

# MWP

## Environmental Impact Assessment Report (EIAR)

### Chapter 04 Population and Human Health

**Dernacart Wind Farm  
110kV Substation and Grid Connection**

**Statkraft Ireland**

**October 2024**

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## **4. Population and Human Health**

### **4.1 Introduction**

This chapter considers the potential effects on population and human health arising from the Proposed Development. A full description of the Proposed Development and all associated elements is provided in **Chapter 2** of this EIAR. The nature and probability of effects on population and human health arising from the overall project has been assessed. The assessment comprises:

- A review of the existing receiving environment.
- Prediction and characterisation of likely impacts;
- Evaluation of effects significance; and
- Consideration of mitigation measures, where appropriate.

#### **4.1.1 Competency of Assessor**

The assessment was completed by Zeba Haseeb, BS Hons (Environmental Science), MS Environmental Science, and Caitríona Fox (B.A Geography and Mathematics), M.Sc (Sustainable Development).

Zeba is an Environmental Scientist at Malachy Walsh and Partners (MWP worked on a variety of projects conducting environmental assessments and supporting the delivery of a number of environmental deliverables including Environmental Impact Assessment (EIA) Screening Reports, Appropriate Assessment Screening Reports, feasibility studies, Construction Environmental Management Plans (CEMP), and Environmental Impact Assessment Reports (EIAR). She has contributed to EIA's of wind farms, dam, mines, tourism, and residential developments in a number of countries.

Caitríona is an Environmental Consultant with over 20 years environmental consultancy experience. She is an Environmental Impact Assessment practitioner and has taken on the role of EIA Project Manager for a variety of large-scale EIA projects including wind farms, commercial, industrial and tourism developments. She has extensive experience in the management and compilation of environmental reports and has authored numerous specialist reports including air and climate impact assessments, population and human health impact assessments, landscape and visual impact assessments, and material assets assessments for project EIAs.

#### **4.1.2 Legislation**

This chapter has been prepared in accordance with the Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU.

## 4.2 Methodology

The methodology used for this study included desk-based research of published information and site visits to assemble information on the local receiving environment.

### 4.2.1 Desk Study

The desk study included the following activities:

- Review of the most recent CSO Census of Ireland data (2022) to establish settlement demographics and economic context of the study area.
- Review of Ordnance Survey Mapping and aerial photography (Geohive<sup>1</sup>) to establish existing land use and settlement patterns within the study area.
- Review of local and regional development plans including Laois County Development Plan (CDP) 2021-2027, Offaly County Development Plan (CDP) 2021-2027, and planning policy in order to identify future development and identify any planning allocations within the study area.
- Review of Laois County Council's, Offaly County Council's and ABP's Planning Register to identify relevant development proposals currently under consideration by the Council and board.
- Review of planning policy and strategies included within the Laois CDP (2021-2027) and Offaly CDP (2021-2027) to identify, way-marked walking and cycling routes and other Rights of Ways within the study area.
- Review of tourism data (tourism policies and local attractions) from Laois CDP (2021-2027), Offaly CDP (2021-2027) and websites including Tourism Ireland, Fáilte Ireland and local websites to identify tourism data and visitor attractions within the study area.

### 4.2.2 Field Surveys

Site visits to supplement the desk studies and establish an understanding of land use patterns, tourism and recreational resources within the vicinity of the Proposed Development were undertaken.

### 4.2.3 Guidelines and Best Practice

The desk-based research also had regard to published information on public health and wind turbines including:

- World Health Organisation (WHO) Regional Office for Europe, *Night Noise Guidelines for Europe*, (2009);
- WHO *Environmental Noise Guidelines for the European Region* (2018).
- Guidelines for Planning Authorities and An Bord Pleanála in carrying out Environmental Effect Assessment (Department of Housing, Planning and Local Government, August 2018)
- Guidelines on the Information to be Contained in Environmental Effect assessment Reports (Environmental Protection Agency (EPA), May 2022);
- The European Commission 'Guidance on the preparation of the Environmental Effect Assessment Report, 2017;
- Guidelines on the Treatment of Tourism in an Environmental Effect Assessment, Fáilte Ireland. 2011;

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<sup>1</sup> <https://webapps.geohive.ie/mapviewer/index.html>

#### 4.2.4 Study Area

The study area for the purpose of this assessment on Population and Human Health primarily focuses on the local receiving human environment in the vicinity of the proposed development site. These include those who reside, work, visit, or use the local road networks in the general area.

Electoral Divisions (EDs) are the smallest legally defined administrative areas in the State for which Small Area Population Statistics (SAPS) are published from the Census of Population. Therefore, in order to discuss the receiving human environment and other statistics in the vicinity of the proposed development site, the Study Area for this assessment has regard to EDs within or located close to the proposed development site. The extent of the EDs considered for the purposes of this assessment are shown in **Figure 4.4**.

Although this chapter predominantly describes the human environment in the vicinity of the proposed development, sensitive human receptors in the broader human environment are considered in the other specialised environmental topics including the following;

- Air Quality and Climate (Chapter 8);
- Noise (Chapter 9);
- Cultural Heritage (Chapter 10)
- Landscape and Visual (Chapter 11) and;
- Material Assets - Traffic and Transportation (Chapter 12).
- Material Assets – Built Environment (Chapter 13)

#### 4.2.5 Scope of Assessment

**Table 4.1** outlines the issues which the EPA 2022 EIAR guidance documents suggest may be examined as part of the human environment study.

**Table 4.1 Issues relevant to the Human Environment**

Topic Area	Potential Issues
Employment	Will the development affect employment opportunities?
Settlement patterns	Will the development change settlement patterns and types of activity?
Land use patterns	Will the development change land use patterns and types of activity?
Baseline population	Will the development affect the current population?
Demographic trends	Will the development change concentrations of a particular ethnic group or influence the movement of human populations?
Human health	Vectors through which human health impacts could be caused e.g. will there be risk of death, disease, discomfort or nuisance?
Amenity	Will the development change the uses of the site, loss of rights of way or amenities?

Accordingly, the scope of this assessment is made with respect to these topic areas and considers the effects of the construction, operation and decommissioning of the proposed development in terms of how the proposal could affect employment, settlement patterns, land use patterns, baseline population, demographic trends, human health and amenities.

#### 4.2.5.1 Tourism and Amenities

Tourism and amenity impacts are interrelated with effects on landscape and visual amenity, archaeology and cultural heritage and transport. Each of these effects are addressed in other chapters of this EIAR and reference should therefore be made to **Chapter 10** Cultural Heritage, **Chapter 11** Landscape and Visual, and **Chapter 12** Material Assets-Traffic and Transportation.

While reference is made to these effects where relevant, this chapter does not re-evaluate these assessments. The focus of this assessment is primarily on physical disruption, severance or exclusion of users' ability to continue existing activities or deter additional further development of amenities and tourism potential.

#### 4.2.5.2 Human Health

The European Commission document 'Guidance on the preparation of the Environmental Impact Assessment Report, 2022; provides that: *"Human health is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population"*.

Similarly, the EPA Guidelines on the information to be contained in environmental impact assessment reports (2022), states that *'in an EIAR, the assessment of impacts on population & human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under the environmental factors of air, water, soil etc'*.

The EPA (2022) guidance also advises that *'The evaluation of effects on these pathways is carried out by reference to accepted standards of safety in dose, exposure and risk. These standards are in turn based upon medical and scientific investigation of direct effects on health of the individual substances, effect or risk. This practice of reliance upon limits doses and thresholds for environmental pathways such as air water or soil provides a robust and reliable health protection criteria for analysis relating to the environment'*.

