Chapter 3:

Human Beings & Community

(Revised January 2017)

3.1 Introduction

This chapter addresses the potential social and economic impacts of the construction and operational phases of the proposed Pinewoods Wind Farm development under the heading of Human Beings. Actual and perceived impacts of the proposed development on human beings may arise from various aspects and could potentially have an effect on living and working conditions and well-being. These impacts are dealt with throughout the Environmental Impact Statement (EIS), in particular, interactions may occur with effects described in the following chapters:

- Chapter 6: Water
- Chapter 8: Landscape and Visual Assessment
- Chapter 10 & 10(a): Noise & Vibration
- Chapter 11: Shadow Flicker
- Chapter 12: Telecommunications
- Chapter 13: Transportation and Access

This chapter initially sets out the methodology used for the assessment (Section 3.2), and describes the receiving environment, the predicted impacts of the proposed development (Section 3.3), the interactions between potential impacts (Section 3.4), mitigation measures to be incorporated (Section 3.5). A summary table of impacts and mitigation is provided in **Table 3.11A and 3.11B** at the end of this chapter. No difficulties were encountered in compiling information in this chapter

3.2 Methodology

3.2.1 Legislation and Guidelines

The following guidelines were referred to while preparing and writing this chapter:

- EPA: Guidelines on the Information to be contained in Environmental Impact Statements, 2002;
- EPA: Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) 2003;
- Wind Energy Development Guidelines for Planning Authorities, 2006. Department of Environment, Heritage and Local Government.

An assessment of the socio-economic impacts has been undertaken in line with these guidelines. The EPA Guidelines provide advice on impact types including cumulative impacts which are often important for socio-economic assessments, for instance where an individual development has implications for subsequent or future development. Consideration has also been given to the EPA: Revised Guidelines on The Information to be Contained in Environmental Impact Statements (Draft, September 2015) and the EPA: Advice Notes for Preparing Environmental Impact Statements (Draft, September 2015).

3.2.2 Data Sources and Consultations

A socio-economic assessment requires that an understanding of the community is built up through background research, site visits, and discussions with local people. Specifically, in the case of this study, data has been collected by means of:

- Primary data sources (e.g. preliminary demographic data from Census 2016 and from Census 2011 produced by the Central Statistics Office);
- Maps and photomontages of the proposed development;
- Other relevant environmental data considered during the preparation of the Environmental Impact Statement (EIS), especially traffic, noise, shadow flicker and visual impacts;

- A review of strategic energy policy documents, including the Government White Paper on 'Ireland's Transition to a Low Carbon Energy Future 2015-2030 and the Wind Energy Development Guidelines for Planning Authorities 2006 (DoEHLG).
- A review of relevant planning policy document including the Laois County Development Plan 2011-2017, including Appendix 5 Wind Energy Strategy, and the Kilkenny County Development Plan 2014-2020, including Appendix J: - Wind Energy Development Strategy;
- A review of secondary and supplementary data including the Ballinakill Village Plan 2008;
- Observation of local settlement and travel patterns and the location of community and commercial facilities;
- Discussions with local people;
- Review of submissions received to the planning application.

3.2.3 Impact Categories and their assessment

3.2.3.1 Overview

The purpose of this assessment is to identify the likely significant impacts of the proposed development which may affect locally sensitive receptors and the environmental resources and attributes which are valued by the local population. The effects examined include both known and perceived effects, such as perceived loss of rural character.

3.2.3.2 Construction impacts

Potential impacts on human beings during the construction phase that are potentially relevant and significant to human beings in a socio-economic assessment include:

- Impacts due to construction traffic on local journeys or general amenity;
- Impacts on environmental and residential amenity;
- Construction employment and local expenditure.

3.2.3.3 Operational Phase

Potential impacts during the operational phase fall into three key categories, namely:

- Population sustainability and residential amenity: An assessment of potential impacts on local environmental quality as it relates to residential amenity and property;
- General amenity and well-being: An assessment of potential impacts with regard to general amenity, including recreational amenity, social interaction and use of community facilities, particularly by older people, children or other sensitive or vulnerable groups. An assessment of the impact on objective and subjective well-being
- Economic impacts: an evaluation of the proposed development in the context of local economic resources, development and employment.

Impacts are compared between the Do-Nothing and the Do-Something (with proposed development) scenarios and result from direct, indirect, secondary and cumulative effects on environmental conditions. Effects can be positive, neutral or negative. The significance of an effect is described as Imperceptible, Slight, Moderate, Significant, Very Significant, or Profound. Significance depends, among other considerations, on the nature of the environmental effect, the timing and duration of an effect, and the probability of the occurrence of an effect. The impacts may be short term, medium term or long term. All construction impacts are temporary in nature.

For example, an impact on population sustainability and residential amenity, or on general amenity and well-being is defined according to the criteria set out in **Table 3.1.**

Impact level	*Significance criteria*
Imperceptible	No appreciable change to population sustainability, or present levels of amenity or well-being.
Slight	Slight stimulus to patterns of population sustainability, amenity or well-being where impact is positive. Some disruption of population sustainability, amenity or well-being where impact is negative.
Moderate	Moderate stimulus to population sustainability, amenity or well-being where impact is positive sufficient to cause an initial or lasting moderate change in social habits. Moderate disruption population sustainability, amenity or well-being where impact is negative.
Significant	Significant stimulus to population sustainability, amenity or well-being where impact is positive sufficient to cause lasting change in social habits. Significant disruption to patterns of population sustainability, amenity or well-being where impact is negative.
Very significant	Very significant stimulus to population sustainability, amenity or well-being where impact is positive sufficient to cause marked and lasting change in social habits. Very significant disruption to population sustainability, amenity or well-being where impact is negative.
Profound	A change sufficient to cause a complete and permanent improvement in population sustainability, amenity or well-being where impact is positive. Disruption sufficient to cause a complete and permanent loss of population sustainability, amenity or well-being where impact is negative.

