KWF Grid Connection EIA Report 2023

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Chapter 6: Population & Human Health

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Appendices referenced in this topic chapter can be found at the end of the chapter.

Glossary of Terms

Term	Definition
Electoral Districts (EDs)	Defined by the CSO as the smallest legally defined administrative areas in the State for which Small Area Population Statistics (SAPS) are published from the Census. There are 3,440 legally defined in the State.
National Economy	The economy of the Republic of Ireland. It encompasses the value of all goods and services manufactured within the country.
Local Economy	The economic system and range of economic activity in a local area that serves a local population.
Gross Value Added (GVA)	The measure of the values of goods and services produced in an area, industry or sector of an economy
Glossary of General Terms	
KWF Grid Connection (the subject development)	Underground cabling, additional plant and apparatus in the existing Woodhouse Substation, the construction a new link road, the widening of an existing forestry road and the use of the existing entrance and windfarm road network at Woodhouse Windfarm.
Authorised Knocknamona Windfarm	Not Constructed - Knocknamona Windfarm authorised in 2016 (ABP-PL 93.244006); Amendments to Knocknamona Windfarm to provide for larger turbines authorised in September 2022 (ABP-309412-21) and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower authorised in December 2022 (ABP-314219-22)
Whole Project	KWF Grid Connection with Authorised Knocknamona Windfarm
Sensitive Aspect	Any sensitive receptor in the local environment which could be impacted by the project.

6 Environmental Factor: Population & Human Health

6.1 Introduction to the Population & Human Health Chapter

6.1.1 What is Population & Human Health?

Population relates to the people living in the area, and includes their demographic makeup, economic activity, physical and mental well-being, and the social functioning of local communities.

6.1.2 Overview of Population & Human Health in the Local Environment

The Knocknamona Windfarm (KWF) Grid Connection is located in County Waterford, and specifically in the electoral division (ED) of Keereen. The immediate area surrounding KWF Grid Connection is rural and sparsely populated, with isolated residences and farmsteads scattered throughout the area. There are 17 houses within 1km of KWF Grid Connection, the nearest dwelling house being c.330m from the KWF Grid Connection construction work boundary (Woodhouse Substation). The next nearest house is adjacent and is 460m from the construction works boundary. These 2 No. houses are landowners involved in the development. The nearest non-landowner dwelling house is c.550m from the construction works boundary at the nearest point (the grid cabling as it enters Woodhouse Substation).

The nearest settlement is the village of Aglish, c.3.5km to the west. The prominent coastal town of Dungarvan, Co. Waterford is 8km to the east. Youghal town is located 14km to the south in neighbouring County Cork.

During the Census 2016 (latest fully reported small area Census), over 90% of the local population in Keereen described themselves as having either 'Very Good' or 'Good' health. Overall, it is considered that there is a very small population present within the study area, who, based on the interpretation of census and public health data, are not considered particularly sensitive to environmental or socio-economic impacts.

Relevant Figure (at the end of this chapter)
Figure 6.1: Location of houses within 1km of KWF Grid Connection Works

A survey of business, community and tourism amenities was carried out for the whole Knocknamona Windfarm Project area in February 2023. Survey results to be found in Section 6.2.1.2 below.

Relevant Figure (at the end of this chapter)
Figure 6.2.2 Study Area for Local Businesses and Community Facilities

6.1.3 SENSITIVE ASPECTS of Population & Human Health

Any receptor in the local environment which could be affected by a development is a Sensitive Aspect.

6.1.3.1 Sensitive Aspects included for detailed evaluation in this Topic Chapter

The following Sensitive Aspects are **included for detailed evaluation in this topic chapter** as it is likely or there is potential, for these Sensitive Aspects to be affected by the KWF Grid Connection:

Sensitive Aspect No. 1	**Local Population** (local residents, local community, local economy)	Section 6.2
Sensitive Aspect No. 2	**Transient People** (walkers, road users, farm workers etc.)	Section 6.3

The above listed Sensitive Aspects are evaluated in Section 6.2 and Section 6.3 of this Chapter.

6.1.3.2 Sensitive Aspects excluded from further evaluation

The following Sensitive Aspects are **excluded from further evaluation in this topic chapter** because any effects caused by the KWF Grid Connection will be Neutral or the Sensitive Aspect are evaluated in one of the other topic chapters within the EIAR.

The following Sensitive Aspects **are excluded from this topic chapter**:

National Economy	Rationale for excluding this Sensitive Aspect: **Neutral Impact** The National economy relates to economic activity and employment over the territory of the entire State. In 2021 the Gross National Product (GNP) for Ireland amounted to €321 billion[1]. In a national context, the financial transactions (positive) associated with the KWF Grid Connection, alone and cumulatively with Knocknamona Windfarm will represent less than 0.02 per cent of the national economy. This positive impact, while important, will be Neutral due to the very small scale of financial transactions in the context of the size of the National Economy.
Settlement Patterns	Rationale for excluding this Sensitive Aspect: **Neutral Impact** The financial transactions (positive) and any potential business disruption impacts from increased journey times on the local roads (negative) during the construction and operational stages of the KWF Grid Connection alone and cumulatively with Knocknamona Windfarm, will not be of a nature or scale to have any impact on local settlement patterns, i.e. it will not require or result in the temporary or permanent relocation of business or population.
Land users	Rationale for excluding this Sensitive Aspect: **Evaluated in Chapter 8: Land & Soils** (agricultural landuse, and forestry landuse).
Road users & End users of Built Services	Rationale for excluding this Sensitive Aspect: **Evaluated in Chapter 12: Material Assets**
Local Population along National & Regional Road	Effect of construction materials and turbine component haulage on houses along the National/Regional roads. Rationale for excluding this Sensitive Aspect: **Neutral Impact** - HGV are part of the baseline use of these roads. The extra proposed development traffic will be temporary and will not be noticeable in the context of daily traffic use on the National & Regional Roads involved.

6.1.4 The Authors of this Population & Human Health Chapter

The population element of the Population and Human Health chapter has been prepared by Ciara Morley(Ph.D. and M.A. in Economics and Finance), Director at Morley Economic Consulting Ltd. Ciara Morley has more than 10 years' experience in economic research and consulting. Prior to setting up her own economic consultancy in 2020, she was a Manager with EY-DKM, and a Researcher with the ESRI. Ciara's main areas of research include socio-economic analysis, regional development, and Economic Impact

[1] https://www.cso.ie/en/releasesandpublications/ep/p-ana/annualnationalaccounts2021/gdpandgrowthrates /

Assessments, across a broad range of sectors.

The human health element of the Population and Human Health chapter has been prepared by Tara Barratt, an Associate Director in Savills' Health and Social Impact Assessment team with an MSc in Environmental Technology, specialising in Environmental Epidemiology and three years' experience on major and nationally significant infrastructure projects. Tara is an Associate Member of the Institute of Environmental Management and Assessment (IEMA) and sits on the IEMA Health in EIA Working Group, recently being acknowledged as a co-author on guidance relating to 'effective scoping for human health in EIA' and 'determining significance for human health in EIA'.

The human health element of the Population and Human Health chapter has been reviewed by Dr Andrew Buroni, Savills' Health and Social Impact Assessment Practice Leader with 23 years' experience. Dr Buroni holds a PhD on international Health and Impact Assessment methods and best practice, a Masters in Environmental Impact Assessment and BSc (Hons) in Biological Sciences. He is a Fellow of the Royal Society of Medicine (RSM) and Royal Society for Public Health (RSPH) and sits on the IEMA Health in EIA Working Group, recently being acknowledged as a co-author on guidance relating to 'effective scoping for human health in EIA' and 'determining significance for human health in EIA'.

6.1.5 Sources of EIAR Information

The following sources of information were used to gather information on the baseline environment and evaluate impacts, including cumulative impacts.

Table 6-1: Sources of EIAR Information

Type	Information Source
Consultation	Feedback of a general nature was received from Uisce Eireann. • See Chapter 3: The Scoping Consultations, and Appendices for further details.
Legislation, Regulations & Policy	Regional Spatial & Economic Strategy for the Southern Region (Southern Regional Assembly Project Ireland 2040); and • Waterford County Development Plan 2022-2028.
Guidelines	• Health Impact assessment Guidance, Institute of Public Health in Ireland (2021); • WHO global air quality guidelines 2021; and • International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz) (1998)
Desktop	• Census of Population 2016 and Preliminary and Summary Results of Census 2022, various volumes published by the CSO; • GeoDirectory database of business and residential premises; • EMF Literature review of electromagnetic fields (EMF) and human health, and an evidence base of EMF measurements from the Irish Transmission System, EirGrid (RPS July 2014); In co-ordination with and by review of the other EIA Report Chapters as follows: • Chapter 5: Description of Development;

Type	Information Source
	• Chapter 9: Water; • Chapter 10: Air; • Chapter 12: Material Assets; and • Chapter 14: Landscape. Review of Authorised Knocknamona Windfarm Planning Docs • Knocknamona Windfarm Revised EIS 2015 • Amendment to Knocknamona Windfarm – Larger Turbines Revised EIAR 2021 • Junction & Bend Widening Works Screening for EIA 2022 Available in Volume F: Reference Documents
Field Surveys	• Site visits to establish the proximity of nearby sensitive receptors to the works areas.

6.1.6 Methodology used to Describe the Baseline Environment and to Evaluate Impacts

European Commission Guidance: As outlined in the Guidance on the preparation of the Environmental Impact Assessment Report (EC, 2017), it is important to ensure that methods employed in a population and health assessment are proportionate and tailored to meet the assessment requirements of the project in question, which can differ considerably depending on the scale and nature of a proposal, but are further influenced by local context and varying community circumstance and sensitivity.

The evaluation of effects to Human Health follows the approach recommended by the Institute of Public Health in Ireland (IPH, 2021). The guidance relates to both HIA and the application of HIA within EIA, covering the following key themes: screening, scoping, analysis, reporting, implementation, monitoring, and evaluation.

Once screened in, the focus for scoping is to ensure that any assessment is proportionate. In terms of analysis and reporting, the guidance states that both qualitative and quantitative approaches can be used (or a combination of both). Whether qualitative or quantitative, all conclusions on significance require explanation, the steps of which involve characterising criteria relevant to sensitivity, magnitude and contextual considerations. This is supported by evidence sources, such as scientific literature and policy context.

For instance, the sensitivity of a population can be informed by some or all of the following: life stage; deprivation; health status; daily activities; inequalities; outlook; capacity to adapt; and/or resource-sharing with the project. Sensitivity is considered in relation to the general population and vulnerable groups. The magnitude of change can be informed by some or all of the following: exposure; scale; duration; frequency; severity; population extent; outcome reversal; and/or service quality implications.

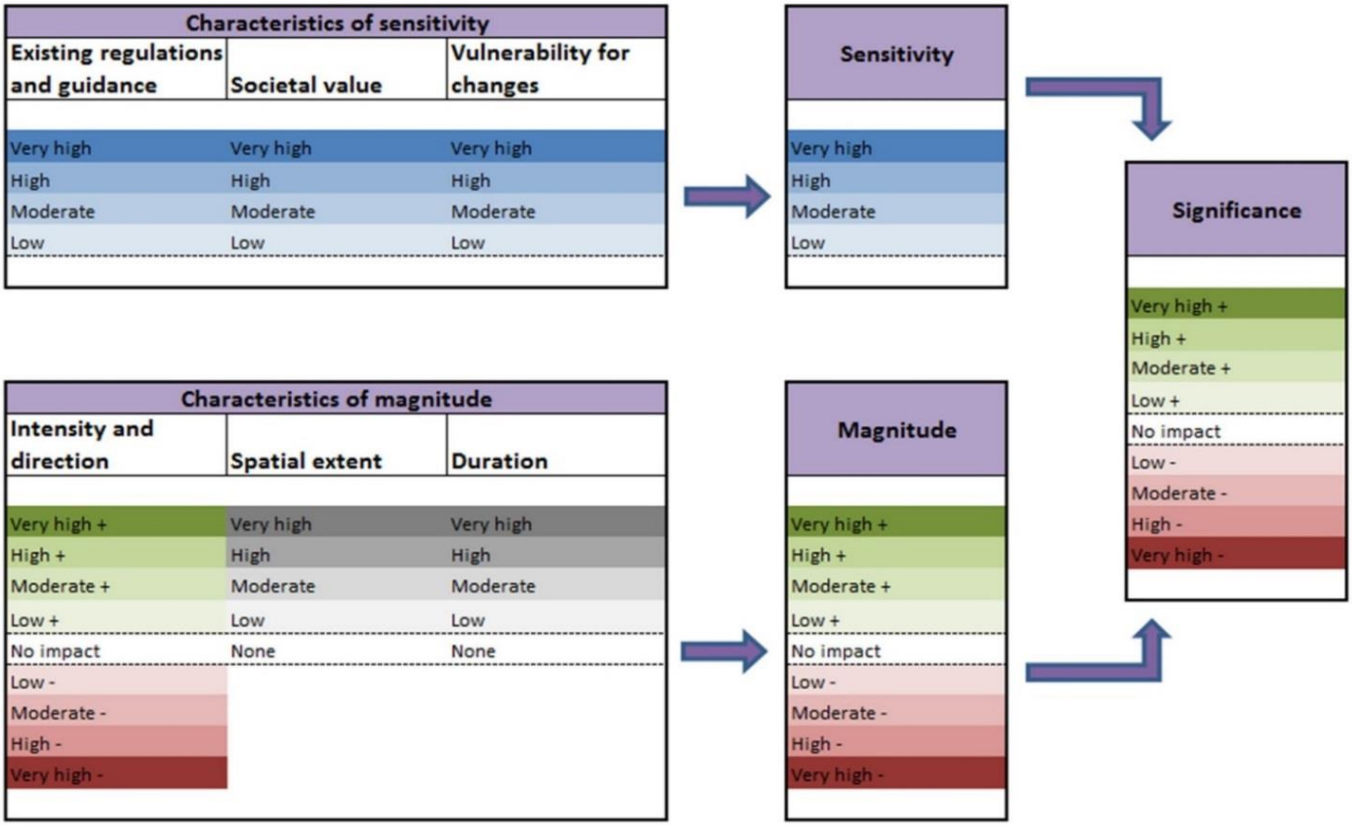
Such an approach provides the flexibility to investigate, remove and address potential environmental health issues, while also providing a framework to explore wider determinants of health and community requirements important to good health and wellbeing. The Human Health section draws from and builds upon the wider EIA technical disciplines, most notably Chapter 9: Water, Chapter 10: Air, Chapter 12: Material Assets.

As there are no industry guidelines/standards for the evaluation of socio-economic related effects to

population, a standard methodology – using the IMPERIA methodology – is employed. The IMPERIA methodology is described in Section 6.1.6.1 below.

6.1.6.1 Overview of the IMPERIA Methodology

In the framework developed under the EC LIFE project - IMPERIA, the evaluation of impact significance uses a replicable, multi-criteria decision analysis, where the sensitivity of the receptor (i.e. the sensitivity of a Sensitive Aspect of the environment) and the magnitude of the change caused by a project are rated using sub-criteria or scales, and then the overall significance is evaluated using a matrix.



The criteria for determining the overall sensitivity of a receptor and magnitude of the change (impact) to the receptor, is provided in the tables below. The matrix for determining the significance of the impact to the receptor is provided after these tables.

6.1.6.2 Criteria for Evaluating the Sensitivity of a Receptor

Sensitivity of the receptor is a description of the characteristics of the receptor or aspect of the environment which will be affected by the development. It is a measure of 1) existing regulations and guidance, 2) societal value and 3) vulnerability for the change. The sensitivity of a receptor is estimated in its current state prior to any change implied by the project.

Existing regulations and guidance describes whether there are any such objects in the impact area, which have some level of protection by law or other regulations (e.g. prohibition against polluting groundwater and Natura areas), or whose conservation value is increased by programs or recommendations (e.g. landscapes designated as nationally valuable).

Societal value describes the value of the receptor to the society and depending on the type of impact may be related to economic values (e.g. water supply), social values (e.g. landscape or recreation) or environmental values (e.g. natural habitat). Societal value measures general appreciation from the point of

view of the society. When relevant, the number of people impacted is taken into account.

Vulnerability for the change describes how liable the receptor is to be influenced or harmed by changes to its environment.

Sensitivity	Criteria Existing regulations/guidance	Criteria Societal value	Criteria Vulnerability to change
Low	Few or no recommendations which add to the conservation value of the impact area, and no regulations restricting use of the area (e.g. zoning plans).	The receptor is of small value or uniqueness. The number of people impacted is small.	Even a large external change would not have substantial impact on the status of the receptor. There are only few or none vulnerable receptors in the area.
Moderate	Regulation sets recommendations or reference values for an object in the impact area, or the project may impact an area conserved by a national or an international program.	The receptor is valuable and locally significant but not very unique. The number of people impacted is moderate.	At least moderate changes are needed to substantially change the status of the receptor. There are some vulnerable receptors in the area.
High	The impact area includes an object that is protected by national law or an EU directive (e.g. Natura 2000 areas).	The receptor is unique and valuable to society. It may be deemed nationally significant and valuable. The number of people impacted is large.	Even a small external change could substantially change the status of the receptor. There are many vulnerable receptors in the area.
Very High	The impact area includes an object that is protected by national law or an EU directive (e.g. Natura 2000 areas).	The receptor is highly unique, very valuable to society and possibly irreplaceable. It may be deemed internationally significant and valuable. The number of people affected is very large.	Even a very small external change could substantially change the status of the receptor. There are very many vulnerable receptors in the area.

The **overall sensitivity of a receptor** is assessed by the competent expert on the basis on his/her assessment of the components of sensitivity. A general guide for deriving the overall sensitivity is to pick the maximum of existing regulations and guidance and societal value and then adjust that value depending on the level of vulnerability.

Determining the Overall Sensitivity of a Receptor	
Low	The receptor has minor social value, low vulnerability for the change and no existing regulations and guidance. Even a receptor which has major or moderate social value may have low sensitivity if it's not liable to be influenced by the development.
Moderate	The receptor has moderate value to society, its vulnerability for the change is moderate, regulation may set reference values or recommendations, and it may be in a conservation program. Even a receptor which has major social value may have moderate sensitivity if it has low vulnerability, and vice versa.
High	Legislation strictly conserves the receptor, or it is very valuable to society, or very liable to be harmed by the development.
Very High	Legislation strictly conserves the receptor, or it is irreplaceable to society, or extremely liable to be harmed by the development. Even minor influence by the proposed development is likely to make the development unfeasible.

6.1.6.3 Criteria for Evaluating the Magnitude of an Impact

Magnitude of the impact describes the characteristics of changes the planned project is likely to cause. Magnitude is a combination of 1) intensity and direction, 2) spatial extent, and 3) duration. Assessment of magnitude evaluates the likely changes affecting the receptor *without* taking into account the receptors sensitivity to those changes.

Intensity describes the physical dimension of a development. The direction of the impact/change is either positive (green) or negative (red).