Human health, in this chapter of the EIAR, is therefore considered in relation to health effects/issues and environmental hazards arising from the other environmental factors and the assessment is made with regard to the established international health-based guidelines limit value necessary to protect the public.

The potential wellbeing and nuisance effects of the proposed project on the local human environment have been identified as follows:

- Dust emissions from construction activities
- Noise emissions during construction activities and operation
- Traffic nuisance during construction

Each of these issues have been fully assessed and are documented in other chapters of the EIAR as set out in **Table 4.2**. These assessments were reviewed to inform this study.

**Table 4.2 Nuisances and Health and Safety issues and relevant assessment**

Development Phase	Potential Nuisance / Health & Safety Issue	Addressed in EIAR Chapter
Construction Phase	Noise emissions and vibration	Chapter 09 Noise
	Dust emissions	Chapter 08 Air and Climate
	Traffic nuisance	Chapter 12 Material Assets
Operational Phase	Noise emissions and vibration	Chapter 09 Noise
	Air quality effects	Chapter 08 Air and Climate
	Traffic and Transportation	Chapter 12 Material Assets

### 4.2.5.3 Assessment Criteria

Determination of the significance of an effect will be made in accordance with the terminology outlined in the EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (2022). These are outlined in detail in **Chapter 1** of the EIAR.

### 4.2.6 Statement on Limitations and Difficulties Encountered

In preparation of this Chapter, the following difficulties were encountered:

- Limited preliminary population data from the 2022 census was available at the time of writing.

Notwithstanding the above, we consider that the data collected, and analyses outlined reflects an accurate representation of the population and human health considerations with respect of the proposed development.

## 4.3 Baseline Environment

### 4.3.1 Site Location and Description

The proposed development is located within south east Co. Offaly and north east Co. Laois. **Figure 4.1** shows the proposed development site boundary included in the planning application.

#### 4.3.1.1 Substation

The proposed 110kV substation development site is situated in County Offaly within the townland of Barranghs. The proposed substation is present in a rural and sparsely populated area approximately 3km northeast of Mountmellick, Co. Laois, and 1.3km southwest of Garryinch village. The site is currently characterised by agricultural lands and scrublands. Existing boundaries include hedgerows on the eastern, western, and southern sides, with hedgerows and conifer forestry defining the northern perimeter while the R423 runs immediately to the south of the site. Immediately beyond the site to the west is a private access road and agricultural lands. The permitted Dernacart windfarm is located approximately 2.3km to the northwest of the proposed substation site.

#### 4.3.1.2 Collector Cable and Access Track

The proposed 2.45km access track and 33kV underground electrical cabling, connecting the permitted Dernacart windfarm to the substation, will traverse the townland of Barranaghs, Co. Offaly. The route encompasses a commercial forestry plantation, scrub and peatland, with a small section at the end transitioning through an existing local road bordered by forestry and peatland.

#### 4.3.1.3 110kV Grid Cable Route

The proposed underground 110kV underground grid line connection will connect the proposed Dernacart 110kV substation at Barranaghs, Co. Offaly to the permitted 110kV substation at Barcklone, Portarlinton, Co. Laois. The grid connection spans approximately 10.85km. The route passes through the townlands of Barranaghs, Garryhinch, Annamore in County Offaly and Coolnavarnoga, Coolaghy, Kilbride, Ballymorris, Coolederry and Bracklone in Co. Laois.

The underground cabling (UGC) is to be installed entirely within the carriageway of the public road network.

Figure 4.1 Site Location

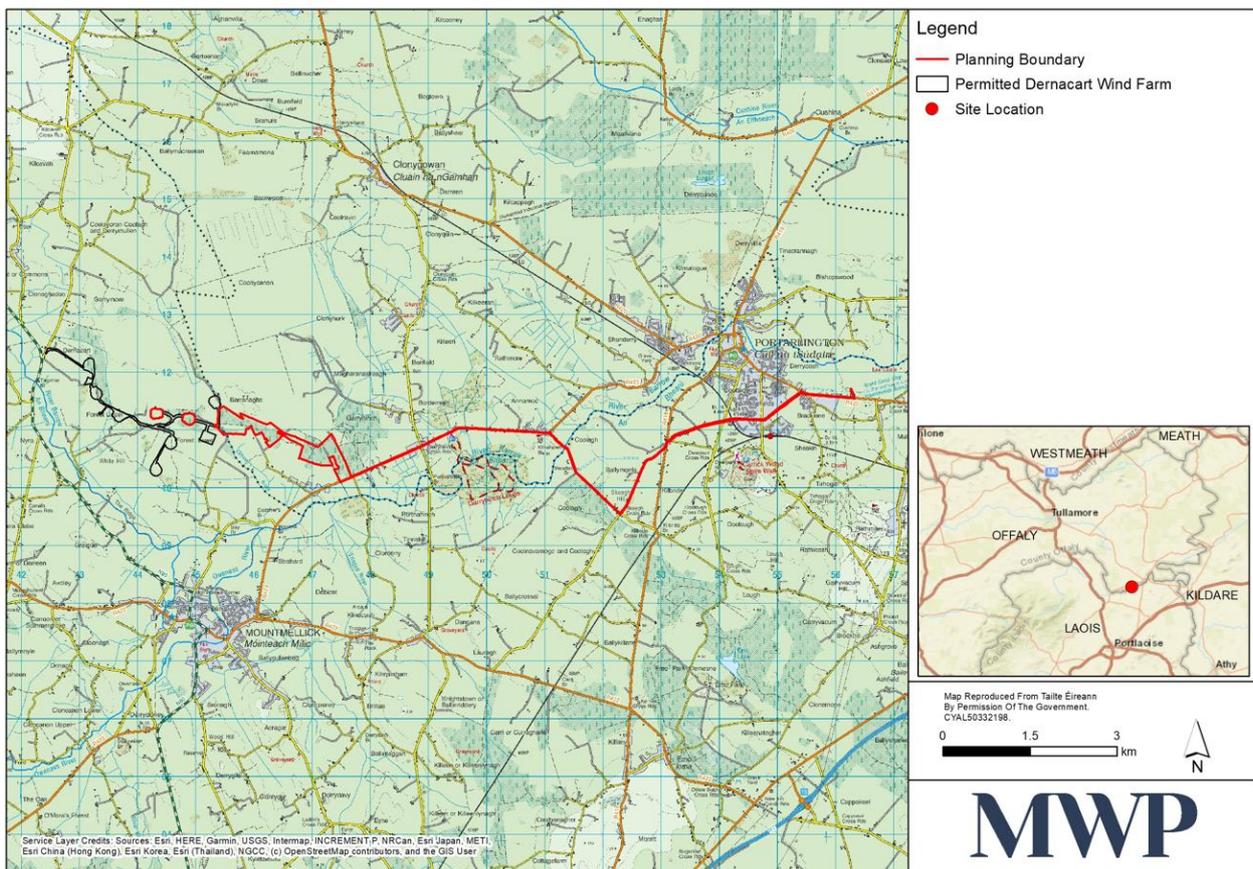
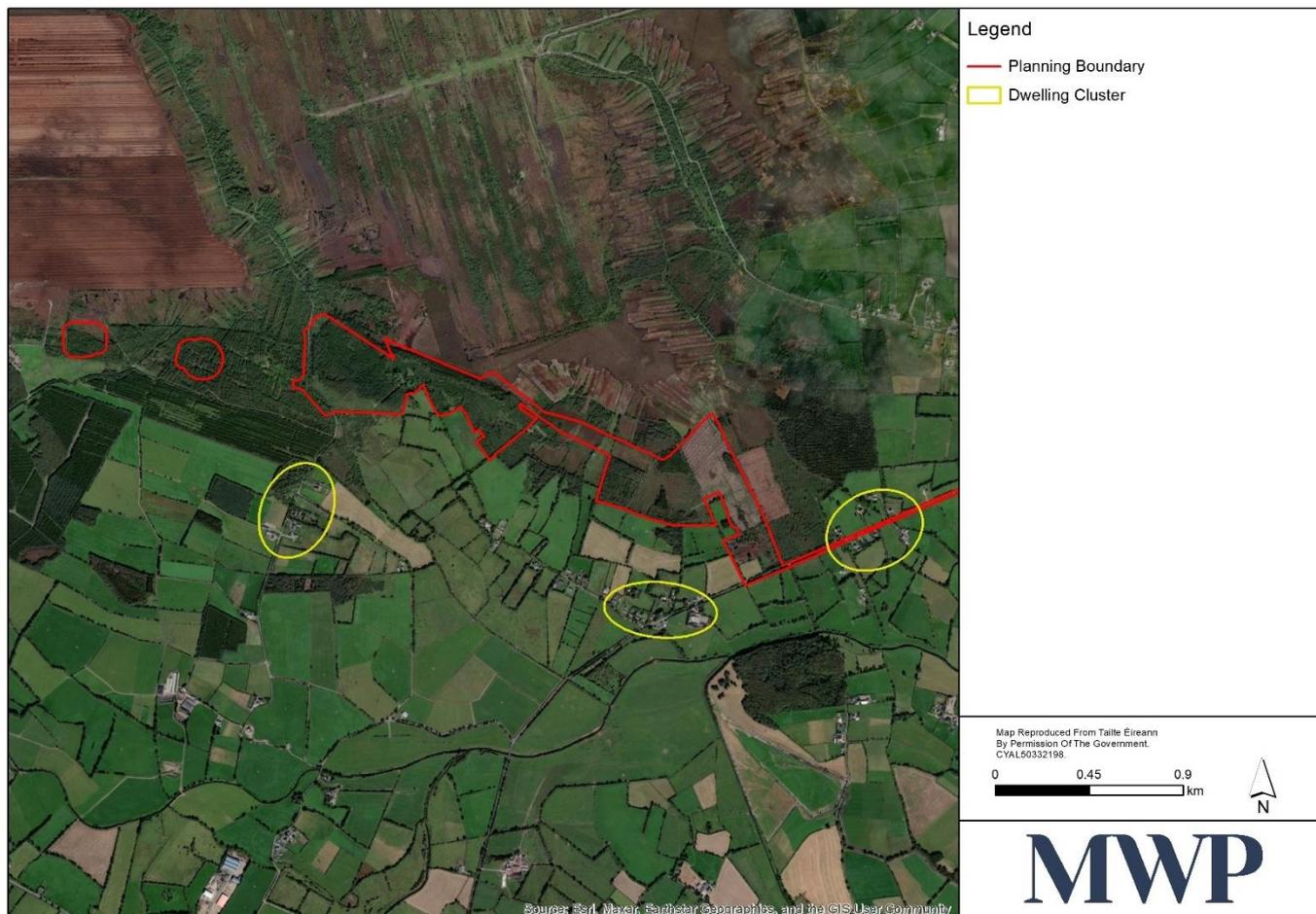