Table 3.1: Criteria used in the assessment of population sustainability, residential amenity, and for general amenity and well-being

An economic impact is defined according to the criteria set out in **Table 3.2**.

Impact level	*Significance criteria*
Imperceptible	No significant economic impacts are apparent
Slight	A small effect on the business environment can be attributed to the proposed development
Moderate	A moderate effect on the business environment can be identified.
Significant	An effect that has the potential to impact on business performance or to influence the location decisions of new business.
Very significant	An effect that has the potential to substantially impact on business performance or to influence the location decisions of new business.
Profound	Effects of a scale to substantially impact on the performance of a major business or several businesses. Where these businesses are important local employers there is the possibility of major impacts for the general prosperity of the local area or region.

Table 3.2: Criteria used in the assessment of Economic Impacts

It usually follows that impacts of a socio-economic nature are a function of:

- the location of the proposed development and the character of the local environment;
- the sensitivity of the local population and its capacity to absorb change;
- the nature of the environmental effect;
- the scale or extent of the effect in terms of area or population affected;
- the duration and frequency of an effect, and
- the probability of an impact's occurrence.

The assessment addresses impacts at a community level rather than for individuals or identifiable properties. Impacts on individual receptors are addressed separately in Chapter 6 (Water), Chapter 8 (Landscape & Visual), Chapter 10 (Noise) (Chapter 10(a) Vibration) and Chapter 11 (Shadow Flicker).

The 'significance' of an impact as it would affect the worst affected subset of the local population is summarised in **Table 3.10** with respect to the human population and socio-economic factors. Construction impacts are by their nature temporary, while operational impacts can be short to long term. 'Scale' represents the number of people (or businesses) likely to be affected and are categorised as very high, high, medium or low. For example, an impact may be very significant for a particular population subset, but the number of people concerned could be small such that scale is labelled as "low".

3.2.4 Description of the Existing Environment

3.2.4.1 Context

Population

The subject site is located approximately 17.5km southwest of Portlaoise and 25km north of Kilkenny City. While the wind turbines are located within County Laois, the project in its entirety straddles the county border and is partially located in County Kilkenny. The site is centred on the Electoral Divisions (EDs) of Dysartgallen, Ballinakill and Blandsford in County Laois and Clogh in County Kilkenny, which according to the Preliminary Report from the recent Census 2016, have a combined population of 2,608.

Table 3.3 shows that Clogh has the largest population in the study area. The EDs of Clogh and Ballinakill both contain small urban centres of the same name. The table also shows how the population has changed since the previous Census in 2011 and reveals a combined reduction in population of 1.7%. In contrast, the populations of the two county centres of Portlaoise and Kilkenny have increased by respectively 5.1% and 3.9% over the same period. The study area has a low population density of between 12 and 42 persons per km2 even when compared with that of the average for the largely rural counties of Laois and Kilkenny.

	2016	*2011*	*Percent change*	*Population density persons/km2*
Clogh	1,219	1,276	-4.5%	34.9
Dysartgallen	255	266	-4.1%	12.3
Ballinakill	825	792	+4.2%	41.6
Blandsford	309	318	-2.8%	15.1
Co Laois	*84.732*	*80,559*	*+5.1%*	*49.3*
Co. Kilkenny	*99,118*	*95,419*	*+3.9%*	*47.8*

Table 3.3: Population 2016 and 2011

Other detailed Census data is currently only available for 2011. **Table 3.4** shows how the population at the time was distributed in terms of the number of households with Clogh having the highest number, which is consistent with its relative population size as outlined in **Table 3.3** above.

Size of family	*Households*
Clogh	435
Dysartgallen	86
Ballinakill	269
Blandsfort	103
Co Laois	*28,020*
Co Kilkenny	*33,679*

Table 3.4: Households 2011

Table 3.5 shows how the mainly middle-aged adult population of the EDs around the subject site represents a higher proportion of the total population than for the counties of Laois and Kilkenny as a whole, although this pattern is not atypical for rural areas. The older population of "empty-nesters" and retired people is closer to the average of the two counties. The proportion of the population of pre-school age is slightly lower than at county level. Dysartgallen has a relatively high proportion of its population of early school years, although this figure is somewhat influenced by the small population (sample) size of the ED. Altogether the figures indicate a fairly typical age / family cycle pattern for a rural population in Ireland.

	Clogh	*Dysartgallen*	*Ballinakill*	*Blandsfort*	*Co Laois*	*Co. Kilkenny*
Pre-school	10.5%	9.1%	10.0%	10.6%	*13.6%*	*11.8%*
Early school	11.4%	21.2%	13.4%	7.1%	*13.1%*	*11.3%*
Pre-Adolescent	10.8%	10.6%	5.7%	9.4%	*12.3%*	*11.3%*
Adolescent	10.8%	12.1%	11.5%	9.4%	*11.6%*	*11.9%*
Pre-family	6.0%	6.1%	6.7%	10.6%	*10.2%*	*9.3%*
Adult	35.0%	24.2%	36.8%	34.1%	*22.9%*	*25.4%*
Empty nest	9.9%	9.1%	12.0%	9.4%	*9.9%*	*10.9%*
Retired	5.7%	7.6%	3.8%	9.4%	*6.4%*	*8.0%*

Table 3.5: Family Cycle 2011

Figures on the age of properties in **Table 3.6** do indicate an older housing stock than for the counties of Laois and Kilkenny as a whole with smaller proportions of recent builds except in the ED of Ballinakill. **Table 3.7** does, however, show that vacancy rates are not too dissimilar to those of the two counties, although nearly 20% of properties in Ballinakill are unoccupied.

