interaction of horses and wind turbines was raised. Section 10.8 of the An Bord Pleanála Inspectors Report dismissed this point as it did not represent a significant issue. Upon speaking with the owner of the Mace Upper Equestrian Centre - Mr. Noel Walsh, his experience of the three wind turbines on his land has been very positive.

The three turbines are within approximately 200m, 280m and 450m of the equestrian centre buildings and areas where outdoor equestrian events are held. A video of the turbines and the equestrian centre as well as an interview with the owner has been produced by Element Power and is available for viewing<sup>xxi</sup>.

The first onshore wind farm in Britain which became operational in 1991 was developed on the site of a stud farm. This wind farm, which has since been expanded, is in Delabole in Cornwall. Young horses are regularly broken in within 50 metres of wind turbines there and are ridden through the wind farm site. Along with having no impact on the horses, there are no reports of any animal or activities disturbances at the adjacent Camel Valley Riding Club from the turbines. Furthermore, in 2007 a nine turbine wind farm was developed at Stags Holt in the Fenlands in Cambridgeshire on a site adjoining a stud farm. This wind farm was subsequently extended to almost double its original size in 2010 and there have been no issues with the owners of the stud.

In conclusion, considering the existing scientific evidence, the proposed wind farm layout, the case studies and the mitigation measures outlined above, the Maighne wind farm as proposed does not have a significant impact on the bloodstock industry in the area.

### 11.5.5 Health and Safety

#### *Construction Health and Safety Mitigation Measures*

A site specific Safety and Health Management Plan has been prepared on a preliminary basis for the project in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 and is included in the Outline CEMP contained in Appendix D of Volume 3 EIS Appendices.

The Safety and Health Management Plan shall be finalised in accordance with this outline plan following the appointment of the contractor for the main construction works.

All hazards will be identified and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be established. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project.

FAS Safe Pass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required.

The developer is required to ensure a competent contractor is appointed to carry out the construction works. The contractor will be responsible for the implementation of procedures outlined in the Safety & Health Plan. Public safety will be addressed by restricting site access during construction. Appropriate warning signs will be posted, directing all visitors to the site manager.

#### *Operational Health and Safety Mitigation Measures*

For security purposes, access to the towers and the substation compound will not be obtained without the corresponding keys. As outlined in Section 11.4.5, the substation will be enclosed by palisade fencing and equipped with intruder and fire alarms in line with ESB and EirGrid standards.

A harness will be provided to allow access to the nacelle and will be connected to a central line running behind the ladder. This will prevent personnel from freefalling more than a few centimetres, hence reducing the potential for injury.

Adequate clearance of structures from overhead lines will be provided. In this case, all on-site electrical connections are carried by underground cable.

There will be lightning conductors on each turbine as all structures standing tall in the sky require protection and turbines in particular to allow surge protection to electrical components.

As no impacts from ELF-EMF have been identified, mitigation measures are not included.

#### 11.5.6 Material Assets

It is proposed to undertake slit trenching as part of the construction works which will identify existing services along the proposed cable routes. This will minimise the impact in terms of disruption or damage to existing utilities. It is not intended to divert existing services but instead where possible the cable will be laid above or below existing services. Communication with the services providers will be maintained for the duration of the construction works.

Non-renewable resources will be sourced locally as far as possible to minimise transportation distances and indirect impacts on climate change.

### 11.6 Residual Impacts on Human Environment

The residual impact of the development with respect to socio-economics, is considered to be positive, as a result of the employment opportunities associated with the construction and operation of the wind farm. In particular, the rates generated from the proposed development will result in positive residual impacts for both the local area and wider county of Kildare resulting from the investment in services, infrastructure and facilities.

The community benefit programme proposed will support local environmental improvements and recreational, social or community amenities and initiatives which will also give rise to positive residual impacts.

The residual land use impacts will be very low given the area that will contain infrastructure will be less than 1% of the total site and existing land uses can continue during the operation of the wind farm.

The laying of HV cable through lands within the Drehid-Hortland cluster will lead to a sterilisation of the lands directly above the cable.