Magnitude	Criteria – Intensity & Direction
Very High	The proposal has an extremely beneficial effect on nature or environmental load. A social change benefits substantially people's daily lives.
High	The proposal has a large beneficial effect on nature or environmental load. A social change clearly benefits people's daily lives.
Moderate	The proposal has a clearly observable positive effect on nature or environmental load. A social change has an observable effect on people's daily lives.
Low	An effect is **positive** and observable, but the change to environmental conditions or on people is small.
No impact	An effect so small that it has no practical implication. Any benefit or harm is negligible.
Low	An effect is **negative** and observable, but the change to environmental conditions or on people is small.
Moderate	The proposal has a clearly observable negative effect on nature or environmental load. A social change has an observable effect on people's daily lives and may impact daily routines.
High	The proposal has a large detrimental effect on nature or environmental load. A social change clearly hinders people's daily lives.
Very High	The proposal has an extremely harmful effect on nature or environmental load. A social change substantially hinders people's daily lives.

Spatial extent describes the geographical reach of an impact area, or the range within which an effect is observable.

Duration describes the length of time during which an impact is observable and it also takes other related issues such as timing and periodicity into account. These are relevant for impacts which aren't observable all the time such as periodic impacts.

Magnitude	Criteria Spatial Extent	Criteria Duration
Low	Impact extends only to the immediate vicinity of a source. Typical range is < 1 km.	An impact whose duration is at most one year, for instance during construction and not operation. A moderate-term impact may fall into this category if it's not constant and occurs only at periods causing the least possible disturbance.
Moderate	Impact extends over one municipality. Typical range is 1-10 km.	An impact lasts from one to a number of years. A long-term impact may fall into this category if it's not constant and occurs only at periods causing the least possible disturbance.
High	Impact extends over one region. Typical range is 10-100 km.	An impact lasts several years. The impact area will recover after the project is decommissioned.
Very High	Impact extends over several regions and may cross national borders. Typical range is > 100 km.	An impact is permanent. The impact area won't recover even after the project is decommissioned.

Deriving the overall magnitude of the change from components of magnitude

Magnitude of the change is a comprehensive synthesis of its component factors. In a case, where intensity, spatial case and duration all get the same value, the magnitude would also be given this value. In other cases, intensity should be taken as a starting point, and the assessment should be adjusted based on spatial extent and duration to obtain an overall estimate. The aim is that the overall assessment should capture the characteristics of an effect. The table below describes some example descriptions of different categories for the magnitude of the change.

Determining the Overall Magnitude of the Change/Effect	
Very High	The proposal has beneficial effects of very high intensity and the extent and the duration of the effects are at least high.
High	The proposal has beneficial effects of high intensity and the extent and the duration of the effects are high.
Moderate	The proposal has clearly observable positive effects on nature or people's daily lives, and the extent and the duration of the effects are moderate.
Low	An effect is positive and observable, but the change to environmental conditions or on people is small.
No impact	No change is noticeable in practice. Any benefit or harm is negligible.
Low	An effect is negative and observable, but the change to environmental conditions or on people is small.
Moderate	The proposal has clearly observable negative effects on nature or people's daily lives, and the extent and the duration of the effects are moderate.
High	The proposal has harmful effects of high intensity and the extent and the duration of the effects are high.
Very High	The proposal has harmful effects of very high intensity and the extent and the duration of the effects are at least high.

6.1.6.3.1 Assessing the significance of an impact

The **assessment of the overall significance uses the matrix below,** where positive impacts are in green and negative in red. The matrix is based on the **magnitude of the change** affecting a receptor and on the **sensitivity of the receptor** to those changes.

The values obtained from the table are indicative because the most relevant dimensions for characterising an impact are dependent on the type of impact. Thus, some discretion from the expert is required, in particular in cases, where the one component is low and the other one high or very high.

Determining the Overall Significance of an Impact

Impact Significance		Magnitude of change								
		Very High	**High**	**Moderate**	**Low**	**No Change**	**Low**	**Moderate**	**High**	**Very High**
Receptor Sensitivity	**Low**	Significant*	Moderate*	Slight	Imperceptible	No Impact	Imperceptible	Slight	Moderate*	Significant*
	Moderate	Significant	Significant	Moderate	Slight	No Impact	Slight	Moderate	Significant	Significant
	High	Profound	Significant	Significant	Moderate*	No Impact	Moderate*	Significant	Significant	Profound
	Very High	Profound	Profound	Significant	Significant*	No Impact	Significant*	Significant	Profound	Profound

* Especially in these cases, significance might get a lower estimate, if sensitivity or magnitude is near the lower bound of the classification

Note on Terms used in 'Determining the Overall Significance of an Impact' Table: *The Significance rating ascribed in the Table above have been refined from the ARVI tool, to provide a more nuanced understanding of the significance and also to be compatible with the terms used throughout this EIA Report, which have been informed by the EPA Guidelines on Information to be contained in EIAR (2017) for description of effects.*

In the above Table - Low has been refined as Slight or Imperceptible depending on context; High has been renamed as Significant; Very High has been renamed as Profound and No Impact is understood to also mean Neutral effect, which is defined in the EPA Guidelines as 'no effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error'.

6.1.7 Certainty and Sufficiency of the Evaluation/Information

There is no specific guidance on the production of a Population & Human Health chapter of an EIA Report, with respect to economic activity and employment. However, extensive experience with EIA and planning systems together with the EPA guidance on EIAR preparation and the application of the IMPERIA methodology, has informed the production of this chapter.

Baseline data and trends for the local population have been derived from a range of national statistical data sources which annually collect and report statistics for geographic areas across the whole of Ireland and include datasets from the CSO census data.

There is some degree of uncertainty around future trends, particularly in relation to international market influences, which are difficult to predict. However, on the basis that these future trends are not anticipated to change enough to alter the baseline scenario when compared to the national average, the baseline environment information provided within this chapter is considered sufficient for the purpose of this assessment.

6.2 Sensitive Aspect No.1: Local Population

This Section 6.2 provides a description of the baseline environment and an evaluation of the likely impacts of KWF Grid Connection, both alone and cumulatively, on **Local Population** which relates to local residents, local community and the local economy.

6.2.1 Description of the BASELINE ENVIRONMENT for Local Population

This Section 6.2.1 comprises the identification of the Study Area for direct or indirect effects and for cumulative effects, and a description of the context, character, importance and sensitivity of the Local Population in the area. Trends or changes in the baseline environment and expected receiving environment are also identified.

6.2.1.1 STUDY AREA for Local Population

Study areas relate to areas which could be affected by impacts from KWF Grid Connection, whether direct impacts from the KWF Grid Connection on its own or cumulative impacts from KWF Grid Connection and other projects or activities.

The KWF Grid Connection study areas are described in the table below and on relevant figures.

Relevant Figures (at the end of this chapter)

Figure 6.2.1: Study Area for Local Businesses and Community Facilities
Figure 6.2.2: Study Area for Local Population (local amenity and tourism)
Figure 6.2.3: Study Area for Population and Human Health (construction stage)
Figure 6.2.4: Study Area for Population and Human Health (operational stage)

Table 6-2: KWF Grid Connection Study Area for Local Population

KWF Grid Connection Study Area (direct or indirect effects)	Cumulative Study Area
Study Area Extent: Keereen Electoral Division (ED) in relation to socio-economic impacts and secondary effects on health. Study areas associated with Air in relation to cross factor effects to health; 350m of construction works areas & within 50m of the Local Roads L60741 and L6074 as far as Woodhouse Windfarm Site Entrance and the Woodhouse Windfarm access roads to be used for delivery of construction materials and turbine component loads. *Operational Noise:* Houses within 1km of KWF Grid Connection. *Operational EMF:* 100m from KWF Grid Connection cabling and additional plant in Woodhouse Substation.	Study Area Extent: Electoral Divisions (EDs): Dromana, Keereen, Whitechurch, Dromore, Mountstuart, Carriglea in relation to cumulative socio-economic impacts and secondary effects on health. Cumulative study areas associated with Air in relation to cross factor effects to health: 700m from KWF Grid Connection construction works areas & within 50m of the Local Roads L60741 and L6074 as far as Woodhouse Windfarm Site Entrance and the Woodhouse Windfarm access roads to be used for delivery of construction materials and turbine component loads; 200m from KWF Grid Connection operational electrical equipment and underground cabling (operational EMF); and houses within 1km of KWF Grid Connection construction works area and access through Woodhouse Windfarm Entrance (operational noise).

Justification for Study Area Extent: The local population is considered to be the population in the immediate vicinity of the KWF Grid Connection site works and activities. *Construction Dust, Noise & Vibration*: Based on the criteria outlined in Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014). The L2018 and L2019 at Cappagh Quarry have been excluded because quarry traffic forms the normal baseline traffic for these roads and KWF Grid Connection quarry materials traffic is minimal in that context. *Construction Noise and Vibration:* Based on the Guidelines for the Treatment of Noise and Vibration in National Road Schemes, the Guidelines recommend that receptors within 300m of a route be identified, however in order to capture the nearest house, the wider Air Quality study area of 350m from construction works is used in the appraisal. *Operational Noise:* In order to assess all houses in the vicinity. *Operational EMF:* Based on professional judgement, EMF Field emissions can extend to this distance	Justification for Study Area Extent: The Electoral Divisions surrounding Keereen ED includes the population in the wider area. In relation to the potential for cumulative effects to health - doubling the distance (in all directions) for cumulative study areas, identifies those parts of the Authorised Knocknamona Windfarm and Other Projects with potential to cause cumulative impacts with KWF Grid Connection. Operational Noise: In order to assess all houses in the vicinity the cumulative assessment comprises the existing noise from Woodhouse Substation cumulatively with the additional electrical infrastructure associated with KWF Grid Connection.
Relevant development stage: Construction stage & operational stage. Justification: Financial transactions (operational) and the potential for cross factor effects during construction (i.e. from Air) associated with the KWF Grid Connection project.	Relevant development stage: Construction stage & operational stage Justification: Cumulative financial transactions (operational) and potential for cross factor effects (construction) associated with the whole Knocknamona Windfarm Project

6.2.1.2 Description of the BASELINE CONTEXT and CHARACTER of Local Population

The baseline context includes a description of the KWF Grid Connection Study Area and also the wider area which includes the Cumulative Study Area; Knocknamona Windfarm project area; Woodhouse Substation and Woodhouse Windfarm project areas.

6.2.1.2.1 Baseline for KWF Grid Connection Study Area (Local Population)

The KWF Grid Connection is located wholly within County Waterford, in the southwest of the County. The immediate area of the KWF Grid Connection is rural in nature, comprised of agricultural grassland, commercial forestry plantations, private roads and public roads. The area is sparsely populated with individual properties and farmsteads widely dispersed throughout. In relation to nearest neighbours to the proposed development, the nearest dwelling houses are 330m and 460m from the KWF Grid Connection construction works boundary (Woodhouse Substation). The residents of these houses are landowners involved in the project. The nearest 3rd Party (non-landowner) dwelling house is 550m from the construction works boundary (grid connection cabling entering Woodhouse Substation). The nearest settlement is the village of Aglish, c.3.5km to the west.

The following information is taken from Census data, both Census 2016 and population and economic data from the Preliminary results of Census 2022.

Population: The KWF Grid Connection is located within the Electoral Division (ED) of Keereen, which had a total population of 227 as per Census 2016 and according to the preliminary results of Census 2022[2], that population has increased to 240, which is an increase of 5.7%. This compares to a population increase of 9.4% in County Waterford and 7.6% across Ireland as a whole (Census 2022 preliminary results).

Human Health: According to Census 2016, 92% of the population of Keereen reported 'Very Good' or 'Good' health, which is slightly higher than the National average of 87%.

Local Economy: Gross Value Added (GVA) data is not available at a county or sub-county level, however GVA is available at a regional level, the most up-to-date data being for 2020 (Preliminary). Keereen ED is in the Southeast region where GVA per person stood at €43,534 in 2020, this is less than the national average of €70,967 GVA per person. Based on the above numbers, the GVA of the KWF Grid Connection study area is estimated at €10.4 million[3] in 2020.

According to Census 2016[4], employment in Keereen is concentrated in Agricultural, Forestry and Fishing (17%), Manufacturing (17%), Professional Services (17%) and Commerce and Trade (14%). A lower percentage of the not-working portion of the population within Keereen is unemployed (43.5%) when compared to the county (50.2%) and national average (47.5%). Of those not working, there is a higher proportion of the population within Keereen who are classed as "looking after home/family" (12%) when compared to the county (8.3%) and national average (9.1%), and a lower proportion of retirees (14.7%) compared to the county (16.5%) and national average (15.9%).

Data from Census 2016 suggests that just over three quarters (79%) of the population commutes to either work or for educational purposes, with 78% of those commuting for less than a half an hour. This indicates

[2] Preliminary Census 2022 results can be found at https://www.cso.ie/en/releasesandpublications/ep/p-cpr/censusofpopulation2022-preliminaryresults/
[3] Local Population (240) multiplied by GVA per person in the South East (€43,534).
[4] Census 2016. Small Area Statistics https://visual.cso.ie/?body=entity/ima/cop/2016&boundary=C03736V04484&guid=4c07d11e-1134-851d-e053-ca3ca8c0ca7f

that they are likely to be accessing employment or education opportunities in nearby urban areas, notably Dungarvan in County Waterford or Youghal in County Cork, with each of these towns less than a half hour away from Keereen ED.

Amenities: With the exception of the Keereen Bar, which is c.2km west of KWF Grid Connection, the nearest amenities are located in Aglish village, 3.5km to the southwest, which includes schools, garda station, accommodation, pubs, a GAA club and heritage amenities.

In the wider area, the town of Dungarvan is located 8km to the northeast and is rich with natural amenities including a scenic coastline. A range of festivals and events have raised the tourism profile of Dungarvan: The Waterford Greenway which ends in Dungarvan; West Waterford Festival of Food in Dungarvan; Blackwater Valley Opera Festival in Lismore; Sean Kelly Cycle Route - The Heritage Route[5]. Dungarvan acts as a hub for tourism accommodation, the arts and services in the general area. These combine to provide the tourism and hospitality sectors with an opportunity to harness commercial opportunities. Closer to KWF Grid Connection, there are scenic routes to the south and west of the site. Villierstown and Dromona House are to the west of the development, while the historic town of Lismore is located further to the northwest.

Saint Declan's Way, a long distance (104km) pilgrim route from Cashel in County Tipperary to Ardmore in County Waterford passes to the west of KWF Grid Connection, c.1.5km from the proposed development at its closest point.

6.2.1.2.2 Baseline for the Cumulative Study Area (Local Population)

The cumulative study area includes five additional EDs which surround the Keereen ED, namely Dromana, Whitechurch, Dromore, Mountstuart and Carriglea, all of which are in Co. Waterford. In the preliminary results for Census 2022, the population of the cumulative study area (including Keereen ED) totalled 2,172 persons, with the area's population growing from Census 2016 by 87 persons or 4.2%. These EDs are a typical rural upland area in Ireland and are sparsely populated, with each having a population density below the State average. The GVA of the Cumulative Study area is estimated to be €94.6 million[6].

A survey of business, community and tourism amenities was carried out in February 2023. It was found that there are 15 No. businesses (including 7 No. agri-businesses; 2 No. quarries; 3 No. retail businesses; and 3 No. public houses); 2 No. national schools; 1 No. village (Aglish) and 3 No. GAA Clubs within the Cumulative Study Area. The operational Woodhouse Windfarm and Woodhouse Substation are located adjacent (west) to KWF Grid Connection.

In the wider area, amenities (such as schools, accommodation, pubs and places to eat and activities or heritage attractions) are concentrated in Aglish village in Keereen ED/Dromana ED; Villerstown Village in Dromana ED and Whitechurch in Whitechurch ED.

Relevant Figures (at the end of this chapter)

Figure 6.2.1: Study Area for Local Businesses and Community Facilities
Figure 6.2.2: Study Area for Local Population (local amenity and tourism)
Figure 6.2.3: Study Area for Population and Human Health (construction stage)
Figure 6.2.4: Study Area for Population and Human Health (operational stage)

6.2.1.2.3 Consideration of the Passage of Time

[5] https://www.alltrails.com/trail/ireland/county-waterford/sean-kelly-cycle-route-the-heritage-route

[6] Preliminary results Census 2022 Local Population (2,172) multiplied by GVA per person in the South East (€43,534).

Previous surveys of business, community and tourism amenities in the study areas for Knocknamona Windfarm were carried out during 2016 and 2020, results of which informed the Knocknamona Windfarm Revised EIS 2015 and Larger Turbines Revised EIAR 2021. Also a survey of the area around the Junction & Bend Widening Works to the east of the windfarm entrance in Knocknaglogh Lower, was carried out in 2022 to inform the Screening for EIAR. The effects on the baseline of the passage of time since these previous surveys, has been considered in this EIAR.

A new Renewable Electricity Support Scheme (RESS 4) is expected to be announced by the Irish Government in Q4 2023. In terms of Community Benefit and, similar to previous RESS schemes, all projects successful in the RESS 4 auction will likely be required to pay into a Community Benefit Fund an amount annually of €2 per megawatt hour of electricity produced in the year, which would translate into a community benefit fund of €192,000 per annum - this fund to be distributed annually for the lifetime of Knocknamona Windfarm. It is the Applicant's intention to apply for RESS4 for the Knocknamona Windfarm project.

The explicit evaluation of 'Human Health' is a new requirement for EIA. In the Knocknamona Windfarm Revised EIS 2015 and in the Larger Turbines Revised 2021 the impact on Human Beings including socio-economic impacts (employment, property values), impacts on residential amenity (operational phase noise and shadow flicker) and impacts on air quality and on road users was assessed. In this 2023 EIAR, Human Health is included in the evaluations of the effects on the Environmental Factor 'Population and Human Health'. The evaluation encompasses the KWF Grid Connection development and the whole Knocknamona Windfarm project.

6.2.1.3 IMPORTANCE of Local Population

The local economy is key to the well-being of the Local Population and sustains and underpins the structures of society. Through economic activity and employment, the local economy generates incomes for the population, which enables individuals and families to prosper and achieve their social aspirations, all of which is important in creating sustainable local communities. These issues are particularly important at a local level for a rural area, where the range of economic opportunities is limited compared to larger more urban areas.

Census 2016 small area population statistics (latest available) indicates that a significant proportion of the local workforce commute to work by car or as a car passenger, and that the key employment sectors in the study area are 1) agriculture, forestry and fishing, 2) manufacturing industries, 3) professional services and 4) Commerce and Trade. Excluding some of those who are employed within agriculture, forestry or fishing, it is likely that the local population are accessing employment opportunities in the nearby urban areas, notably Dungarvan or Youghal.

In the absence of good physical, mental and social health and wellbeing, individuals and communities become limited in achieving their full potential. Therefore, achieving and maintaining good health and wellbeing through prevention techniques rather than treatment is of utmost importance.

6.2.1.4 SENSITIVITY of Local Population

Given the concentration of local employment in potentially exposed sectors such as Agriculture, Forestry and Fishing; Manufacturing; and Commerce and Trade, the local economy may be sensitive to changes in international markets. In recent years, key sectors for the local economy, including agri-food and tourism, have been significantly impacted by supply chain disruptions, input cost inflation, lower purchasing power, and labour shortages. While economic performance is forecasted to remain buoyant at a national level[7],

[7] https://www.esri.ie/system/files/publications/QEC2023SPR_0.pdf

these factors have the potential to impact growth and standard of living at a local level.

Individuals are considered more sensitive if there is a prominent existing burden of poor health within the area, it is considered that this is not the case within the KWF Grid Connection study area with 92% of the local population reporting Very Good to Good health in the CSO Census 2016 (latest available).

Because the number of people living in the study area is very small, with 92% reporting very good/good health and no particularly vulnerable groups present within the KWF Grid Connection Study Area, the **sensitivity of the Local Population is considered to be Low**.