Year Built	*Clogh*	*Dysartgallen*	*Ballinakill*	*Blandsfort*	*Co Laois*	*Co Kilkenny*
pre 1981	55.7%	57.0%	49.8%	49.5%	*35.2%*	*43.4%*
1981-1990	9.9%	8.1%	7.9%	17.5%	*9.0%*	*10.4%*
1991- 2000	16.4%	11.6%	7.5%	10.7%	*13.0%*	*13.7%*
2001 - 2005	6.7%	15.1%	18.7%	12.6%	*21.4%*	*16.9%*
2006 - later	7.6%	7.0%	13.5%	7.8%	*17.5%*	*12.2%*
Not stated	3.7%	1.2%	2.6%	1.9%	*3.9%*	*3.4%*

Table 3.6: Age of Housing Stock 2011

	Clough	*Dysartgallent*	*Ballinakill*	*Blandsfort*	*Co Laois*	*Co Kilkenny*
Occupied	70	10	63	10	*4,673*	*5,324*
Percent	13.9%	10.3%	19.1%	8.8%	*14.3%*	*13.6%*

Table 3.7: House Occupancy 2011

Table 3.8 shows that levels of employment and unemployment are not dissimilar to those for counties Laois and Kilkenny as a whole, except in Clogh where there is a higher level of unemployment at 15% and also a high proportion who are not working for reasons of illness or disability. **Table 3.9** reveals a higher level of employment in the agriculture and forestry sectors than for Counties Laois and Kilkenny as a whole as might be expected. There is also a relatively lower proportion of people working in commerce or the transport and communications sectors.

	Clogh	Dysartgallert	Ballinakill	Blandsford	County Laois	County Kilkenny
At work	41.9%	52.5%	49.9%	55.9%	*50.0%*	*50.2%*
Looking for first job	0.7%	1.5%	1.1%	0.8%	*1.1%*	*0.8%*
Unemployed	14.8%	8.6%	9.7%	4.5%	*12.5%*	*11.3%*
Student	11.3%	11.1%	10.7%	10.2%	*9.4%*	*10.4%*
Home worker	10.5%	12.6%	13.2%	11.4%	*10.7%*	*9.8%*
Retired	12.7%	11.6%	10.0%	15.1%	*11.1%*	*13.1%*
Not working: sickness or disability	7.9%	2.0%	4.6%	1.6%	*4.7%*	*4.2%*

Table 3.8: Principal Economic Status 2011

	Clogh	Dysartgallert	Ballinakill	Blandsford	Co Laois	Co Kilkenny
Agriculture & forestry	9.5%	23.1%	13.4%	19.0%	*8.0%*	*9.1%*
Construction	6.2%	5.8%	3.5%	6.6%	*5.4%*	*5.7%*
Manufacturing	12.6%	11.5%	16.6%	9.5%	*10.9%*	*12.0%*
Commerce	19.5%	15.4%	17.9%	20.4%	*22.6%*	*23.5%*
Transport & communications	3.3%	2.9%	4.8%	6.6%	*6.7%*	*4.9%*
Public administration	7.1%	6.7%	5.8%	5.8%	*8.7%*	*6.0%*
Professional services	25.0%	24.0%	24.6%	24.1%	*22.4%*	*24.3%*
Other	16.7%	10.6%	13.4%	8.0%	*15.2%*	*14.5%*

Table 3.9: Persons at Work by Industry

Finally, **Table 3.10** provides information on people's sense of their own health, revealing a similar pattern as for the general population of Counties Laois and Kilkenny, albeit with a higher proportion reporting "fair" to "bad" health in the ED of Clogh. The 2011 Census also records that a total of 335 persons, or 12.8% of the population of the four EDs, have a disability, although the nature of this disability is not specified.

Health	Clogh	Dysartgallert	Ballinakill	Total	Co Laois	Co Kilkenny
Very good	54.9%	63.2%	57.1%	67.3%	*59.9%*	*61.8%*
Good	30.4%	27.8%	33.1%	24.8%	*28.0%*	*27.3%*
Fair	11.3%	6.0%	6.6%	5.7%	*7.9%*	*7.8%*
Bad	1.6%	0.0%	1.3%	1.3%	*1.2%*	*1.1%*
Very bad	0.2%	0.8%	0.4%	0.0%	*0.3%*	*0.3%*
Not stated	1.5%	2.3%	1.6%	0.9%	*2.7%*	*1.7%*

Table 3.10: Reported Health 2011

Tourism

Employment in tourism is not indicated in **Table 3.9**, but the nearby communities such as Abbeyleix and Durrow have a relatively high proportion of their populations employed in this sector given the presence of heritage features, hotels and guest houses. Although bypassed now by the M7, Abbeyleix is still a regular stop for visitors on route to destinations such as Cork or the west.

Although not a major tourism destination, County Laois contains various sites of interest to visitors, including the Rock of Dunamaise, Emo Court and the Timahoe Round Tower. County Kilkenny has a somewhat higher tourism profile due to the City of Kilkenny, its heritage and annual festivals, destinations such as Thomastown and Inistoige, and attractions such as Dunmore Cave and the Castlecomer Discovery Park.

3.2.4.2 Character

Although elevated, the study area is not of great height (c.260-300 mAOD). The primary land use is coniferous forestry while transitional woodland scrub is amongst the main land cover types. The dominant land use in the vicinity is agricultural pasture. The top of the hill is not easily visible from its slopes, noting also the presence of hedgerows and woodland plantations. The hill is more visible from adjacent elevated areas, for example to the west.

