



STATKRAFT

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DERNACART WIND FARM

CHAPTER 10 - TRAFFIC AND TRANSPORTATION

DECEMBER 2019



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Laois County Council Planning Authority, Viewing Purposes Only

10 TRAFFIC AND TRANSPORTATION

10.1 Introduction

This chapter of the EIAR describes the existing road network and study area along with the traffic and transportation in the vicinity of the proposed Dernacart Wind Farm. This section examines the potential impacts and any necessary mitigations required in relation to the construction, operation and decommissioning of the wind farm.

The proposed development consists of up to 8 turbines with a tip height of up to 185m, access tracks, hardstanding areas, substation and associated infrastructure including a temporary construction compound and underground electricity grid connection to the proposed Bracklone substation in Portarlinton.

The wind farm is located at Dernacart, Co. Laois with an onsite substation and a grid connection which follows the public road to the proposed Bracklone substation in Portarlinton. c16.5km of the cable will be laid within the public road.

10.1.1 Study Area

The study area for the traffic and transportation chapter includes the proposed wind farm site itself along with the surrounding road network leading to and from the site. The site entrance is assessed, and the turbine delivery route and grid connection are also included within the study area.

10.2 Assessment Methodology

The following chapter outlines the existing environment including the existing road network in the area surrounding the site. The details of the proposed development are then considered in relation to the construction, operation and decommissioning phases of the project. The likely traffic is estimated to produce a volume of trips generated by the wind farm. The impacts of the wind farm including its cable route and turbine delivery route are then considered, and any necessary mitigations proposed.

The assessment uses a combination of field surveys, data counters, desktop studies and consultation. The haul routes and turbine delivery routes are also considered.

The following guidance was used during the assessment of traffic and transport in this EIAR:

- TII Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions) DN-GEO-03060 April 2017;
- Laois County Council - County Development Plan (2017 – 2023);
- EPA Guidelines on The Information To Be Contained In Environmental Impact Assessment Reports (DRAFT), 2017;
- TII Project Appraisal Guidelines for National Roads: Estimating AADT on National Roads, October 2016;
- NRA Project Appraisal Guidelines for National Roads: Unit 5.5 Link-Based Traffic Growth Forecasting, 2011

7-day automatic traffic counts on local roads were taken at two locations; L2092 Kilcavan Road and N80 Mountmellick Road, between the 24th and 30th May 2019.

10.2.1 Consultation

A meeting was held with Laois County Council on 20th June 2019 to discuss the proposed development, including delivery routes and the impact of the project on the existing road network. Laois County Council also provided feedback relating to the grid connection route, enclosed in Appendix 10-2.

Feedback from the Roads Department in Laois County Council included the following requirements:

- Pre-construction Survey Report for the proposed route to capture the condition of the roads prior to ducting installation;
- Pre-condition Survey of the route for traffic to/from the site;
- Railway Bridges- Survey (detailed proposal for bridge crossings; liaising with Irish Rail regarding permissions);
- Condition survey of bridges (rivers) and detail for crossing - Liaising with Inland Fisheries Ireland (IFI) if crossing through riverbed;
- Construction site setups- compound locations;
- Traffic Management plan for construction traffic to the site;
- Traffic Impact Assessment for the proposed route for construction traffic;
- Survey of street infrastructure and details of any alteration required for long/wide loads;
- Abnormal Loads permits for wide/long/heavy roads;
- Details of any laybys/road widening/strengthening to be undertaken;
- Details of reinstatement of trenches proposed;
- Post-construction surveys of the routes to review any damage;
- Remedial works to be identified post survey.

A meeting was held with Offaly County Council on 24th July 2019 to discuss the proposed development, including delivery routes and the impact of the project on the existing road network. In terms of the road network, OCC recommended that where possible, the grid connection cable should be laid in the verge of the road; if laid in the road pavement, at a minimum single lane reinstatement would be required. Where bog roads are present and the cable is to be laid in the road, full width reinstatement would be required. A road opening licence would also be required. OCC requested that the EIAR consider haul routes and their effect on the local road network. In terms of the River Barrow, directional drilling would be required for any crossing points.

Offaly County Council General Requirements:

- A Construction Management Plan to be submitted to OCC. Contents to include implementation of planning conditions and EIAR Requirements;
- OCC to be advised of details of PSDP, PSCS and contractors;
- A road opening licence will be required from OCC;
- Insurances;
- Performance Bond;
- A dedicated liaison engineer to be appointed by OCC and all associated costs covered by the Developer;
- Long term damage fee or works in lieu;
- Developer to consult with An Garda Síochána, emergency services and bus operators in relation to each stage of the works;
- Developer to liaise with planning authority in Laois County Council;
- Liaison with public, residents' businesses and school;
- Allow for briefing of Elected Members in Municipal Districts.

Traffic Infrastructure Ireland (TII) were also consulted in relation to the project and their response is summarised as follows:

- The national road network shall continue to serve its intended strategic purpose and not be affected by the development;
- Consultations should be had with the relevant local authorities;

- Alternatives to laying of cables along the national road network should be considered;
- Haul routes should be identified to fully assess the network to be traversed;
- Where appropriate, a Traffic and Transport Assessment should be carried out;
- TII standards should be consulted to determine if a Road Safety Audit and Road Safety Impact Assessment should be carried out;
- Design to standards and guidance of TII publications;
- EIAR to give consideration to TIIs Environmental Assessment and Construction Guidelines for the treatment of Air Quality during the planning and construction of National Road Schemes;
- The EIAR should consider Environmental Noise Regulations 2006.

10.3 Existing Environment

10.3.1 Existing Road Network

Roads in the Republic of Ireland are classified as motorways, national (primary and secondary), regional and local roads. Transport Infrastructure Ireland (TII) has overall responsibility for the planning and supervision of the construction and maintenance of motorways, national primary and secondary roads. The local authorities have responsibility for all non-national roads. The hierarchy of roads throughout Ireland is outlined in Table 10-1.

Table 10-1: Road Categories

Road Category	Description
Motorways	These are high quality multiple lane roads with limited grade separated junctions. They are high speed (120kph) road predominantly provided to facilitate strategic traffic with reduced journey times.
National Primary Roads	These are predominantly single carriageway, with some that are dual carriageway. Generally high speed (100kph) roads that facilitate strategic traffic, with reduced journey times.
National Secondary Roads	These are medium distance through-routes connecting towns, serving medium to large geographical areas and link to primary routes to form a homogeneous arterial network.
Regional Roads	Predominantly single carriageway roads of regional and local importance. These roads generally receive more frequent maintenance criteria than Local Roads and therefore tend to be structurally sound.
Local Roads (Primary, Secondary and Tertiary)	The local road system is operated in three tiers defining local importance, usage and maintenance priorities. They form a network of single carriageway roads of varying quality.