Figure 4.3 Nearest Residential Dwellings to the proposed Substation & wind farm collector cable access road



#### 4.3.2.2 110kV Grid Cable

Settlement patterns along the proposed UGC route exhibits sections of ribbon development and one-off dispersed detached housing. As the route approaches Portarlinton, it transitions through higher density residential and commercial developments.

#### 4.3.3 Population Density and Trends

The proposed substation and wind farm collector cable are situated within the Electoral Division (ED) of Hammerlane in Co. Offaly. The route of the underground 110kV grid cable commences in Hammerlane ED and continues eastwards passing through the EDs of Emo, Ballybrittas and Portarlinton South in County Laois.

A review of the 2016 and 2022 population statistics for each ED shows that while the recorded population densities vary across each ED, the overall study area is generally moderately populated. The lowest population density was observed in the Hammerlane ED which involves all three main elements of the development.

The available data on population trends indicates that all EDs experienced a rise in population in the period 2016-2022. **Table 4.3** and **Table 4.4** summarises population statistics for each ED within the study area.

**Table 4.3 Electoral Division and Population Trends**

Electoral Division	Total Population 2016	Total Population 2022	% change in population 2016-2022
Hammerlane	555	590	6.3%
Ballybrittas	1283	1520	18.5%
Emo	1252	1338	6.9%
Portarlington South	7138	7859	10.1%
<b>Total</b>	<b>10,228</b>	<b>11,307</b>	<b>10.5%</b>

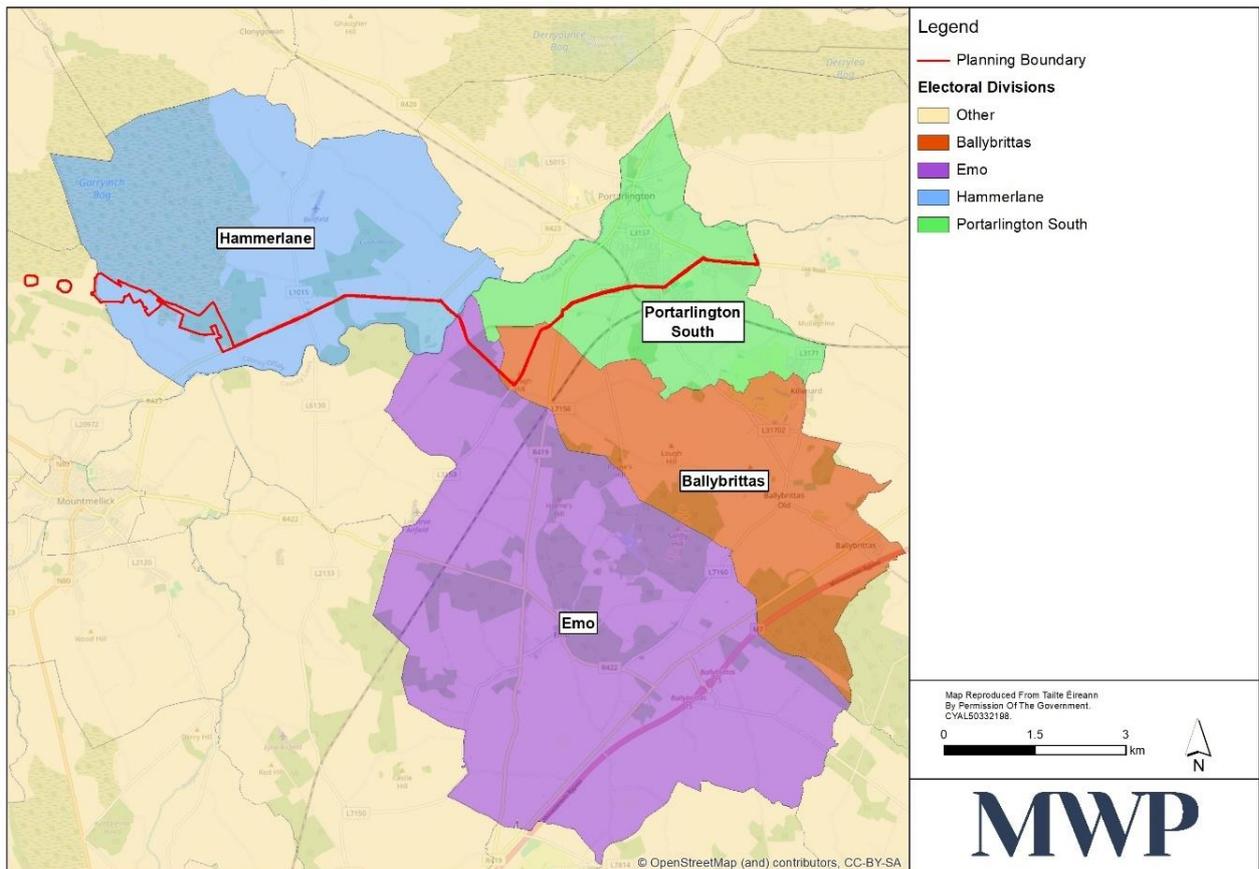
(Source: CSO Census of Population 2016 and 2022)