The area is crossed by single vehicle minor roads and forestry tracks. A receptor survey indicates 33 no. properties within 1,030 metres (10 rotor diameters) of the proposed turbines. The properties are either single houses or occur in the form of scattered linear development, for example in Graiguenahown to the southeast. The nearby community of Knock contains a primary school, a church and a handful of houses. Boleybeg is a small community to the west containing a branch of Glanbia and a community field. The principal communities include Ballinakill on the R432 and Clogh to the east on the R426. The former contains a national school, churches and a mixture of community facilities, including an outdoor swimming pool. There is also tourist information point. The Heywood Demesne and its historic gardens are located just outside of Ballinakill to the north and the village is also located on Laois Cycle Trail (Number 1) which connects with Durrow to the west. Heywood Community School is located close to the entrance of the demesne. The village of Clough contains a soccer and GAA club and a local community walk. The Swan is a similar sized community located at a junction between the R430 and R426 to the north of Clogh. A brickworks is located here as well as a community centre and primary school

As well as farm businesses, there are a small number of aggregate/quarrying companies/sites, and small family businesses in the vicinity including organic farms, livery and dog grooming. There is some equine activity, such as training and breeding, and pony trekking available in the wider area including an equine stud near Ballinakill. To the west is the town of Abbeyleix and located on the N77 which represented the main route to Cork before the completion of the M7.

A map showing all dwellings within 1km of the site is provided in Appendix 3.1. A further map showing all significant commercial activity, schools, holiday accommodation, tourism and recreational facilities etc. is provided in Appendix 3.2.

3.2.4.3 Significance

The upper elevations of Cooper's Hill and the Spink are largely unoccupied, with land cover which comprises of grazing or rough grazing land and commercial forestry. At lower elevations there are dairy enterprises and pockets of broadleaf woodland. These lower elevations include minor roads along which there has been a modest amount of individual development as noted above. The overwhelming majority of this development has been residential, although there are instances of family businesses such as vehicle workshops, equine businesses and dog grooming as well as, of course, farms. There is only a light level of recreation or tourism activity in terms of walking or accommodation, although a circular walking route of the Spink using local roads and tracks has been promoted. Another local walking route, the Slieve Margy Way, passes through The Swan to the east. A local walking festival was held at Knock in July 2016. There are also cycle routes. The surrounding area, particularly between Boleybeg and Ballinkill, contains diverse attractive countryside with expansive views.

3.2.4.4 Sensitivity

Concerns raised by local residents in previous submissions to wind farm development at the proposed site include visual and landscape, loss of local amenity, noise, shadow flicker, health, impacts on wildlife, water quality, equine and livestock, road use and widening, and possible impacts on property prices and tourism. Possible impacts relating to visual impact, noise, shadow flicker, biodiversity, traffic, safety and material impacts are addressed elsewhere in the EIS. It is understood that such concerns can be a cause of anxiety and that this in itself may have implications for the health of sensitive population subsets. This applies in particular to people whose livelihood depends, to some degree or another, on agriculture or equine activity, or on tourism which has a relationship with the quality of the local environmental resource, including perceptions of environmental quality. People who work night shifts or who have disabilities, including dependents, are among those population subsets that could be described as being sensitive. Children are not uniquely a sensitive subset of the population in this instance, but it is acknowledged that there are primary schools in the area, of which the nearest to the proposed development is Knock National School (approximately 1.3 kilometres north of Turbine 1).

The open land comprising the Spink and Coopers Hill receive light amenity (walking, cycling) with most activity being on-road/tracks given the nature of the terrain. As noted above, a circular walking route has been described in locally available publications, which uses these roads and tracks. There is currently a low level of tourism activity in the area, although Heywood Demesne is maintained by the OPW and receives small but regular numbers of visitors. The surrounding attractive countryside has potential for tourism activity.

Mount Nugent Stud, which is located at Ironmills to the east of Ballinakill, is involved in the breeding of thoroughbreds and is amongst the sensitive receptors located within 6kim of the site of the proposed development. The local River Owenbeg is a tributary of the River Nore and, although lightly fished itself, is important for the spawning of salmon and trout.

3.3 Description of Likely Impacts

3.3.1 Construction Phase

3.3.1.1 Population sustainability and residential amenity

Construction of the proposed development is expected to last between 12 and 18 months with works to occur within daytime hours of 08.00 to 20.00 Monday to Friday and 08.00 to 18.00 hours on Saturday. Except for certain specific works, e.g. concrete pouring, and any possible emergency works, construction activity is not expected to occur outside of these hours or on Sunday. Construction works will generate noise, of which Chapter 10 (Noise) finds that noise levels at properties nearest to the proposed development will be below guideline limits. It remarks that noise levels will be transitionary and temporary in nature and will diminish with distance. The chapter notes that the most significant contribution is likely to arise from lorry movements, particularly movements on uneven surfaces, during the construction phase. In this respect, site access will be provided by sealed local roads L7800 and L78001. Works or transport involving higher noise levels will be intermittent and below noise thresholds required for residential receptors at distances greater than 100m.

Chapter 13 (Transport & Access) notes that the construction phase is estimated to generate 176 trips of abnormal sized loads during the 12-18 month period, including the movement of abnormal sized turbines and cranes. In addition, it is estimated that 3,252 HGV trips and 4,683 van trips will be generated. The EIS concludes that the construction phase impacts at the nearest sensitive property (H03) to the north-east of the site access at Graiguenahown, and those along the L7800 access route (3 no. dwellings), are expected to be of a temporary nature and below reference criteria. Construction noise is not expected to be a significant impact for properties at more than 500m. No

significant effect on population sustainability is anticipated and impacts on residential amenity are expected to be slight to moderate negative, of a temporary nature with the specific impacts dictated by the proximity of individual residences to the site or access roads.

3.3.1.2 General amenity and well-being

Construction works will be temporary in nature. As discussed above, these are proposed to occur within daytime hours and not on Sundays. The proposed development will be located on private lands and lands in the ownership of Coillte, and no rights-of-way are affected during construction. The site will be appropriately fenced off with appropriate warning signs to prevent unauthorised access in accordance with health and safety requirements. There will be visual impacts during construction, but these will be temporary in nature and comparable to those of forestry harvesting operations already occurring periodically as noted in Chapter 8 (Landscape & Visual).