Motorway

The nearest motorway to the Dernacart Wind Farm site is the M7 which is approximately 12km southwest of the wind farm site. The M7 is the main route from Dublin to Limerick.

To the north, the M6 connects Dublin to Athlone, this is located 23km directly north of the site.

The next closest motorway is the M8, 27km to the southwest. The M8 starts at the M7 17km west of Portlaoise. The M8 connects Cork to the M7 near Portlaoise.

National Primary Routes

The closest national primary route is the N80, which travels close to the site entrance. The N80 is a national primary route which connects the Enniscorthy By-Pass (c87km to the southeast) to the N52 at Tullamore (c14km northwest).

The N80 has an annual average daily traffic (AADT) volume of approximately 8300¹.

The next closest national primary routes are the N52 at Tullamore which connects Kilbeggan to Nenagh and the N77 at Portlaoise which connects Portlaoise to Kilkenny.

Regional Roads

The regional road R423 connects Portarlinton to Mountrath. This road is located to the south east of the development site. The grid connection route will be installed along part of the R423.

The next closest regional road is the R422 which connects New Inn to the south east, with Castlecuffe to the west.

The R420 is located to the north of the site and connects Portarlinton to Tullamore.

Local Roads

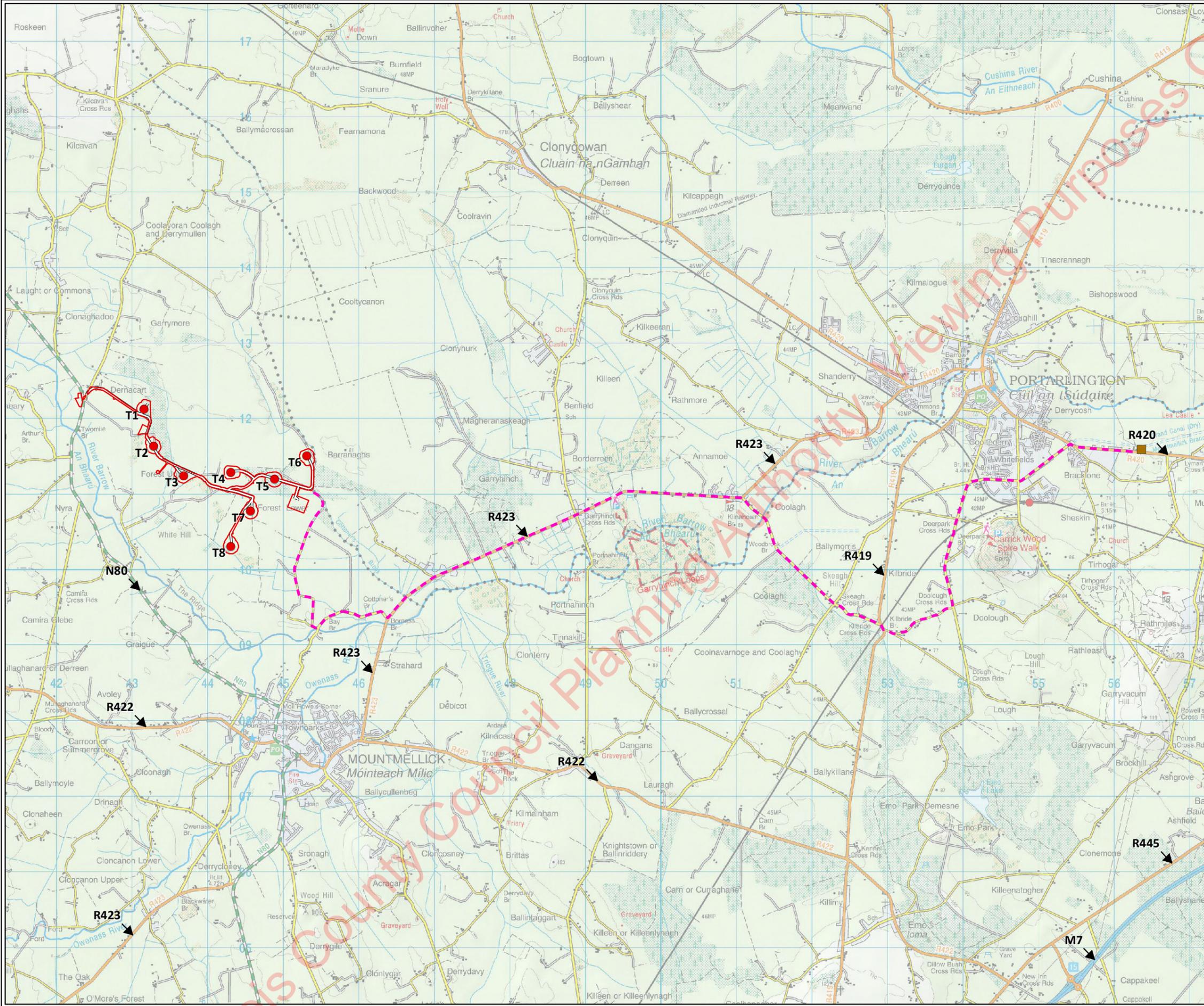
The proposed site entrance is at the local road (L2092) between the N80 and Kilcavan. This local road runs along the western boundary of the development site and the site entrance is located on this road, near the N80 at Dernacart. The AADT associated with the L2092 is approximately 1,000² vehicles per day.

To the north of the site there is a local road which connects the N80-Kilcavan local road to College Hill. To the east, there is a local road which connects the N80 at Mountmellick to Ballynamire, this is a narrow country lane, used only for local property accesses.

The grid cable will be installed along the L20978, L20972, L7161 and the L3157 local roads to Portarlinton.