**Table 4.4 Population Density 2016 - 2022**

Electoral Divisions	Population Density 2016 (persons per sq km)	Population Density 2022 (persons per sq km)
Hammerlane	23.8	25
Emo	33.8	36
Ballybrittas	82.3	97
Portarlington South	625.7	681

(Source: CSO Census of Population 2016 and 2022)

**Figure 4.4 Electoral Divisions in the Development Area**



### 4.3.4 Public Health

The 2022 Census also provides information on the general health profile of the population for each electoral division. See **Table 4.5**.

Based on the health statistics provided overall the general health of the local population in the proposed development area is recorded as either 'very good' or 'good'.

**Table 4.5 General Public Health 2022**

Electoral Division	Very good	Good	Fair	Bad	Very bad	Not stated
Hammerlane	337	186	45	9	1	12
Emo	791	360	107	15	5	60
Ballybrittas	916	437	92	11	0	64
Portarlinton South	3,989	2,459	749	121	27	514
<b>Total</b>	<b>6,033</b>	<b>3,442</b>	<b>993</b>	<b>156</b>	<b>33</b>	<b>650</b>

(Source: CSO Census of Population 2022)

### 4.3.5 Economic Activity/Employment

According to the 2022 census of population employment statistics for the region, the work force within the study area is employed in a diverse range of industries (**Table 4.6**). The statistics show that within the study area, the highest level of employment is within the 'Commerce and Trade' industry, accounting for 25.21% of the workforce within the study area. Other notable employment sectors include 'Professional Services' (24.43%), 'Manufacturing Industries' (10.82%), and 'Building and Construction' (6.69%). Employment in the Agriculture, Forestry, and Fishing industry within the study area is relatively low, comprising just 2.26% of the total workforce population.

**Table 4.6 Electoral Division Population Employment Statistics 2022 - Persons at Work Industry**

Electoral Division	Agriculture, forestry, fishing	Building and construction	Manufacturing industries	Commerce and trade	Transport / Communication	Public admin	Professional Services	Other	Total
Hammerlane	14	28	35	63	19	15	70	27	271
Emo	40	45	58	130	31	38	136	76	554
Ballybrittas	23	30	80	186	69	55	203	72	718
Portarlinton South	33	232	353	847	290	246	779	540	3,320
<b>Total</b>	<b>110</b>	<b>335</b>	<b>526</b>	<b>1,226</b>	<b>409</b>	<b>354</b>	<b>1,188</b>	<b>715</b>	<b>4,863</b>

(Source: CSO Census of Population 2022)

A review of the 2022 commuters data suggests that the majority of the local population commute outside of the study area for work and education purposes.

**Table 4.7 Means of travel to work**

Electoral Division	On Foot	Bicycle	Bus	Train, Dart or Luas	Motorcycle or scooter	Car Driver	Car Passenger	Van	Other (including Lorry)	Work mainly at or from home
Hammerlane	6	1	0	6	2	180	9	39	6	16
Emo	14	1	21	12	2	315	17	54	12	72
Ballybrittas	18	7	14	31	2	432	22	59	6	92
Portarlington South	184	30	78	217	5	1843	186	223	13	270
<b>Total</b>	<b>222</b>	<b>39</b>	<b>113</b>	<b>266</b>	<b>11</b>	<b>2770</b>	<b>234</b>	<b>375</b>	<b>37</b>	<b>450</b>

(Source: CSO Census of Population 2022)

**Table 4.8 Population aged 5 years and over by journey time to work, school or college**

Electoral Division	Journey time		
	Under 15 mins	Under ½ hour	Greater than 1/2hour
Hammerlane	147	101	148
Emo	273	240	293
Ballybrittas	315	224	448
Portarlington South	1580	1149	2394
<b>Total</b>	<b>2315</b>	<b>1714</b>	<b>3283</b>

(Source: CSO Census of Population 2022)

#### 4.3.6 Land Uses

The site of the proposed 110kV substation mainly comprises of marginal and scrub land with a mix of wet grasslands, and hedgerow with treelines. The primary land use in the vicinity is agriculture, commercial forestry and residential.

The land use within the proposed 33KV underground collector cables and access track traverses through cutover bog, scrub, wet grassland, bare ground, and commercial forestry land.

The land use along the proposed UGC varies from rural to urban settings. The area that surrounds the UGC along its route include agricultural land, peatland and artificial surfaces.

#### 4.3.7 Tourism and Amenities

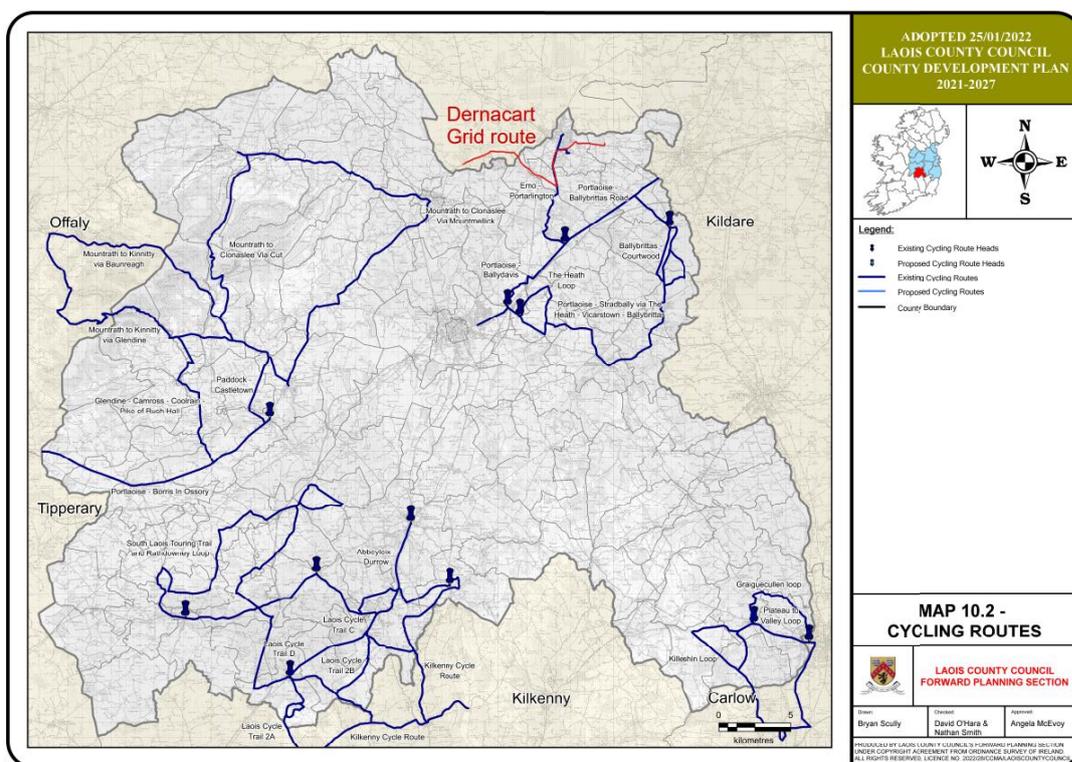
There are currently no tourism attractions on or near the proposed 110kV substation or 33kV underground collector cable and access track.

