15. MATERIAL ASSETS

Material Assets are defined in the '*Advice Notes for Preparing Environmental Impact Statements'* (EPA, 2022) as "*resources that are valued and that are intrinsic to specific places" and in the* 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022) as "*built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure.*" They may be either of human or natural origin. The cultural assets of Archaeology and Cultural Heritage are addressed in Chapter 13 of this Environmental Impact Assessment Report (EIAR). Economic assets of natural heritage include non-renewable resources such as minerals or soils, and renewable resources such as wind and water. These assets are addressed in Chapter 8: Land, Soils and Geology, Chapter 9: Hydrology and Hydrogeology, and Chapter 10: Air Quality. Tourism and amenity resources, which are also considered material assets, are addressed in Chapter 5: Population and Human Health. Waste management which is also considered under the heading of material assets by the above EPA documents, is summarised in Section 4.3.10.7 of Chapter 4 of the EIAR and considered in Section 15.2.5 below. Traffic volumes generated by the removal of waste from the site of the Proposed Development to fully authorised waste facilities, are considered in Section 15.1 below.

This chapter of the EIAR addresses the likely significant effects of the Proposed Development on transportation infrastructure (Section 15.1 Traffic and Transport) and on Other Material Assets (Section 15.2), which are economic assets of human origin. This chapter of the EIAR has been prepared in accordance with the requirements of the EIA legislation and guidance outlined in Section 1.7 of Chapter 1 of this EIAR.

15.1 Traffic and Transport

15.1.1 Introduction

15.1.1.1 Background and Objectives

The purpose of this section is to assess the effects on roads and traffic of the traffic movements that will be generated during the construction, operational and decommissioning phases of the Proposed Development.

For developments of this nature, the construction phase is the critical period with respect to the traffic effects experienced on the surrounding road network, in terms of both the additional traffic volumes that will be generated on the road network, and the geometric requirements of the abnormally large loads associated with the delivery of wind turbine components. The requirements of the additional traffic and abnormal sized loads generated during the construction stage were assessed on both the external road network and at the junction of the R314 and the local Killerduff Road that will provide access to the site.

It should be noted that abnormal weight loads are not a feature of the turbine delivery vehicles, they are abnormal in size only. All construction and delivery vehicles for the Proposed Development will be subject to the standard axle weight requirements set out under Road Traffic (Construction and Use of Vehicles) Regulations 2003 (S.I. No. 5 of 2003), as amended, and therefore the loadings from construction traffic will not exceed the relevant standards. Notwithstanding the need to use some specialist vehicles to facilitate turbine delivery, it should be noted that the number of load-bearing axles for any specialist vehicles carrying large loads are designed to ensure that the load on any one axle does not exceed acceptable load bearing statutory limits. Therefore, the structural integrity of the national and regional road network used during the construction of the Proposed Development is adequate to provide for these accepted loads.

The magnitude of the increase in traffic volumes experienced on the surrounding network is identified during the various construction stages of the proposed development. Traffic management measures are also provided in Sections 15.1.7 and 15.1.10.6 aimed at minimising the traffic impact on the local highway network. Refer also to Appendix 15-2 for the Traffic Management Plan (TMP).

15.1.1.2 Statement of Authority

This section of the EIAR has been prepared by Alan Lipscombe of Alan Lipscombe Traffic and Transport Consultants Ltd. Alan is a competent expert in traffic and transport assessments. In 2007 Alan set up a traffic and transportation consultancy providing advice for a range of clients in the private and public sectors. Prior to this Alan was a founding member of Colin Buchanan's Galway office having moved there as the senior transportation engineer for the Galway Land Use and Transportation Study. Since the completion of that study in 1999, Alan has worked throughout the West of Ireland on a range of projects including: major development schemes, the Galway City Outer Bypass, Limerick Planning Land-Use and Transportation Study, Limerick Southern Ring Road Phase II, cost benefit analyses (COBA) and various studies for the University of Galway. Before moving to Galway in 1997, Alan was involved in a wide variety of traffic and transport studies for CBP throughout the UK, Malta and Indonesia. He has particular expertise in the assessment of development related traffic, including many consented wind farm developments including the following; Ardderoo, Derrinlough, Knocknamork, Meenbog, Shehy More, Cloncreen, Ballyhorgan, Cahermurphy, Lettergull, Barnadivane, Cleanrath and Knocknalough.

Alan has a BEng (hons) Degree in Transportation Engineering (Napier University, Edinburgh, 1989), is a member of Engineers Ireland and of the Institute of Highways and Transportation and is a TII accredited Road Safety Audit Team Member.

Traffic counts were undertaken by Traffinomics Ltd, which is an Irish traffic survey company; with a comprehensive knowledge of traffic data collection methods. The company is 10 years old and is headed by Simon Wheeler, who has been in the traffic survey data collection business for 35 years. Previously Simon worked with Count On Us Ltd followed by Abacus Transportation Surveys Limited, Ireland's first lens based traffic data collection business. Clients include TII, Local Authorities and many leading retailers.

15.1.1.3 Guidance and Legislation

This section has been completed in accordance with the guidance set out in Chapter 1 of this EIAR. The assessment uses standard terminology (refer to Table 1-2 of Chapter 1 of the EIAR) to describe the likely significant effects associated with the proposed development. Further information on the classification of effects used in this assessment is presented in Section 1.8 of this EIAR. See also Section 15.1.1.4 below for additional guidance that has been adhered to.

15.1.1.4 Scoping and Consultation

The scope for this assessment has been informed by consultation with statutory consultees, bodies with environmental responsibility and other interested parties as outlined in Sections 2.6 and 2.7 of Chapter 2 of the EIAR and summarised below.

Transport Infrastructure Ireland

Transport Infrastructure Ireland (TII) responded to Scoping on the 30th of March 2023, in which it provided a list of recommendations to be followed when preparing the EIAR. All relevant TII guidelines and policies have been adopted in the preparation of this assessment, including the following;

- PE-PDV-02045, Transport Assessment Guidelines, Transport Infrastructure Ireland, May 2014
- PE-PAG-02017, Project Appraisal Guidelines, Unit 5.3, Travel Demand Projections, Transport Infrastructure Ireland, October 2021
- DN-GEO-03060, Geometric Design of junctions, Transport Infrastructure Ireland, May 2023.

Specific issues raised by TII include the following;

- TII notes that the subject site accesses the local and regional road network via the N59 national secondary road and that consultations should be had with relevant Local Authority / National Roads Design Offices with regards to locations of existing and future national roads schemes. It is confirmed that extensive consultation has been undertaken with the Local Authorities as set out below.
- TII is specifically concerned as to the potential significant impacts that the development would have on the national road network (and junctions with national roads) in the proximity of the proposed development, including the potential Turbine Delivery Route. The impacts of the Proposed Development in terms of link flows on the delivery routes are set out is Section 15.1.6.1 of the EIAR, while an assessment of the capacity of the R314 / Killerduff Road junction is set out in Section 15.1.6.2. A swept path analysis undertaken for the abnormally large loads on the Turbine Delivery Route, is discussed in Section 15.1.8 of the EIAR. The assessment sets out the temporary local measures that will be required on the national, regional and local road networks during the construction of the Proposed Development.
- Visual impacts should be assessed from existing national roads. This is addressed in Chapter 14 Landscape & Visual of the EIAR.
- The developer should have regards to any EIS and all conditions and /or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should in particular have regard to any potential cumulative impacts. The traffic related cumulative impacts are addressed in Section 15.1.10.5 of this EIAR.
- The developer, in preparing an EIAR, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works). It is confirmed that all relevant guidelines were adopted in the preparation of this EIAR.
- The developer, in preparing EIAR, should have regard to TII's Environmental Assessment and Construction Guidelines, including the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (National Roads Authority, 2006). This is addressed in Chapter 10 Air Quality of the EIAR.
- The EIAR should consider the Environmental Noise Regulations 2006 (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (1st Rev., National Roads Authority, 2004)). This is addressed in Chapter 12 Noise & Vibration of the EIAR.
- It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site with reference to impacts on the national road network and junctions of lower category roads with national roads. In relation to national roads, the Authority's Traffic and Transport Assessment Guidelines (2014) should be referred to in relation to proposed development with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of the NRA/TII TTA Guidelines which addresses requirements for sub-threshold TTA. Any improvements required to facilitate development should be identified. It will be the responsibility of the developer to pay

for the costs of any improvements to national roads to facilitate the private development proposed as TII will not be responsible for such costs. It is confirmed that the assessment presented in Chapter 15 of the EIAR is undertaken in accordance with Traffic and Transport Assessment Guidelines, TII (2014).