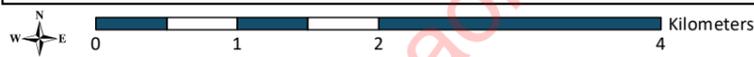
¹ Based on 7-day automatic traffic count data May 2019

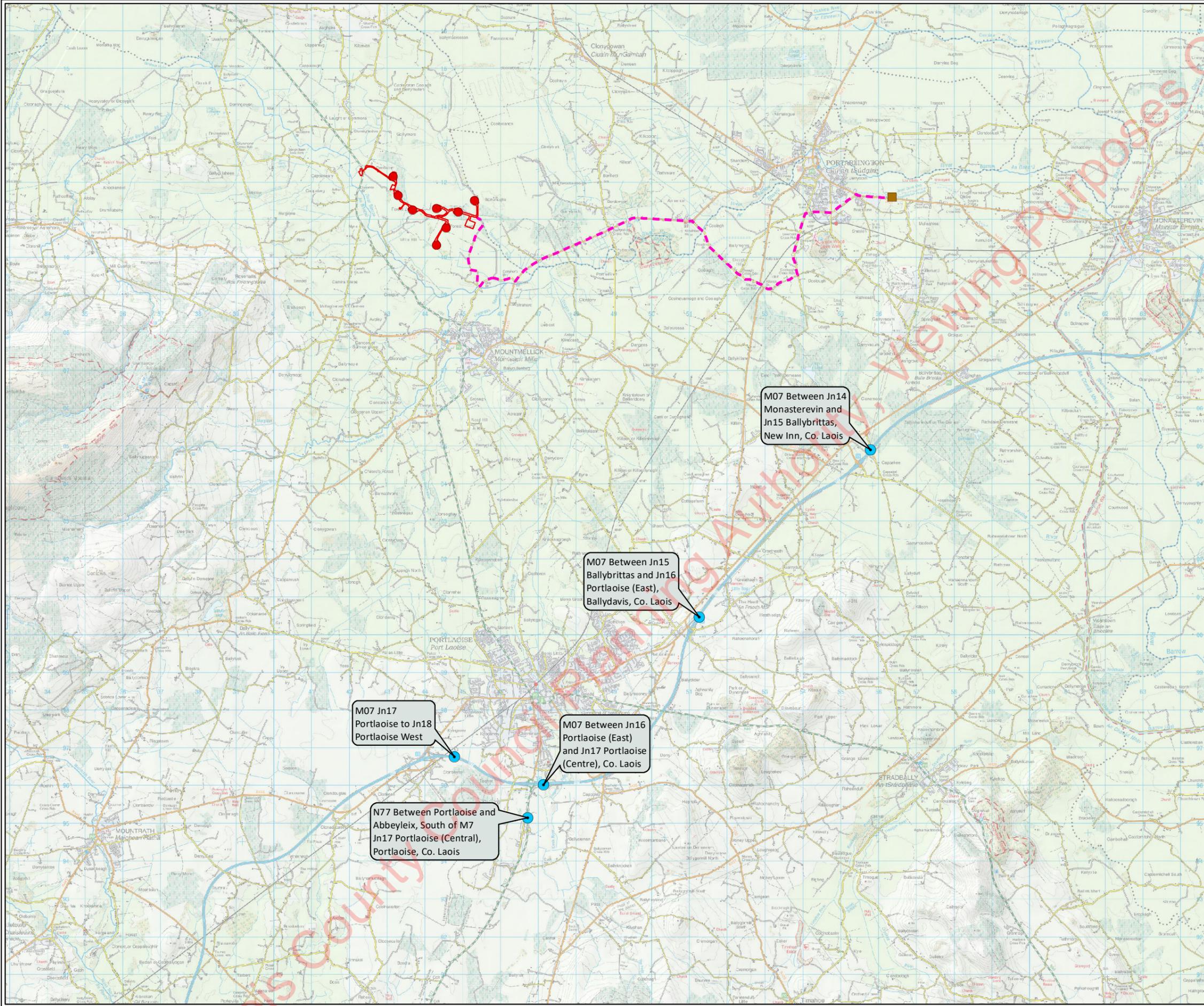
² Based on 7-day automatic traffic count data May 2019



- Proposed Turbines
- Proposed Future Bracklone Substation
- Proposed Planning Boundary
- Proposed Cable Route
- Proposed Access Tracks

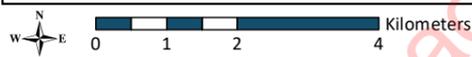
TITLE:	Proposed Site Location and Surrounding Road Network	
PROJECT:	Dernacart Wind Farm	
FIGURE NO:	10.1	
CLIENT:	Statkraft	
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- TII Traffic Counter Locations
- Proposed Turbines
- Proposed Future Bracklone Substation
- Proposed Planning
- - - Proposed Cable

TITLE: Existing TII Traffic Counter Locations in the Vicinity of the Proposed Development	
PROJECT: DernaCart Wind Farm	
FIGURE NO: 10.2	
CLIENT: Statkraft	
SCALE: 1:100000	REVISION: 0
DATE: 30/01/2020	PAGE SIZE: A3





- Traffic Counter Locations
- Proposed Turbines
- Proposed Met Mast
- Proposed Planning Boundary
- Study Area Boundary
- Proposed Turbine Hardstanding Areas
- Proposed Temporary Compound
- Proposed Access Tracks**
 - Existing Track to be Upgraded
 - New Track

TITLE:	Traffic Counter Locations		
PROJECT:	Dernacart Wind Farm		
FIGURE NO:	10.3		
CLIENT:	Statkraft		
SCALE:	1:10000	REVISION:	0
DATE:	30/01/2020	PAGE SIZE:	A3



10.4 Proposed Development

The proposed development consists of the installation of up to 8 wind turbines along with associated hardstanding areas at each turbine location, access tracks, a new substation and associated works, grid connection works, turbine delivery route and temporary construction compounds. A full description of the development is provided in Chapter 4. The proposed layout, turbine delivery route, internal access tracks, temporary compound location, proposed grid connection route and proposed onsite substation location are displayed in Figures 4.2 – 4.7 in Chapter 4 of the EIAR respectively.

10.4.1 Construction Programme

It is estimated that the construction of the development will take approximately 12 months. There are a number of items which will be conducted in parallel, but the basis construction programme would involve site establishment, site access road construction, hardstanding construction and substation works, the grid connection works are likely to be done in parallel with the site works. The turbine installation works will be completed before commissioning, reinstatement, and landscaping.

10.4.2 Site Entrance

The proposed site entrance is at the local road (L2092) between the N80 and Kilcavan. The site entrance has been designed to accommodate the turbine component deliveries but also to achieve adequate sight lines in both directions. The site entrance is located on a straight section of road which has good visibility in both directions. Sightlines of 160m are achieved in both directions at a setback distance of 3m and is designed in accordance with TII guidelines (DN-GEO-03060).