While there are no tourist attractions pertaining specifically to the site of the proposed substation and collector cable development, there are a number of recreational and cultural amenities in the wider area.

Garryhinch, Co. Offaly is a small rural village located 1.3km northeast of the substation site, along the R423 and includes tourist spot such as a Garryhinch forest recreational area. The river Barrow, a popular fishing spot, is also located close by, approximately 315m southeast of the proposed substation site.

Other tourism attractions in the wider area are Emo Court House, approximately 7.2km southeast of the grid route, which offers guided tours around the 18<sup>th</sup> century grounds. Derrycastle and Walkway is also located in the greater area, approximately 3.4km northwest of the proposed grid route near Portarlington. This is a popular recreational area used mainly for walking and angling. The beautiful lakes and walkways consist of a 3km, 5.5km and 14km walking loops.

A review of Laois County Development plan 2021-2027 provided map for cycling routes near the proposed development site. See **Figure 4.5**.



**Figure 4.5 Laois County Development plan 2021-2027 Cycling Routes**

The grid routes pass through the Emo-Portarlington cycling routes at the point where they intersect with the R419. Additionally, two more cycling routes were observed running along the R423.

The first route is the Women’s Cycle, covering a distance of 21.5km, which starts and finishes in Portarlington, Co. Laois, extending to Mountmellick. Beginning on the R420 exiting Portarlington, it follows the R423 to Mountmellick. The route then loops back towards Portarlington on the R422 before rejoining the R423, ultimately returning to its starting point in Portarlington.

The second route on the R423 is the Charity Cycle, which commences and concluding in Portarlington. This 97km loop passes through various townlands. This cycle route directly intersects with the grid route along the R423.

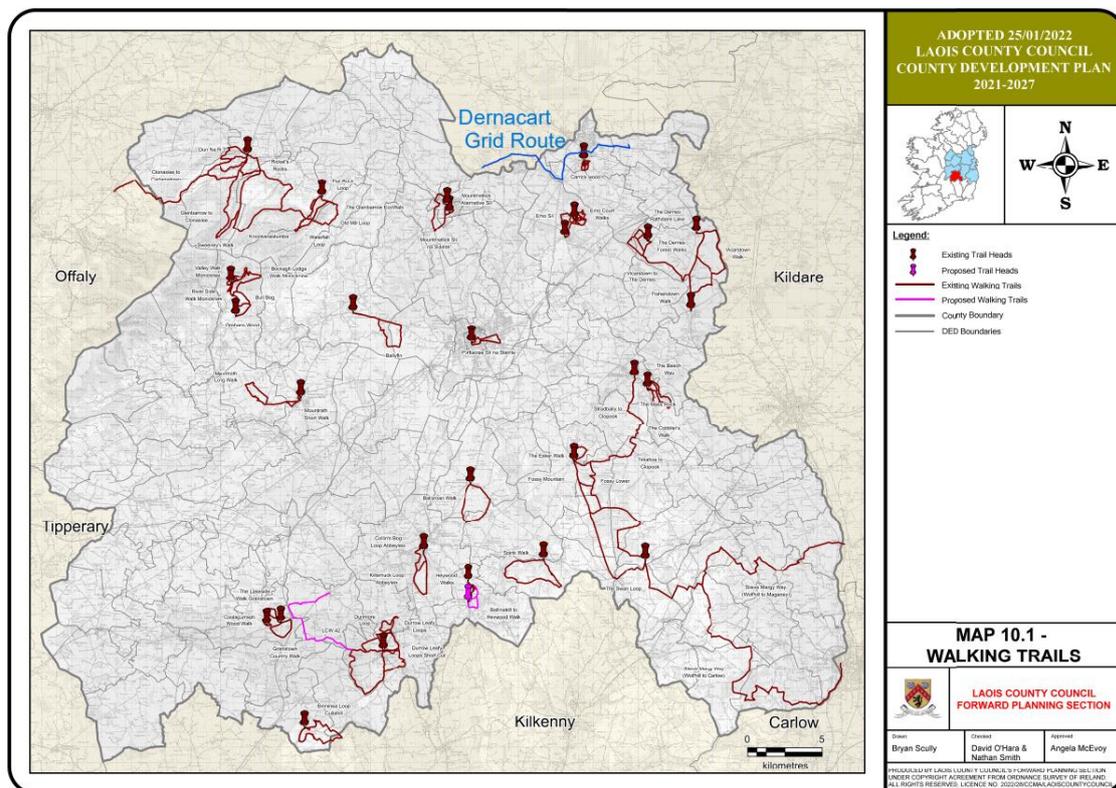


Figure 4.6 Laois County Development plan 2021-2027 Walking Trails and Dernacart Grid Route

Carrick Woods is a walking trail located approximately 540m south from the proposed grid route where it passes through Portarlinton town. The walkway explores 32 hectares of beautiful broadleaf woodland and includes a picnic area and a historic 18<sup>th</sup> century Spire. This walking facility is very popular specifically during the summer months.

Emo Court Walks is a variety of trails found in the historic Emo Estate. The walking routes within the area venture around the beautiful woodland, parkland, gardens and lake. Emo Park is located approximately 3.3km from the proposed grid route.

There are a number of amenities present within the town of Mountmellick, Co. Laois. These amenities include convenience shops, B&B, GAA Club, along with a number of bars and restaurants.

Additional amenities are available in Portarlinton, that offers services such as shops, transportation facilities including a train station, and leisure amenities.

A review of Tourism Information and Heritage Site maps<sup>2</sup> from Offaly County Council do not identify any specific tourism amenities in the vicinity of the proposed development site.

2

(<https://offalycoco.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=164c7ccc4e149f19456d15b671f9d13>)

## 4.4 Assessment of Impacts and Effects

### 4.4.1 Construction Phase

#### 4.4.1.1 Employment/Economic Activity

It is unlikely that the proposed development would directly or indirectly lead to any reduction in existing economic activity within the area throughout any phase of the proposed development. During the construction phase, aggregates, concrete and surface dressing supplies will be obtained from local quarries and suppliers, thus supporting the local economy. There is also potential economic opportunities for local companies and businesses to provide a ranges of services including plant hire. The Proposed Development is anticipated to have a **short term, positive** and **slight** effect on economic activity during this phase.

During the construction phase of the proposed development, resources and labour will mainly be sourced locally whenever possible. It is estimated that this phase will last approximately 16 months and may employ up to 30 - 40 workers which will include site contractors, on-site machinery operators, engineers, delivery personnel, HSE personnel and thereby generating a **positive, short term** effect on employment.

#### 4.4.1.2 Population and Settlement

The construction phase will have no impact on the population of the area in terms of changes to settlement pattern of the area. There will be no loss of residential dwellings due to the proposed project, and therefore there will be no displacement of the existing population. There will be no mass in-migration associated with the Proposed Development considering the nature and duration of the proposed project.