- The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required, It is noted that a new access junctions is proposed on the regional road network. It is proposed that the Road Safety Audit process is undertaken prior to the commencement of construction of the Proposed Development.
- In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network. All construction will be undertaken in accordance with current guidelines including the "Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works" (DoT now DoTT&S) and "Guidance for the Control and Management of Traffic at Roadworks" (DoTT&S).
- In relation to haul route identification the applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed. Where abnormal weight loads are proposed separate structure approvals and other licenses maybe required in connection with the proposed haul route and all structures on the haul route should be checked by the applicant/developer, to confirm their capacity to accommodate any abnormal load proposed. The proposed haul routes are identified in this Chapter 15 of the EIAR. While it is proposed that the delivery stage of the Proposed Development will involve abnormally large loads, the axle loadings will not exceed accepted limits. A program of pre delivery condition and structural assessment of the route is however proposed, as set out in the Traffic Management Measures, included as Appendix 15-2.
- In relation to grid connection and cable routing, proposals should be developed to safeguard proposed road schemes, as TII will not be responsible for costs associated with future relocation of cable routing, where proposals are catered for in an area of a proposed national road scheme. In that regard, consideration should be given to routing options, use of existing crossings, depth of cable laying, etc. It is noted that the proposed cable route does not impact on any existing national road or any proposed national road scheme.
- In the context of existing national roads, alternatives to the provision of cabling along the national road network, such as alternative routing or the laying of cabling in private lands adjoining the national road, should be considered in the interest of safeguarding the investment in and the potential for, future upgrade works to the national road network. The cable routing should avoid all impacts to existing TII infrastructure, such as traffic counters, weather stations. etc. and works required to such infrastructure shall only be undertaken in consultation with and subject to the agreement of TII. Any costs attributable shall be borne by the applicant / developer. The developer should also be aware that separate approvals may be required for works traversing the national road network. Again, it is noted that the proposed cable route does not impact on any existing national road or any proposed national road scheme.

Mayo County Council

Mayo County Council responded to the scoping request on 16th June 2021. The Roads Department commented on the following issues:

- An assessment of the structural capacity of the local road network adjacent to the proposed wind farm will be required, which should include Falling Weight Deflectometer (FWD) and visual assessments.

- Structural road pavement improvements identified from the FWD and visual assessments will be required in advance of any construction, and following completion, if required. If required, these will be undertaken as part of proposed mitigation measures set out in Section 15.1.10.6.
- The proposal to construct the grid connections along the local road network and N59 is not acceptable as it has the potential to undermine the structural capacity of the roads concerned. A private wayleave should be secured. It is noted that the proposed grid connection cable route does not travel along the N59.
- Details of any significant additional strengthening and widening of the public road along the haul route should be provided, with works undertaken in advance of any construction works commencing. Temporary measures required on the Turbine Delivery Route are set out in Section 15.1.8 of this EIAR.
- Any pavement damage caused by construction traffic / activities must be repaired to the satisfaction of Mayo County Council. This Applicant agrees with this statement as set out in Section 15.1.10.6.

15.1.1.5 Methodology and Section Structure

The traffic and transport assessment is undertaken in accordance with the guidance for such assessments set out by TII (listed in Section 15.1.1.4 above). The geometric requirements of the turbine delivery vehicles were assessed using Autocad and Autotrack, with this element undertaken by Collett & Sons Ltd. Collett & Sons Ltd. are a specialist heavy transport and general haulage logistics company that have provided haulage consultancy services, including geometric assessments of turbine delivery routes, since 1998.The Traffic and Transport Section of this chapter is set out as follows:

- A review of the existing and future transport infrastructure on the proposed delivery routes serving the Proposed Development (Wind Farm and Grid Connection), including an assessment of observed traffic flows from 2019 and 2021, and traffic forecasts for an assumed construction commencement date in the year of 2028 (Sections 15.1.2 - Receiving Environment and 15.1.3 – Existing Traffic Volumes).
- A description of the nature of the Proposed Development and the traffic volumes that it will likely generate during the different construction stages and when it is operational and during decommissioning (Section: 15.1.4 – Proposed Development and Traffic Generation).
- A description of the abnormally sized loads and vehicles that will require access to the site (Section 15.1.5 – Construction Traffic Design Vehicles).
- A review of the likely increases in traffic volumes due to development generated traffic on links and junctions (Section 15.1.6 – Expected Traffic during Construction, during Operation and during Decommissioning.
- Identification of traffic management for large deliveries during construction and decommissioning (Section 15.1.7 – Traffic Management for Large Deliveries).
- A geometric assessment of the turbine delivery route and its capacity to accommodate the abnormal-sized loads associated with the Proposed Development (Section 15.1.8 – Abnormal Load Route Assessment).
- An assessment of the provision for sustainable modes of travel (in this case primarily with respect to the transport of construction staff) (Section 15.1.9 – Provision for Sustainable Modes of Travel).
- An assessment of the effects of the Proposed Development on roads and traffic (Section 15.1.10 – Likely and Significant Effects and Associated Mitigation Measures, including Traffic Management Plan).

15.1.2 Receiving Environment

15.1.2.1 Site Location

The Proposed Development, known as Glenora Wind Farm, is located in north Co. Mayo, in the townlands listed in Table 1-1 of Chapter 1: Introduction.

The Proposed Development site is located approximately 6km southwest of Ballycastle and 19km north of Crossmolina. The Proposed Development site entrance is accessed off an unnamed local road approximately 6 km west of the R314 Regional Road. The site location is shown in Figure 1-1 of the EIAR.

15.1.2.2 Proposed Abnormal Size Load Delivery Route (Turbine Delivery Route)

A detailed assessment of the transport route for the abnormally large vehicles (TDR) was carried out. The TDR commences from the proposed port of entry in Galway City, with the route shown in Figure 15-1 and discussed in detail in Section 15.1.8.

The route assessment includes 38 no. locations on the TDR, that were identified as potential pinch points and were subject to geometric assessment, as shown in Figures 15-2a, 15-2b, 15-2c and 15-2d, and are as follows.

- Location 1 – The assessment locations include the left turn from Monivea Road onto Connolly Avenue
- Location 2 – The right turn from Connolly Avenue onto the Tuam Road (R336) in Galway City.
- Location 3 – The right turn from the Tuam Road (R336) onto the N6 in Galway City.
- Location 4 – The left turn on the N6 through the Coolagh Roundabout in Galway City.
- Locations 5 and 6 – The Kilmore and Mountpotter Roundabouts on the Tuam Bypass respectively.
- Locations 7 and 8 – The route then heads north for approximately 60 km on the N17 through the villages of Milltown, Ballindine, Knock and Killkeely before accessing the N17 / N5 Bracklagh Roundabout (Location 7) and the N17 / N5 westbound slip road (Location 8) located to the south of Charlestown.
- Location 9 – The route then heads west on the N5 for approximately 30 km before turning right onto the N58 at Ballyvary.
- Locations 10, 11 and 12 through Foxford – The TDR then heads north for approximately 12 km on the N58 to the town of Foxford, where the route negotiates the urban network via the N58 / N26 junctions and the River Moy Bridge crossing.
- Locations 13, 14 and 15 through Ballina – From Foxford the route travels north on the N26 for approximately 17 km to Ballina where the town will be negotiated at the junctions between the R314 Killala Road / Sli Ectra (Location 13), Sli Ectra / L1119 McDermott Street (Location 14) and the Gurteens Roundabout (Location 15).
- Locations 16 and 17 through Crossmolina – From Ballina the TDR heads west on the N59 for approximately 13 km to Crossmolina where the roundabout on the east side of the Deel River (Location 16) and the S-bend on the eastern side of the river (Location 16) will require to be negotiated.
- Location 18 – From Crossmolina the route continues west on the N59 for approximately 19 km to the sharp bend located at Bellacorick. At this location it is proposed to use the existing bypass that has been constructed for the purpose of turbine delivery in the townland of Moneynieren. This bypass was permitted by

ABP following a Section146B request by Owenniny Power 2 DAC (ABP Ref. 309043-20).