As discussed in the previous section, the construction phase is expected to generate 176 trips of abnormal size. The haul route of turbine components will proceed from the M9 and N78 onto the R430 and will require traffic management coordination with the local authority and Gardai. There will be a need for the temporary removal of minor obstacles such as road signs. Some local access restrictions may be required for the delivery of turbine components. Most of the projected 3,252 HGV trips will be used to carry aggregates to the site from existing quarries/sources identified in Chapter 13 (Transportation and Access) using the principal local roads of the R430 and R426. This will involve movements through the small communities of Swan or Boleybeg, but will not add appreciably to the existing volume of traffic on these roads. In all, construction traffic movements will have a slight to moderate negative impact of a temporary nature.

Existing tracks in the vicinity of the proposed development, including forestry tracks, are in generally good condition. These tracks will need to be widened to approximately 5m. In addition, a total of 7.4km of new access tracks will be constructed in and around the site.

The proposed development will be able to connect directly to the Laois-Kilkenny Grid Reinforcement Project which passes directly adjacent to the site. It will therefore not require the installation of a separate overhead transmission lines, but rather construction of a 203m^2 substation and two strain towers of up to 26.5m in height. Impacts in this respect are therefore less than for some other wind farm developments and the cumulative impact will be of slight significance.

Decommissioning of the site will involve removal of materials and transportation impacts, including abnormal loads. While the decommissioning of the project will largely be a reversal of the construction process, the intensity of works and number of vehicular trips is likely to be lower. It may not, for example, be necessary to remove all the aggregates used in track construction and foundations. The decommissioning impact will have a slight to moderate negative impact and be of a temporary nature.

3.3.1.3 Economic and employment

The proposed construction works will have a slight impact on agricultural or forestry activities on the site itself, but elsewhere, both within and in the vicinity of the subject site (including equine), these activities will be able to continue throughout the construction phase.

It is anticipated that pre-construction and construction activities will create a demand for around 53 jobs (around 1.5 jobs per MW). The low population density of the study area also sets the scope for construction employment opportunities, and it is likely that the more specialised workers will travel from outside of the study area. However, there will be a need for some workers to reside locally and this will create some demand for locally available accommodation in towns such as Portlaoise, Athy, Ballinakill or Abbeyleix.

Due to their proximity, lower transport costs and lower overheads (e.g. accommodation) local businesses will be well-placed to provide competitive tenders for less specialised construction works.

Up to 25% of the construction contract value (up to €15m) could enter the local economy. Sectors that could benefit include civil engineering companies, electrical service companies, quarries and concrete suppliers, steel reinforcing suppliers, road haulage operators, plant hire companies, ancillary workers (e.g. fencing, timber) and accommodation and catering. There are, for example, a number of existing quarries in the vicinity of the proposed development site. Altogether, the economic and employment impact is moderate positive, while being of a temporary nature. Eventual decommissioning is expected to require a lower level of economic input and employment.

3.3.2 Operational Phase

3.3.2.1 Population sustainability and residential amenity

Section 3.2.4 above noted that the study area is characterised by a low population density, recent declines and an older housing stock, but finds too that the age and employment profile is fairly typical of rural areas and for the county with a relatively high level of employment in agriculture and forestry.

The impact of wind farm developments on property values is the subject of speculation. A RICS/Oxford Brookes University study examined the impact of wind farms on property values on a number of sites in the UK. The study acknowledged that the potential impact of wind farms on property values is a complex and emotive subject. Inevitably, the potential for impacts at any one location depends on the influence of design and screening, as well as the context and character of the area in which the development is located, including aspects of population characteristics/ stability, tourism, employment and landscape. The evidence from the RICS/Oxford Brookes study was that factors other than the presence of a wind farm, have a more significant impact on property values. Landscape and visual considerations are a factor. Chapter 8 (Landscape & Visual Assessment) of the EIS distinguishes both landscape and visual effects. For the latter, it assesses the relationship with receptor sensitivity for each of the various reference points at varying distances from the proposed development. Only 4 no. of 23 no. locations, i.e. LC1 2.54km to the northwest, LC5 1.05 to the south-east LC8 0.16km to the east and northeast, and LC9 0.32km to the west and north, have a visual impact that is assessed as being of substantial-moderate significance, of which only LC8 is considered to have a dominant presence, while others are somewhat screened or not in conflict with the surrounding terrain or landscape pattern. A small number of residential developments are contained within the distance associated with these points, but none within that of LC8.

Noise and shadow flicker impacts are addressed in the respective chapters of the EIS and found to be below significant levels. The assessment finds that operational noise levels for all properties, including those closest to the proposed development, are within the daytime and night-time limits of 45dB LA90 and 43dBLA90 respectively. The turbines will cease to rotate in high wind conditions above around 25m/sec and this will remove the risk of excess noise generation on such days. Chapter 11 (Shadow Flicker) confirms that this effect only applies during the operational phase. It notes that this impact is not anticipated to exceed 30 hours per annum and that the highest values of between 14.46 and 18.09 hours per annum would occur at the nearest properties under normal weather conditions. Notably, all three properties are economically involved in the proposed development. The other 30 no. properties within a ten rotor length diameter of the proposed development would all experience less than 30 hours of flicker per year with 21 no. receiving less than 10 hours per year. Mitigation measures are available to completely remove the risk of shadow flicker to below 30 minutes per day should this be required.

On the basis of the assessments of landscape and visual impacts, noise and shadow flicker, the potential for negative impacts on property or site values is confined to individual sellers' or purchasers' subjective perceptions. The Wind Energy Development Guidelines for Planning Authorities 2006 do not refer to property prices, but on the basis of assessments undertaken, the proposed development complies with the criteria in respect of, inter alia, noise and shadow flicker.

Therefore, it is reasonable to conclude that the likely residual impact on property values will be imperceptible.