A minor number of key employees involved in the construction, may decide however to temporarily re-locate to the area in the short-term. The Proposed Development is likely to have a **short term, neutral** and **imperceptible** effect on population and human settlement during the construction phase.

#### 4.4.1.3 Land Use Patterns

During construction there may be a level of effect on existing land-uses within the proposed development site. Existing forestry activities and harvesting within the plantation would cease for the duration of the collector cable construction works.

Outside of the development footprint, the existing land-uses in proximity to the proposed collector cable and substation will remain broadly unchanged during the construction phase of the project, however, some land use in close proximity to the site will be temporarily disrupted during the construction phase. This will occur on the forestry lands, peatland and the agricultural lands where the wind farm collector cables and associated infrastructure are proposed.

Approximately 2.8ha of felling and 320m removal of hedgerow will be required within and around the substation and collector cable infrastructure to accommodate the construction of the substation and collector cable, and access tracks. This will result in a **long-term, moderate, negative impact** to forestry in the area.

Temporary effects on land use will arise as a result of the installation of the grid connection which will be constructed within the public road corridor. It will result in **brief to temporary, slight, negative** and **localised impact**.

The land-use along the proposed underground grid cable comprises transport networks. The surrounding land use is mainly agriculture land, residential and forestry related. The underground grid construction works, estimated to be 6-8 months, will require a road opening licence and temporary traffic management measures along the grid route, including alternating one-way stop/go traffic. This will result in disruption to existing traffic and access for local landowners and property owners/residents in the vicinity of the route. The active construction area for the Proposed Development will be small, ranging from 100 to 200 m in length at any one time, and it will be transient in nature as it moves along the route. The construction works will therefore have a temporary, slight and negative effect for road users, local landowners and property owners/residents in the vicinity of the route. Overall, it is considered that during the construction phase there is likely to be a temporary, negative and not significant negative effect on land use

#### 4.4.1.4 Human Health

Construction works not only pose safety risks but affect health and wellbeing.

The potential wellbeing and nuisance effects of the Proposed Development on the local human environment have been identified as follows:

- Dust emissions from construction activities
- Noise emissions during construction/operation activities
- Traffic nuisance during construction activities

Each of these issues has been fully assessed and documented in other chapters of the EIAR as set out in **Table 4.9**. These assessments were reviewed to inform this study and it is concluded, there will be no significant effects on human health as a result of the Proposed Development as discussed in the following sections.

**Table 4.9 Nuisances issues and relevant assessment**

Development Phase	Potential Nuisance / Health & Safety Issue	Addressed In EIAR Chapter
Construction Phase	Noise emissions and vibration	Chapter 9
	Dust emissions	Chapter 08
	Traffic nuisance	Chapter 12

##### 4.4.1.4.1 Noise

**Chapter 9** Noise and Vibration of this EIAR considers the effects of noise emitted for the Proposed Development against national guidelines.

There will be an increase in noise levels in the vicinity of Proposed Project site during the construction phase, as a result of heavy machinery and construction work. These impacts will have a **short-term slight to moderate, negative impact**. The noisiest construction activities associated with Proposed Project will be the excavation, access track and road and substation elements.

A small section of grid will be worked on each day (75m – 100m) which will cause **slight temporary negative** impact. Construction noise at any given noise sensitive location will be variable throughout the construction

project, depending on the activities underway and the distance from the main construction activities to the receiving receptors.

The results of the construction noise prediction indicate that noise generated during the construction phase will not exceed the acceptable construction noise limit at any dwelling location, for the duration of the construction phase. The noise assessment proposes measures to reduce the amount of noise reaching the noise sensitive areas in accordance with BS528-1:2009, Code of Practice for noise and vibration control on construction.

As outlined in **Chapter 09**, there will be a *short term, slight to moderate negative* effect at noise sensitive receptors near construction work areas.

#### **4.4.1.4.2 Air Quality**

There is the potential for temporary, negative effects in terms of dust emissions during the construction phase of the Proposed Development as outlined in **Chapter 08** Air Quality and Climate.

Vehicle and fugitive dust emissions will occur primarily during construction. Dust generated during the construction phase is not likely to significantly affect the local air quality. Given the distances to the nearest sensitive receptors, dust levels will not exceed the recommended TA Luft 350mg/m<sup>3</sup>/day guide-limit. There is, however, the possibility of nuisance dust occurring in the vicinity of the site entrance and along the local public road which could affect road users. This is considered a *short-term, minor negative impact* and mitigation will be needed, which is proposed in **Chapter 08** Air Quality and Climate.

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction phase of the development. In particular, the traffic-related air emissions may generate quantities of air pollutants such as NO<sub>2</sub>, CO, Benzene and PM<sub>10</sub>. Road traffic may give rise to CO<sub>2</sub>. However, as the anticipated changes in traffic volumes on the road affected by the development are below the criteria requiring a quantitative air and climate modelling assessment, it can therefore be determined that the effect to climate from traffic emissions will not be significant.

As outlined in **Chapter 08** Air Quality and Climate, dust and emissions from the construction works will likely result in a *temporary to short term, imperceptible* and *negative* effect on sensitive receptors for the duration of the construction phase.

#### **4.4.1.4.3 Traffic and road usage**

Potential impacts on the surrounding road network will arise principally during the construction phase.

The entry and exit of construction vehicles from the substation site may result in negative impact due to the additional traffic on the public road. These impacts will *slight* and will be *short-term* in duration.

The construction works, estimated to be **16 months**, will require a road opening licence and temporary traffic management measures along the grid route, including alternating one-way stop/go traffic as outlined in **Chapter 12** Material Assets and the Traffic Management Plan in **Appendix 3**. Road closures will not be required.

This will result in disruption to existing traffic and access for local landowners and property owners/residents in the vicinity of the route. The works however will be temporary and appropriate traffic control and management

systems will be in place to minimise as far as possible traffic disruption to road users. Once the works are complete, the road will be reinstated.

The construction works will therefore have a **temporary to short-term, negative** and **slight to moderate** effect for road users and local landowners and property owners/residents in the vicinity of the route.

#### 4.4.1.5 Tourism and Amenities

The closest tourist amenity to the proposed substation site is Garryhinch forest recreation area that will be effected during the construction due to noise and traffic generated. As a result, the Proposed Development will likely result in **temporary to short-term, negative** and **slight to moderate** effect on this amenity. Currently, given that there are no tourism attractions or facilities located specifically within the proposed substation site, it can be said that there are no direct impacts associated with the construction phase of the proposed substation. The location of the substation and collector cable site ensures visitors and tourists are not affected or impeded in anyway.

There are currently two cycling loops (Women’s Cycle Route, and Charity Cycle) which may be affected during the grid connection as they travel along the R423, therefore access may be temporarily restricted. This will be a **slight to moderate negative temporary to short term impact** on this amenity.

The proposed substation and collector cable works will cause **temporary to short term negative and localised** impacts that could impact tourism in the vicinity of the site.

Overall, this assessment concluded that the Proposed Development will likely have a **slight to moderate, negative and short term** effect.