- Locations 19 to 20 – The route then heads west on the N59 for approximately 13 km passing through bends at Ballymunnelly (Location 19) before continuing in a northwest direction on the R313 at Bangor-Erris. The route continues on the R313 for approximately 1.5kms before turning right at a priority junction onto the L1204 near Attavally (Location 20).
- Locations 21 to 24 – From this location the route heads north on the L1204 for approximately 9km passing through bends at Glencullen Lower (Location 21), Glemturk More Bog (Location 22) and Ballagelly South (Location 23) before turning right at the priority junction with the R314 (Location 24).
- Locations 25 to 38 – The route then progresses east for approximately 30 kms on the R314 negotiating bends at Belderrig More (Locations 25 to 28, Belderrig (Locations 29 to 31), Glenurla (Locations 32 and 33), Muingelly (Locations 34 and 35) and Killerduff (Location 36). The route then continues on the R314 before turning right onto a new road at a location approximately 0.6kms northwest of Ballycastle (Location 37). The new link road then links into the local Ballyglass local road. The route then travels west on the unnamed road in Ballyglass before heading southwest at a Y-junction (Location 39) to access the proposed site.

All deliveries of abnormally sized loads will be made using Garda Siochana escorts and local transient traffic management measures put in place by the haulage company in the form of escort vehicles.

15.1.2.3 Proposed Construction Traffic Haul Route

The delivery route(s) for general construction traffic including site staff and heavy goods vehicles (HGVs) may vary depending on the location of the suppliers used for concrete and other materials required to construct the Proposed Development. Based on the location of suppliers in the vicinity of the Proposed Development (as described below), it is estimated that concrete and general construction traffic may travel towards the site via the R314 to the east and west, or the R315 to the east, and that these roads then link into the national road network via the N59, as shown in the delivery routes for general construction traffic in Figure 15.1.

Concrete

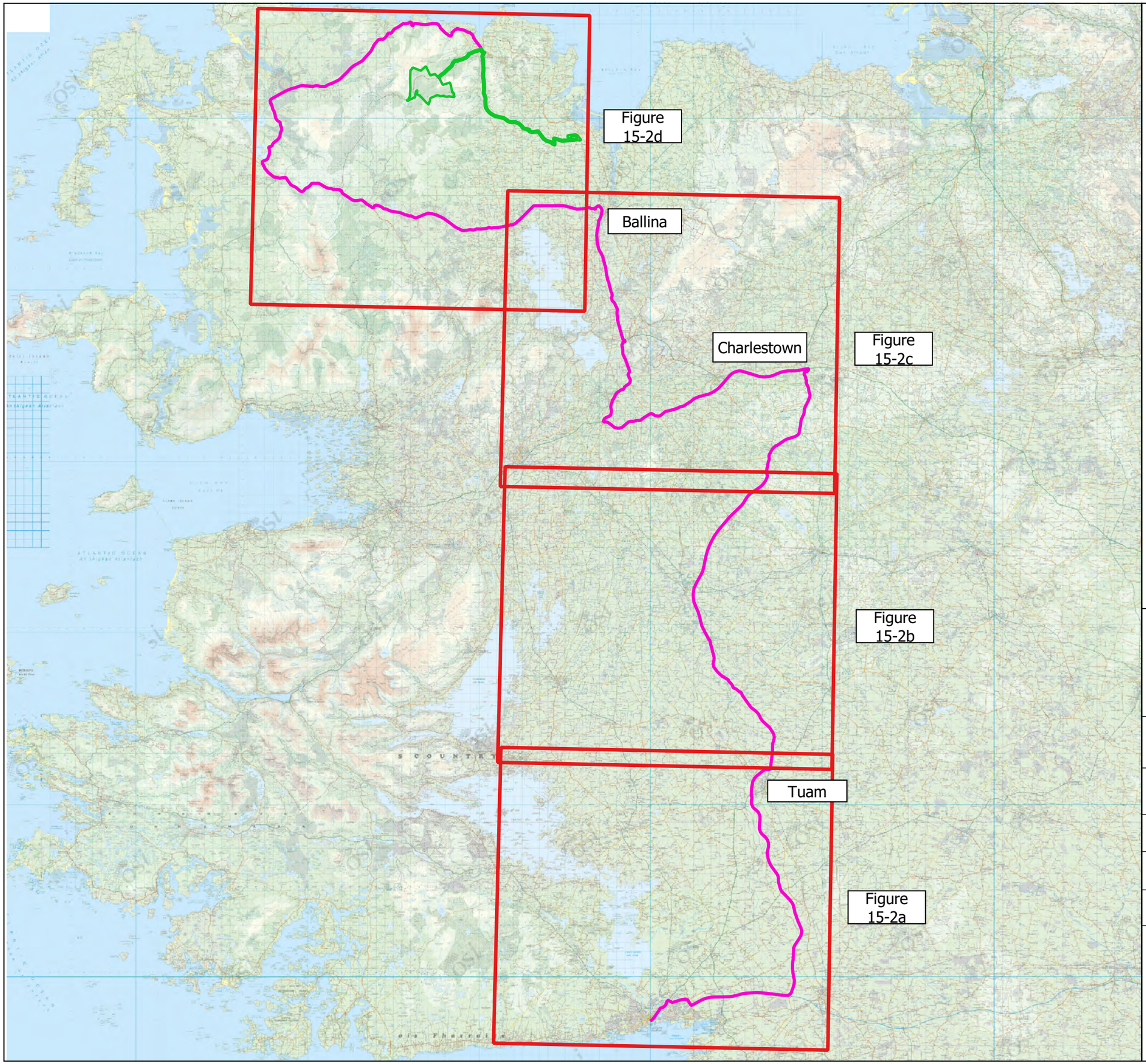
- It is not confirmed at this stage where the concrete required for the turbine foundations during the construction phase will be transported from. For the purposes of the assessment, it has been assumed the concrete will be transported from local quarries located to the east, south and west of the site. Stone from any of the quarries will be transported to the site via the R314.

General construction materials, felled timber, other miscellaneous items and waste

- Similarly, it is not confirmed at this stage where general construction materials, felled timber, miscellaneous items and waste will be transported from or to. Again, in order therefore to test a precautionary scenario it was assumed that all general construction traffic may be delivered from as far as the N59 in Ballina, as shown in Figure 15-1.

Other wind turbine component deliveries (components delivered using standard HGVs)

- All other wind turbine components delivered by standard HGVs will arrive at the Port of Galway and will be delivered by via the same TDR as for the abnormally



Map Legend

- EIAR Site Boundary
- Proposed Turbine Delivery Route
- Glenora Route Assessment Locations

Drawing Title

Overall Turbine Delivery Route

Project Title

Glenora Wind Farm

Drawn By	Checked By
ER	EMC
Project No.	**Drawing No.**
201120	15-1
Scale	**Date**
1:430,000	2023-12-08