While non-renewable resources such as aggregates and cement are required onsite during the construction phase, the proposed development will result in a positive residual impact on non-renewable resources by offsetting the use of fossil fuel power generation.

While 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 will be very low.

## 11.7 References

- <sup>i</sup> Central Statistics Office: Census 2011 Population Classified by Area, Table 1: Population of Province, County and City, actual and percentage change 2006-2011
- <sup>ii</sup> Census 2011
- <sup>iii</sup> Central Statistics Office: Census 2011 Population Classified by Area, Table 1: Population of Province, County and City, actual and percentage change 2006-2011
- <sup>iv</sup> Central Statistics Office: Census 2011 Population Classified by Area, Table 12: Alphabetical list of towns and their population 2006-2011
- <sup>v</sup> Central Statistics Office: Census 2011 Population Classified by Area, Table 12: Alphabetical list of towns and their population 2006-2011
- <sup>vi</sup> Fáilte Ireland, Research, Regional Statistics and Reports, Regional tourism performance in 2013.
- <sup>vii</sup> Influencing Society Transforming Energy, Sustainable Energy Authority of Ireland (SEAI) Annual Report 2012
- <sup>viii</sup> European Renewable Energy Council, 2007, <http://www.erec.org/>
- <sup>ix</sup> <http://www.iwea.com/index.cfm/page/facesofwind>
- <sup>x</sup> European Wind Energy Association, factsheets
- <sup>xi</sup> CEBR/Renewable UK study entitled 'The effect of wind farms on house prices', March 2013
- <sup>xii</sup> [http://www.mccarthykos.ie/db/Attachments/News/August\\_2013\\_/Wind%20turbines%20not%20impacting%20on%20property%20values\\_/2013.08%20-%20A%20Spatial%20Hedonic%20Analysis%20of%20the%20Effects%20of%20Wind%20Energy%20Facilities%20on%20Surrounding%20Property%20Values%20in%20the%20US.pdf](http://www.mccarthykos.ie/db/Attachments/News/August_2013_/Wind%20turbines%20not%20impacting%20on%20property%20values_/2013.08%20-%20A%20Spatial%20Hedonic%20Analysis%20of%20the%20Effects%20of%20Wind%20Energy%20Facilities%20on%20Surrounding%20Property%20Values%20in%20the%20US.pdf)
- <sup>xiii</sup> Chartered Institute of Environmental Health and University of Ulster, "Living with Wind Turbines, An investigation into public perceptions and experiences of affected communities", June 2012.  
<http://www.cieh-nireland.org/assets/0/72/130/234/264/2c5b43d7-6149-4bb0-a0d7-83609c88bab1.pdf>
- <sup>xiv</sup> "Wind Farms – Visitor Attitudes on the Environment", Fáilte Ireland, National Tourism Development Authority, No. 3, 2008
- <sup>xv</sup> Fáilte Ireland, 2011, 'Guidelines on the treatment of tourism in an Environmental Impact Statement'
- <sup>xvi</sup> Visit Scotland, Insight Department, "Wind Farm Consumer Research" Topic Paper, August 2012  
<http://www.visitscotland.org/pdf/Revised%20Oct%2012%20%20Insights%20Wind%20Farm%20Topic%20Paper.pdf>
- <sup>xvii</sup> Visit Scotland, Insight Department, Scotland Visitor Survey 2011 & 2012, Summary of 2011 Results, January 2012  
<http://www.visitscotland.org/pdf/external%20visitor%20survey.pdf>
- <sup>xviii</sup> Protecting horses from excessive music noise – a case study, Cornelius (Neil) Huybregts, Marshall Day Acoustics Pty Ltd (2008)
- <sup>xix</sup> Le Blanc et al. 1991. "Physiological Responses of Horses to Simulated Aircraft Noise
- <sup>xx</sup> Marshall Day Acoustics Memo on SUMMARY OF RESEARCH OF NOISE EFFECTS ON ANIMALS
- <sup>xxi</sup> [http://www.youtube.com/watch?feature=player\\_embedded&v=4lbQw9kmSC8](http://www.youtube.com/watch?feature=player_embedded&v=4lbQw9kmSC8)