With regard to population stability, each turbine will generate land rental payments to local landowners, thereby helping to provide a diversified source of income. There is no evidence that wind turbines pose any threat to the welfare of horses or livestock and therefore the proposed development will be able to coexist with existing agricultural, equine and forestry land uses both within the subject site and in the immediate vicinity. Furthermore, Chapter 6 (Water) of the EIS) finds that the proposed development will have no impact on water quality or drinking water for human consumption or agricultural purposes.

The applicant has also committed to contributing €500 per annum towards the annual electricity costs of each household within a distance of ten rotor diameters (1,030m) of a proposed turbine where this household is not economically involved in the project. In addition, it is proposed that a community fund of €1,000 per annum per MW generated will be made available to local community groups. This could lead to a total of €35,200 per annum becoming available to fund community groups or projects. The fund will be administered by a committee set up by the applicant and will involve a percentage of the net profit being set aside for such purposes. Preference will be given to local groups or projects, thereby contributing to the vitality and viability of the local population. Although recipients would need to be decided at the time, it is noted that there are a variety of local community and sports organisations or clubs in the study area. This fund is a very positive impact with regard to the vitality of the local population, the significance of which will depends on the actual sums transferred.

3.3.2.2 General amenity and well-being

The Wind Energy Strategy for County Laois requires that no turbines will be permitted within 250m of an existing or permitted property and that those between 250m and 500m be considered subject to a noise assessment. An assessment of possible shadow flicker is required within a distance of 600m. Cumulative impacts are also to be taken into account.

The Wind Energy Strategy designated the proposed development site to be within a 'Preferred Area' and 'Areas Open for Consideration' for wind energy development. The strategy proposes that consideration is given to areas that are of "significant importance for recreation or tourism" in selecting appropriate locations for wind energy developments. In this respect, it is noted that the study area currently has only a light level of tourism activity as discussed in Section 3.2. There is potential for further tourism development which would be complemented by the presence of the surrounding pleasant countryside and the proximity of communities such as Abbeyleix and Durrow. Independent studies have shown that wind energy development and tourism are not incompatible.

A locally published circular walk which passes around Spink is discussed in Section 3.2. There is also a light level of walking activity, principally by local people using local roads and tracks. The proposed development itself will be located on private land and no rights-of-way are affected. Due to the potential for enhanced access around the site of the proposed development, it is proposed that the developer will seek to collaborate with land owners and other interested parties to facilitate responsible and safe public access for education or recreational purposes.

In terms of the specific impact of the development on tourism or amenity, Chapter 8 (Landscape & Visual Assessment) identifies the receiving landscape to be of low sensitivity and that the impact of the proposed development will be minor. This is consistent with the criteria for the designation of the subject site in the adopted Wind Energy Strategy as a 'Preferred Area' and 'Areas Open for Consideration'. Chapter 8 adds that there are only a few receptor locations where users, such as tourists or hill walkers, are likely to be highly attuned to the landscape. This assessment of residual impacts is interpreted here as being of imperceptible significance in terms of tourism visits, and to be of slight negative significance in the context of the low, but tangible level of local amenity activity.

There is no evidence that wind energy development has any impact on human health, including on persons with disabilities. However, concerns of possible visual, noise, water, biodiversity and other material impacts are addressed elsewhere in the EIS. They are acknowledged in this chapter to the extent that they can be a cause of potential anxiety in advance of the development and that this in turn can possibly affect human health and well-being. Section 3.2 identified some elevated levels of disability in Clogh, but noted that the type of disability is not identified by the statistics that are publicly available. There is though no evidence of any impact on persons with disabilities where wind energy development is consistent with the 2006 Wind Energy Development Guidelines. Reference can be made to Chapter 10 (Noise) and Chapter 11 (Shadow Flicker) which identify no exceedance of guidance levels due to the distance of the proposed development from private residences. Similarly, Chapter 6 (Water) of the EIS concludes that, with the implementation of all proposed mitigation measures, there will be no impact on local water quality or supplies for human consumption or agricultural activities.

In addition, wind turbines, like all machines, can emit a modest amount of electromagnetic radiation comparable to the levels from a diesel generator. There is no known risk to human beings from these emissions. Although the proposed turbines may potentially interfere with television signals, simple technological solutions exist to mitigate any such impacts (see Chapter 12). Power cables from each turbine will be buried. The proposed development will be able to connect directly to the Laois-Kilkenny Grid Reinforcement Project which passes directly adjacent to the site and will not require additional overhead transmission lines, but rather an on-site substation and two strain towers. The substation will be rendered in concrete and sand, securely fenced for health and safety, and screened to minimise visual impact.

Other possible concerns relate to lightening and ice accumulation. With respect to the former, appropriate protection measures will be incorporated in the turbine designs to ensure that lightning is conducted harmlessly down to earth. The rotor blades of the proposed turbine model are equipped with lightning receptors mounted in the blade. The turbine is grounded and shielded to protect against lightning. In the event of a lightning strike or an abnormal increase in voltage (overvoltage), the entire electrical and electronic equipment is protected by built-in energy absorbing components with surge protection in the electrical components.

In extremely cold conditions, ice can potentially build up on blades or other parts of the turbines, although such conditions are extremely unusual for Ireland. Modern turbines are fitted with anti-vibration sensors, which will detect any imbalance caused by the icing of the blades. The sensors will cause the turbine to idle until the blades have been de-iced prior to beginning operation. As all occupied/habitable properties in the vicinity of the proposed wind farm are located in excess of 500m from a proposed turbine, there is no likely impact in respect of ice throw.

3.3.2.3 Economic and employment

As noted above, the proposed development will be able to coexist with all existing land-based activities and enterprises, including agriculture, equine and forestry land uses and will have an imperceptible impact on tourism. The operation of the wind farm will be overseen by specialised maintenance teams, although there is potential for some activities to be performed by local personnel, providing local employment and associated benefits. Overall, the impact on the local economy and employment during the operational phase is expected to be slight positive.