6.2.1.5 TRENDS for Local Population in the Baseline Environment

Keereen ED's population was 227 in 2016 and according to the preliminary results of Census 2022, that population has increased to 240. Central Statistics Office (CSO) population forecasts estimate that the State's population will increase by 27.2 per cent from 2016 to 2051, from 4.8 million to 6 million.[8] Assuming that the local population would grow in line with the national growth rate, the population of the KWF Grid Connection Study Area will increase to 305 by the year 2051, an increase of 65 people over 2016.

Deprivation statistics provided by Pobal that consider a range of socio-economic data detailed within the census, shows that between the years of 2011 and 2016 (latest available), the level of deprivation within Keereen has reduced from -5.42 in 2011 to -3.51 in 2016, showing an increase in affluence and an improvement in socio-economic circumstance within the area.

According to Census 2016, 92% of the population of Keereen reported 'Very Good' or 'Good' health[9], which shows a slight improvement since the 2011 census[10] which recorded 90% of the population reporting 'Very Good' or 'Good' health.

In relation to local employment, the unemployment rate in the South-East region has improved significantly in the past 10 years. In Q1 2012, unemployment stood at 17.8 per cent in the South-East Region and now stands at 5.4 per cent – a drop of 12.4 percentage points. According to Census 2016 (latest available), the unemployment rate of Keereen was 10.3 per cent, down 6 percentage points on the corresponding rate in Census 2011. It is anticipated that a further significant reduction in the unemployment rate in Keereen ED will be recorded in the Census 2022 small area data results to be published in September 2023. Lockdowns imposed from March 2020 to the start of 2022, in response to the Covid-19 pandemic resulted in increased unemployment levels nationwide. On an adjusted basis, having peaked at 7.3 per cent in mid-2021, the national unemployment rate is now lower than pre-Covid-19 levels, standing at 4.2 per cent in the final quarter of 2022.

In relation to tourism: According to Fáilte Ireland's most recent Tourism Barometer[11], Ireland's tourism sector is showing tentative signs of recovery following the Covid-19 pandemic. Oversees visitor levels have improved in the past 12 months but are not yet back to pre-Covid-19 levels, while the domestic market remains an important driver of the recovery. Despite concerns on the impact of inflation – both in terms of operating costs and consumers' purchasing power, tourism operators do anticipate continued growth in the sector through 2023 and 2024, a trend which would invariably benefit the local economy. The latest overseas

[8] Based on the most moderate of six population projection scenarios from the CSO. https://www.cso.ie/en/releasesandpublications/ep/p-plfp/populationandlabourforceprojections2017-2051/

[9] https://visual.cso.ie/?body=entity/ima/cop/2016&boundary=C03736V04484&guid=4c07d11e-1134-851d-e053-ca3ca8c0ca7f&theme=11

[10] https://www.cso.ie/en/census/census2011smallareapopulationstatisticssaps/

[11] https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/Publications/failte-ireland-tourism-barometer-december-2022.pdf?ext=.pdf

visitor statistics[12] confirm that cross country walking and hiking continues to be the most popular activity amongst overseas visitors, accounting for 75 per cent of the activities engaged in by overseas visitors in 2019.[13]

6.2.1.6 The 'Do Nothing Scenario' (the Environment if the Development is not carried out)

If the KWF Grid Connection does not proceed, the effects on the environment will not occur, and the baseline environment will only change in line with the trends identified above.

6.2.1.7 Description of the RECEIVING ENVIRONMENT for Local Population

The receiving environment is the likely state of the baseline environment at the time of construction/operation/decommissioning as relevant i.e. baseline + trends.

The KWF Grid Connection will be operated on a permanent basis. Although the population of Keereen ED was relatively static, it is expected that over the operational phase of KWF Grid Connection that the local population would grow slowly in line with the national growth rate. It is also expected that the size of the local economy will also grow slowly with increasing GVA per person, and consequently that socio-economic and health circumstances will continue to improve over the long-term.

However, it is considered that the socio-economic and health circumstance will not change enough to materially alter the baseline scenario. As a result, it is assumed in this report that the baseline environment will not have materially changed by the time of the construction or operation of the development.

Relevant Figure (at the end of this chapter)

Figure 6.1: Location of houses within 1km of KWF Grid Connection Works
Figure 6.2.1: Study Area for Local Businesses and Community Facilities
Figure 6.2.2: Study Area for Local Population (local amenity and tourism)
Figure 6.2.3: Study Area for Population and Human Health (construction stage)
Figure 6.2.4: Study Area for Population and Human Health (operational stage)

12 https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/3_Research_Insights/4_Visitor_Insights/KeyTourismFacts_2019.pdf?ext=.pdf

13 Activities captured by Fáilte Ireland include Hiking/walking; cycling; golf; equestrian; and angling.

6.2.2 EVALUATION OF IMPACTS to Local Population

In this Section, the direct or indirect impacts and the cumulative impacts of KWF Grid Connection on Local Population are described.

6.2.2.1 Potential Impacts Evaluated for Local Population

A conceptual site model exercise was carried out to identify potential impacts through the examination of the specific pathways between the project (source) and the sensitive aspect (receptor).

The potential for impacts was **examined in the absence of mitigation measures**, and **based on the description of development, standard construction methodologies, construction activities and operational activities as described in Chapter 5**: **Description of the Development**.

The potential impacts which were evaluated are listed in the 1st column of the table below. As summarised in the table below, **no significant effects are likely to occur**.

Table 6-3: Conclusion of the Evaluation of Potential Impacts to Local Population

Potential Impacts which were evaluated	Relevant Stage of KWF Grid Connection	Direct Impact of KWF Grid Connection	Cumulative Impact of KWF Grid Connection with the Authorised Knocknamona Windfarm	Impact with Woodhouse Windfarm and Woodhouse Substation	Cumulative Whole Knocknamona Windfarm Project Impact
Gross Value Added to Businesses & Employment Opportunities	Construction	**Neutral**	Imperceptible	No additional cumulative impact	***Positive*** **- Not Significant**
Business disruption	Construction	**Neutral**	No potential for cumulative impact	Neutral	**Not Significant**
Increased road maintenance cost to Waterford County Council	Construction	**Neutral**	No potential for cumulative impact	No additional cumulative impact	**Not Significant**
Reduction in tourism revenue	Construction	**Imperceptible**	Imperceptible	Imperceptible	**Not Significant**
Improvement in local health due to increased local employment	Construction	**Neutral**	Neutral	No additional cumulative impact	***Positive*** **- Not Significant**
Impact on health due to potential contamination of water supplies	Construction	**No potential**	No potential for cumulative impact	No potential for cumulative impact	**Not Significant**

Potential Impacts which were evaluated	Relevant Stage of KWF Grid Connection	Direct Impact of KWF Grid Connection	Cumulative Impact of KWF Grid Connection with the Authorised Knocknamona Windfarm	Impact with Woodhouse Windfarm and Woodhouse Substation	Cumulative Whole Knocknamona Windfarm Project Impact
Impact on health due to changes in air quality	Construction	**Neutral**	No potential for cumulative impact	No additional cumulative impact	**Not Significant**
Impact on health due to changes in ambient noise and vibration	Construction	**Neutral**	Neutral	Neutral	**Not Significant**
Risk of Road Accidents	Construction	**Neutral**	No potential for cumulative impact	Neutral	**Not Significant**
Gross Value Added to Businesses & Employment Opportunities	Operational	**Neutral**	Neutral	Neutral	**Not Significant**
Increase in local economy due to Community Benefit Scheme	Operational	**No direct impact**	*Positive* - Moderate	*Positive* - Moderate	***Positive*** **- Not Significant**
Improvements in County budget due to Commercial Rates	Operational	**No potential for impact**	*Positive* - Slight	*Positive* - Slight	***Positive*** **- Not Significant**
Reduction in tourism revenue	Operational	**Neutral**	Neutral	Neutral	**Not Significant**
Decrease in local property values	Operational	**No impact**	No likely cumulative impact	No likely cumulative impact	**Not Significant**
Improvements in health due to increased local employment	Operational	**Neutral**	Neutral	Neutral	**Not Significant**
Impact on health due to exposure to EMF	Operational	**Neutral**	Neutral	Neutral	**Not Significant**
Impact on health due to changes in ambient noise and vibration	Operational	**Neutral**	No potential for cumulative impact	No potential for cumulative impact	**Not Significant**
Risk of Road Accidents	Operational	**No likely impact**	No likely cumulative impact	No likely cumulative impact	**Not Significant**

In order to keep this EIA Report concise and focused on potential significant impacts, where the evaluation of potential impacts found no significant impacts from the development, the evaluation tables are presented in the appendix to the chapter.

Because no significant impacts to Local Population are likely to occur, the Impact Evaluation Tables for the potential impacts listed in the table above are in Appendix 6.1: Evaluation of Potential Impacts to Population & Human Health.

6.2.2.1.1 Risk Perception and Windfarms

Supplementary Appendix 16.2 Risk Perceptions and Windfarms

It is noted that risk perceptions associated with the cumulative health impacts from the whole Knocknamona Windfarm Project have previously been raised by third party representative. Key themes highlighted include the WHO noise health evidence base on wind farms, wind turbine syndrome, and autism. Risk perception occurs when a hazard is confused with a risk; it is important to note that there is an important difference between hazard and risk; a hazard is something with the potential for harm, while a risk is the likelihood that any hazard will actually cause harm. It is only when there is a hazard source, a sensitive receptor and a pathway of exposure that there is a credible risk to human health.

A supplementary appendix (Appendix 6.2) has been prepared discussing each specific risk perception in more detail, to support the conclusions on impact of the proposed development to health.

In summary, the WHO define a source specific recommendation for wind turbine noise during the daytime period but note that the recommendation is conditional due to the low quality of literature which has informed it (relating to cardiovascular disease, diabetes, and quality of life, wellbeing and mental health). The guidance notes that no evidence of a potential relationship between wind turbine noise and cognitive impairment, hearing impairment/tinnitus or adverse birth outcomes exists.

The hundreds of symptoms reported in individuals living near wind turbines are referred to as “wind turbine syndrome” and are more likely to be symptoms of hypervigilance or anxiety associated with the adverse risk perceptions surrounding the wind turbines, rather than the wind turbines themselves. This is on the basis that scientific literature has failed to find any credible causal mechanism behind such symptoms, and from the evidence available, it is likely that health complaints associated with wind turbines are typically associated with contextual and personal factors rather than actual noise exposure.

In relation to autism specifically as a health concern, there is simply no evidence that the presence of wind turbines can cause autism, or that they can trigger/initiate symptoms for those who have Autism spectrum disorder (ASD). This position is confirmed by the National Autism Society (a leading advice provider for autistic people and their families), which stated that wind turbines are not an issue that service users or members have raised as a concern, and that they are also not aware of any evidence suggesting a link.

Relevant Appendix (at the end of this chapter)

Appendix 6.1 Evaluation of Potential Impacts to Population & Human Health – Evaluation of Potential Impacts to Local Population (Tables 1 to 18)

Appendix 6.2 Risk Perception and Wind Farms May 2023

6.2.2.2 Summary of the Significance of the Potential Impacts to Local Population

As outlined in the table above, negative **impacts to Local Population (being local residents, local community and local economy) as a direct result of KWF Grid Connection will be Neutral/Imperceptible**, in general this is due to the very small scale and duration (4 months) of construction works associated with the proposed development; the very small scale of operational activities (4 days per year); the use of a very lightly used local roads to deliver materials and the sparsely populated nature of the area.

Cumulative impacts of KWF Grid Connection with Authorised Knocknamona Windfarm will be Neutral (negative) and Slight to Moderate (positive), this is generally due to the temporary duration of construction works; the small locational overlap of the KWF Grid Connection with Authorised Knocknamona Windfarm; and no cumulative effects can occur to Local Population on the road network as the two projects will predominately use separate public road networks except for the L2018 and L2019 at Cappagh Quarry. Positive (Moderate) cumulative impacts include the payment of community benefit scheme and commercial rates associated with the windfarm. **Overall the 'whole project' effect of KWF Grid Connection and Authorised Knocknamona Windfarm will not be significant**.

When Woodhouse Windfarm and Woodhouse Substation are considered for cumulative impact, it is evaluated that cumulative impacts will be Neutral (negative) and Slight to Moderate (positive), because Woodhouse Windfarm and Woodhouse Substation are already constructed and therefore effects are limited to the operational period which will cause no noticeable increase in traffic or local employment. Also there will be neutral effect on property values and tourism revenue because of the nature (underground cable and additional plant in Woodhouse Substation) and scale of the additional KWF Grid Connection development.

6.3 Sensitive Aspect No.2: Transient People

This Section 6.3 provides a description of the baseline environment and an evaluation of the likely impacts of KWF Grid Connection, both alone and cumulatively, on **Transient People**. The Sensitive Aspect, Transient People, relates to the health and wellbeing of people who may work in or visit the area such as farm and forestry workers, road users, walkers and other recreational users.

6.3.1 Description of the BASELINE ENVIRONMENT for Transient People

This Section 6.3.1 comprises the identification of the Study Area for direct or indirect effects and for cumulative effects, and a description of the context, character, importance and sensitivity of the Transient People in the area. Trends or changes in the baseline environment and expected receiving environment are also identified.

6.3.1.1 STUDY AREAS for Transient People

Study areas relate to areas which could be affected by impacts from KWF Grid Connection, whether direct impacts from the KWF Grid Connection on its own or cumulative impacts from KWF Grid Connection and other projects or activities.

The KWF Grid Connection study areas are described in the table below and on relevant figures.

Relevant Figures (at the end of this chapter)
Figure 6.3.1: Study Area for Transient People (Construction Stage)
Figure 6.3.2: Study Area for Transient People (Operational Stage)

Table 6-4: Study Area for Transient People

KWF Grid Connection Study Area (direct or indirect effects)	KWF Grid Connection Cumulative Study Area (cumulative effects)
Study Area Extent: To evaluate potential cross factor effects to health, the same study area boundaries as those used for Chapter 10: Air are used here: 350m from KWF Grid Connection construction works areas & within 50m of the Local Roads L60741 and L6074 as far as Woodhouse Windfarm Site Entrance and the Woodhouse Windfarm access roads to be used for delivery of construction materials and turbine component loads, 100m from KWF Grid Connection electrical equipment and underground cabling (operational EMF)	Study Area Extent: To evaluate potential cumulative cross factor effects to health, the same cumulative study area boundaries as those used for Chapter 10: Air and Chapter 12: Material Assets are used here: 700m from KWF Grid Connection construction works, 50m from haul routes on Local Roads L6074 and the L60741 to Woodhouse Windfarm Site Entrance for construction materials and abnormal turbine component loads, 200m from KWF Grid Connection electrical equipment and underground cabling (operational EMF)
Justification for Study Area Extent: The geographic boundaries are consistent with Chapter 10: Air, thereby enabling the Human Health section authors to appraise potential cross factor effects. Road users on haul routes on the Regional R671, National Route N72 and the L2018 and L2019 local roads between the Roadstone Cappagh quarry and the N72, are scoped out as they will	Justification for Study Area Extent: The geographic boundaries are consistent with Chapter 10: Air thereby enabling the Human Health section authors to appraise potential cross factor cumulative effects. Road users on haul routes on the Regional R671, National Route N72 and the L2018 and L2019 local roads between the Roadstone Cappagh quarry and the N72, are scoped out as they will not be additionally affected by cumulative traffic due to the existing high daily usage of these roads by HGVs.

not be particularly affected by KWF Grid Connection, because, due to the existing high daily usage of these roads by HGVs and the negligible volume of deliveries associated with KWF Grid Connection, KWF Grid Connection will not cause any noticeable change in traffic volumes for transient people.	The Junction & Bend Widening Works for the Knocknaglogh Lower Windfarm entrance are minor in scale, temporary in nature and located on a very quiet local public road with little traffic or activity in the vicinity and therefore are scoped out for effects on road users and transient workers. The Authorised Knocknamona Windfarm quarry and other construction materials traffic will not use the R671 and generally use different haul routes to KWF Grid Connection haulage and therefore there is no potential for cumulative impacts from construction materials traffic.
Relevant development stage and justification: Construction stage & operational stage. Justification: potential for cross factor effects from Air associated with both of these stages of the project.	Relevant development stage and justification: Construction stage & operational stage. Justification: potential for cross factor effects from Air associated with both the construction and operational stages of windfarms and substations.

6.3.1.2 Description of the BASELINE CONTEXT and CHARACTER of Transient People

The baseline context includes a description of the KWF Grid Connection Study Area and also the wider area which includes the Cumulative Study Area; Knocknamona Windfarm project area; Woodhouse Substation and Woodhouse Windfarm project areas.

6.3.1.2.1 Baseline for KWF Grid Connection Study Area (Transient People)

Transient people represent those who may work in or visit the area such as farm and forestry workers, windfarm and substation maintenance workers, road users, walkers and other recreational users.

The surrounding area of the KWF Grid Connection is rural, comprising mainly of agricultural land and forestry plantations and Woodhouse Windfarm. There are a number of minor roads in the area, in particular the Local Roads L6074 and L60741 between Clogh Crossroads and the 2 No. Woodhouse Windfarm entrances. Traffic counts carried out on these roads show that they are very lightly used.

The number of Transient People within the KWF Grid Connection Study Area is expected to be low, and limited to:

- Farm, windfarm, substation and forestry workers who may be present on lands at Woodhouse, Keereen and Knocknamona;
- walkers on the Saint Declans Way where it crosses the haul route just near the junction of the L6074 and the L6074;
- walkers or bikers who may be present on forestry roads; and
- road users along the Local Roads L6074 and L60741 between Clogh Crossroads and the Woodhouse Windfarm Entrance and again a short streach of the L6074 between a 2nd Woodhouse Windfarm Entrance and Woodhouse Substation Entrance.

6.3.1.2.2 Baseline for the Cumulative Study Area (Transient People)

Transient People within the Cumulative Study Area relate to farm or forestry workers, windfarm and substation workers, road users and any walkers within the forestry, who may be present in the area. Also considered are users of the services detailed in Section 6.2.1.2.2 Baseline for the Cumulative Study Area (Local Population) above.

6.3.1.3 IMPORTANCE of Transient People

In the absence of good physical, mental and social health and wellbeing, individuals become limited in achieving their full potential. Therefore, achieving and maintaining good health and wellbeing through prevention techniques rather than treatment is of utmost importance. In addition to the clear benefits of good health on an individual scale, healthy lifestyles and behaviours contribute to relieving any unnecessary burden on healthcare services across Ireland to maintain good quality, access, value, standards of care and patient outcomes.

6.3.1.4 SENSITIVITY of Transient People

It is difficult to obtain demographic and health status data for visitors classified as transient people as their origin is unknown. However, visitors to the area will only be exposed to changes in the environment associated with the development temporarily and as a result, are not considered particularly sensitive.

Individuals who work on the land, such as farmers, will be exposed to changes in the environment associated

with the KWF Grid Connection on a more consistent basis. It should be noted that recent research by Teagasc (2021) suggests that, within the age range 17-64, death from CVD and cancer is higher among Irish farmers than occupational groups with the lowest rate by five and three times, respectively. As a result are considered marginally more sensitive to changes in the environment than the average population. However, due to the brief nature of their exposure to any potential impacts, farmers are not considered particularly sensitive receptors.

Overall, **the sensitivity of Transient People is considered to be Low**.