#### 4.4.1.6 Summary of Construction Effects

Table 4.10 Summary of Construction Effects

Impact	Quality of Effect	Significance	Spatial Extent	Duration
Employment	Positive	Slight	Local - Regional	Short term
Economic Activity	Positive	Slight	Local - Regional	Short term
Population and Settlement	Neutral	Imperceptible	Local	Short term
Land use patterns	Negative	Moderate	Local	Long term
Human Health	Negative	Slight - moderate	Local	Short term
Tourism and Amenities	Negative	Slight - moderate	Local	Short term

## 4.4.2 Operational Phase

### 4.4.2.1 Employment/Economic Activity

Once the proposed substation is constructed and collector cables are installed, it is envisioned that only a small proportion of employment will be associated with the operational phase of the substation. These jobs will include operations, maintenance, and back-office support.

As the collector cables and grid route will be underground, the only reason personnel required will be for their maintenance, thus no impact is anticipated from the operational phase of the grid route and collector cable.

Hence, the Proposed Development is anticipated to have a *long term, neutral* effect on economic activity during this phase.

### 4.4.2.2 Population and Settlement

The proposed substation will be the only component that will require small proportion of employees during the operational phase for the operations and maintenance. It is expected that the employees will be sourced locally and will not be requiring accommodation. Thus, will not be bringing changes to the population and settlement structure in the area. The Proposed Development will have no effect on population and human settlement during the operational phase.

### 4.4.2.3 Land Use Patterns

The footprint of the proposed substation and collector cable will occupy a small proportion of the development site area when operational, and it is anticipated that there will be *no additional impact* on existing land uses arising from the operational phase. With the exception of the permanent loss of the current land uses associated on these lands there will be no impact on any adjoining land use activities.

The grid route will be installed on the existing public roads and will be underground, hence bringing no changes to the existing land use in the area. Activity is not expected at the Grid Connection during the operational phase of the proposed project. Therefore, during the operational phase, grid route will have a *no impact* on land use.

Overall, the development is expected to have *no impact* during the operational phase.

## 4.4.2.4 Human Health

### 4.4.2.4.1 Noise

Once operational, the main noise source from a substation is from the transformer(s). The noise is generally recognisable as a steady hum which arises from electric and magnetic forces within the transformer. Infrequent noise may also arise from voltage changes (tap changer) and cooling fans under high loads. No operational noise impacts will be generated from the underground grid cable.

The results of the noise modelling assessment undertaken shows that the Proposed project can achieve a low noise impact during daytime and night-time periods

#### 4.4.2.4.2 Air and Climate

Once the proposed development is operational there will be no significant direct emissions to the atmosphere. The substation does not produce emissions as there is no combustion process. The development will mostly be monitored remotely. Maintenance of the proposed development will be minimal, comprising of maintenance of drainage features and the replacement of damaged electrical components (rare), servicing visits to ensure that all electrical infrastructure is working properly. Emissions from maintenance will be minimal and no impact from dust, PM10 or vegetation effects on sensitive receptors is envisaged.

While the risks associated with a fire involving electrical equipment cannot be completely eliminated, the risk to the local environment and wildlife habitat are considered low. The onsite monitoring systems will reduce the likelihood of a fire occurring within the facility. In the event of a fire ignition within the facility, the fireproof construction and limited combustibility of the on site structures will restrict the growth and development of a fire to the structure of origin and reduce the risk of fire spread to adjacent equipment, surrounding vegetation or adjacent properties.

The overall risk of fire ignition within the compound is considered low therefore the likelihood of the resulting release of toxic smoke or other harmful by products of a fire in an industrial electrical facility is also considered negligible.

There will be no potential impacts to air quality during the operational phase associated with the underground grid route.

#### Traffic

Once operational, the development will for the most part be monitored remotely with only occasional trips generated by maintenance and monitoring personnel. This would generate a relatively low volume of vehicles, including occasional heavy vehicles. Therefore, there will be negligible operational stage traffic impacts associated with the proposed development. On the basis of the EPA Guidelines, the proposed operational phase would have **imperceptible to not significant** traffic effects.

#### 4.4.2.5 Tourism and Amenities

There will be no likely impacts on tourism or amenities during the operational phase. It is unlikely that works will be required on the grid route during the operational phase of the proposed development except for potential repair works to the grid connection. Overall, it is expected that the operational phase of the proposed development will have a **long-term, imperceptible, and neutral impact** on recreation and amenity.

#### 4.4.2.6 Summary of Operational Effects

Table 4.11 Summary of Operational Effects

Impact	Quality of Effect	Significance	Spatial Extent	Duration
Employment	Positive	Slight	Local - Regional	Short term
Economic Activity	Neutral	Not significant	Local	Long term
Population and Settlement	Neutral	Imperceptible	Local	Long term
Land use patterns	Neutral	Imperceptible	Local	Long term
Human Health	Neutral	Not significant	Local	Long term
Tourism and Amenities	Neutral	Imperceptible	Local	Long term

### 4.4.3 Decommissioning Phase

#### 4.4.3.1 Employment/ Economic Activity

The potential impacts associated with the decommissioning phase regarding employment and economic activity will mirror those of the construction phase but to a lesser extent. A construction team will be necessary for dismantling the infrastructure and carrying out restoration as needed. Since the decommissioning of the project is expected to be less intensive than the construction phase, fewer construction workers will likely be required. Employment opportunities will be available at the substation site during the decommissioning phase. The influx of construction workers to the substation site will have a **temporary to short-term positive impact** on local businesses and services, contributing to the local economy, similar to that of the construction phase but of lesser magnitude.

There will be a **temporary to short-term slight, positive** impact on employment, and economic activity in the area associated with the employment of construction workers within the vicinity of the development during the decommissioning phase.

#### 4.4.3.2 Population and Settlement

The potential impacts associated with the decommissioning phase in relation to population and settlement pattern will be similar to those associated with construction phase but of a reduced magnitude. A construction crew will be required for dismantling the infrastructure and carrying out remediation where necessary. During the decommissioning phase, the population of the substation and collector site will increase daily during working hours and return back to normal outside of working hours. The decommissioning phase is therefore likely to result in a slight, temporary increase in population within the substation and collector cable site, producing a **slight temporary to short term impact** on population. It is not likely that the decommissioning phase will result in any permanent impact to population in terms of changes to population in the area. The grid route element of the project will remain in situ following decommissioning. There is no expected impact on population due to the Grid Connection as a result of the decommissioning phase.

#### 4.4.3.3 Land Use Patterns

Decommissioning works will include removal of the on-site substation. The access track will be left in situ to continue to be used for agricultural, forestry land uses. The decommissioning works will require a construction crew on-site and may cause temporary disruption to surrounding land uses. Removal of infrastructure from the site may have temporary impact on forestry and agricultural practices. During decommissioning works forestry and agricultural access tracks within the permitted Dernacart wind farm site may be in use by construction crews which may temporarily prohibit access to certain areas of forestry or hinder access to areas of agricultural pasture. Impact to these land uses during the decommissioning phase is expected to be **temporary to short-term, slight, and negative**.

The underground grid connection will remain in situ following decommissioning and form part of the national grid. Therefore, impact on land use along the grid route is unlikely during the decommissioning phase.

#### 4.4.3.4 Human Health

The potential impacts associated with the decommissioning phase in relation to recreation, amenity and tourism will be similar to those associated with construction phase but will likely be of a reduced magnitude.

#### 4.4.3.5 Tourism and Amenities

The potential impacts associated with the decommissioning phase in relation to recreation, amenity and tourism will be similar to those associated with construction phase but will likely be of a reduced magnitude. Decommissioning works will include removal of above ground structures including fencing, substation and associated infrastructure. Similar to the construction phase, this is expected to have a **short-term not significant to imperceptible, negative impact** on recreation.