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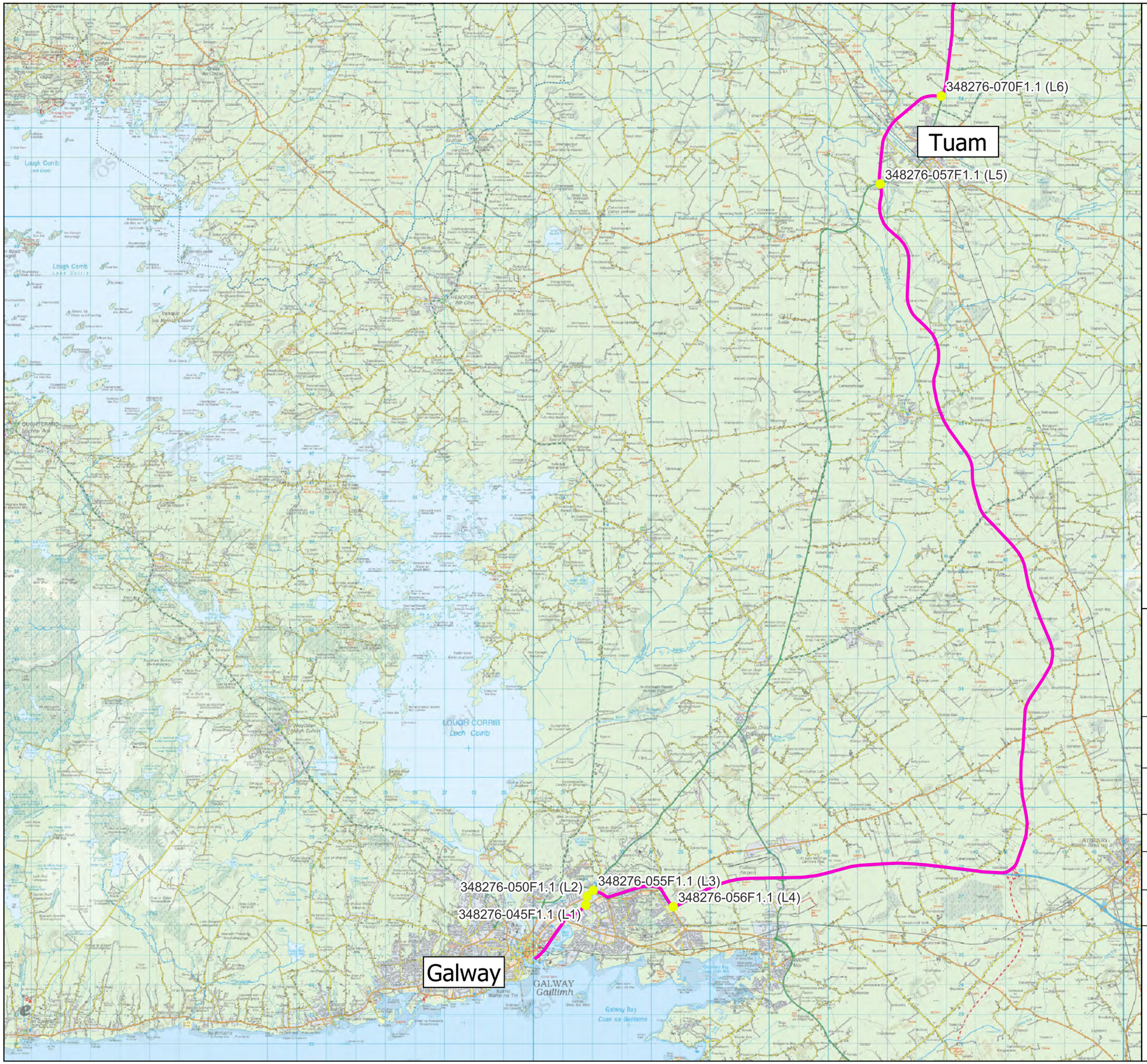

Map Legend

- Proposed Turbine Delivery Route
- Route Assessment Points

Drawing Title

Route Assessment Locations

Project Title

Glenora Wind Farm

Drawn By	Checked By
ER	EMC
Project No.	**Drawing No.**
201120	15-2a
Scale	**Date**
1:125,000	2023-12-08

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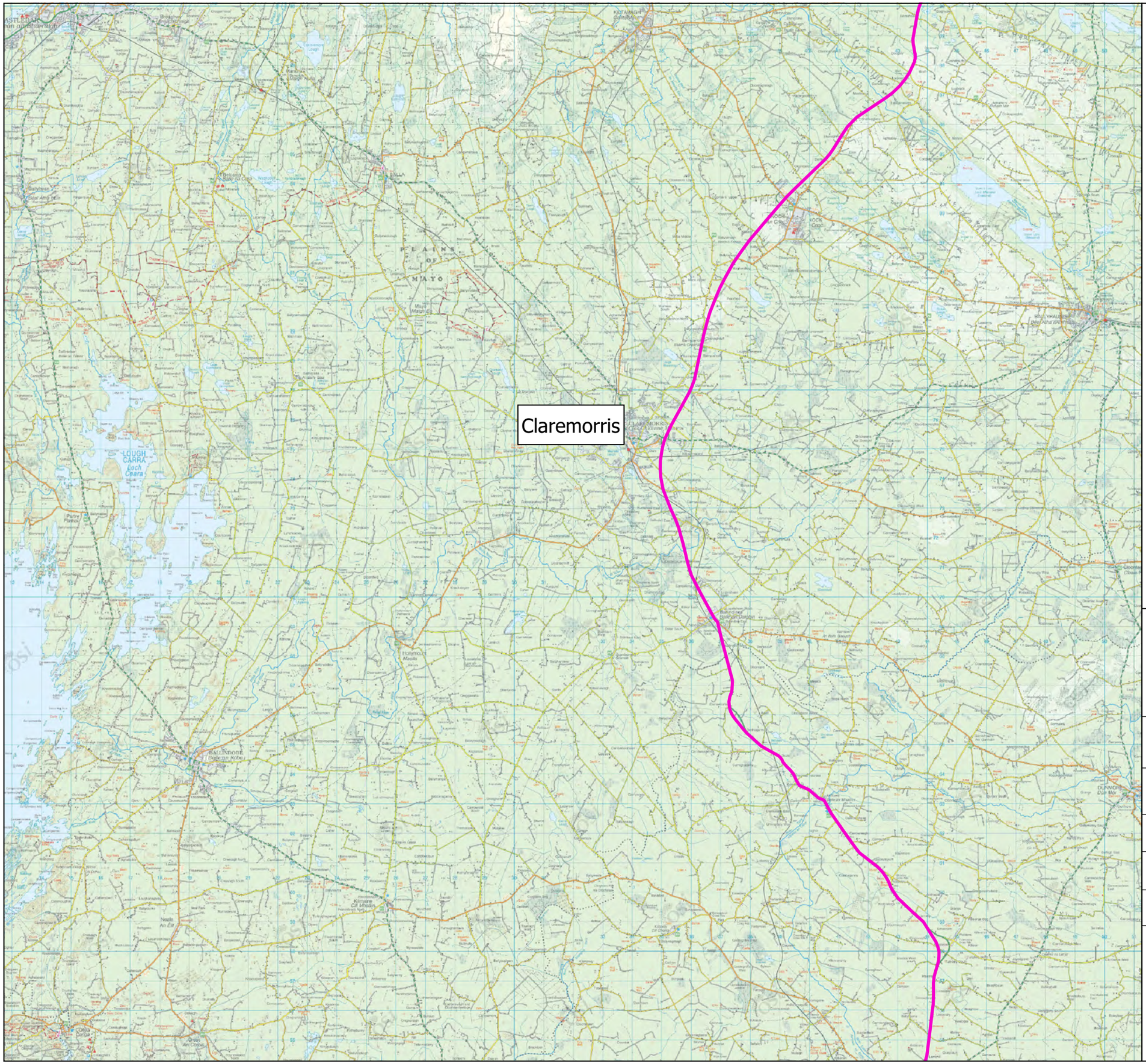

Map Legend

- Proposed Turbine Delivery Route
- Route Assessment Points

Drawing Title

Route Assessment Locations

Project Title

Glenora Wind Farm

Drawn By	Checked By
ER	EMC
Project No.	Drawing No.
201120	15-2b
Scale	Date
1:125,000	2023-12-08