6.3.1.5 TRENDS for Transient People in the Baseline Environment

Fáilte Ireland's Tourism Facts for recent years point to very strong growth in both international and domestic tourist numbers in Ireland. The statistics confirm that walking and hiking have maintained their strong popularity for tourists as overall numbers have grown, and it is likely that the number of walkers using cycling and walking trails in the study area will continue to increase slowly over time.

As per Chapter 12 Material Assets, the number of road users is increasing, albeit at a very slow rate.

6.3.1.6 The 'Do Nothing Scenario' (the Environment if the Development is not carried out)

If the KWF Grid Connection does not proceed, the effects on the environment will not occur, and the baseline environment will only change in line with the trends identified above.

6.3.1.7 Description of the RECEIVING ENVIRONMENT for Transient People

The receiving environment is the likely state of the baseline environment at the time of construction/operation/decommissioning as relevant i.e. baseline + trends.

Any changes to the baseline environment in relation to land management and tourism are anticipated to occur slowly. As a result, it is assumed in this report that the baseline environment will not have materially changed by the time of the construction or operation of the development.

Relevant Figures (at the end of this chapter)

Figure 6.2.1: Study Area for Local Businesses and Community Facilities
Figure 6.2.2: Study Area for Local Population (local amenity and tourism)
Figure 6.3.1: Study Area for Transient People (Construction Stage)
Figure 6.3.2: Study Area for Transient People (Operational Stage)

6.3.2 EVALUATION OF IMPACTS to Transient People

In this Section, the direct or indirect impacts and the cumulative impacts of KWF Grid Connection on Transient People are described.

6.3.2.1 Potential Impacts Evaluated for Transient People

A conceptual site model exercise was carried out to identify potential impacts through the examination of the specific pathways between the project (source) and the sensitive aspect (receptor).

The potential for impacts was **examined in the absence of mitigation measures**, and **based on the description of development, standard construction methodologies, construction activities and operational activities as described in Chapter 5**: **Description of the Development**.

The potential impacts which were evaluated are listed in the 1st column of the table below. As summarised in the table below, **no significant effects are likely to occur**.

Table 6-5: Conclusion of the Evaluation of Potential Impacts to Transient People

Potential Impacts which were evaluated	Relevant Stage of KWF Grid Connection	Direct Impact of KWF Grid Connection	Cumulative Impact of KWF Grid Connection with the Authorised Knocknamona Windfarm	Impact with Woodhouse Windfarm and Woodhouse Substation	Cumulative Whole Knocknamona Windfarm Project Impact
Impact on health due to changes in ambient noise and vibration	Construction	**Neutral**	Neutral	Neutral	**Not significant**
Impact on health due to changes in air quality	Construction	**Neutral**	Neutral	No additional cumulative impact	**Not significant**
Risk of Road Accidents	Construction	**Neutral**	No potential for cumulative impact	Neutral	**Not significant**
Impact on health due to changes in ambient noise and vibration	Operational	**Neutral**	Neutral	Neutral	**Not significant**
Impact on health due to exposure to EMF	Operational	**Neutral**	Neutral	Neutral	**Not Significant**

Risk of Road Accidents	Operational	**No likely impact**	No likely cumulative impact	No likely cumulative impact	**Not significant**

In order to keep this EIA Report concise and focused on potential significant impacts, where the evaluation of potential impacts found no significant impacts from the development, the full evaluation tables are presented in the appendix to the chapter.

Because no significant impacts to Transient People are likely to occur, the Impact Evaluation Tables for the potential impacts listed in the table above are in Appendix 6.1.

Relevant Appendix (at the end of this chapter)

Appendix 6.1. Evaluation of Potential Impacts to Population & Human Health – Evaluation of Potential Impacts to Transient People (Tables 19 – 24).

6.3.2.2 Summary of the Significance of the Potential Impacts to Transient People

As outlined in the table above, **impacts to Transient People (such as walkers, road users, farm or forestry workers) as a direct result of KWF Grid Connection will be Neutral**, in general this is due to the very small scale and duration (4 months) of construction works associated with the proposed development; the negligible level of operational stage activities; the low levels of EMF emitted by the new electrical cables and equipment; and the low number of transient people expected to be in the study area.

Cumulative impacts of KWF Grid Connection with Authorised Knocknamona Windfarm where there is potential for cumulative impacts will be Neutral, this is generally due to the temporary duration of construction works, and the small location overlap of the KWF Grid Connection with Authorised Knocknamona Windfarm; the negligible level of operational stage activities; the low levels of EMF emitted by the new electrical cables, equipment or turbines; the low number of transient people (such as road users, walkers, farm or forestry workers) expected to be in the cumulative study area, and no cumulative effects can occur to road users or walkers on the road as the grid connection and windfarm elements will generally use separate public road networks. **Overall the 'whole project' effect of KWF Grid Connection and Authorised Knocknamona Windfarm will not be significant.**

When Woodhouse Windfarm and Woodhouse Substation are also taken into account, it is evaluated that where there is potential for cumulative impacts, these will be Neutral, this is generally due to the operational status of Woodhouse Windfarm and Woodhouse Substation resulting in minimal contributions to KWF Grid Connection construction stage effects;, the separation of Woodhouse Windfarm and Woodhouse Substation from Authorised Knocknamona Windfarm; the negligible level of operational stage activities; the low levels of EMF emitted by the new electrical cables, equipment or turbines; and the low number of transient people (such as road users, walkers, farm workers) expected to be in the cumulative study area.

6.4 Summary of the Population & Human Health Chapter

The Population & Human Health chapter examines the effects of KWF Grid Connection on people living in the area and includes their demographic makeup, economic activity, well-being and the social functioning of local communities. People working in or passing close to the project are also examined.

The following aspects of Population & Human Health were considered during scoping for this topic chapter: Local Population, Transient People, National Economy, Settlement Patterns, land users, road users and end users of built services (such as the Eir and ESBN networks).

Local Population and Transient People were aspects deemed to be sensitive to the development and were scoped in for detailed examination.

The other aspects listed were scoped out because; the effects would be Neutral (National Economy and Settlement Patterns) or; the aspect is examined elsewhere in the EIAR (land users – see Chapter 8: Land & Soils; Road users/users of built services - see Chapter 12: Material Assets), (Rationale for scoping out Section 6.1.3.2).

In relation to the sensitive aspects which were scoped in for evaluation, the results were as follows:

Local Population (local population, local economy and local community): potential negative impacts were evaluated as being **no greater than Imperceptible impacts.** Positive impacts evaluated as ranging from **Slight to Moderate Impact**. (Section 6.2)

Transient People (people passing through the area such as walkers, roads users, farm or forestry workers, windfarm and substation workers): potential impacts were evaluated as **Neutral**. (Section 6.3)

Related Documents

Non-Technical Summary of this chapter can be found in Volume C1: Non-Technical Summary: Section 6

Figures for Population & Human Health chapter

Figure 6.1: Location of houses within 1km of KWF Grid Connection Works
Figure 6.2.1: Study Area for Local Businesses and Community Facilities
Figure 6.2.2: Study Area for Local Population (local amenity and tourism)
Figure 6.2.3: Study Area for Population and Human Health (construction stage)
Figure 6.2.4: Study Area for Population and Human Health (operational stage)
Figure 6.3.1: Study Area for Transient People (Construction Stage)
Figure 6.3.2: Study Area for Transient People (Operational Stage)

Appendices for Population & Human Health chapter

Appendix 6.1: Evaluation of Potential Impacts to Population & Human Health
Appendix 6.2 Risk Perception and Wind Farms May 2023

6.5 Reference List

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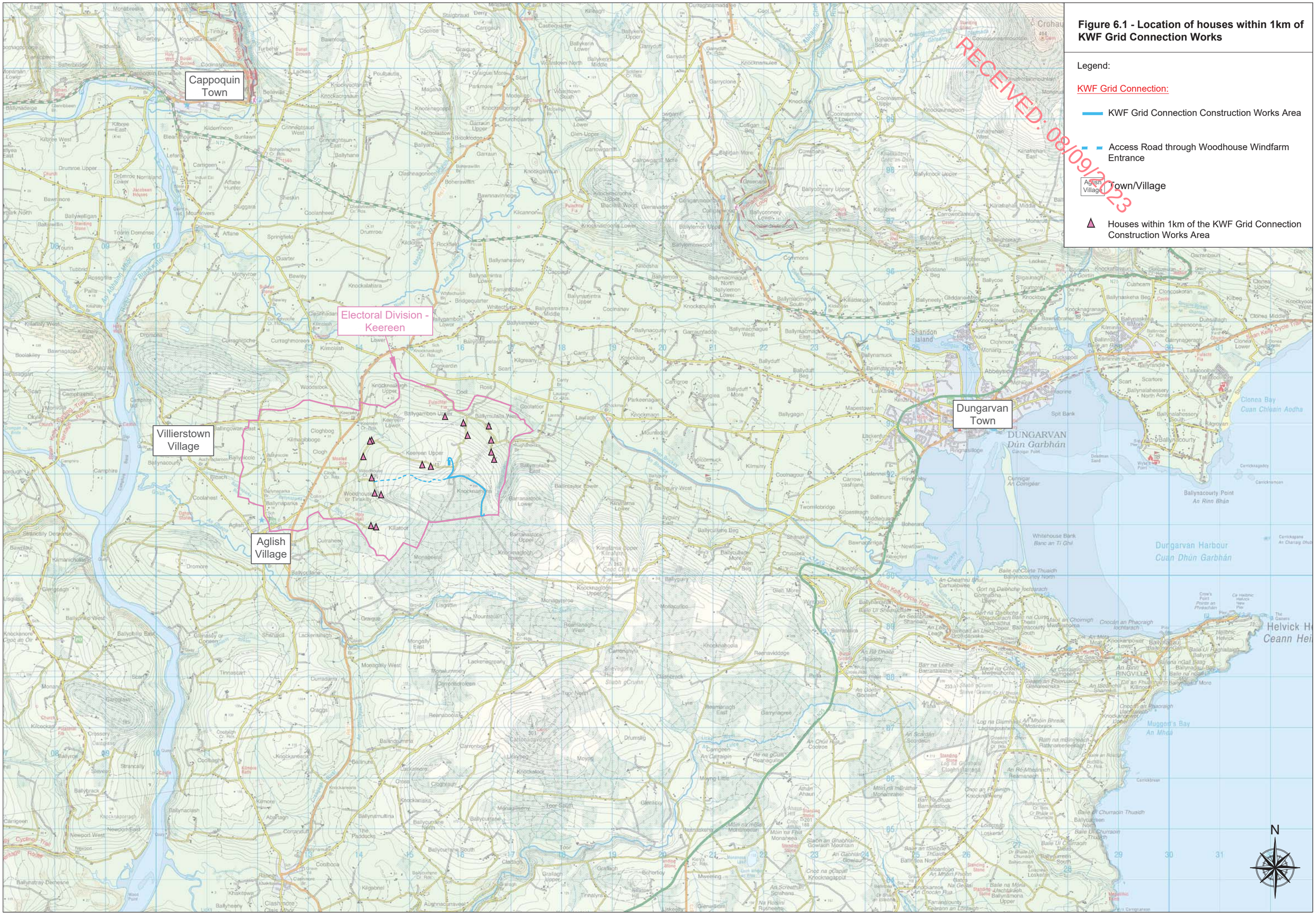


Figure 6.1 - Location of houses within 1km of KWF Grid Connection Works

Legend:

KWF Grid Connection:

- KWF Grid Connection Construction Works Area
- Access Road through Woodhouse Windfarm Entrance
- Aglish Village — Town/Village
- Houses within 1km of the KWF Grid Connection Construction Works Area

Figure 6.2.1 - Study Area for Local Businesses and Community Facilities

Legend:

KWF Grid Connection:

- KWF Grid Connection Construction Works Area
- Access Road through Woodhouse Windfarm Entrance

Study Area Extents:

- KWF Grid Connection Study Area (Keereen Electoral District)
- Cumulative Study Area

Whole Project:

- Authorised Knocknamona Windfarm and amendments
- Authorised Junction & Bend widening works

Other Projects:

- Existing Woodhouse Substation
- Existing Woodhouse Windfarm

Survey Results:

- Schools
- GAA Clubs
- Businesses
- Aglish Village — Village/Town
- Whitechurch Electoral District — Electoral Districts

Cappoquin Town
National Road - N72
Cumulative Study Area
Dromana Electoral District
Whitechurch Electoral District
Keereen Electoral District
Carriglea Electoral District
Mountstuart Electoral District
Dromore Electoral District
River Valley Plants
Western Brand Hatchery
Molaisin Compost
MMG Ireland
Whitechurch National School
Roadstone Quarry
Dungarvan Conservatories
Kereen Quarry
Keereen Bar
Blackwater Agri Sales & Services
Villierstown Village
Existing Woodhouse Substation
KWF Grid Connection Construction Works Area
The Little Milk Company
Coolcormuck Stud
Regional Road R671
Woodhouse or Tinakilly
Existing Woodhouse Windfarm
Study Area
Aglish Village
Maureen's Bar
Silver Birch Stables
Farm Machinery Contractor
Authorised Knocknamona Windfarm and amendments
Authorised Junction & Bend widening works
Glenbeg National School
National Road - N25
Cumulative Study Area

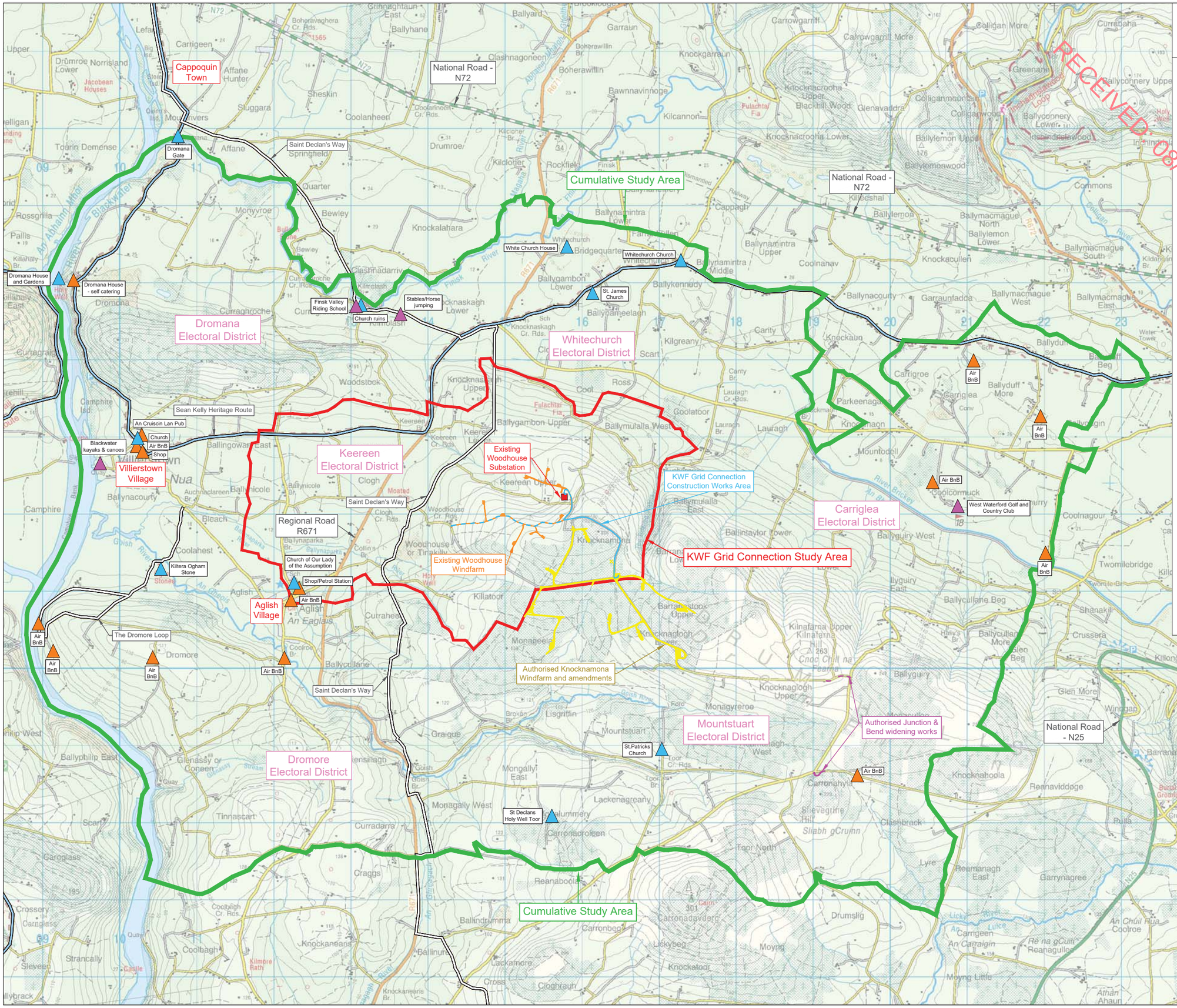


Figure 6.2.2 - Study Area for Local Population (local amenity and tourism)

Legend:

KWF Grid Connection:

- KWF Grid Connection Construction Works Area
- Access Road through Woodhouse Windfarm Entrance

Study Area Extents:

- KWF Grid Connection Study Area (Keereen Electoral District)
- Cumulative Study Area

Whole Project:

- Authorised Knocknamona Windfarm and amendments
- Authorised Junction & Bend widening works

Other Projects:

- Existing Woodhouse Substation
- Existing Woodhouse Windfarm

Survey Results:

- Accomodation
- Heritage
- Activities
- Walking Routes
- Cycling Routes
- Aglish Village — Village/Town
- Whitechurch Electoral District — Electoral Districts

Figure 6.2.3 - Study Area for Population and Human Health (construction stage)

Legend:

KWF Grid Connection:

- KWF Grid Connection Construction Works Area
- Access Road through Woodhouse Windfarm Entrance

Study Area Extents:

- KWF Grid Connection Construction Dust, Noise & Vibration
- 50m from the Local Roads L60741 and L6074 and Woodhouse Windfarm access roads to be used for delivery of construction materials and turbine component loads
- Cumulative Construction Dust, Noise & Vibration
- Houses within 1km of KWF Grid Connection

Whole Project:

- Authorised Knocknamona Windfarm and amendments

Other Projects:

- Existing Woodhouse Substation
- Existing Woodhouse Windfarm

Survey Results:

- St. Declan's Way
- Construction Materials Haul Route for KWF Grid Connection
- Turbine Component Haul Route through Woodhouse Windfarm Main Entrance

Kereen Quarry
St.Declan's Way
Existing Woodhouse Substation
R671
L6074
700m Cumulative Study Area
Site Entrance 1 at Woodhouse Substation
KWF Grid Connection Construction Works Area
Public Road Cable Crossing
L6074
L60741
Existing Woodhouse Windfarm
Site Entrance 2 at Woodhouse Windfarm SIte Entrance
350m Study Area
St.Declan's Way
Authorised Knocknamona Windfarm and amendments
N

Figure 6.2.4 - Study Area for Population and Human Health (operational stage)

Legend:

KWF Grid Connection:

- KWF Grid Connection Construction Works Area
- Access Road through Woodhouse Windfarm Entrance

Study Area Extents:

- Houses within 1km of KWF Grid Connection
- KWF Grid Connection EMF: 100m
- Cumulative EMF: 200m

Whole Project:

- Authorised Knocknamona Windfarm and amendments
- Knocknamona Windfarm Cabling

Other Projects:

- Existing Woodhouse Substation
- Existing Woodhouse Windfarm
- Woodhouse Windfarm Internal Cabling

Map Features:

- St. Declan's Way
- 110kV Overhead Transmission Line

St.Declan's Way

Nearest 3rd party House to KWF Grid Connection Construction Works Area

Existing Woodhouse Substation

Nearest House to KWF Grid Connection Construction Works Area

200m Cumulative Study Area

100m Study Area

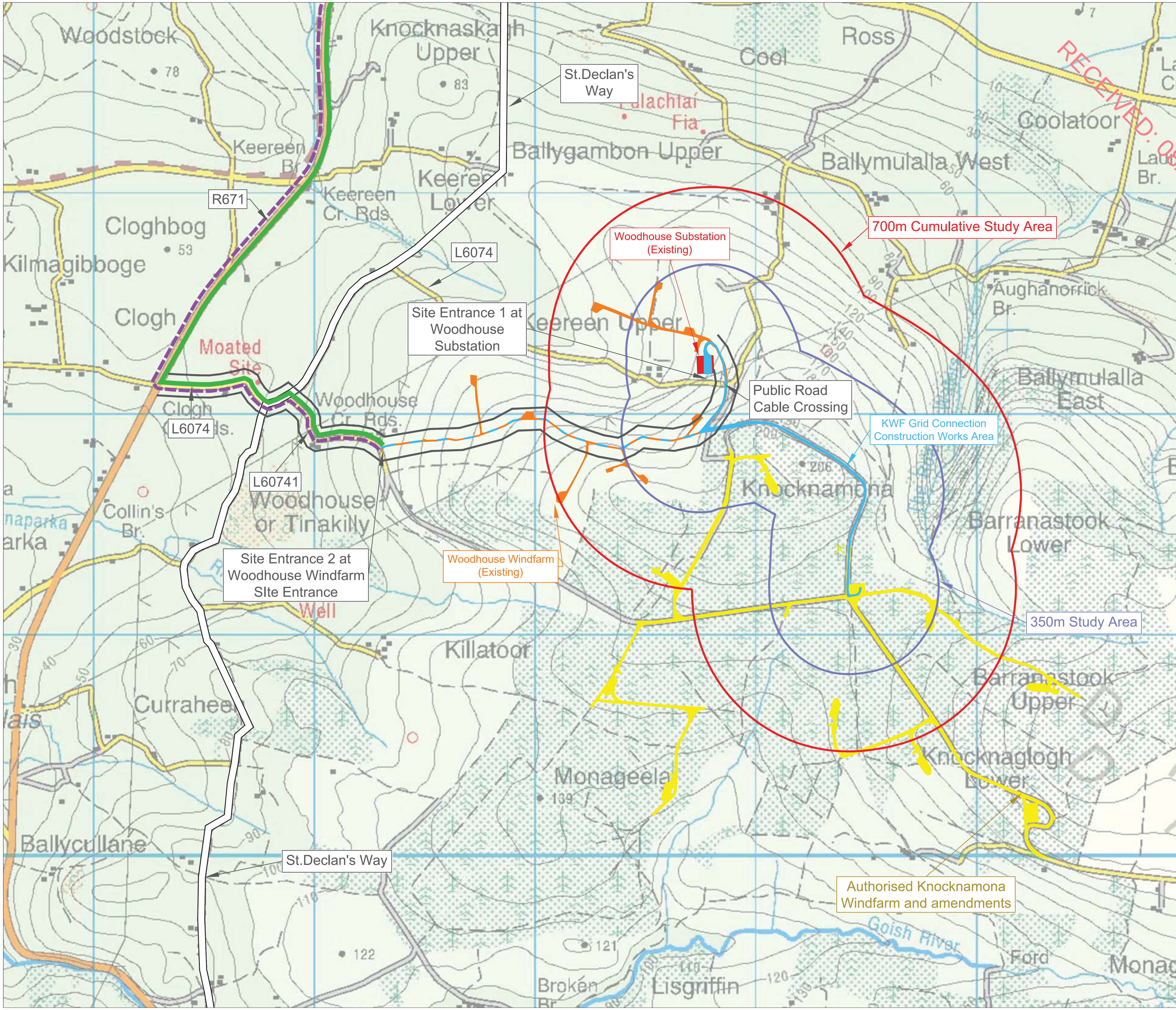
KWF Grid Connection Construction Works Area

110kV Overhead Transmission Line

Existing Woodhouse Windfarm

Authorised Knocknamona Windfarm and amendments

N



Woodstock
Knocknaskagh Upper
Ross
Cool
Coolatoor
St.Declan's Way
Ballygambon Upper
Ballymulalla West
Keereen Br.
Keereen Lower
Keereen Cr. Rds.
R671
Cloghbog
Kilmagibboge
L6074
Clogh
Moated Site
Site Entrance 1 at Woodhouse Substation
Woodhouse Substation (Existing)
700m Cumulative Study Area
Aughanorrick Br.
Ballymulalla East
Public Road Cable Crossing
KWF Grid Connection Construction Works Area
Woodhouse Cr. Rds.
L60741
Woodhouse or Tinakilly
Collin's Br.
Site Entrance 2 at Woodhouse Windfarm SIte Entrance
Woodhouse Windfarm (Existing)
Well
Knocknamona
206
Barranastook Lower
350m Study Area
Killatoor
Curraheen
Barranastook Upper
Kilnafarna Hill
Knocknaglogh Lower
Monageela
139
Ballycullane
St.Declan's Way
Authorised Knocknamona Windfarm and amendments
Goish River
Knocknaglogh Upper
Monagyreroe
Ford
122
121
Broken Br.
Lisgriffin
N

Figure 6.3.1 - Study Area for Transient People (construction stage)

Legend:

KWF Grid Connection:
- KWF Grid Connection Construction Works Area
- Access Road through Woodhouse Windfarm Entrance

Study Area Extents:
- KWF Grid Connection Construction Dust, Noise & Vibration
- 50m from the Local Roads L60741 and L6074 and Woodhouse Windfarm access roads to be used for delivery of construction materials and turbine component loads
- Cumulative Construction Dust, Noise & Vibration

Whole Project:
- Authorised Knocknamona Windfarm and amendments

Other Projects:
- Existing Woodhouse Substation
- Existing Woodhouse Windfarm

Map Features:
- St. Declan's Way
- Construction Materials Haul Route for KWF Grid Connection
- Abnormal Loads Delivery Route for KWF Grid Connection
- L6074 Road Identification Number

Figure 6.3.2 - Study Area for Transient People (operational stage)

Legend:

KWF Grid Connection:

- KWF Grid Connection Construction Works Area
- Access Road through Woodhouse Windfarm Entrance

Study Area Extents:

- KWF Grid Connection EMF: 100m from KWF Grid Connection
- Cumulative EMF: 200m from KWF Grid Connection

Whole Project:

- Authorised Knocknamona Windfarm and amendments
- Knocknamona Windfarm Cabling

Other Projects:

- Existing Woodhouse Substation
- Existing Woodhouse Windfarm
- Woodhouse Windfarm Internal Cabling
- 110kV Overhead Transmission Line

Map Features:

- St. Declan's Way

St.Declan's Way

Existing Woodhouse Substation

200m Cumulative Study Area

100m Study Area

110kV Overhead Transmission Line

KWF Grid Connection Construction Works Area

Existing Woodhouse Windfarm

Authorised Knocknamona Windfarm and amendments

N

Appendix 6.1: Evaluation of Potential Impacts to Population & Human Health

This Appendix contains Impact Evaluation Table for the following Sensitive Aspect:

Sensitive Aspect Details as per Main EIA Report		**Relevant Section of Main EIA Report:**
Sensitive Aspect No. 1	Local Population (local residents, local community, local economy).	Section 6.2
Sensitive Aspect No. 2	Transient People (walkers, road users, farm workers etc.).	Section 6.3

Evaluation of Potential Impacts to Local Population

In relation to **Local Population**, the following potential impacts were evaluated:

Potential Impacts which were evaluated	Relevant Stage of KWF Grid Connection	Evaluated in this Appendix in Table :
Gross Value Added to Businesses & Employment Opportunities	Construction	A6.1 Table 1
Business disruption	Construction	A6.1, Table 2
Increased road maintenance cost to Waterford County Council	Construction	A6.1, Table 3
Reduction in tourism revenue	Construction	A6.1, Table 4
Improvement in local health due to increased local employment	Construction	A6.1, Table 5
Impact on health due to potential contamination of water supplies	Construction	A6.1, Table 6
Impact on health due to changes in air quality	Construction	A6.1, Table 7
Impact on health due to changes in ambient noise and vibration	Construction	A6.1, Table 8
Risk of Road Accidents	Construction	A6.1, Table 9
Gross Value Added to Businesses & Employment Opportunities	Operational	A6.1, Table 10
Increase in local economy due to Community Benefit Scheme	Operational	A6.1, Table 11
Improvements in County budget due to Commercial Rates	Operational	A6.1, Table 12
Reduction in tourism revenue	Operational	A6.1, Table 13
Decrease in local property values	Operational	A6.1, Table 14
Improvements in health due to increased local employment	Operational	A6.1, Table 15
Impact on health due to exposure to EMF	Operational	A6.1, Table 16
Impact on health due to changes in ambient noise and vibration	Operational	A6.1, Table 17
Risk of Road Accidents	Operational	A6.1, Table 18

A6.1 Table 1. Local Population - Gross Value Added to Businesses & Employment Opportunities

Impact Source	**Construction contracts, purchasing of material and services, landowner payments**
Impact Pathway (between Source and Sensitive Aspect)	Financial Transactions
Brief Impact Description	An increase in gross value added to business and employment opportunities in the study area due to the purchase of goods, materials and services, employment, which will also result in secondary induced spending in the local economy.
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because of the: • Low sensitivity of the Local Population, given the low population number and the fact that the local population is not liable to be influenced by the development. • No noticeable change to the Local Economy: The Knocknamona Grid Connection capital costs amount to €1.9 million. It is unlikely that local contractors within the Keereen ED will be employed. In terms of impact on the local economy, the cost of locally-sourced construction materials for the project would be €13,000 and would be sourced from the local quarry, which is equivalent to approximately 0.1 per cent of the overall size of the local economy in the KWF Grid Connection Study Area, in the year of construction. Up to 8 personnel for both underground cabling/access road works, and c.15 personnel for substation works will be employed during the construction stage. While these individuals may generate some additional spending in the local area, such spending will not have any noticeable effect to the local economy.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact will have **Imperceptible** significance because of the: • Low sensitivity of the Local Population , and • No noticeable change to the Local Economy due to capital costs: In addition to the capital costs for KWF Grid Connection (as outlined in the row above), the capital costs for the Authorised Knocknamona Windfarm (with Larger Turbines) would be €47 million, made up of €16 million for civil, electrical and miscellaneous contracts (Irish suppliers) and €31 million for the 8 turbines and the substation (EU supply). Similar to the KWF Grid Connection, these contracts will not be sourced locally, and with the exception of stone and concrete supply from a local quarry, the combined expenditure of the whole project will have no direct impact on the local economy, therefore any cumulative impacts on the local economy will be Imperceptible (positive). • The Larger Turbines do not require additional groundworks, contracts or construction activity. • The Junction & Bend Widening Works are temporary, short-term and not significant.

	• Approximately 75 persons, some from the locality and some from other areas will be engaged in the civil, electrical, project management, legal and financial services, material supply and component deliveries for the windfarm. Cumulatively with personnel involved with KWF Grid Connection (c.23 personnel), the construction of the whole project is likely to generate some additional individual spending in the local area, however due to the small scale and temporary duration of construction works, this spending will not have any noticeable effect to the local economy.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	**No additional cumulative impact** because of the Woodhouse Windfarm and Woodhouse Substation are already constructed, with operational activities carried out by ESB personnel from the Munster area, rather from the local area. The employment of these operational personnel will have no noticeable effect on the local economy (through individual spending).

A6.1 Table 2. Local Population - Business Disruption

Impact Source	**Traffic management measures, increased traffic volumes**
Impact Pathway (between Source and Sensitive Aspect)	Road
Brief Impact Description	The potential for business disruption, is limited to the local road network between the R671 at Clogh Crossroads and the existing Woodhouse Windfarm entrance on the L60741 local road and the existing Woodhouse Substation entrance on the L6074 local road. There will also be increased traffic in the vicinity of Cappagh Quarry on the L2018 and L2019 but this type of traffic is habitual on these roads. Business disruption could result from increased traffic on these roads due to deliveries of stone/concrete and other materials and personnel to the KWF Grid Connection site.
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because of: • the Low sensitivity of the Local Population, • No noticeable impact magnitude: With the exception of local farming, there are no businesses located off the local public roads that will be used during the construction stage. • No works required along the delivery route for construction materials, turbine components or electrical apparatus either on the public road network or within the Woodhouse Windfarm; • Traffic volumes associated with the KWF Grid Connection will be very low. Underground Cabling, Link Road and forestry road widening works will take approximately 2 months and the additional works and installation of additional Electrical Plant in Woodhouse Substation will take approximately 4 months. During the first and second month there will be 3 loads per day, over a 2-month period and during the third and fourth month there will be 1 load every 2 days over a 2-month period, therefore there will be no noticeable increased journey times and no disruption of access to businesses as a result of increased construction traffic.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction &	**No Potential for Cumulative Impact** because: • Materials and plant/equipment being delivered to the KWF Grid Connection and Authorised Knocknamona Windfarm sites will not use the same local or regional road routes, i.e. the haul routes and road works for KWF Grid Connection are not located on any haul routes associated with Authorised Knocknamona Windfarm construction material deliveries or construction personnel transportation except for an overlap on the L2018 and L2019 at Cappagh Quarry. • The Larger Turbines do not require additional groundworks contracts or construction activity. • The Junction & Bend Widening Works are temporary, short-term and not significant. Impacts to traffic capacity and access on haul routes for

Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	Knocknamona Windfarm were previously assessed by An Bord Pleanála in 2016 and in 2022 as not significant. When the additional effects of KWF Grid Connection are taken into account, the cumulative effect (of Business Disruption) remains not significant.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative impact will have **Neutral** significance because: • No noticeable impact magnitude: As outlined above, there will be no cumulative impact with Authorised Knocknamona Windfarm. In relation to the operational Woodhouse Substation and Woodhouse Windfarm, any additional operational traffic will be negligible, and cumulatively with KWF Grid Connection will not cause any increase in journey times or disrupt access to businesses.

A6.1 Table 3. Local Population - Increased road maintenance cost to Waterford County Council

Impact Source	**Increased traffic volumes, road works**
Impact Pathway (between Source and Sensitive Aspect)	Roads
Brief Impact Description	Increased costs of road maintenance due to damage caused by increases in road traffic, especially HGV traffic, excavation of the road surface, and an increase in services under the road pavement
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because of: • No noticeable impact magnitude: The underground cable crossing will be carried out by directional drilling beneath the road structure and cable identification marker posts install on either side of the road. There will be no damage to the road surface or obstruction to traffic. • Given the very low volume of traffic associated with KWF Grid Connection, it is unlikely that there will be a noticeable reduction in the condition of the local roads along haul routes. Any increase in underground services at the road crossing point will not cause any noticeable increase in road maintenance costs to Waterford County Council as there are already electricity cables under this part of the local road. • The delivery of turbine components for Knocknamona Windfarm will use the new Link Road via the existing roads through Woodhouse Windfarm. No works are required to the public road network along the route. • the Low sensitivity due to the low societal value of the road, with low volumes of traffic occurring on this local road.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at	**No Potential for Cumulative Impact** because: • The road works for KWF Grid Connection are pre-dominantly not located on any haul routes associated with Authorised Knocknamona Windfarm. • Construction materials (i.e. stone, rock) being delivered to the KWF Grid Connection and Authorised Knocknamona Windfarm sites will not use the same haul routes save for a small section of local road at Cappagh Quarry and will not share site entrances. • The delivery of abnormal loads for KWF Grid Connection (which will include turbine component loads for Knocknamona Windfarm and electrical apparatus for Woodhouse Substation) will not use any Knocknamona Windfarm construction material haulage routes on local or regional roads, therefore there is no potential for cumulative effects. • No works required along the delivery route through Woodhouse Windfarm Entrance for abnormal loads either on the public road network or within Woodhouse Windfarm; • The Larger Turbines do not require additional groundworks, contracts or construction activity.

Knocknaglogh Lower	• The Junction & Bend Widening Works are temporary, short-term and not significant. • Impacts to roads as a result of Authorised Knocknamona Windfarm were previously assessed by An Bord Pleanála in 2016 and 2022 as not significant. The cumulative impact will not be significant when the additional Neutral impact associated with KWF Grid Connection is taken into account.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	**No additional cumulative impact** because: • As outlined in the row above, there will be no potential for KWF Grid Connection to cause cumulative impacts with Authorised Knocknamona Windfarm. • Due to their separate locations and access points, there will be no potential for cumulative impacts with Woodhouse Windfarm or Woodhouse Substation. • The cables which exist under the public road at Keereen Upper are considered part of the baseline and form part of the characteristics of the road at this location. • In relation to the operational Woodhouse Substation and Woodhouse Windfarm, it is not expected that the existing underground electricity cables at the road crossing (which are connected to Woodhouse Substation and Woodhouse Windfarm) will require removal or other works that will require the excavation of the public road, and therefore no cumulative impacts to Waterford County Council are expected with the KWF Grid Connection works.