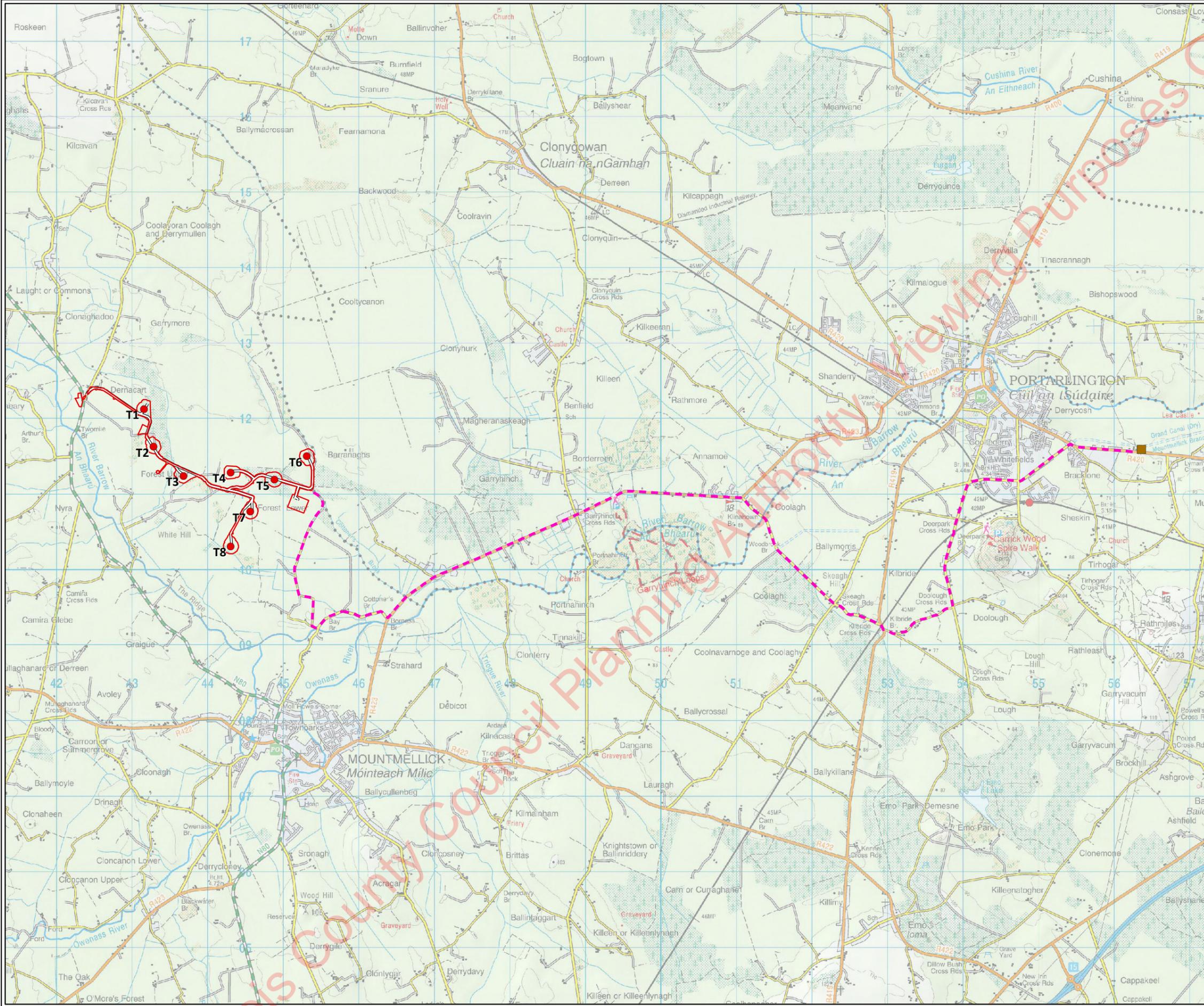
Details of the site entrance can be seen on drawing P1982-0101-0001.

10.4.3 Cable Route and Grid Connection

The turbines will be connected using internal collector cables within the site boundary. These will connect to the proposed new substation where they will then export power to the national grid via the grid connection cable.

The grid connection is proposed to route from the on-site substation to a proposed substation at Bracklone in Portarlinton. The cable will follow the route along a local road on the eastern boundary of the site, joining the R423. The grid connection is then proposed to be laid in the R423 to Portarlinton Golf Club. At Portarlinton Golf Club, the grid route follows a local road to Kilbride. At Kilbride the grid route will follow local roads to the R420 and connect to the proposed Bracklone substation. The grid connection to Bracklone will also involve two crossings at the railway.

The grid connection route is shown on Figure 10-4 and the onsite substation location is displayed in Figure 4.7 of Chapter 4.



- Proposed Turbines
- Proposed Future Bracklone Substation
- Proposed Planning Boundary
- — — Proposed Grid Connection Route
- — — Proposed Access Tracks

TITLE:		Grid Connection Route	
PROJECT:		Dernacart Wind Farm	
FIGURE NO:	10.4		
CLIENT:	Statkraft		
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10.4.4 Trench Details

Typical details for trench reinstatement are shown on drawing P1982-0400-0004.

Further design work will be conducted post-planning to ensure that the pavement is reinstated to a condition equal or better than the existing pavement, pre-construction. The reinstatement detail is therefore subject to change based on ground conditions encountered.

All materials used in the reinstatement of trenches should comply with the requirements of the DTAS guidelines for the Opening, Backfilling and Reinstatement of Trenches in Public Roads and the TII Specifications for Road Works.

10.4.5 Wind Farm Construction Haul Routes

In constructing the new wind farm project, materials and plant will need to be delivered to site. The material haul routes will include some of the surrounding road network and will need to cater for the additional traffic associated with the development.