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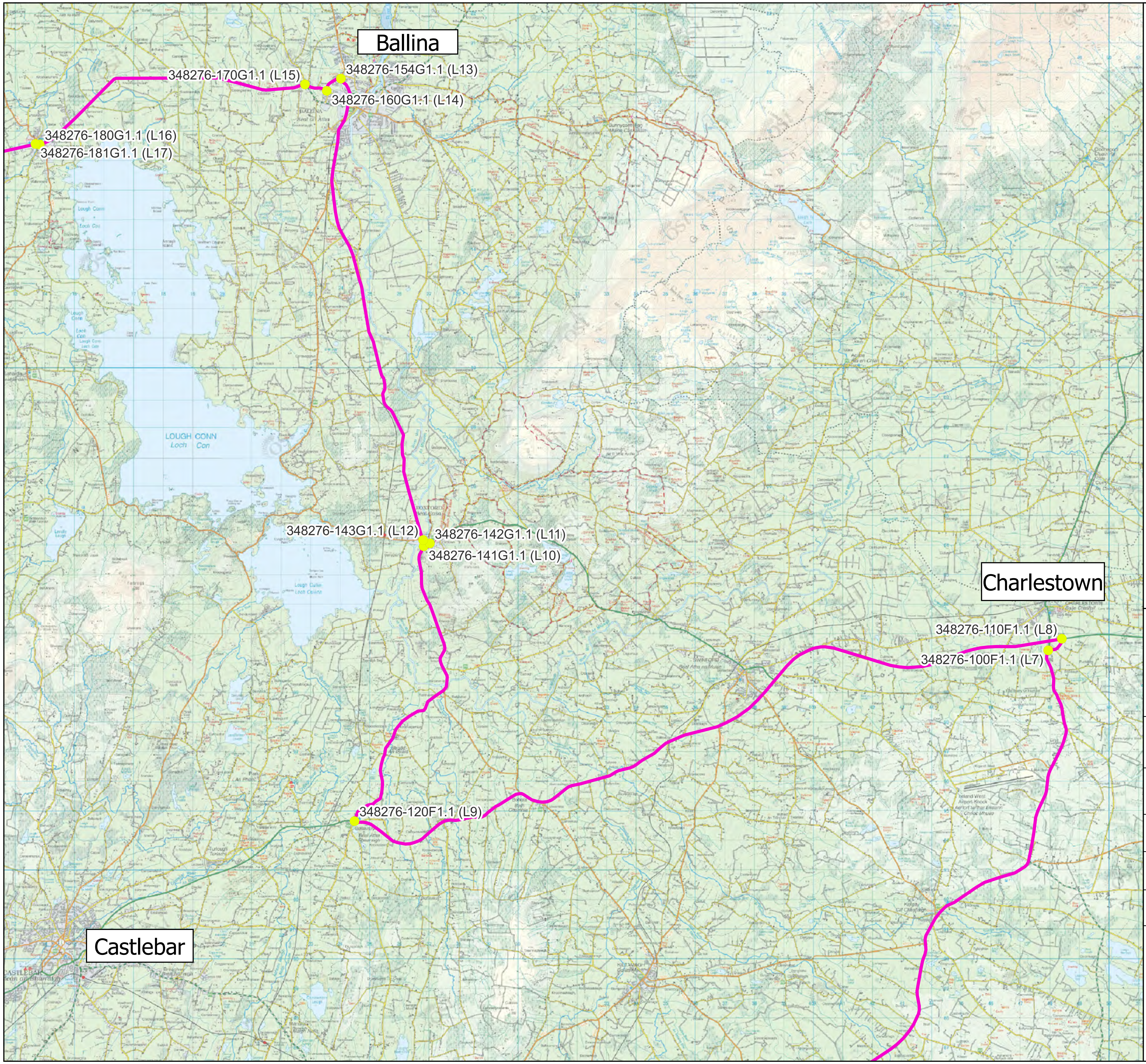

Map Legend

- Proposed Turbine Delivery Route
- Route Assessment Points

Drawing Title	Route Assessment Locations
Project Title	Glenora Wind Farm
Drawn By: ER	Checked By: EMC
Project No.: 201120	Drawing No.: 15-2c
Scale: 1:125,000	Date: 2023-12-08

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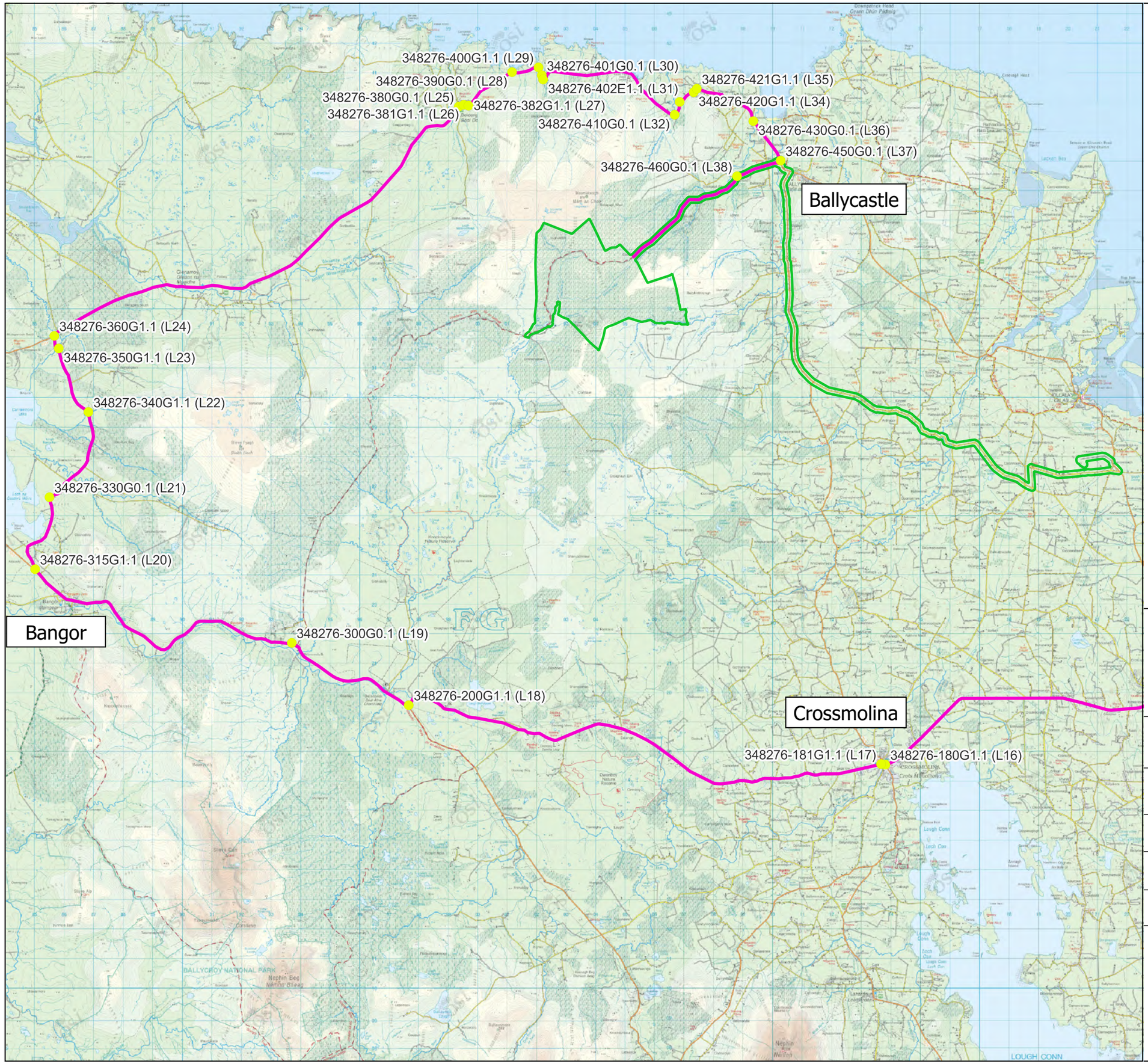

Map Legend

- Proposed Turbine Delivery Route
- Route Assessment Points
- EIAR Site Boundary

Drawing Title

Route Assessment Locations

Project Title

Glenora Wind Farm

Drawn By	Checked By
ER	EMC
Project No.	**Drawing No.**
201120	15-2d
Scale	**Date**
1:125,000	2023-12-08

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sized loads as set out in 15.1.2.2 above and will occur at the same time as the abnormal sized loads.

The impacts of additional traffic generated due to the construction of the grid connection are also assessed, including the potential impacts on existing traffic that will require to undertake local detours for short periods.

The assessment presented in this chapter of the EIAR is based on these conservative scenarios.

15.1.2.4 Site Entrances

During the construction phase, the proposed development site will be accessed via an existing entrance off an existing forestry access road which runs along the eastern boundary of the site in the townland of Glenora. The existing forestry access road merges with the Ballyglass local road approximately 4.7km to the northeast of the site in the townland of Ballyglass. The Ballyglass local road meets the R314 approximately 1.6km further east.

This existing entrance will be widened to accommodate turbine component deliveries and will also be used as the primary site entrance for HGVs and other abnormal loads during the construction phase of the proposed development.

Once the proposed Glenora Wind Farm is operational, this entrance will remain in place and will be used for forestry operations. The entrance will be used in the event of the delivery of a replacement turbine component or other abnormal load required for the operational maintenance of the wind farm. It will also be used by operational and maintenance staff and by the visiting public in order to access the recreation and amenity facilities.

The on-site substation will be accessed via the existing site entrance off the existing forest road running along the eastern boundary of the site.