A6.1 Table 4. Local Population - Reduction in Tourism Revenue	
Impact Source	**Construction activities, construction noise**
Impact Pathway (between Source and Sensitive Aspect)	Air, Visibility, Forestry Roads
Brief Impact Description	Reduction in tourism revenue due to reduced tourism numbers from reduced value or quality of tourism products in the area
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	• The impact will have **Imperceptible** significance because of the: • Low Magnitude of any impact: The St Declan's Way walking route is located c.1.5km distance from KWF Grid Connection construction works at its closest point and it crosses the haulage route for KWF Grid Connection works, on the L6074 for traffic using the Woodhouse Substation entrance. Three loads of material, namely stone, electrical equipment or concrete will be delivered along the L6074 local road each day over a 2-month period, and one load every two days for a further 2-month period. Any noise or traffic related effects to walkers will be brief. The impact on visual amenity of St Declan's Way, will be imperceptible, due to the low volume of construction/construction vehicles while visibility of construction works will be limited. • Turbine component deliveries on the L6074 local road could also interact with walkers on the St Declan's Way, however turbine component deliveries are typically carried out during the early hours of the morning and it is unlikely that any walkers will be affected. • No works required along the delivery route for turbine component and electrical apparatus deliveries through Woodhouse Windfarm entrance either on the public road network or within the Woodhouse Windfarm; • In the context of the interaction of walkers with other large machinery such as tractors and farm machinery on this local road. • Low sensitivity of the Local Population to tourism revenue - it is unlikely that construction activities will cause any reduction in tourism revenue as there are very few tourism-oriented businesses in the KWF Grid Connection study area, being limited to Keereen Bar, and some accommodation in Aglish village.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the	The cumulative impact will have **Imperceptible** significance because: • Low Magnitude of any cumulative impact: although the forestry roads within Authorised Knocknamona Windfarm are used by local walkers (there are no waymarked trails within the Knocknamona Windfarm site), diversions will be provided on forestry roads to ensure walkers can continue to walk around the forestry. The existing forestry road where the works for KWF Grid Connection overlaps the Authorised Knocknamona Windfarm will be managed through diversions to ensure that access to the forest is not interrupted during construction works. • Low sensitivity of local walkers due to the low numbers of walkers combined with the availability of alternative routes, and the temporary nature of any diversions and brief duration of any effects.

windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	• Low sensitivity of the Local Population to tourism revenue - it is unlikely that construction activities will cause any reduction in tourism revenue as there are very few tourism-oriented businesses in the immediate area, and services in the wider Cumulative Study Area (accommodation, heritage attractions, activities, and walking and cycling routes), will not be affected by the construction works. • The Larger Turbines do not require additional groundworks, contracts or construction activity. • The Junction & Bend Widening Works are temporary, short-term and not significant. • the impact of Authorised Knocknamona Windfarm to tourism and amenity were previously assessed by An Bord Pleanála in 2016 and 2022 as not significant, and as any impacts of KWF Grid Connection either on its own or cumulative with Knocknamona Windfarm will be imperceptible, it is considered that the cumulative impact (reduction in tourism revenue) will not be significant.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative impact will have **Imperceptible** significance because: Low Magnitude of any impact: • In relation to disrupted access to walkers, the cumulative impact is limited to KWF Grid Connection and Authorised Knocknamona Windfarm, as evaluated above, because Woodhouse Windfarm and Woodhouse Substation are operational and will not cause any disruption to local or walker access along the public road network (the Woodhouse Windfarm and Woodhouse Substation are on private lands with no access to walkers, unlike the Knocknamona forestry which is accessible to walkers). • In relation to reduced enjoyment of St Declan's Way: The Woodhouse Substation and Woodhouse Windfarm are operational and part of the baseline environment. Any combined noise from operational turbines and construction works will not cause any noticeable cumulative reduction in the enjoyment of St Declan's Way walk, given the separation distance to construction works at KWF Grid Connection and Authorised Knocknamona Windfarm, and the setting of the walk through a working agricultural setting and along public road networks • Low sensitivity of local walkers due to the low numbers of walkers, the brief duration of any effects and the reversibility of any effects as the walkers move through the local area. • Low sensitivity of the Local Population to tourism revenue - it is unlikely that construction activities will cause any reduction in tourism revenue as there are very few tourism-based businesses in the immediate area, and services in the wider Cumulative Study Area (accommodation, heritage attractions, activities, and walking and cycling routes), will not be affected by the KWF Grid Connection construction works.

A6.1 Table 5. Local Population - Improvement in local health due to increased local employment

Impact Source	**Construction contracts, purchasing of material and services**
Impact Pathway (between Source and Sensitive Aspect)	Financial Transactions
Brief Impact Description	Direct (KWF Grid Connection) and indirect (supply chain) employment contributing to consistent income. Both factors are considered two of the most important wider determinants of good health and wellbeing.
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	The impact (positive) will have **Neutral** significance because: The duration of the construction phase is short-term and temporary (approximately 4 months). In addition, there are limited job opportunities available during the construction phase (up to 8 personnel for both underground cabling/access road works, and c.15 personnel for substation works). Therefore, any potential income and employment consistency, and associated benefits to health and wellbeing is limited, with construction personnel most likely not being from the local area.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact (positive) will have **Neutral** significance because: • The cumulative duration of the construction phase of both the grid connection and the windfarm itself remains temporary. In addition, there are limited cumulative job opportunities available (a peak of 75 personnel on the Authorised Knocknamona Windfarm site and 18 for KWF Grid Connection works) during construction. Therefore, any potential income and employment consistency, and associated benefits to health and wellbeing is limited. • The cumulative impact (positive) is similarly limited due to the temporary nature of the construction works of both projects and will not be significantly positive. • The Larger Turbines do not require additional groundworks or construction activity. • The Junction & Bend Widening Works are temporary, short-term and not significant.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	**No Additional Cumulative Impact** because: Woodhouse Substation and Woodhouse Windfarm are already constructed, and therefore will not contribute to any increase in construction related income or employment consistency. Operational maintenance is carried out by ESB Network crews and Nordex windfarm turbine technicians, who generally are from the wider Munster area, rather than the local area.

A6.1 Table 6. Local Population - Impact on health due to potential contamination of water supplies

Impact Source	**Storage of small volumes of fuels and oils on-site**
Impact Pathway (between Source and Sensitive Aspect)	Water
Brief Impact Description	Potential impact on human health associated with contamination of water supplies from accidental spillages of small volumes of fuels and oils stored on-site.
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	**No Potential for Impact** because: No likely effect on water supplies, as per Chapter 9: Water - No likely effects to local water supplies due to the shallow nature of the works, the elevated nature of the location, and the absence of GSI mapped wells or indeed houses within at least 100m of the works. No springs or surface abstractions were located down-gradient of KWF Grid Connection.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	**No Potential For Cumulative Impact** because: • No likely effects by KWF Grid Connection; • As per the Revised EIS 2015 and R.EIAR 2021, imperceptible effect from Authorised Knocknamona Windfarm; • The Larger Turbines do not require additional groundworks or construction activity. • The Junction & Bend Widening Works are temporary, short-term and not significant; and • As the KWF Grid Connection has no potential to cause effects, the cumulative impact is in the order of Authorised Knocknamona Windfarm – i.e. not significant, as assessed by An Bord Pleanála in 2016 and 2022.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	**No Potential For Cumulative Impact** because: • No likely effects by KWF Grid Connection; and • Woodhouse Windfarm and Woodhouse Substation are already constructed, and therefore are not likely to cause any effects to water supplies.

A6.1 Table 7. Local Population - Impact on Health due to Changes in Air Quality

Impact Source	**Machinery and general construction activities**
Impact Pathway (between Source and Sensitive Aspect)	Air
Brief Impact Description	Potential impact on respiratory and cardiovascular health from changes in local air quality associated with exhaust fumes (NO_2 and PM_{10} from machinery) and dust generated from general construction activities.
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because: • As per Chapter 10: Air, any increase in dust emissions or reductions in air quality will be imperceptible; • The duration of the construction phase is short-term and temporary (approximately 4 months); • There are a limited number of sensitive receptors within the study area – the nearest resident is c.330m from KWF Grid Connection works at Woodhouse Substation; • The increase in traffic associated with the proposed development is negligible, from which it can be deduced that the potential for increase in traffic related pollutants which could impact health is also negligible; and • The worst-case change in concentration or exposure would not be of a magnitude sufficient to quantify any change in local health.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	**No Potential For Cumulative Impact** because: • There are no sensitive receptors (local residents or local community facilities) within 350m of both KWF Grid Connection and Authorised Knocknamona Windfarm construction works areas; the nearest residence is 330m from KWF Grid Connection and is occupied by the landowner involved in the proposed development and in Woodhouse Windfarm and as such did not considered a sensitive receptor. • No works required along the delivery route through Woodhouse Windfarm entrance for turbine components and electrical apparatus either on the public road network or within the Woodhouse Windfarm; • No cumulative increase in traffic as construction material deliveries or personnel transportation for KWF Grid Connection will use a different route to those for construction materials/personnel transportation for the Authorised Knocknamona windfarm; • The Larger Turbines do not require additional groundworks or construction activity. • The Junction & Bend Widening Works are temporary, short-term and not significant; and • Authorised Knocknamona Windfarm was assessed by An Bord Pleanála in 2016 and in 2022 as not having significant effects to people. When the additional

	effects of KWF Grid Connection are taken into account, the combined whole project effect remains not significant.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	**No Additional Cumulative Impact** because: Woodhouse Windfarm and Woodhouse Substation are both operational, and no dust generating activities are likely to occur, therefore neither Woodhouse Windfarm nor Woodhouse Substation will contribute to any cumulative dust emissions with KWF Grid Connection and Authorised Knocknamona Windfarm.

A6.1 Table 8. Local Population - Impact on Health due to Changes in Noise and Vibration

Impact Source	**Machinery and general construction activities**
Impact Pathway (between Source and Sensitive Aspect)	Air
Brief Impact Description	Potential impact on cardiovascular and mental health (including annoyance and sleep disturbance) from noise generated by the operation of machinery and general construction activities.
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral s**ignificance because: • The duration of the construction phase is short-term and temporary (approximately 4 months); • Construction activities will be limited to normal working hours with no construction to take place during the nighttime therefore limiting potential health impact to annoyance; • The very low number of people who could be affected - there is only 1 residence within the study area for noise and vibration (within 350m from works) and this resident is considered to not be particularly sensitive as they are landowners associated with the project and due to their separation distance (330m) from the proposed works in Woodhouse Substation; and • The worst-case change in noise exposure during construction works would not be of a magnitude sufficient to quantify any change in local health.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact will have **Neutral** significance because: • There are no local residences located within 350m of both KWF Grid Connection and Authorised Knocknamona Windfarm construction works areas. The local residence within 350m of KWF Grid Connection Works is further away (>500m) from the closest Authorised Knocknamona Windfarm works. • There is only one resident within 350m of Authorised Knocknamona Windfarm construction works, these works involve upgrading the forestry roads at the existing forestry entrance, and the construction of the windfarm's construction compound. • The cumulative impact is not significant due to the temporary duration of construction works associated with both projects (4 months for KWF Grid Connection and 9 to 12 months for Authorised Knocknamona Windfarm). • As per planning condition for Authorised Knocknamona Windfarm, construction activities will be limited to normal working hours with no construction to take place during the nighttime therefore limiting potential health impact to annoyance, as per Chapter 5 construction works for KWF Grid Connection will also be limited to normal daylight working hours. • The Larger Turbines do not require additional groundworks or construction activity. • The Junction & Bend Widening Works are temporary, short-term and not significant; and

	• The cumulative construction noise emissions will not be of a magnitude to cause any change in the health of the Local Population due to the temporary duration of construction works, the very small number of sensitive receptors (2) within 350m of either works and the carrying out of works during normal working hours.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative impact will have **Neutral** significance because: • There is one receptor within 350m of KWF Grid Connection. This local resident is a landowner involved in the operational Woodhouse Windfarm and Woodhouse Substation and is therefore not considered to be particularly sensitive to either noise from the operational turbines or the operational substation, or to any additional construction noise (from KWF Grid Connection). • Construction noise from KWF Grid Connection works at Woodhouse Substation will be of temporary duration (up to 4 months) and will be carried out during daylight hours. • The health of this resident is not affected by the noise from the operational turbines or operational substation (Ecopower consultation with landowner), and it is expected that any additional noise from construction works for KWF Grid Connection will not cumulatively cause any change in health. • Trend data from the Central Statistics Office showed an increase in the proportion of the Local Population reporting 'Very Good' or 'Good' health between the survey periods 2011 (90%) and 2016 (92%) – latest available Small Area statistics. Woodhouse Windfarm and Woodhouse Substation did not exist in 2011 but were operational by the time of the survey in 2016.

A6.1 Table 9. Local Population - Risk of Road Accidents

Impact Source	**Construction traffic and road works along haul routes**
Impact Pathway (between Source and Sensitive Aspect)	Roads
Brief Impact Description	Potential increased risk of accident and injury associated with changes to local traffic nature and flow rate.
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral s**ignificance because: • The duration of the construction phase is temporary (approximately 4 months); • The very low number of road users on the local roads (L6074, L60741, L2018 and 2019) which will be used for construction stage deliveries and transport; • Very low volume of additional traffic associated with the KWF Grid Connection construction works; and • No increase in the risk of road accidents is likely to occur.
BCumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	**No Potential For Cumulative Impact** because: • The use of separate haulage/travel routes - construction related traffic for the Authorised Knocknamona Windfarm will occur on different roads to the traffic associated with KWF Grid Connection, save for a small section of local road at Cappagh Quarry. • As per planning condition, a bespoke Transport Management Plan for Authorised Knocknamona Windfarm will be followed by all construction staff and will minimise the risk of road traffic accidents. • The Larger Turbines do not require additional groundworks or construction activity. • The Junction & Bend Widening Works are temporary, short-term and not significant. • Due to the absence of cumulative impacts, and the Neutral effect of KWF Grid Connection on its own, the cumulative impact is in the order of Knocknamona Windfarm – i.e. not significant, as assessed by An Bord Pleanála in 2016 and 2022.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative impact will have **Neutral** significance because: • The Woodhouse Windfarm and Woodhouse Substation are already constructed, with negligible levels of operation-related traffic, the cumulative traffic associated with both KWF Grid Connection and these operational projects will be negligible, and is not likely to cause any increase in the risk of road accidents on the L6074 or L60741. • No potential for cumulative impacts with Authorised Knocknamona Windfarm due to the use of separate local road networks for access to Woodhouse Windfarm/Woodhouse Substation.

A6.1 Table 10. Local Population - Gross Value Added to Businesses & Employment Opportunities (Operational)

Impact Source	**Operational maintenance contracts, purchasing of material and services, landowner payments**
Impact Pathway (between Source and Sensitive Aspect)	Financial Transactions
Brief Impact Description	An increase in gross value added to business and employment opportunities in the study area due to the purchase of goods, materials and services, employment, and payments to landowners, which will also result in secondary induced spending in the local economy.
Project Stage:	Operational
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because of the: • Low sensitivity of the Local Population, and • No noticeable change to the Local Economy: scheduled inspection and maintenance activities for the KWF Grid Connection will be carried out by 2 crews over a total of 4 days per year. It is unlikely that these jobs will be sourced locally as crews are expected to be ESBN crews from the wider Munster region.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact will have **Neutral** significance because of the: • Low sensitivity of the Local Population, and • No noticeable change to the Local Economy - there will be 4 permanent jobs created in operation and maintenance activities, legal, electricity sales and asset management as a result of the Authorised Knocknamona Windfarm, 1 of which will be sourced locally. • The Larger Turbines will not require additional maintenance over the previously authorised turbines. • If a requirement for component transportation arises, the Junction & Bend Widening Works will be limited, of very short duration and of limited extent. • No additional employment locally due to KWF Grid Connection, • The cumulative impact, while a positive impact, will be Neutral (i.e. no impact or an imperceptible impact at most).
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative impact will have **Neutral** significance because of the: • Low sensitivity of the Local Population, and • No noticeable change to the Local Economy: In addition to the 4 people employed for Authorised Knocknamona Windfarm, 4 people are employed for operational and maintenance activities at Woodhouse Windfarm. This implies that a total of 8 permanent jobs will be supported as a result of the Woodhouse and Knocknamona windfarms, while 2 crews over a total of 4 days per year will

	be employed maintaining the KWF Grid Connection. Even if these 8 jobs are sourced from the Cumulative Study Area, any effects will not be noticeable given the size of the population (2,166 people in 2022).

A6.1 Table 11. Local Population - Increase in local economy due to Community Benefit Scheme

Impact Source	**Community Benefit Scheme**
Impact Pathway (between Source and Sensitive Aspect)	Financial transactions
Brief Impact Description	Additional revenue to local community and the subsequent development of community projects through a Community Benefit Scheme payment as a result of the project
Project Stage:	Operational stage
A: Direct/Indirect Impacts of KWF Grid Connection	**No Direct Impact** because: While the KWF Grid Connection itself will not make any contribution to a Community Benefit Scheme, it will facilitate the development of Authorised Knocknamona Windfarm, which will have a Community Benefit Scheme in place, as outlined in the row below.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative **positive impact** will have **a Moderate** significance because: • The Authorised Knocknamona Windfarm will generate a direct payment to the community of c. €192,000 per annum via a Community Benefit Scheme, as noted in Larger Turbines R.EIAR 2021: Section 1.6.5.2; • While the Community Benefit Scheme will not be noticeable when compared to the size of the Cumulative Study Area, community projects have a long lasting and noticeable effect and improve the fabric of local communities. • As KWF Grid Connection will not make a direct contribution to community payments, the cumulative impact is in the order of Authorised Knocknamona Windfarm and will have Moderate positive significance to the local population.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative **positive impact** will have **Moderate** significance because: In addition to the above, the Woodhouse Windfarm Community Fund generates €20,000 per annum[1] for the local community, resulting in a cumulative total of €212,000 per annum distributed through community benefit scheme payments as a result of the Woodhouse and Authorised Knocknamona windfarms. As stated above, community projects have a long lasting and noticeable effect and improve the fabric of local communities.

[1] https://windfarmcommunityfunds.ie/funds/woodhouse-wind-farm/

A6.1 Table 12. Local Population - Improvements in County budget due to Commercial Rates

Impact Source	**Commercial Rates Revenue**
Impact Pathway (between Source and Sensitive Aspect)	Financial Transaction
Brief Impact Description	Additional revenue to Waterford County Council through increased commercial rates as a result of the project
Project Stage:	Operation stage
A: Direct/Indirect Impacts of KWF Grid Connection	**No Potential Impact** because: KWF Grid Connection will not generate any commercial rates for Waterford County Council.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative **positive impact** will have **Slight (positive)** significance because: • Low Magnitude: Based on the average commercial rates payments from windfarms in Ireland, it is estimated that the Authorised Knocknamona Windfarm will generate commercial rates of c.€450,000 per annum, with these funds being used by the County Council for the general funding of the county and representing 1.35 per cent of overall commercial rates collected by Waterford City and County Council, as per the Council's latest Financial Statement[2]. It is considered that it is unlikely that the payment of these rates will cause any noticeable positive consequences for the local population within the Cumulative Study Area. • As KWF Grid Connection will not generate any commercial rates, the cumulative impact is in the order of Authorised Knocknamona Windfarm – i.e. Neutral impact.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative **positive impact** will have **Slight** significance because: • Low Magnitude: In addition to the above, the Woodhouse generates commercial rates of c. €325,000[3] per annum for Waterford County Council, with these funds being used for the general funding of Waterford County Council. • Cumulatively a total of €775,000 per annum would be generated in commercial rates as a result of Woodhouse and Knocknamona Windfarms. This would represent 2.3 per cent of overall commercial rates collected by Waterford City and County Council, as per the latest 2017 annual report, and at these levels it is

[2] Waterford City & County Council Financial Statement y/e December 2021 – total rates income €33,439,115
[3] Woodhouse wind farm valued at €1.26m, and given Waterford's County & City ARV of 0.2583, this equates to commercial rates for the site amount to €325,458 per annum
https://www.valoff.ie/en/
https://www.oireachtas.ie/en/debates/question/2018-03-08/621/

	expected that there would be noticeable positive effects to the Local Population within the Cumulative Study Area from increased or improved county services.