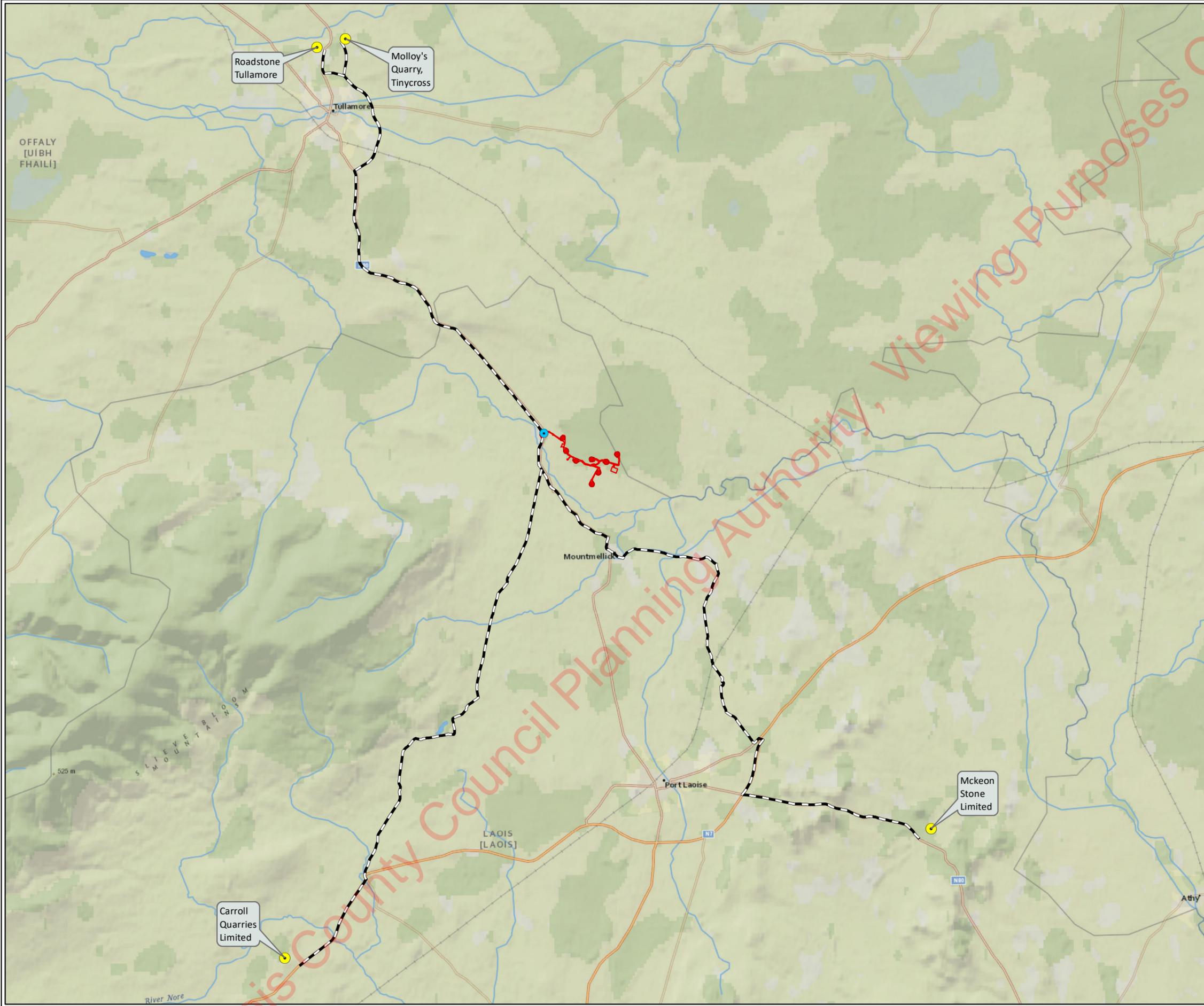
Typical traffic associated with the construction phase include:

- Heavy Goods Vehicles (HGVs) carrying stone;
- HGVs (Concrete wagons) carrying concrete for turbine foundations and substation foundations;
- HGVs carrying building materials for the substation;
- HGVs carrying plant and fuel;
- HGVs exporting site waste;
- Cranes and associated elements for the main crane for erecting the turbines;
- Private cars and vans for the commuting workforce

There are a number of quarries in the area that may be used as potential sources of construction material, therefore the haul routes to the site are identified. The list of quarries are as follows:

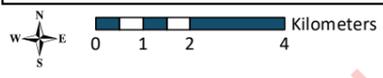
- Carrol Quarries Limited, Portlaoise, Co Laois – Tarmacadam Contractor and Limestone Quarry. 26km from the development site;
- Roadstone Tullamore, Tullamore, Co. Offaly – Concrete supplier, block, asphalt and building materials. 24km from the development site;
- Molloy's Quarry, Tynecross, Co. Offaly – Aggregate supplier. 21km from the development site;
- McKeon Stone Limited, Stradbally, Co. Laois – Stones, limestone slabs. 30km from the development site.

The haul routes are shown in Figure 10-5 over.



- Quarries
- Proposed Site Entrance
- Proposed Turbines
- Proposed Planning Boundary
- Potential Haul Routes

TITLE:		Potential Haul Routes	
PROJECT:		Dernacart Wind Farm	
FIGURE NO:	10.5		
CLIENT:	Statkraft		
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10.4.6 Turbine Delivery Route

Turbine deliveries will likely be from Dublin Port to the M6, where the turbine components would travel to Junction 5. At Junction 5 of the M6, the turbine component deliveries would exit the motorway and travel along the N52 traveling through the Ardan, Cappincur, Cloncollig and Clonminch roundabouts. At the Clonminch roundabout, the deliveries would travel along the N80 through Killeigh to the site entrance at Dernacart. The turbine delivery route is displayed in Figure 4.3 in Chapter 4. At the junction of the N80 and the local road leading to the site entrance, a turning area is required for the delivery truck. It is proposed to use a blade adaptor to minimise the land required at this location. The blade adaptor is capable of raising the blade from its horizontal position to a vertical position thus reducing the swept path/length of the load and reducing the requirements for hedge trimming/land takes etc. The blade is connected to a specially adapted motorised unit and tilted up to 60 degrees into the air and transported through the restricted area. The tilting of the blade reduces the length and thus a reduced area of land is required for the transportation of the blade.

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10.5 Potential Impacts of Proposed Development

Potential impacts of the proposed development are outlined below, these are categorised in relation to the wind farm construction (including grid connection and turbine delivery), operational phase and decommissioning of the development.

10.5.1 Potential Impacts of Proposed Wind Farm Construction Works

The wind farm construction activities associated with the wind farm will lead to additional construction related traffic on the existing public road network over the duration of the construction works. These impacts will include:

- HGVs transporting materials to and from the site, including road making materials, concrete, building materials, drainage/ducting materials, cabling, electrical components and excavated material;
- HGVs transporting conventional earthworks machinery such as excavators, dumper trucks and rollers;
- Fuel trucks transporting fuel for plant to each site compound during the construction phase;
- LGVs such as cars, 4x4s and vans used by the workers and supervisory staff involved in the construction works;
- Abnormal loads including turbine components (more details below).