3.4 Interactions

Section 3.3.2.2 discusses the value of the study area for amenity and the potential for future tourism development. In this respect, Chapter 8 (Landscape & Visual) identifies no evidence of recognised scenic views in close proximity of the site as identified in view/route designations, guide books, etc. A Landscape Character Assessment has also been prepared by Laois County Council, but does not provide any sensitivity ratings. The proposed development site is located within the extensive 'Hills

and Uplands' landscape character area occupying the southeast of the County. It is noted in the LCA that the Wind Energy Strategy has identified these upland areas for consideration in terms of future wind energy development. The assessment of the EIS is that the existing landscape is of low sensitivity and relatively robust in its capacity to absorb new development, and that the proposed development will have a minor physical impact without conflicting with the character of the productive rural landscape.

There is interaction too between the socio-economic assessment and those for Transportation and Access (Chapter 13), especially during the construction phase, Noise (Chapter 10) during both construction and operation, Shadow Flicker (Chapter 11) and Water (Chapter 6) during the operational phase. All of these potential interactions have been considered in this chapter and in the relevant chapters of the EIS and it is concluded that there is no likely significant impact.

3.5 Proposed Mitigation

To specifically address impacts of a socio-economic nature, it is proposed that:

- Information be made available to local residents and to visitors to the area to allow them to contact the wind farm operators directly in the event of any issues relating to construction (see also below) or operation.
- Specific mitigation measures are listed in individual chapters of the EIS dealing with aspects such as construction, traffic, noise, shadow flicker and landscape and visual.
- A Traffic Management Plan shall be agreed with the local authority as part of the Construction Management Plan in advance of the commencement of works;
- A designated contact point and coordinator will be put in place to manage construction works and access arrangements and to interface with the public and the local authority;
- A plan for the timing and routing of construction traffic to and from the site, along with directional signage and particular proposals for the delivery of abnormal loads;
- Diversions shall be implemented to facilitate continued public use of roads where temporary traffic restrictions have to be put in place;
- Traffic restrictions shall be kept to minimum duration and extent;
- Adequate signage shall be provided at entrances during the construction and operational phase to providing information on access and safety and also safety warning information;
- Maximum use of existing forest tracks, minimal use of new access tracks and appropriate reinstatement or landscaping.

3.6 References

Wind Energy Strategy for County Laois 2012-2018. Appendix 5, Laois County Development Plan 2012-2018.

Wind Energy Development Strategy 2007. Kilkenny County Development Plan 2014-2020, Appendix J.

Department of Communications, Climate Action and Environment (2015) White Paper on 'Ireland's Transition to a Low Carbon Energy Future 2015-2030

Department of Environment, Heritage and Local Government (2006) Wind Energy Development Guidelines for Planning Authorities.

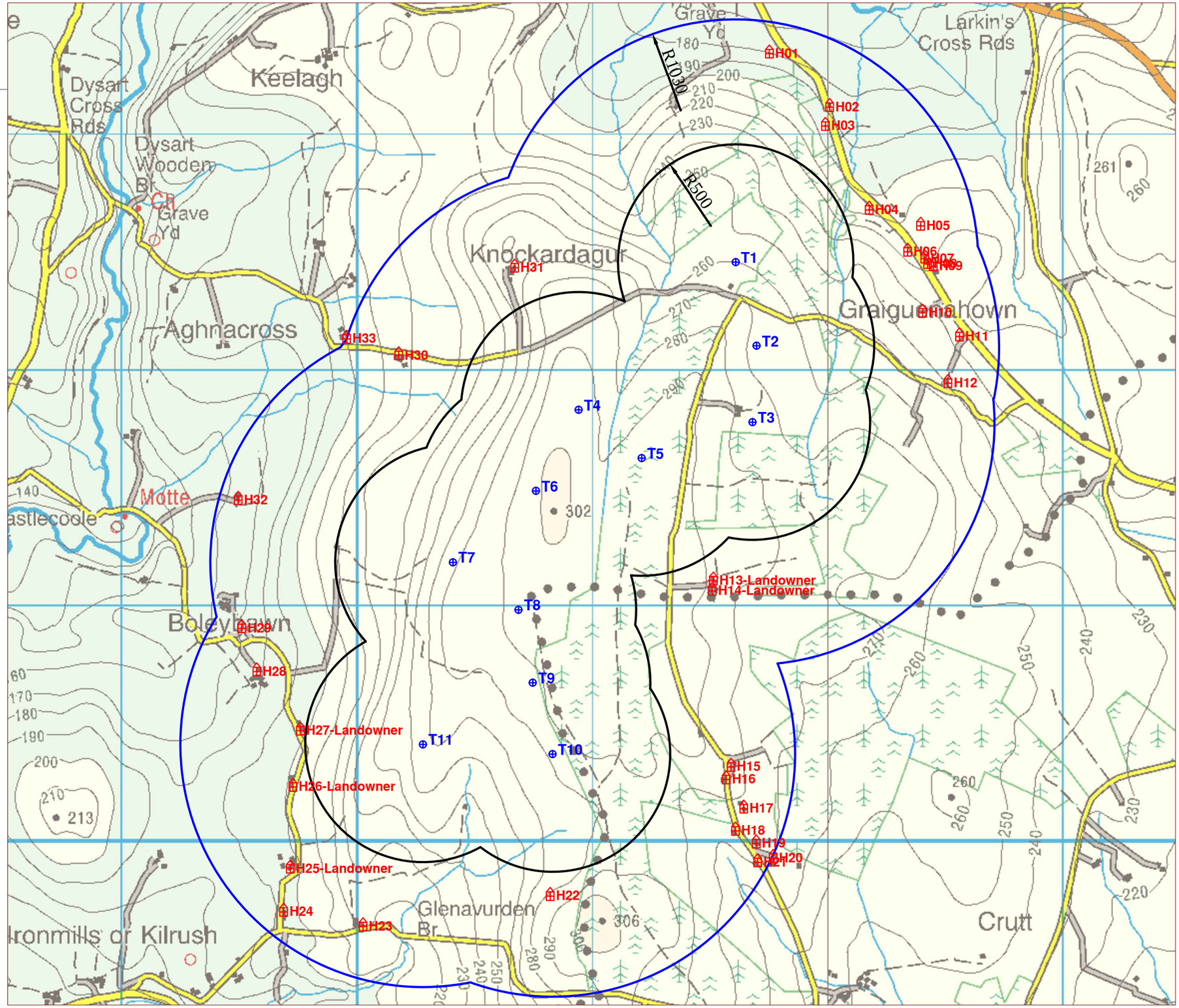
Location	*Nature of Impact*	*Population subsets*	*Impact of the proposed scheme*	*Significance*	*Magnitude*	*Interactions*	*Mitigation proposed*	*Residual Impact*
Residential amenity	Environmental impacts	Nearby residents within 1,030m	Potential for environmental impacts, especially noise and traffic	Moderate negative	Low	Noise, visual and traffic	See specific chapters	Slight to moderate temporary negative
General amenity	Environmental impacts	Visitors and local residents	Potential for environmental impacts, especially noise and traffic	Moderate negative	Medium	Noise, visual and traffic	See specific chapters	Slight to moderate temporary negative
Economic	Employment and purchases of local services	Local people and businesses	Opportunities for purchases of local services/supplies and for local employment	Moderate positive	Medium	-	n/a	Moderate temporary positive