The site entrance is shown on Figure 4-1b and on the layout drawings included in Appendix 4-1 of this EIAR.

15.1.3 Existing Traffic Volumes

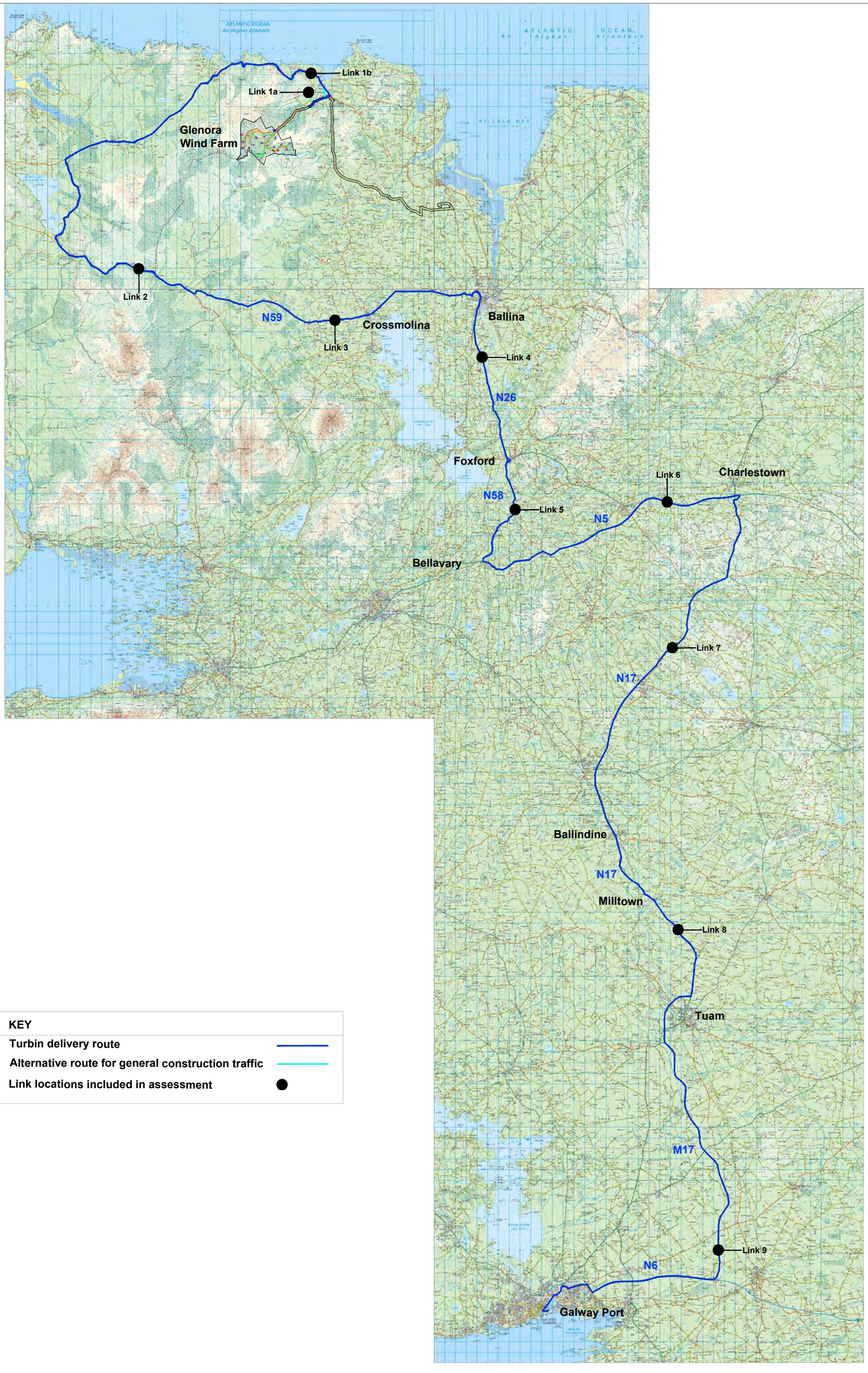
It should be noted that traffic volumes are discussed in terms of vehicles and passenger car units (PCU), where each vehicle is expressed in terms of its demand on the network relative to the equivalent number of cars or light goods vehicles (LGV). For example, an articulated HGV was given a factor of 2.4 passenger car units (as per TII Project Appraisal Guidelines for National Roads Unit 5.2), while one of the extended loaders required to transport the large wind turbine equipment and discussed in Section 15.1.5 was assigned a value of 10 PCUs.

15.1.3.1 Background Traffic Flows

Link count locations 1 to 9 included in the assessment are shown in Figure 15-3.

An all-day classified turning count was undertaken by Traffinomics Ltd at the junction between the Killerduff Road leading to the site and the R314 (Links 1a and 1b) and on the N59 adjacent to the L-52926 at Ballymunnelly (Link 2). These counts were undertaken in 2021 and provided base flows for these links. For all other links on the TDR (Links 3 to 9) traffic flow data was obtained from continuous traffic count sites maintained by TII.

The traffic count undertaken at the R314 / Killerduff Road junction and on the N59 at Ballymunnelly were undertaken on Tuesday 27th July, 2021, which was during a period when some Covid-19 related government travel restrictions were impacting on traffic flows. In order to determine the scale of the



KEY

Turbin delivery route	
Alternative route for general construction traffic	
Link locations included in assessment	

NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-3 Route assessment location plan

PROJECT:	Glenora Wind Farm		
CLIENT:	SSE	SCALE:	NTS
PROJECT NO: 9351	DATE: 14.12.23	DRAWN BY:	AL

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TRAFFIC & TRANSPORT CONSULTANTS

likely reduction in traffic demand on the day of the survey, daily traffic volumes observed at the TII count site on the N59, closest to the site were compared for the year 2019, prior to the Covid-19 pandemic, with those recorded in 2021, the year of the survey. An average annual daily traffic volume of 2,175 vehicles was observed in 2019, compared to 1,884 in 2021, indicating a Covid-19 related correction factor for traffic demand on the N59 of +15.4%.

The observed Year 2021 traffic flows for the Killerduff Road, the R314 and the N59 at Ballymunnelly are shown in Table 15-1, with the Covid-19 adjusted flows shown in the same table.

The base data used from the ATC counts was taken from the year 2019, which predates the Covid-19 pandemic, with no correction factor therefore required. The base data for all links 1 to 9 are shown in Table 15-2.

Table 15-1 Observed average all day traffic flows (AADT) by location and year (2-way vehicles)

Link	2021 observed	2021 Covid-19 adjusted
1a. Killerduff Road to site	72	83
1b. R314 north of Ballycastle	1,108	1.279
2. N59 adjacent to L-52926	3,192	3,684

Table 15-2 Observed average all day traffic flows (AADT) by location and year (2-way vehicles)

Link	2019	2021
1a. Killerduff Road to site	NA	83
1b. R314 north of Ballycastle	NA	1,279
2. N59 adjacent to L-52926	NA	3,684
3. N59 between L-52926 and Ballina	2,175	NA
4. N26 between Foxford and Ballina	8,095	NA
5. N58 between Ballylahan and Foxford	6,016	NA
6. N5 between Swinford and Charlestown	5,730	NA
7. N17 between Charlestown and Knock	6,422	NA
8. N17 Tuam and Claremorris	9,893	NA
9. M17 between N63 and M6	11,506	NA

15.1.3.2 Future Background Traffic Volumes

This section describes the process adopted to produce background traffic forecasts for an assumed construction year of 2028.

Revised guidelines for forecasting annual growth in traffic volumes were produced by TII in October 2021, as set out by county in the 'Project Appraisal Guidelines for National Roads (Unit 5.3)'. The annual growth rates for light vehicles for Co. Mayo, and factors for the years relevant to this study, are shown in Table 15-3 and Table 15-4. Traffic volumes are forecast to increase during the period from 2019 to 2028 (the assumed construction year) by 12.0% and from 2021 to 2028 by 9.2%, assuming a medium growth scenario. All day traffic flows at locations 1 to 9 are compared for the years 2019, 2021 and 2028 in Table 15-5.