Based on existing AADT volumes and capacity of the N80, the proposed temporary increase in traffic due to the development during the construction phase will be low. The associated adverse impact is considered to be temporary in duration and slight in significance according to EPA guidelines.

10.5.2 Potential Impacts of Proposed Grid Connection Works

The traffic impact associated with the grid connection will fall into two main categories, the construction traffic related impacts and the road/lane closure related impacts.

Construction Traffic Related Impacts

The proposed grid connection route is shown on Figure 10-4 and the existing environment along the route is described IN Section 10.3 above.

The proposed grid route will cross the railway line at three locations; Kilbride Cross Roads, Deerpark Cross Roads and on Canal Road, all south of Portarlinton. At two locations it is proposed to lay the cable in the road in the bridge deck and at the other location, the trench will be installed beneath the railway (road crosses beneath the railway line).

The cable route construction works will involve constantly moving the working area as the cable installation works progress. The grid works are estimated to take approximately 10 months on the assumption that 75m of cable is installed each day. These works will lead to additional traffic associated with the cable installation as it is constructed.

Grid Connection Roadworks

The grid connection construction works will require a combination of temporary traffic diversions and temporary lane closures along the proposed route. The impact of the traffic diversions and lane closures on a section of road will depend on the location of the grid connection works and active traffic at the time of installation.

All road works will be subject to a road opening licence, but it is anticipated that the cable installation along the R423 will be advanced using rolling lane closures. In this scenario, the traffic will be allowed to travel in both directions, but a stop/go system will be used to control the flow of traffic passing the works. This will have a temporary negative impact on road users.

On the local roads (L20978 and L20972) between the R423 and the site, it is anticipated that grid cable installation will involve temporary road closures. Roadworks along this section will impact on road users and will lead to increased journey times for the duration of the roadworks.

Connection works will involve the installation of ducting and cables within the road or road verge. This will result in traffic associated with the delivery of plant and materials along with traffic related to the excavation and reinstatement of trenches.

The negative impact of the grid connection works is anticipated to be temporary and 'slight' to 'moderate' in significance without appropriate mitigation (i.e. traffic management).

10.5.3 Potential Impacts of Turbine Delivery

The delivery of turbine components including blades, tower sections and nacelles is a specialist transport operation owing to the oversized loads involved. The blades are the longest component and have been considered for the purpose of this assessment.

Turbine deliveries will be carried out at night during off-peak times and will be completed using a convoy and a specialist heavy haulage company. Turbine deliveries will also be escorted by An Garda Síochána. This will minimise the disruption to traffic and ensure the impacts of the turbine deliveries are minimised.

In some cases, accommodation works are required along the turbine delivery route such as hedge or tree cutting, relocation of powerlines/poles, lampposts, signage and local road widening. Any accommodation works will be carried out in advance of the turbine deliveries, following consultation and agreement with the local authority. Road widening/accommodation works will be required at a number of roundabouts at Tullamore which will be reinstated to the satisfaction of the local authority.

A Turbine Delivery Report has been completed for the delivery of components to the site and can be found in Appendix 10-1.

The impact of the turbine deliveries is anticipated to be temporary in duration and 'imperceptible' in significance.

10.5.4 Traffic Trip Generation

10.5.4.1 Construction Phase

The estimated construction phase traffic generated by the development on the surrounding network has been predicted by estimating the number of vehicles required for each phase of the development. A construction period of 12 months has been applied to the estimate. The number of vehicles are then converted to the equivalent two-way trips, whereby every vehicle will generate two trips; one to, and one from the site.

It is assumed that there will be no borrow pit on site in order to assess a worst-case scenario situation and thus all stone will be imported to site. This will create a conservative estimate of the volumes to be imported, the actual value will be less as there may be an amount of material found suitable on site can be reused which could reduce the volumes of imported stone and hence reduce traffic.

Stone deliveries will be brought to site on HGV tipping vehicles with a capacity to carry up to 10m³ of stone. The concrete deliveries will be ready-mix concrete wagons and not articulated and have a capacity to carry up to 8m³ concrete per delivery.

It is estimated that the construction phase for the wind Farm will lead to 14,516 additional HGV trips (two-way) over the duration of the construction works. Figure 10.6 illustrates the trip generation over the 12-month construction period.

An average workforce of 30 persons is anticipated, increasing to 45 persons during peak periods. This is estimated to give rise to an increase of Light Goods Vehicle (LGV) traffic of 40 trips per working day and rising to 60 during peak construction periods. The combined HGV and LGV average daily increase is 97 trips per day.

The predicted AADT for the L2092 during the installation phase of the proposed development is presented in Table 10-2.

Table 10-2: Predicted AADT Volumes with Average Construction Phase Traffic

Location	AAADT (2019)	Predicted AADT During Construction (Estimated Site Start 2021)	Average Daily Trips Generated by Development	Predicted Combined AADT During Construction	% Increase
N80 South N80/N52 Jn, Tullamore, Co. Offaly	9929	10,383	97	10,480	0.93%
M07 Between Jn16 Portlaoise (East) and Jn17 Portlaoise (Centre), Co. Laois	28,905	30,225	97	30,322	0.32%
Counter taken (N80 at Dernacart)	8,300	8,679	97	8,776	1.12%
Counter taken (Local Road at Site Entrance - L2092 Kilcavan Road)	1,078	1,127	97	1,224	8.61%

Project related traffic will vary over the course of the construction programme. Activities can be broken up into the following main categories:

- Site mobilisation
- Onsite access road and drainage
- Turbine cranepads
- Foundations
- Cabling
- Substation

The busiest period during the construction programme is expected to occur in Month 4 when multiple construction activities are expected to take place concurrently. Average daily vehicle trips during this month are estimated to reach up to 132 for HGV's. The distribution of HGV traffic generation throughout the construction programme is presented in the figure below.