#### 4.4.3.6 Summary of Decommissioning Effects

**Table 4.12 Summary of Decommissioning Effects**

Impact	Quality of Effect	Significance	Spatial Extent	Duration
Employment	Positive	Slight	Local - Regional	Short term
Economic Activity	Positive	Slight	Local - Regional	Short term
Population and Settlement	Neutral	Imperceptible	Local	Short term
Land use patterns	Negative	Moderate	Local	Long term
Human Health	Negative	Slight - moderate	Local	Short term
Tourism and Amenities	Negative	Slight - moderate	Local	Short term

#### 4.4.4 Cumulative Impacts and Effects

In the assessment of cumulative impacts, all existing, permitted, or proposed developments in the surrounding area have been considered for their potential to create cumulative effects with the proposed development. The potential cumulative impacts on the local population and human health, specifically noise, dust, and traffic are discussed in relevant chapters of this EIAR.

During the construction phase, there is potential for cumulative effects on noise, dust, and traffic impacts associated with both the permitted Dernacart wind farm and Bracklone substation, as construction activities for the proposed development may coincide with those of the Dernacart wind farm and Bracklone substation.

Regarding traffic, the potential for cumulative effects will primarily occur during the construction phase, where construction traffic from the proposed development could overlap with construction or operations of other projects, which are currently permitted but not yet constructed, as identified in Chapter 12 (Traffic and Transport).

If the Bracklone substation works were to be carried out simultaneously with the proposed Dernacart substation and grid route works, there is potential for cumulative traffic-related nuisances. However the impacts will be managed by implementing the mitigation measures addressed in Chapter 12. Notwithstanding works have currently commenced on the Bracklone substation therefore there is unlikely to be any cumulative construction effects in respect of these developments.

Considering the grid works conducted in manageable sections (75-100 meters) each day, no significant impacts on traffic are expected during the construction phase. While the underground electrical cabling route for the Grid Connection will primarily be located within the public road network, once operational, the road corridors containing the underground electrical cabling route will be fully reinstated, thereby eliminating any potential cumulative operational phase effects.

During the construction phase of the Proposed Development and other existing, permitted, and proposed projects, there will be minor emissions from construction plant and machinery and potential dust emissions associated with construction activities and construction vehicles. However, once the mitigation measures as outlined in Chapter 08 are implemented during the construction phase of the Proposed Development, no cumulative negative effect on air and climate are expected.

Noise impacts during the construction and operational phases of the Proposed Development are fully assessed in Chapter 09, Noise. The Dernacart Wind Farm works are located approximately 2.3km from the proposed substation site, minimising any potential cumulative noise and dust effects due to the considerable distance between the two projects. The assessment finds no significant noise and vibration effects associated with the construction and operational phase of the Proposed Development, either alone or in combination with any other existing, permitted, or proposed projects in the area.

**Pre-Mitigation Effect Rating Summary**

In **Table 4.13** below the relevant rating for each of the types of criteria pre mitigation is provided for these cumulative effects on population and human health. The criteria, their explanations and the effect rating methodology outlined in **Chapter 1** of the EIAR have been used to assess this effect.

**Table 4.13 Cumulative Effects**

Phase	Impact	Quality of Effect	Significance	Spatial Extent	Duration
CONSTRUCTION PHASE	Traffic	Negative	Moderate	Localised	Temporary to short term
	Noise	Negative	Slight	Localised	Temporary to short term
	Dust	Negative	Imperceptible	Localised	Temporary to short term
OPERATIONAL PHASE	Traffic	Neutral	Not Significant	Localised	Long Term
	Noise	Negative	Slight	Localised	Long Term

## **4.5 Mitigation and Monitoring Measures**

The potential for significant effects on the human environment will principally arise during the construction phase from traffic, noise and dust effects. Mitigation in relation to these issues are outlined in their respective Chapters of this EIAR. No additional mitigation is proposed here for those particular aspects. There is no likelihood of any significant effects associated with the operational phase of the Proposed Development, therefore no mitigation is proposed.

## **4.6 Residual Impacts and Effects**

- It is not likely that the Proposed Development will directly or indirectly result in any reduction in existing economic activity of the area during any phase of the development.
- There will be no loss of residential dwellings and therefore there will be no displacement of the existing population or change in settlement patterns.
- In terms of impacts to neighbouring lands and land-uses it is considered that the Proposed Development does not pose a significant risk to either existing or future land-uses. All existing land use practices can co-exist with the Proposed Development. There will be no severance, loss of rights of way or amenities as a result of the Proposed Development
- With the implementation of standard traffic management measures as set out in Chapter 12 Material Assets, traffic nuisances will be kept to a minimum.
- With the implementation of standard best management construction activities as set out in Chapter 11 Air and Climate, dust levels will remain within recommended acceptable guide limits.
- With the implementation of mitigation measures as set out in Chapter 9 Noise and Vibration, noise nuisances will be kept to a minimum and within acceptable noise limits.

Overall, there will be no significant residual effects on population and human health as a result of the Proposed Development.

**Table 4.14 Summary of Residual Effects**

PHASE	CATEGORY	IMPACT	QUALITY OF EFFECT	SIGNIFICANCE	SPATIAL EXTENT	DURATION
Construction Phase	Employment	Construction Employment	Positive	Slight	Local- Regional	Short term
		Increased demand for goods & services	Positive	Slight	Local-Regional	Short term
	Population & Settlement	In-migration of workers	Neutral	Slight	Local	Short term
		Pop. changes due to nuisance effects	Neutral	Imperceptible	Local	Short term
	Land Use	Loss of Agricultural and Forestry Land	Negative	Moderate	Localised	Long Term
		Disruptions to Traffic	Neutral	Slight	Localised	Brief to temporary
	Tourism & Amenity	Loss of tourism due to nuisance effects	Neutral	Slight	Localised	Short Term
	Human Health	Health effects from dust	Neutral	Imperceptible	Localised	Temporary to Short term
		Health effects from noise	Neutral	Slight	Localised	Short term
		Health effects from traffic	Negative	Slight to moderate	Localised	Temporary to Short term
Operational Phase	Employment	Employment	Neutral	Not significant	Local- Regional	Long Term
	Population & Settlement	No Impact	N/A	N/A	N/A	N/A
	Land use	No Impact	N/A	N/A	N/A	N/A
	Tourism & Amenity	No Impact	N/A	N/A	N/A	N/A
	Human Health	Health effects from noise	Neutral	Not significant	Localised	Long term
		Health effects from traffic	Neutral	Slight	Localised	Long term

## 4.7 Conclusion

As with any development, the construction activities can cause a nuisance to the local community and are likely to pose temporary minor disturbances locally. The most notable of these disturbances relates to the generation of additional traffic on the local networks. Here noise and safety implications are also a concern. However, disturbances associated with the additional volumes of traffic will principally be confined to the construction phase and will cease on completion of works. The construction phase will be managed to minimise the impact on the human environment and the local residents. With the mitigation measures in place, no significant negative effects on the local human environment are expected.

There are no predicted adverse operational impacts associated with the proposed development which would result in significant negative effects on local society.

In terms of impacts to neighbouring lands and land-uses it is considered that the proposed development does not pose a significant risk to either existing or future land-uses. All existing landuse practices can co-exist with the proposed development. There will be no severance, loss of rights of way or amenities as a result of the proposed development.

Noise effects are not considered to be significant. The noise assessment shows that the proposed development will operate within the recommended EPA noise limit criteria at all third-party properties and thus will not adversely impact on the quality of life of local residents and the existing relatively tranquil environment in which they live.

Overall, there will be no significant residual effects on population and human health as a result of the Proposed Development