Table 3.11A: Impacts Summary – CONSTRUCTION

Location	Nature of Impact	Population subsets	Impact of the proposed scheme	Significance	Magnitude	Interactions	Mitigation proposed	Residual Impact
Residential amenity	Property values.	Nearby residents within 1,030m	Potential for visual and environmental impacts	Slight negative	Low	Noise, visual and shadow Flicker	See specific chapters	Imperceptible
Population sustainability	Community fund	Local residents	Positive impact for local community groups/clubs.	Positive (dependent on sums transferred)	High	-	n/a	Positive
Tourism	Environmental impacts	Tourists and tourism services	Principally any adverse landscape and visual impacts	Slight negative	Medium	Noise, visual and shadow flicker	Conform to Landscape & Visual mitigation	Imperceptible
Amenity	Environmental impacts	Local people	Adverse impacts due to noise, shadow flicker or on landscape and visual.	Slight negative	Medium	Noise, visual and shadow flicker	Conform to mitigation proposals of respective chapters	Imperceptible to slight
Economic	Employment and purchases of local services	Local people and businesses	On-going maintenance and supplies	Slight positive	Low	-	n/a	Slight positive

Table 3.11B: Impacts Summary – OPERATION

Appendix 3.1: Map of Dwellings with within 1km of the Proposed Development Site



Dwelling Location Plan 1:17,000

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GALETECH ENERGY SERVICES

Legend:

- Location of proposed turbine
- Dwelling Locations
- Areas within 500m of a proposed turbine
- Areas within 1030m of a proposed turbine

Date:	Rev:	Description:	Drawn By:

Agent Address:

Galetech Energy Services.,
Clondargan,
Stradone,
Co. Cavan

Job Title:

Pinewoods Wind Farm

Client:

Pinewoods Wind Farm

Drawing Title:

Dwelling Location Map

Drawing No.:	Revision No.:
5220-1/CMP/EISD/001	0
Scale:	**Date:**
(A3) 1:17,000	19/05/2016

Drawn By:	Checked By:	Confirmed By:
C.M.P	S.D	D.S

Appendix 3.2 - Significant Commercial Activity, Schools, Holiday Accommodation, Tourism and Recreational Facilities within 5km of the Proposed Development site.

Legend:

- 5km Boundary
- Wind Turbines
- Built Up Areas (Containing Community Areas)
- Local Businesses (Outside Built Up Areas)
- Quarry
- Community Areas
- Public House
- Cooper's Hill Walk
- Slieve Margy Way
- Laois Cycle Trail A

Item No.	Type	Name
1.	Community Area	Ballypickas GAA
2.	Community Area	GAA Field
3.	Community Area	Knock N.S.
4.	Community Area	Knock Community Centre
5.	Community Area	St. Lazarian's Church
6.	Community Area	Potential Microlight
7.	Community Area	Dysart Abbey Cemetery
8.	Community Area	Heywood Gardens
9.	Community Area	Heywood Community School
10.	Community Area	Ballinakill GAA
11.	Community Area	Outdoor Karting
12.	Public House	Headen's Pub
13.	Local Business	Glanbia
14.	Local Business	Moate Pig Farm
15.	Local Business	Moyadd Caravan Centre
16.	Local Business	Ned Kelly Car Repairs
17.	Local Business	Mount Nugent Stables
18.	Local Business	Avril's Dog Grooming
19.	Quarry	Kilsaran
20.	Quarry	Behan Quarries
21.	Quarry	Joseph Delaney
22.	Quarry	Humphrey Dowling
23.	Quarry	Readymix (ROL) Ltd.
24.	Quarry	Humphrey Dowling

Date:	Rev:	Description:	Drawn By:

Prepared by:

GALETECH ENERGY SERVICES
Galetech Energy Services
Clondargan
Stradone
Co. Cavan

Client:

Pinewoods Wind Ltd

Job Title:

Pinewoods Wind Farm - Further Information Request

Drawing Title:

Human Beings and Community

Regarding Item 10 of Further Information Request

Drawing No.:	Revision No.:
20170112/JB/PD/005	00
Scale:	**Date:**
(A3) 1:50,000	12/01/2017
Drawn By:	**Checked By:**
J.B.	C.M.P.
Confirmed By:	
D.S.	