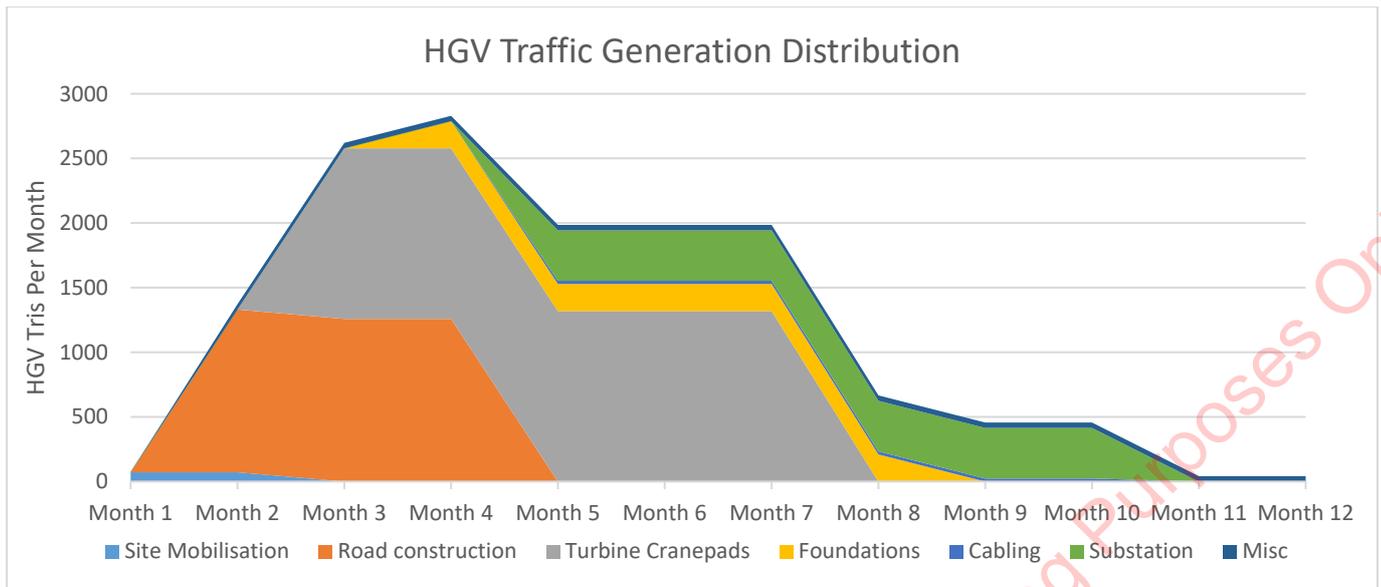


Figure 10-6: Estimated Traffic Distribution

10.5.4.2 Operation Phase

The trip generation for the development once operational is anticipated to be minimal. The constructed wind farm will be monitored remotely, and the substation will be unmanned.

The operational trips generated by the completed wind farm are likely to involve a technician attending the site to do routine maintenance and/or inspection works. This would be estimated as a maximum of two vehicles travelling to site infrequently with a typical attendance of one to two trips per day.

10.5.5 Potential Impacts – Operation Phase

The wind farm will be monitored remotely once operational. The only associated traffic with the operational phase of the wind farm will be from the wind farm owner/operator, ESBN and EirGrid personnel visiting the substation, and maintenance staff. There will also be a limited infrequent attendance by routing environmental monitoring/compliance staff.

Routing turbine maintenance is generally conducted by personnel climbing inside the tower. However, there may be circumstances where a crane may need to be mobilised to site to conduct non-routine maintenance.

The adverse impact associated with the estimated number of vehicles visiting the site is deemed to be imperceptible in significance.

10.5.6 Potential Impacts – Decommissioning

The impacts associated with the decommissioning phase are expected to be considerably less than those during construction. The decommissioning phase of the project is described in Chapter 4 of this EIAR and these works will be subject to a decommissioning plan, to be agreed with the local authority. The traffic impact associated with the decommissioning phase will be less than the construction phase.

During the decommissioning phase, the dismantled turbine components will be removed from site and are likely to be broken up before removing from site.

Cables installed in ducts are likely to be removed and areas of hardstanding and access roads no longer required will be reinstated or covered in topsoil.

Negative or adverse effects on the receiving environment associated with decommissioning works considered to be temporary in duration and slight in significance without appropriate mitigation.

Infrastructure associated with the grid connection will form part of the national transmission network and will be left in-situ. Therefore, no impacts are envisaged upon decommissioning of the wind farm development and no mitigation is required.

10.6 Cumulative Impacts of Proposed Development

Relevant projects in proximity to the proposed Dernacart Wind Farm development are listed in Table 10-4 below.

Table 10-3: Potential Cumulative Impact from other Developments

	Development	Distance to Dernacart	Status	Interface	Potential Cumulative Traffic Impact
1	Moanvane Wind Farm	8km	Granted	Potentially share a portion of the N52 around Tullamore if constructed at the same time	Slight
2	Solar Farm at Ballyduff	10km	Granted	Potentially share a portion of the N52 around Tullamore if constructed at the same time	Imperceptible to Slight
3	Solar Farm at Shanderry	8.5km	Granted	If the solar farm is using McKeon's in Stradbally for stone deliveries, the haul route may cross the grid route at the R419.	Imperceptible to Slight
4	Wind Farm at Stonestown	33km	Granted	None	None
5	Energy Storage Facility at Lumcloon	18km	Granted	Potentially share 7.5km of the N52 around Tullamore if Roadstone or Mollys quarries in Tullamore are used by both projects. 18.5km of road would be shared if both projects use McKeons quarry in Stradbally. These impacts would only occur if constructed at the same time	Imperceptible
6	Solar Farm at Derrymore	21km	Granted	None	Imperceptible
7	Cheese Manufacturing Facility at Togher, Portlaoise.	17km	Granted	None	Imperceptible

10.7 Mitigation Measures

This section outlines the mitigation measures that will reduce, minimise or eliminate the potential impacts created by the development and outlined above.

10.7.1 Construction Phase Mitigation

The following mitigation measures are proposed to reduce the impact of the construction activity in relation to the construction phase of the wind farm development.

Traffic Management Plan

A detailed Traffic Management Plan (TMP), incorporating all of the mitigation measures set out in the outline TMP submitted as part of the CEMP included in this EIAR, will be agreed with the roads authority and An Garda Síochána prior to commencing construction. The TMP will include the following:

Traffic Management Co-ordinator – A dedicated Traffic Management Coordinator will be appointed for the duration of the project and this person will be the main point of contact for all matters relating to traffic management on the project.

Roads and Routes: The final TMP will clearly identify roads that will be used to access the project site and roads that are not to be used. In some cases, the roads authority may wish that certain roads are not used for HGVs but can be used by LGV traffic.

One-way Systems: as some of the local roads are relatively narrow, the roads authority may want to introduce a system of one-way construction traffic movements during the construction of the development. Any such one-way systems would be agreed with the roads authority in advance of construction.