A6.1 Table 13. Local Population - Reduction In Tourism Revenue (Operational)	
Impact Source	**Operating substations, operating turbines**
Impact Pathway (between Source and Sensitive Aspect)	Air/Visibility
Brief Impact Description	Reduction in tourism revenue due to reduced tourism numbers from reduced value or quality of tourism products in the area
Project Stage:	Operational
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because of the: • Any visual impact is limited to the additional apparatus at Woodhouse Windfarm, as the new and widened roads will be perceived as part of the working forestry at Knocknamona. • No noticeable impact magnitude due to the small scale of the new plant at Woodhouse Substation and the screening provided by topography and by the existing infrastructure at Woodhouse Substation, • therefore it is considered that the KWF Grid Connection will not cause any noticeable effects to local walks or waymarked trails or to other tourism products in the wider area.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact will have **Neutral** significance because: • Low Sensitivity of Local Population with relatively few tourism products in the Cumulative Study Area • No noticeable cumulative impact magnitude: Due to the predominately underground nature of the KWF Grid ; the Neutral effects of the new above ground plant and apparatus at Woodhouse Substation; and the separation distance between Knocknamona turbines and Woodhouse Substation it is considered that KWF Grid Connection will not cause any additional noticeable cumulative impact in combination with Authorised Knocknamona Windfarm, to the enjoyment of local walks or waymarked trails or other tourism products in the wider area, and therefore it is considered that KWF Grid Connection will not cause any noticeable cumulative impacts to tourism revenue. • The Larger Turbines would not cause noticeable cross-factor changes to the to the attractiveness of tourism offerings in the area, including hill walking routes within the Comeragh and Knockmealdown ranges, the nearby St Declan's Way pilgrim walking route and the further afield heritage views (stately houses, gardens and historic villages). According to the evaluations in the Landscape & Visual Amenity section of the Larger turbines R.EIAR 2021, no material increase in the authorised visual impact along walking routes and heritage views are expected to occur, and therefore no change to the authorised impact is expected to tourism offerings. The evaluation remains Neutral. • Changes in turbine noise remains comparable with that previously authorised, adhering to the same constraints, representing a negligible change, with no material risk to public health. Shadow Flicker effect will be controlled in accordance with planning conditions.

	• It is considered that the cumulative impact on the enjoyment of tourism products in the area, will be in the context of Authorised Knocknamona Windfarm which has already been determined by An Bord Pleanála in 2016 and 2022 to be not significant. Any secondary impacts on tourism revenue will, therefore, also not be significant.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative impact will have **Neutral** significance because: • Low Sensitivity of Local Population with relatively few tourism products in the Cumulative Study Area • Due to its predominately underground nature and Neutral impact of additional plant and apparatus at Woodhouse Substation, it is considered that KWF Grid Connection will not cause any additional noticeable cumulative impact in combination with Authorised Knocknamona Windfarm and Woodhouse Windfarm and Woodhouse Substation, to the enjoyment of local walks or waymarked trails or other tourism products in the wider area, and therefore it is considered that KWF Grid Connection will not cause any noticeable cumulative impacts to tourism revenue. • The Authorised Knocknamona Windfarm cumulatively with Woodhouse Windfarm and Woodhouse Substation has already been determined by An Bord Pleanála in 2016 and 2022 to be not significant.

A6.1 Table 14. Local Population - Decrease in local property value

Impact Source	**New infrastructure, operational windfarms**
Impact Pathway(between Source and Sensitive Aspect)	Value of property
Brief Impact Description	Decline in value of nearby property prices as a result of new development and infrastructure
Project Stage:	Operational stage
A: Direct/Indirect Impacts of KWF Grid Connection	**No impact** because: Due to the scale, nature (mainly underground or well screened, with no significant dust, noise or visual impacts as a result of the construction or operational phase) and location (separation distance of c.330m to nearest house, and c.550m to the nearest non-landowner house), the grid connection will not negatively impact the value of local properties.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	**No Likely cumulative impact** because: • Due to the scale, nature and location of KWF Grid Connection, it will not cause noticeable cumulative effects to property values with Authorised Knocknamona Windfarm. • Authorised Knocknamona Windfarm will comprise 8 No. wind turbines with each having an overall height to blade tip up to 155meters. Despite this, research has suggested that there is no evidence that prices had been affected by either the announcement, construction or completion of the wind farms[4] in local areas. It is therefore considered the negative impacts to property prices as a result of Authorised Knocknamona Windfarm are unlikely to occur. • The Larger Turbines would not cause noticeable cross-factor changes to the impact of Knocknamona Windfarm as evaluated in 2016, to the attractiveness of tourism offerings in the area, including hill walking routes within the Comeragh and Knockmealdown ranges, the nearby St Declan's Way pilgrim walking route and the further afield heritage views (stately houses, gardens and historic villages). According to the evaluations in The Landscape & Visual Amenity section of the Larger Turbines R.EIAR 2021, no material increase in the authorised visual impact along walking routes and heritage views are expected to occur, and therefore no change to the previously authorised impact is expected to tourism offerings. • Changes in turbine noise remains comparable with that previously authorised, adhering to the same constraints, representing a negligible change, with no material risk to public health. Shadow Flicker effect will be controlled in accordance with planning conditions. Therefore there is no deterioration of the amenity of the property.

[4] https://cdn.ymaws.com/www.renewableuk.com/resource/resmgr/publications/reports/ruk-cebr-study.pdf (Page 4)
https://www.energyandpolicy.org/wind-energy-does-not-hurt-property-values/

	• The cumulative effect is in the order of Authorised Knocknamona Windfarm – i.e. no likely impact on local property prices.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	**No Likely cumulative impact** because: Due to the scale, nature and location of KWF Grid Connection, it will not contribute to any effects to property values with Authorised Knocknamona Windfarm and Woodhouse Windfarm. Similar to Authorised Knocknamona Windfarm above, Woodhouse Windfarm and Woodhouse Substation are not expected to be causing negative impact to local property prices.

A6.1 Table 15. Local Population - Improvement in health due to increased local employment

Impact Source	**Operational and maintenance employment contracts**
Impact Pathway (between Source and Sensitive Aspect)	Financial Transactions
Brief Impact Description	Direct (KWF Grid Connection) and indirect (supply chain) employment contributing to consistent income. Both factors are considered two of the most important wider determinants of good health and wellbeing.
Project Stage:	Operation stage
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because: • There are limited job opportunities associated with the operation and maintenance phase, which will be carried out by a 2 person crew over a total of 4 days per year, and most likely sourced from the wider Munster area. Therefore, any potential income and employment consistency, and associated benefits to health and wellbeing is negligible, and likely to be none within the Local Population.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact will have **Neutral** significance because: • There are limited cumulative job opportunities associated with the operation and maintenance of the KWF Grid Connection and the Authorised Knocknamona Windfarm (4 full time equivalent jobs for Knocknamona Windfarm and 2 person crews over a total of 4 days per year will be employed maintaining the KWF Grid Connection). The majority of these jobs are likely to be sourced from the wider Munster area. • The Larger Turbines will not require additional maintenance over the previously authorised turbines. There will be no change to the number of personnel employed during operational phase. • If a requirement for component transportation arises, the Junction & Bend Widening Works will be limited, of very short duration and of limited extent. • Therefore, any potential income and employment consistency, and associated benefits to health and wellbeing to the Local Population within the Cumulative Study Area will be negligible. • The cumulative impact will be Neutral.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative impact will have **Neutral** significance because: • There are limited cumulative job opportunities associated with the operation and maintenance of KWF Grid Connection in-combination with the Authorised Knocknamona Windfarm, Woodhouse Windfarm and Woodhouse Substation (c.8 full time equivalent jobs). The majority of these jobs are likely to be sourced from the wider Munster area.

	• Therefore, any potential income and employment consistency, and associated benefits to health and wellbeing to the Local Population within the Cumulative Study Area will be negligible.

A6.1 Table 16. Local Population - Impact on Health due to Exposure to EMF

Impact Source	**Electrical equipment**
Impact Pathway (between Source and Sensitive Aspect)	Air
Brief Impact Description	Potential health impacts from exposure to EMF associated with transmission of electricity associated with the KWF Grid Connection (e.g. the grid connection itself and associated equipment such as the substation). Cumulative impacts relate to the additional EMF emissions from turbines, substations and underground cabling.
Project Stage:	Operation stage
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because: • There are no local residences or community facilities within 100m of electrical equipment. • In any case, as per Chapter 10: Air, even directly above the underground cables or directly beside the Woodhouse Substation fence, the magnitude of the magnetic or electric fields will not exceed the ICNIRP guideline limit value of 100 µT and 5000V, respectively.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact will have **Neutral** significance because: • There are no local residences or community facilities within 100m of electrical equipment associated with either KWF Grid Connection or Authorised Knocknamona Windfarm (turbine locations or consented Knocknamona Substation). • In any case, even directly above the underground cables or right beside turbine bases or directly beside the Authorised Knocknamona Substation fence, the magnitude of the magnetic or electric fields will not exceed the ICNIRP guideline value of 100 µT and 5000V respectively. • Although the Larger Turbines will result in a change to the electrical output of the turbines, there will be no notable difference in EMF levels emitted from the electrical equipment in the turbine, including the turbine transformer; EMF at the base of the turbines (whichever size) will be substantially below the INCIRP guideline limits; The turbines will remain in the same locations as previously authorised and there will be no additional turbines; The Larger Turbines will not require any changes to the rated capacity of the windfarm substation, Internal Windfarm Cabling or to the KWF Grid Connection. The cumulative impact will be **Neutral**.
C: Cumulative Impact with	The cumulative impact will have **Neutral** significance because:

Woodhouse Substation and Woodhouse Windfarm	• There are no local residences or community facilities within 100m of electrical equipment associated with either KWF Grid Connection or Authorised Knocknamona Windfarm (turbines, cabling or windfarm substation) or Woodhouse Windfarm (turbines or internal underground cabling) or Woodhouse Substation. • In any case, even directly above the underground cables or right beside turbine bases or directly beside the Woodhouse Substation or Knocknamona Substation fences, the magnitude of the magnetic or electric fields will not exceed the ICNIRP guideline value of 100 µT and 5000V respectively.

A6.1 Table 17. Local Population - Impact on health due to changes in ambient noise and vibration

Impact Source	**Noise generated by operation** of additional apparatus at the Woodhouse Substation associated with the KWF Grid Connection, cumulative sources include the existing apparatus at Woodhouse Substation and operational and permitted turbines.
Impact Pathway (between Source and Sensitive Aspect)	Air
Brief Impact Description	Potential impact on cardiovascular and mental health (including annoyance and sleep disturbance) due to noise emissions.
Project Stage:	Operational stage
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because: • The only part of the KWF Grid Connection with potential for operational noise emissions is the additional apparatus at the Woodhouse Substation. There are no community facilities within the study area. The nearest dwelling is located 330m away from the Woodhouse Substation, and due to this separation distance, there will be no discernible noise from the additional apparatus at this residence. • As a result, the worst-case change in noise exposure would not be of a magnitude sufficient to quantify any change in local health.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	**No Potential For Cumulative Impact** because: • Due to separation distance from the nearest residents, KWF Grid Connection will not cause any discernible increase in ambient noise levels. Additional noise from the additional plant in Woodhouse Substation will not contribute to ambient noise levels at any dwellings within the zone of influence of the Authorised Knocknamona Windfarm. As such, any noise generated by the KWF Grid Connection will not contribute to cumulative noise effects with Authorised Knocknamona Windfarm. • The Larger Turbines vibration emissions when operational will remain at levels which are barely measurable, with no risk to public health; • The Larger turbines would not increase the noise levels of the windfarm beyond that already authorised and will utilise more advanced technology to control the operation of the turbine to ensure that noise emissions stay below the levels authorised. On the basis that the larger turbines would adhere to the same noise constraints already evaluated in 2016, the change is negligible, with no material risk to public health. • The Knocknamona Windfarm was assessed as having an acceptable level of noise emissions in relation to effects to local residents, by An Bord Pleanála in 2016 and in 2022. • The worst-case cumulative change in noise exposure as a result of the authorised windfarm and grid connection would not be of a magnitude sufficient to quantify any change in local health.

C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	**No Potential For Cumulative Impact** because: • Due to separation distance from the nearest residents, additional noise from the KWF Grid Connection additional plant in Woodhouse Substation will not cause any discernible increase in ambient noise levels at local residences. There are also no community facilities within the zone of influence. • KWF Grid Connection will not cause any increase in ambient noise levels at any dwellings within the zone of influence of either the Knocknamona Windfarm or Woodhouse Windfarm.

A6.1 Table 18. Local Population - Risk of Road Accidents

Impact Source	**Operational and maintenance related traffic**
Impact Pathway (between Source and Sensitive Aspect)	Roads
Brief Impact Description	Potential increased risk of accident and injury associated with changes to local traffic nature and flow rate.
Project Stage:	Operation stage
A: Direct/Indirect Impacts of KWF Grid Connection	**No Likely Impact** because: • There are a limited number of sensitive receptors within the study area – local roads associated with access to the KWF Grid Connection are very lightly trafficked; and • The magnitude of change would be negligible as maintenance will take place intermittently (over c.4 days per year) throughout the operation of the proposed development.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	**No Likely Cumulative Impact** because: • There are a limited number of sensitive receptors within the cumulative study area - local roads associated with access to both the KWF Grid Connection and Authorised Knocknamona Windfarm are very lightly trafficked. • The Larger turbines will not require additional maintenance over the previously authorised smaller turbines. • The cumulative magnitude of change would be negligible as maintenance will take place over c.2 – 3 days per week throughout the operation of the Authorised Knocknamona Windfarm, and over 4 days in a year for KWF Grid Connection. The traffic associated with the operational stage will predominately relate to vans or four-wheel drive vehicles and will be of a volume substantially less than that of a local residence. As the KWF Grid Connection is not likely to cause effects, the cumulative impact will be in the order of Authorised Knocknamona Windfarm and will not be significant.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	**No Likely Cumulative Impact** because: • There are a limited number of sensitive receptors within the cumulative study area - local roads associated with access to the KWF Grid Connection, Authorised Knocknamona Windfarm, Woodhouse Windfarm and Woodhouse Substation are all very lightly trafficked. • Woodhouse Windfarm and Woodhouse Substation will be accessed from separate local roads to Authorised Knocknamona Windfarm.

	• The cumulative magnitude of change would be negligible as maintenance will take place over c.2 – 3 days per week for each windfarm, and intermittently throughout the operation of the proposed development.

Evaluation of Potential Impacts to Transient People

In relation to **Transient People**, the following potential impacts were evaluated:

Potential Impacts which were evaluated	Relevant Stage of KWF Grid Connection	Evaluated in this Appendix in Table:
Impact on health due to changes in ambient noise and vibration	Construction	A6.1, Table 19
Impact on health due to changes in air quality	Construction	A6.1, Table 20
Risk of Road Accidents	Construction	A6.1, Table 21
Impact on health due to changes in ambient noise and vibration	Operational	A6.1, Table 22
Impact on health due to exposure to EMF	Operational	A6.1, Table 23
Risk of Road Accidents	Operational	A6.1, Table 24

A6.1 Table 19. Transient People - Impact on health due to changes in ambient noise and vibration

Impact Source	**Machinery and general construction activities**
Impact Pathway (between Source and Sensitive Aspect)	Air
Brief Impact Description	Potential impact on cardiovascular and mental health (including annoyance) from noise generated by the operation of machinery and general construction activities.
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because: • The duration of the construction phase is temporary (approximately 4 months); • The duration of any impacts would be momentary to brief; • The number of transient receptors passing through the study area would be very low and limited to the extremely low number of road users on the Local Road L6074, L2018 & L2019, any walkers present on the Saint Declan's Way or on the Knocknamona forestry roads, and any farm/forestry workers present on lands within 350m of construction works. • The worst-case change in noise exposure would not be of a magnitude sufficient to quantify any change in health of transient receptors who would only be exposed temporarily.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact will have **Neutral** significance because: • The cumulative duration of the construction phase is temporary (9-12 months), where the potential for any overlap is up to 4 months. • The duration of any impacts would be momentary to brief. • The Larger Turbines will not result in any changes to construction activities, contracts or duration. • The Junction & Bend Widening Works are minor in scale, of very brief duration and separate to the grid connection and windfarm sites. • The number of transient receptors passing through the study area would be low. • The limited extent of overlap of the two construction sites, and the avoidance of cumulative impacts on haul routes. • The worst-case change in cumulative noise exposure would not be of a magnitude sufficient to quantify any change in health of transient receptors who would only be exposed temporarily. • The combined effects of the cumulative impact will be imperceptible.
C: Cumulative Impact with Woodhouse	The cumulative impact will have **Neutral** significance because:

Substation and Woodhouse Windfarm	• No potential for cumulative construction-related noise impacts as Woodhouse Substation and Woodhouse Windfarm are already constructed and operational. • Any additional noise due to construction works for KWF Grid Connection and Authorised Knocknamona Windfarm will be temporary in duration (4 months and 9-12 months respectively). • The number of transient receptors passing through the study area would be low • The worst-case change in cumulative ambient noise exposure would not be of a magnitude sufficient to quantify any change in health of transient receptors who would only be exposed briefly at most.

A6.1 Table 20. Transient People – Impact on health due to changes in air quality

Impact Source	**Machinery and general construction activities**
Impact Pathway (between Source and Sensitive Aspect)	Air
Brief Impact Description	Potential impact on respiratory and cardiovascular health from changes in local air quality associated with exhaust fumes (NO_2 and PM_{10} from machinery) and dust generated from general construction activities.
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because: • The duration of the construction phase is temporary (approximately 4 months). • The number of transient receptors passing through the study area would be very low and limited to the extremely low number of road users on the Local Road L6074, L60741, L2018 & L2019, any walkers present on the Saint Declan's Way or on the Authorised Knocknamona Windfarm forestry roads, and any farm/forestry workers present on lands within 350m of construction works. • The number of machines which will be used on site will be negligible and the increase in traffic associated with the KWF Grid Connection will be negligible, from which it can be deduced that the potential for increase in machinery/traffic related pollutants which could impact health is also negligible.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact will have **Neutral** significance because: • There is no potential for cumulative effects to transient people along KWF Grid Connection haulage/transportation routes, due to the use of separate roads to the Knocknamona Windfarm save for Local roads L2018 & L2019 near Cappagh Quarry. • The cumulative worst-case change in concentration or exposure due to combined emissions from construction machinery, would not be of a magnitude sufficient to quantify any change in the health of workers or walkers on forestry roads within the Authorised Knocknamona Windfarm, due to the implementation of diversion routes around windfarm works, and the limited duration of KWF Grid Connection works within the Knocknamona Windfarm site. • The Larger Turbines will not result in any changes to construction activities, contracts or duration. • The Junction & Bend Widening Works are minor in scale, of very brief duration and separate to the grid connection and windfarm sites.

	• The cumulative impact will be imperceptible, with negligible impacts on the health of any transient people who may be present briefly in close proximity to Authorised Knocknamona Windfarm and KWF Grid Connection works.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	**No Additional Cumulative Impact** because: There is no potential for additional cumulative impacts as Woodhouse Windfarm and Woodhouse Substation are both already constructed and will not contribute to machinery/traffic related emissions.

A6.1 Table 21. Transient People - Risk of Road Accidents

Impact Source	**Construction traffic and road works along haul routes**
Impact Pathway (between Source and Sensitive Aspect)	Roads
Brief Impact Description	Potential increased risk of accident and injury associated with changes to local traffic nature and flow rate.
Project Stage:	Construction
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because: • The low risk of accidents due to the temporary duration of the construction phase (approximately 4 months) and the very low volume of additional traffic associated with the KWF Grid Connection construction works. • The number of transient receptors passing through the study area would be negligible based on the very lightly trafficked nature of the local roads, albeit some walkers may be present on the crossing of the L6074 by the waymarked St Declan's Way walking route. The L6074 will also be used for project-related traffic. • It is considered that road accidents are unlikely to occur. • No works required along the delivery route for abnormal loads to Woodhouse Windfarm entrance on the L60741 and Woodhouse Substation entrance on the L6074 either on the public road network or within Woodhouse Windfarm.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	**No Potential For Cumulative Impact** because: • The use of separate haulage/travel routes - construction related traffic for the Authorised Knocknamona Windfarm will occur on different roads to the traffic associated with KWF Grid Connection save for a small section of local roads L2018 & L2019 at Cappagh Quarry. • As per planning condition, a bespoke Transport Management Plan for Authorised Knocknamona Windfarm, will be followed by all construction staff and will minimise the risk of road traffic accidents. • St Declan's Way is not located within the Authorised Knocknamona Windfarm site. • The Larger Turbines will not result in any changes to construction activities, contracts or duration. • The Junction & Bend Widening Works are minor in scale, of very brief duration and separate to the grid connection and windfarm sites. • The cumulative impact is in the order of Authorised Knocknamona Windfarm, which with the implementation of the Transport Management Plan, has already been assessed as not significant by An Bord Pleanála in 2016 and in 2022.