It should be noted that while the assumed construction year of 2028 may vary slightly, this will not alter the forecast outcomes and effects presented in this section of the EIAR. This is due to the annual growth rate for background traffic being just 1.27% (as shown in Table 15-3 as 1.0127) and the traffic volumes generated by the Proposed Development will remain unchanged regardless of construction year, as presented subsequently in Section 15.1.4.

Table 15-3 TII Traffic Growth Annual Factors and Indices for County Mayo

Year	Lights – Annual Factor			Lights (Cars and LGVs) – Cumulative factor		
	Low	Medium	High	Low	Medium	High
2019	1.0111	1.0127	1.0161	1.000	1.000	1.000
2020	1.0111	1.0127	1.0161	1.011	1.013	1.016
2021	1.0111	1.0127	1.0161	1.022	1.026	1.032
2022	1.0111	1.0127	1.0161	1.034	1.039	1.049
2023	1.0111	1.0127	1.0161	1.045	1.052	1.066
2024	1.0111	1.0127	1.0161	1.057	1.065	1.083
2025	1.0111	1.0127	1.0161	1.068	1.079	1.101
2026	1.0111	1.0127	1.0161	1.080	1.092	1.118
2027	1.0111	1.0127	1.0161	1.092	1.106	1.136
2028	1.0111	1.0127	1.0161	1.104	1.120	1.155

Source: TII Project Appraisal Guidelines – Unit 5.3, October 2021

Table 15-4 TII traffic growth rates by growth scenario

Period	New Factors		
	Low	Medium	High
2019 – 2028	1.104	1.120	1.155
2021 – 2028	1.080	1.092	1.118

Table 15-5 All day flows by year (2-way vehicles)

Link	2019	2021	2028
1a. Killerduff Road to site	NA	83	91
1b. R314 north of Ballycastle	NA	1,279	1,396
2. N59 adjacent to L-52926	NA	3,684	4,022
3. N59 between L-52926 and Ballina	2,175	NA	2,436
4. N26 between Foxford and Ballina	8,095	NA	9,066
5. N58 between Ballylahan and Foxford	6,016	NA	6,738
6. N5 between Swinford and Charlestown	5,730	NA	6,418
7. N17 between Charlestown and Knock	6,422	NA	7,193
8. N17 Tuam and Claremorris	9,893	NA	11,080
9. M17 between N63 and M6	11,506	NA	12,887

The classified counts undertaken at the R341 / Killerduff Road and the N58 at Ballymunnelly Road, together with the ATC sites maintained by TII on the delivery route were used to determine the existing percentage of HGVs on the study area network. The observed percentage of HGVs was observed to vary on the turbine delivery route from 3.4% on the R314 north of Ballycastle to 13.8% on the N59 at Ballymunnelly. Traffic volumes forecast on the study network for the year 2028 are shown by vehicle type in Table 15-6.

Table 15-6 All day flows, percentage HGVs and flows by vehicle type, year 2028

Link	All day flow (vehs)	% HGV's	Vehicles		PCUs		
			HGVs	Cars / LGVs	HGVs	Cars / LGVs	Total
1a. Killerduff Road to site	91	5.6%	5	86	12	86	98
1b. R314 north of Ballycastle	1,396	3.4%	47	1,349	114	1,349	1,463
2. N59 adjacent to L-52926	4,022	13.8%	555	3,467	1,332	3,467	4,800
3. N59 between L-52926 and Ballina	2,436	4.6%	112	2,324	269	2,324	2,593

Link	All day flow (vehs)	% HGV's	Vehicles		PCUs		
			HGVs	Cars / LGVs	HGVs	Cars / LGVs	Total
4. N26 between Foxford and Ballina	9,066	4.2%	381	8,686	914	8,686	9,600
5. N58 between Ballylahan and Foxford	6,738	3.5%	236	6,502	566	6,502	7,068
6. N5 between Swinford and Charlestown	6,418	6.3%	404	6,013	970	6,013	6,984
7. N17 between Charlestown and Knock	7,193	5.2%	374	6,819	898	6,819	7,716
8. N17 Tuam and Claremorris	11,080	4.3%	476	10,604	1,143	10,604	11,747
9. M17 between N63 and M6	12,887	5.4%	696	12,191	1,670	12,191	13,861

15.1.4 Proposed Development and Traffic Generation

15.1.4.1 "Do Nothing" Scenario

If the Proposed Development does not proceed, there will be no additional traffic generated or accommodation works carried out on the local road network as a result of the Proposed Development and therefore no direct or indirect effects on roads and traffic will occur.

15.1.4.2 Development Trip Generation – During Construction

The assessment of the effects of traffic generated during the construction of the Proposed Development is considered in two stages.

- Stage 1 – Site preparation and groundworks, construction of turbine foundations, cabling, met mast foundation, substation construction, construction of compounds, upgrade and construction of access roads, tree felling, grid connection cable laying and,
- Stage 2 – Turbine component delivery and construction.

For the purpose of the traffic impact assessment, projections based on trip generation data collected from other wind farm construction projects regarding the numbers of trips per quantum of material, the number of turbine component parts based on 22 turbines, the length of the construction phase and work periods were made to inform the assessment. These projections allow for a best estimate but should not be inferred as prescriptive limitations to the construction phase. There are numerous variables which can affect a construction phase programme such as weather for example. The construction phase of the Proposed Development will be carried out in accordance with the CEMP, which is submitted as Appendix 4-3 of this EIAR.

The construction phase of the Proposed Development is expected to last approximately 18 to 24 months (1.5 to 2 years). The shortest potential construction phase duration of 18 months was assumed for the purpose of this assessment in order to test a conservative scenario in terms of concentration of construction traffic volumes. The shortest construction period will give rise to higher volumes of construction traffic using the public road network at any one time.

For assessment purposes a standard 255 working days per annum was adopted, equating to 383 working days over an 18 month construction period. Of these 383 days, the assessment presented below is based on the following number of delivery days for each stage of construction;

- Stage 1 – Site preparation and groundwork – Concrete foundation pouring (22 days)
- Stage 1 – Site preparation and groundwork – All other days(299 days)
- Stage 2 – Turbine construction – Delivery of abnormally sized loads (40 days)
- Stage 2 – Turbine construction – Delivery of other turbine components (22 days)

15.1.4.2.1 *Stage 1 – Site Preparation and Ground Works*

For the site preparation and ground works stage (Stage 1) the total numbers of deliveries made to the site during that period are shown in Table 15-7.

During this construction phase, there will be two distinct types of days with respect to trip generation. A total of 22 days will be used to pour the 22 concrete wind turbine foundations. Foundations will likely be poured one per day, with an estimated 75 concrete loads required for each turbine foundation delivered to the site over a 12-hour period. This will result in just over 6 HGV trips to and from the site per hour. On the remaining 299 working days for this stage, other general materials will be delivered to the site.

During all of Stage 1, it is estimated that 7,146 two-way HGV trips will be made to the site by trucks and large articulated HGVs, as set out in Table 15-7, with the daily effect on the local road network shown in Table 15-8 and 15-9.

The figures in Table 15-8 show that on the 22 days that concrete will be delivered to the site an additional 360 two-way PCUs will be added to the network (comprising 75 two-way HGV trips or 150 movements, with 2.4 PCUs per movement). Similarly, on the 299 days when other materials will be delivered to the site, traffic volumes on the local network are forecast to increase by an average 88 two-way PCUs (or on average 18.4 HGV trips to and from the site per day) as set out in Table 15-9.