Road Condition Survey: a pre-condition survey will be carried out on all public roads that will be used in connection with the development to record the condition of the public roads in advance of construction commencing. A post-construction survey will also be carried out after the works are completed. The specification and timing of the surveys will be agreed with the roads authority. Joint surveys shall be completed if the roads authority requests.

Road Reinstatement: All roads will be reinstated expeditiously on completion of the construction works. Roads will be reinstated to their pre-works condition or better and to the satisfaction of the roads authority.

Site Inductions: All workers will receive a comprehensive site induction which will include a section on traffic management and clear guidance on the routes to be used/not used to access the site.

24-Hour Emergency Contact: a 24-hour emergency phone number will be maintained for the duration of the construction works and the number will be noted on temporary signage at each works area (for grid connection) and the site entrance for the wind farm site.

Traffic Management Guidance: all necessary temporary traffic management will be planned and executed in accordance with best practice, including Chapter 8 of the Traffic Signs Manual published by the Department of Transport.

Letter Drops: a letter drop will be carried out to notify members of the public living near the proposed site and cable route to advise them of any particular upcoming traffic related matters e.g. temporary lane/road closure or delivery of turbine components.

Signage: Clear signage relating to the development, both temporary and permanent, will be provided for accessing the site.

Road Sweeper: If necessary, a road sweeper will be used to maintain the public roads in a clean condition during the construction activities of the project.

Site Entrance: The entrance to the site will be secured when the site is not in use. When necessary a flagman will be used to assist traffic movements at the site entrance.

Temporary Road Crossing Points: Where the internal wind farm access tracks cross a local road, this junction will be managed appropriately to allow safe passage of construction vehicles in and out of the junctions. Priority at these junctions will be maintained for public traffic. These crossing points will be secured when not in use.

Grid Connection Mitigation

Mitigation measures proposed for the grid connection works include:

Road Opening Licence: The road works associated with the grid connection cabling will be completed in line with the requirements of a road opening licence as agreed with the local authority.

Route Proofing: In advance of the main grid connection works an assessment will be carried out to define the precise alignment of the cable route. This will include slit trenching with the aim of avoiding existing services in the road.

Maintaining Local Access: reasonable access to local houses, farms and businesses will be maintained at all times during any road closures associated with the grid connection works. The details of this will be agreed with the roads authority in advance of the grid connection works commencing.

Road Cleanliness: Appropriate steps will be taken to prevent soil/dirt generated during the works from being transported on the public road. Road sweeping vehicles will be used if necessary, to ensure that the public road network remains clean.

Temporary Trench Reinstatement: Trenches on public roads, once backfilled, will be temporarily reinstated to the satisfaction of the roads authority.

Surface Overlay after Trench Reinstatement: following temporary reinstatement of trenches on public roads, sections of the public roads will receive a surface overlay. Details to be agreed with the roads authority.

Haul Route Interface: aggregate imported to the wind farm site from local quarries will be managed as much as possible to ensure they do not coincide with the grid connection works.

Turbine Delivery Mitigation

The turbine delivery route has been assessed using a detailed appraisal of potential routes and the identification of the most appropriate route including the required accommodation works along the route to mitigate the impact of the turbine delivery. The impact of the deliveries on traffic is mitigated by the delivering components during off-peak or night time deliveries. Mitigation measures proposed for the turbine delivery route also include:

Programme of Deliveries: a programme of deliveries will be submitted to the roads authority in advance of deliveries of turbine components to the site. The programme will include details of the dates and times of each component delivery along with the route to be taken.

Reinstatement: Any areas affected by the works to facilitate turbine delivery will be fully reinstated to its original condition unless agreed otherwise.

Consultation: Consultation with the local authorities will be included in the traffic management plan to manage turbine component deliveries.

10.7.2 Operational Phase Mitigation

It is considered that no further mitigation measures are necessary for the operational stage of the development.

10.7.3 Decommissioning Phase Mitigation

All decommissioning works are to be carried out in accordance with a decommissioning plan to be agreed with the planning authority in advance of the works. Decommissioning measures identified should be included in the decommissioning plan for the wind farm.

Infrastructure associated with the grid connection will form part of the national transmission network and will be left in-situ. Therefore, no impacts are envisaged upon decommissioning of the development and no mitigation is required.

Mitigation measures adopted for project decommissioning shall be in line with those identified for the construction phase of the development.

10.8 Residual Impacts

The implementation of mitigation measures outlined in Section 10.7 will ensure that residual impacts are lower than unmitigated impacts of the development.

10.8.1 Construction Phase

Negative or adverse effects on the receiving environment associated with the construction works within the main wind farm site are considered to be short-term in duration and slight in significance following mitigation.

Negative or adverse effects on the receiving environment associated with the turbine delivery route are considered to be temporary and imperceptible following mitigation.

Negative or adverse effects on the receiving environment associated with the grid connection route are considered to be temporary and slight following mitigation.

10.8.2 Operational Phase

The trip generation for the development once operational is anticipated to be minimal.

Effects on the receiving environment associated with the operation phase of the development are considered to be neutral in terms of quality, long-term in duration and imperceptible in significance.

10.8.3 Decommissioning Phase

Negative or adverse effects on the receiving environment associated with decommissioning works at the wind farm site are considered to be temporary in duration and not significant following mitigation.

Negative or adverse effects on the receiving environment associated with the turbine delivery route are considered to be temporary in duration and not significant following mitigation.

Infrastructure associated with the grid connection will form part of the national transmission network and will be left in-situ. Therefore, no impacts are envisaged upon decommissioning of the wind farm site development and no mitigation is required.

10.9 Conclusion

There are no significant impacts expected on the receiving environment as a result of the construction, operation and decommissioning of the proposed development.

The key roads associated with the receiving environment are the N80 and local roads surrounding the site.

The proposed development is likely to result in a slight to moderate short-term negative impact on these roads during construction phase if adequate mitigation measures are not implemented.

Following implementation measures outlined in section 10.7 above, residual impacts during the construction phase shall be reduced and are not expected to exceed 'slight' in significance.

Impacts during operation and decommissioning are considered imperceptible to not significant.

There are no significant cumulative impacts expected on the receiving environment as a result of other projects during the construction, operation and decommissioning of the proposed development.

It is recommended that the mitigation measures identified in this Chapter are adopted by the Contractor and incorporated into the construction stage CEMP and TMP for the project.

Laois County Council Planning Authority, Viewing Purposes Only