C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative impact will have **Neutral** significance because: The Woodhouse Windfarm and Woodhouse Substation are already constructed, with negligible levels of operation-related traffic.

A6.1 Table 22. Transient People - Impact on health due to changes in ambient noise and vibration

Impact Source	Noise generated by operation of additional apparatus at the Woodhouse Substation associated with the KWF Grid Connection, cumulative sources include the existing apparatus at Woodhouse Substation and operational turbines.
Impact Pathway (between Source and Sensitive Aspect)	Air
Brief Impact Description	Potential impact on cardiovascular and mental health (including annoyance) due to noise emissions.
Project Stage:	Operational stage
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because: • The number of transient receptors passing through the study area (road users, farm workers) would be negligible. • No increase in ambient noise on the St Declan's Way walk due to separation distance. • The worst case change in noise exposure would not be of a magnitude sufficient to quantify any change in health of transient receptors who would only be exposed temporarily.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact will have **Neutral** significance because: • Noise from the additional plant in Woodhouse Substation will not contribute to material increases in ambient noise levels within the zone of influence of the Authorised Knocknamona Windfarm. As such, any noise generated by the KWF Grid Connection would have no noticeable influence on cumulative effects. • The number of transient receptors passing through the cumulative study area would be negligible. • The Larger Turbines vibration emissions when operational will remain at levels which are barely measurable, with no risk to public health; • The Larger Turbines would not increase the noise levels of the windfarm beyond that already authorised and will utilise more advanced technology to control the operation of the turbine to ensure that noise emissions stay below the levels authorised; On the basis that the larger turbines would adhere to the same noise constraints already evaluated in 2016, the change is negligible, with no material risk to public health. • The Junction & Bend Widening Works for component transportation will be limited to 3 No. areas, of very short duration and of limited extent • The worst-case change in noise exposure would not be of a magnitude sufficient to quantify any change in health of transient receptors who would only be exposed temporarily. • Levels of operational noise have already been assessed as not being significant by An Bord Pleanála in 2016 and in 2022. When the additional

	effects of KWF Grid Connection are taken into account, the cumulative impact remains not significant.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative impact will have **Neutral** significance because: • While farm workers may be in close proximity to the Woodhouse Substation, the number of transient receptors passing through the cumulative study area would be negligible. • The additional plant and apparatus at Woodhouse Substation for KWF Grid Connection will contribute to ambient noise levels in the immediate vicinity of the substation, however the worst-case cumulative change in noise exposure in the Woodhouse would not be of a magnitude sufficient to quantify any change in health of transient receptors who would only be exposed temporarily.

A6.1 Table 23. Transient People - Impact on Health due to Exposure to EMF

Impact Source	**Electrical equipment**
Impact Pathway (between Source and Sensitive Aspect)	Air
Brief Impact Description	Potential health impacts from exposure to EMF associated with transmission of electricity associated with the KWF Grid Connection (e.g. the grid connection itself and associated equipment such as the substation). Cumulative impacts relate to the additional EMF emissions from turbines, substations and underground cabling.
Project Stage:	Operation stage
A: Direct/Indirect Impacts of KWF Grid Connection	The impact will have **Neutral** significance because: • The number of transient receptors passing through the study area would be low, and limited to farm and forestry workers, people walking within the Knocknamona forestry and road users on the L6074 local road in the vicinity of Woodhouse Substation and the location on the road where cables will cross under the road. • Any walkers on the Saint Declan's Way will not be affected due to separation distance. • In any case, even directly above the underground cables or directly beside the Woodhouse Substation fence, the magnitude of the magnetic or electric fields will not exceed the ICNIRP guideline value of 100 µT and 5000V, respectively.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	The cumulative impact will have **Neutral** significance because: • The number of transient receptors passing through the cumulative study area and who could be affected by both KWF Grid Connection and Authorised Knocknamona Windfarm would be negligible and limited to forestry workers and people walking within the Knocknamona forestry in the vicinity of the Knocknamona Windfarm substation. • Any walkers on the Saint Declan's Way will not be affected due to separation distance. • As per Chapter 10: Air, the Imperceptible to Slight level of worst case cumulative EMF (measured at the consented Knocknamona Windfarm substation fence). The worst case levels of EMF will be substantially below ICNIRP threshold levels, and at this level, no impacts to health are expected to occur. • In any case, even directly above the underground cables or right beside turbine bases or directly beside the Knocknamona Substation fence, the magnitude of the magnetic or electric fields will be Imperceptible to Slight and will not exceed the ICNIRP guideline value of 100 µT and 5000V, respectively (See Chapter 10: Air). • Due to the low number of transient receptors within 100m of KWF Grid Connection and/or Authorised Knocknamona Windfarm, with the worst case

	levels of EMF substantially below the threshold levels recommended by the ICNIRP, it is considered that the cumulative impact will be neutral. • Although the Larger Turbines will result in a change to the electrical output of the Knocknamona Windfarm turbines, there will be no notable difference in EMF levels emitted from the electrical equipment in the turbine, including the turbine transformer; EMF at the base of the turbines (whichever size) will be substantially below the INCIRP guideline limits; The turbines will remain in the same locations and there will be no additional turbines as a result of the amendment; The Larger Turbines will not require any changes to the rated capacity of the windfarm substation, Internal Windfarm Cabling or to the KWF Grid Connection.
C: Cumulative Impact with Woodhouse Substation and Woodhouse Windfarm	The cumulative impact will have **Neutral** significance because: • The number of transient receptors passing through the cumulative study area would be low, and limited to farm and forestry workers, people walking within the Knocknamona forestry and road users on the L6074 local road in the vicinity of Woodhouse Substation and the location on the road where cables will cross under the road. • In any case, even directly above the underground cables or right beside turbine bases or directly beside the Woodhouse Substation or Knocknamona Substation fences, the magnitude of the magnetic or electric fields will not exceed the ICNIRP guideline value of 100 µT and 5000V, respectively.

A6.1 Table 24. Transient People - Risk of Road Accidents

Impact Source	**Operational and maintenance related traffic**
Impact Pathway (between Source and Sensitive Aspect)	Roads
Brief Impact Description	Potential increased risk of accident and injury associated with changes to local traffic nature and flow rate.
Project Stage:	Operation stage
A: Direct/Indirect Impacts of KWF Grid Connection	**No Likely Impact** because of: • The negligible level of operational stage traffic, with maintenance taking place intermittently throughout the operation of the KWF Grid Connection (c.4 days per year), and traffic associated with maintenance generally comprising vans and four-wheel drive vehicles. • The very low number of road users on the local roads.
B: Cumulative Impact of the Whole Project - KWF Grid Connection with the authorised Knocknamona Windfarm i.e. the windfarm; amendments to the windfarm to provide for larger turbines and Junction & Bend Widening Works to facilitate turbine component access through the windfarm site entrance at Knocknaglogh Lower	**No Likely Cumulative Impact** because: • The negligible level of operational stage traffic, with maintenance taking place intermittently throughout the operation of the KWF Grid Connection and Authorised Knocknamona Windfarm (c.2 – 3 days per week throughout the operation of Authorised Knocknamona Windfarm, and over 4 days in a year for KWF Grid Connection), and • The traffic associated with the operational stage will generally comprise of vans or four-wheel drive vehicles and will be of a volume substantially less than that of a local residence. • The very low number of road users on the local roads. • No works required along the delivery route for abnormal loads to Woodhouse Windfarm Entrance on the L6074 or Woodhouse Substation entrance on the L6074, either on the public road network or within the Woodhouse Windfarm; • Saint Declan's Way walk is not routed through Knocknamona Windfarm. • The Larger Turbines will not require additional maintenance or maintenance traffic. • The Junction & Bend Widening Works will be reinstated following the construction stage. • Due to no likely effects from either KWF Grid Connection or Authorised Knocknamona Windfarm, cumulatively they are not likely to cause an increase in the risk of road traffic accidents.
C: Cumulative Impact with Woodhouse Substation and	**No Likely Cumulative Impact** because: • The negligible level of operational stage traffic, with maintenance taking place intermittently throughout the operation of Woodhouse Windfarm and Authorised Knocknamona Windfarm (c.2 – 3 days per week for each

Woodhouse Windfarm	windfarm, and intermittently throughout the operation of Woodhouse Substation and KWF Grid Connection), and • The traffic associated with the operational stage will generally comprise of vans or four-wheel drive vehicles and will be of a volume substantially less than that of a local residence. • The very low number of road users on the local roads. • St Declan's Way walk is not routed through either windfarm or past Woodhouse Substation • Woodhouse Windfarm and Woodhouse Substation will be accessed from separate local roads to Knocknamona Windfarm.

Appendix 6.2: Risk Perception and Wind Farms

The data and descriptions in this appendix have informed Chapter 6: Population and Human Health.

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Appendix 6.2

Risk Perception and Wind Farms

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A6.2.1 Introduction

Adverse risk perceptions often go hand-in-hand with major infrastructure projects, occurring where specific hazards are seen as risks, even when unsupported or contrary to the available scientific evidence. There is an important difference between hazard and risk; a hazard is something with the potential for harm, while a risk is the likelihood that any hazard will actually cause harm. It is only when there is a hazard source, a sensitive receptor and a pathway of exposure that there is a credible risk to human health.

In relation to the whole Knocknamona Wind Farm project specifically, the Inspector's Report highlighted third-party concerns which have been raised regarding potential health impacts on individuals with autism spectrum disorder (ASD). Wind turbine syndrome has also been raised as a concern, along with the application of the World Health Organisation (WHO) noise evidence base on wind farms. The remainder of this note discusses these three concerns in detail.

A6.2.2 WHO noise health evidence base on wind farms

The link between noise and health has been extensively explored by the WHO since 1980. In October 2018, the WHO released new noise guidelines for Europe which included wind turbine source-specific noise recommendations for the protection of health (World Health Organisation, 2018). The guidelines are based on a number of systematic reviews associated with several critical health outcomes including: cardiovascular disease; metabolic effects; annoyance; sleep disturbance; and quality of life, wellbeing and mental health. No studies relating to the effects of wind turbine noise on cognitive impairment, hearing impairment/tinnitus, and adverse birth outcomes were found; therefore, no evidence is available on a potential relationship between wind turbine noise and the stated health outcomes.

Three cross-sectional studies investigated the relationship between cardiovascular disease (specifically hypertension) and exposure to wind turbine noise, and found a positive association; however, the associations were not found to be statistically significant. Furthermore, the WHO concluded that these studies were flawed, with a very serious risk of bias and imprecision of results.

Similarly, three cross-sectional studies investigated the relationship between the prevalence of diabetes (a metabolic outcome) and exposure to wind turbine noise. Only one study found a positive association, and the WHO concluded that there was a very serious risk of bias and imprecision of results.

Five low-quality systematic reviews of wind turbine noise effects on mental health and wellbeing have been carried out. However, these reviews are considered low quality because they differed in their conclusions and delivered inconsistent evidence that wind turbine noise exposure is associated with poorer quality of life, wellbeing and mental health.

Although low-frequency noise is identified in the WHO guidelines as being associated with other noise sources, it is not discussed in relation to wind turbine noise specifically. Furthermore, it was identified that more research on the topic is needed as little scientific evidence is currently available.

Overall, the WHO recommend that noise produced by wind turbines should be no greater than 45 dB L_{den} (day-evening-night level), as wind turbine noise above this level is associated with adverse health effects. The WHO indicate that the recommendation is conditional on the basis that the current health evidence base is of low quality due to the reliance on cross-sectional studies (whereby you cannot infer causation) and the potential for bias and imprecision of results. No recommendation is made for average night noise exposure (L_{night}) of wind turbines on the basis that the quality of evidence of night-time exposure to wind turbine noise is too low to allow a recommendation.

A6.2.3 Wind turbine syndrome

The term "wind turbine syndrome" (WTS) describes health effects which appeared to arise from proximity to wind turbines. A total of 247 different symptoms have been associated with wind turbines including nausea, back pain, conjunctivitis, headaches, fungal skin infection and heartburn, to name a few (Chapman, 2016). However, scientific literature has failed to find any credible causal mechanism behind such symptoms, and has consistently found no reason for wind turbines to be damaging to health (Jeffery, et al., 2013; Knopper & Ollson, 2011). Instead, the wide-ranging and generic health issues reported are likely symptoms of hypervigilance or anxiety (Moss-Morris & Petrie, 1999) which are associated with the adverse risk perceptions surrounding the wind turbines, rather than the wind turbines themselves (i.e. a nocebo effect).

For example, a study of Australian wind farms found that 79% of noise and health complaints relating to wind farms occurred after 2009, when anti-wind farm groups began to add health concerns to their wider opposition. In the preceding years, health or noise complaints were rare despite large and small turbined wind farms having operated for many years. The reported spatiotemporal variations in complaints are consistent with psychogenic hypotheses that health problems and complaints associated with wind turbines are "communicated diseases" with contextual and personal factors rather than any actual change in noise exposure (Chapman, et al., 2006; Kamp & Berg, 2021).

Annoyance is often an issue that arises when assessing impacts from wind turbine noise. Based on the Public Health Wales review of wind turbine-generated noise and health effects (Public Health Wales, 2013), the main findings were that:

- Whilst the potential for annoyance was identified, a direct relationship between turbine noise and health was not established.
- The audible impact of turbines is greatly influenced by background noise. Well-designed turbines are relatively quiet when compared to most road traffic noise.
- Messages communicated about the health impact of turbines can influence public understanding and perception. Information should therefore be appropriate, proportionate and based on available evidence.
- Some people living near turbines reported sleeplessness and stress. The imposition of change, stress, and irritation can be linked with the perception of there being a noise, rather than noise itself.
- Visual dissatisfaction with turbines can modify and influence people's perception of noise.

Findings from a Health Canada cross-sectional study from 2012-14 on wind turbine noise and health identified a potential association between increasing wind turbine noise and the prevalence of annoyance with various wind turbine features (noise, shadow flicker, blinking lights, vibrations, and visual impacts) (Health Canada, 2015; Michaud, et al., 2016). However, there was no evidence to support an association between increasing wind turbine noise and other self-reported or measured health outcomes (Michaud, et al., 2018).

Another study reported that negative symptoms and annoyance were higher in individuals who could see the turbines from their homes, whereas those who benefitted economically from the turbines had a decreased risk of annoyance (Pedersen, et al., 2009), and there are suggestions that social or community gain can reduce negative health effects from the turbines, and be replaced with a positive association, beneficial to health.

While claims of illness are not being dismissed, no measurable impact and no causal mechanism has been proven, and even the principle of direct causation would suggest that this syndrome would affect some people at all wind farm locations, but this is not the case (Chapman & Crichton, 2017).

A6.2.4 Autism and wind farms

There are concerns associated with the potential for wind turbine noise, movement of blades and shadow flicker to create sensory distress in individuals with ASD diagnosis.

Reference in third party objections is made to a previous planning application in 2010 (WF/2008/0900) which was refused because of the unacceptable impact it would have on twin autistic children. The children in question had a particular obsession with spinning and turning objects, and the concern was that if they could see the turbines from their home, watching them persistently would exacerbate this already obsessive tendency and limit them from engaging in more meaningful activities (BBC, 2010; Centre for Sustainable Energy, 2017).

The fact that a planning application was refused in this individual case has led to an increased discussion about autism and wind power on online forums, and this particular planning refusal seems to have become conflated with the general idea that the presence of wind turbines can both cause and exacerbate the symptoms of autism. However, there is simply no evidence that the presence of wind turbines can cause autism, or that they can trigger/initiate symptoms for those who have ASD (Centre for Sustainable Energy, 2017).

This position is confirmed by the National Autism Society (a leading advice provider for autistic people and their families), which stated that wind turbines are not an issue that service users or members have raised as a concern, and that they are also not aware of any evidence suggesting a link (Centre for Sustainable Energy, 2017). Specifically:

1.1.1 "A low level but slowly increasing number of references are being found in anti-wind development literature to a link between autism and wind power. These reports seem originate from the time of the refusal of planning permission in a particular case where the impacts of a wind farm development were likely to have detrimental impacts on the behaviour of twin children with autistic spectrum disorders already living nearby, and where one of the symptoms for these particular children happened to be a specific obsession with spinning objects. The concern was that for these particular children, the turbines would represent such a distraction as to make daily life very difficult for their entire family.

1.1.2 There is no evidence whatsoever that visibility or noise from wind turbines causes autistic spectrum disorders in previously undiagnosed individuals, or that visibility or noise from wind turbines exacerbates the symptoms of autistic spectrum disorders in most people already diagnosed with the condition.

1.1.3 However, as this case shows, a very specific planning issue could arise in the rare incidence that a household with an autistic family member is near to a proposed wind farm site, and where that family member's symptoms include an obsessive interest in (or particular anxiety caused by the presence of) large structures, spinning or moving objects. Such a case would be for the local planning authority to determine, in the same way that they would determine detrimental impacts of any new infrastructure on nearby residents, especially where those residents are vulnerable to change in the wider environment due to diagnosed sensory or autistic spectrum disorders. It is important to note that such considerations are an essential part of any planning application and are not limited to consideration of wind farm planning applications; such a household could be equally negatively impacted by the construction of a new road, or pedestrian crossing that adds new lights and sounds into the local environment.

1.1.4 The fact that an individual planning application has been refused on the grounds that a local resident with autism could have been severely affected by the introduction of wind turbines into their local environment in no way suggests that the presence of wind turbines can trigger autism in otherwise unaffected individuals or routinely exacerbates the symptoms for individuals with previously diagnosed autistic spectrum disorders." – Pers. Comm., Head of Centre, National Autistic Society, 22/02/16.

A6.2.5 Conclusions

In conclusion, the WHO define a source specific recommendation for wind turbine noise during the daytime period, but note that the recommendation is conditional due to the low quality of literature which has informed it (relating to cardiovascular disease, diabetes, and quality of life, wellbeing and mental health). The guidance notes that no evidence of a potential relationship between wind turbine noise and cognitive impairment, hearing impairment/tinnitus or adverse birth outcomes exists.

The hundreds of symptoms reported in individuals living near wind turbines are referred to as “wind turbine syndrome”, and are more likely to be symptoms of hypervigilance or anxiety associated with the adverse risk perceptions surrounding the wind turbines, rather than the wind turbines themselves. This is on the basis that scientific literature has failed to find any measurable impact or credible causal mechanism behind such symptoms, and from the evidence available, it is likely that health complaints associated with wind turbines are typically associated with contextual and personal factors rather than actual noise exposure.

In relation to autism specifically as a health concern, there is simply no evidence that the presence of wind turbines can cause autism, or that they can trigger/initiate symptoms for those who have ASD. This position is confirmed by the National Autism Society (a leading advice provider for autistic people and their families), which stated that wind turbines are not an issue that service users or members have raised as a concern, and that they are also not aware of any evidence suggesting a link.

A6.2.6 References

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