Table 15-7 Stage 1 – Site preparation and groundworks – total movements

Material	Total no. Truck Loads	Truck type
Concrete	1,650	Trucks
Concrete blinding and steel	257	Large artic
Plant / fencing / compound set-up	56	Large artic
Forestry felling	1,181	Large artic
Crushed rock and stone	100	Trucks
Ducting / cabling	691	Large artic
Grid connection cable	3,000	Large artic
Cranes	11	Large artic

Substation components	150	Large artic
Refuelling / maintenance / misc (incl. waste)	51	Large artic
Total	**7,146**	

Table 15-8 Stage 1 – Concrete foundation pouring – total movements and volumes per delivery day

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Movements /day*	2- way PCUs/day
Concrete	1,650	Truck	2.4	3,960	180.0	360.0
* Estimation based on 22 concrete pouring days						

Table 15-9 Stage 1 – Site preparation and groundworks – total movements and volumes per delivery day

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Movements /day*	2- way PCUs/day
Concrete blinding and steel	257	Large artic	2.4	616.0	2.1	4.1
Plant / fencing / compound set-up	56	Large artic	2.4	133.8	0.4	0.9
Forestry felling	1,181	Large artic	2.4	2,833.6	9.5	19.0
Crushed rock and stone	100	Trucks	2.4	240.0	0.8	1.6
Internal Site Ducting / cabling	691	Large artic	2.4	1,657.9	5.5	11.1
Grid cable laying	3,000	Large artic	2.4	7,200.8	24.1	48.2
Cranes	11	Large artic	2.4	26.4	0.1	0.2
Substation components	150	Large artic	2.4	360.0	1.2	2.4

Material	Total Truck Loads	Truck type	PCU Value	Total PCUs	PCU Movements /day*	2- way PCUs/day
Refuelling / maintenance / waste collection / misc.	51	Large artic	2.4	123.2	0.4	0.8
Total	5,496			13,191	44.1	88.2
* Estimation based on groundwork period of 299 working days						

15.1.4.2.2 Stage 2 – Turbine Construction

During the turbine construction stage, including delivery and assembly, some deliveries to the site will be made by abnormally large vehicles, referred to in this section as extended artics, transporting the component parts of the turbines (nacelles, blades and towers). There will also be deliveries made by standard HGVs (large artics), transporting cables, tools and smaller component parts The types of load and associated numbers of trips made to the site during the turbine construction period are shown in Table 15-10, which summarises that a total of 198 trips will be made to and from the site by extended artics, with a further 88 trips made by standard large articulated HGVs.

Table 15-10 Stage 2 – Wind turbine plant – total movements

Material	Units	Quantity per Unit	Total Quantity	Quantity per Truck	Total Truck Loads	Truck type
Nacelle	22	1	22	1	22	Extended Artic
Blades	22	3	66	1	66	Extended Artic
Towers	22	5	110	1	110	Extended Artic
Sub total					***198***	
Transformer	22	1	22	1	22	Standard HGVs
Drive train and blade hub	22	1	22	1	22	Standard HGVs
Base and other deliveries	22	2	44	1	44	Standard HGVs
Sub total					***88***	
Total					**286**	

For the purpose of this assessment a delivery period based on previously constructed wind farm sites is provided, although this may be subject to change. It is assumed that the turbine delivery element will progress at the rate of 5 extended artic trips made by convoy to the site on 2 days per week, resulting in this stage taking approximately 40 days/nights spread over a 20-week period. On a further 22 days at 2 days per week, lasting for approximately 11 weeks, the remaining equipment required during this phase will be delivered to the site. The additional traffic movements for these 2 types of days are summarised in Table 15-11 and Table 15-12. In Table 15-11, a PCU equivalent value of 10 was allocated to each extended artic movement, resulting in an additional 100 PCUs on the study network on these 2 days per week, while an additional 14.4 PCUs are forecast to be on the network on two other days per week, as shown in Table 15-12, during the turbine construction phase.

Table 15-11 Stage 2 – Wind turbine plant, extended artics – total movements and volumes per delivery day

Material	Units	Truck Type	PCU Value	Total PCUs	2-way PCUs/ day
Nacelle	1	Extended Artic	10	10.0	20.0
Blades	3	Extended Artic	10	30.0	60.0
Towers	5	Extended Artic	10	50.0	100.0
Total per turbine	9			90.0	180.0
Total per delivery day	5			50.0	100.0
* Based on 5 abnormal sized loads being delivered per day on 2 days per week (total 198 loads will take 40 days/ nights spread over 20 weeks)					

Table 15-12 Stage 2 - Wind turbine plant, standard artic HGVs - total movements and volumes per delivery day

Material	Quantity per Unit	PCU Value	2-way PCUs / day
Transformer	1	2.4	4.8
Drive train and blade hub	1	2.4	4.8
Base & other deliveries	1	2.4	4.8
Total	3		14.4
* Based on equipment for 2 turbines being moved per week spread over 2 days			

15.1.4.2.3 Construction Employee Traffic

It is estimated that a maximum of 80 staff members will be employed on the site at any one time during the site preparation and groundworks stage of construction, reducing to a maximum of 40 staff at any one time during the turbine construction stage. If a worst case is assumed then all staff will travel to / from the site by car, at an average of 2 persons per car, then a total of 80 PCU movements (each trip is

two way). This is added to the network during the groundworks stage of the development, reducing to 40 PCU trips during the turbine construction stage. This has been included in the figures used in this assessment.

15.1.4.3 Development Trip Generation – During Operation

It is assumed that the wind farm will be unmanned once operational and will be remotely monitored. Traffic associated with the operational phase of the wind farm will be from the wind farm operator, Eirgrid personnel visiting the substation, and maintenance personnel who will visit individual turbines.

It is estimated that the traffic volumes that will be generated by the development once it is operational will be minimal. The site will be unmanned but will generate maintenance trips, with approximately two to three maintenance staff trips per week. The impact on the network of these trips during the operational stage is discussed in Section 15.1.10.3.

Once operational the site will also be open to visitors for amenity purposes, with those travelling by car using the carpark provided and accessed via the site access junction. Based on visitors to existing wind farm sites it is forecast that up to 20 car trips per day will be generated by this use.

15.1.4.4 Development Trip Generation – During Decommissioning

Traffic generation during decommissioning will be significantly less than the trip generation estimates presented for the construction phase presented in 15.14.1. This is because much of the materials brought into site during construction (i.e. concrete, steel formwork, electrical equipment in substation, ducting, crushed stone etc.) will be left in-situ during the decommissioning stage.

15.1.5 Construction Traffic Design Vehicles

The delivery of turbine components including blades, tower sections and nacelles is a specialist operation due to the oversized loads involved. The blades are the longest turbine component and in the case of the Proposed Development blades up to 81m long have been considered for the purpose of this assessment.

The proposed blade length of 81m has been assessed. A confirmatory delivery assessment and program will be carried out by the turbine delivery company.

For the purpose of this assessment set out in this EIAR, it is assumed that the blades, which are the largest turbine components, will be transported using an extended artic where practical. As this method involves transporting the blade in a horizontal position it represents the worst case in terms of the geometric requirements on the road network. For locations where the geometry is constrained, particular through the urban centres of Foxford and Ballina, and at various constrained locations on the N59, L1204, R314 and local road network to the site, the use of blade lift adaptors that can transport blades at an angle of 60º to both lift the rear of the blade and shorten the wheelbase of the transporter, are proposed. .

The critical vehicles in terms of size and turning geometry requirements and used in the detailed route assessment discussed in Section 15.1.8 are the set out below. The geometry of the design vehicles is included as an inset on each of the drawings Appendix 15-1.

The key dimensions of the vehicles tested are as follows:

Transport of Blades – Extended artic

Total length of vehicle 92.69m

Length of blade 81.0m

Transport of Blades – Blade Lift Adaptor Elevated

Total length of vehicle 52.02 m

Length of blade 81m raised to 60 degrees with effective length of 40.5m

The vehicles used to transport the tower sections and nacelles will be shorter in length compared to the blade transporters.

All other vehicles requiring access to the site will be standard HGVs and will be significantly smaller than the design test vehicles.

15.1.6 Expected Traffic During Construction, During Operation and During Decommissioning

As detailed below, transportation of large turbine components will be carried out at night when traffic is at its lightest and in consultation with the relevant Roads Authorities and An Garda Síochána with deliveries accompanied by Garda / Police escort.

15.1.6.1 Expected Traffic on Link Flows – During Construction

Background traffic volumes, as established previously and set out in Table 15-5, and development generated traffic volumes are shown for the anticipated construction day scenarios discussed in Section 15.1.4 are set out in Table 15-13 to 15-16, with the traffic effects summarised in Table 15-17 to 15-20. The actual figures presented in the tables, may vary slightly, however they represent a robust worst case assessment of the likely increases in traffic volumes.

The extent of the road network that the impacts of the various stages of construction traffic is assessed is shown in Figure 15-3. While the impacts of the delivery of the turbine component parts are assessed over the full extent of the route from the port of arrival in Galway City, the delivery of all other materials is assessed as far afield as the N59 from Ballina. This distinction is made as general construction materials, including concrete, are available from quarries and suppliers within this proximity to the site.

In terms of daily traffic flows the potential increase may be summarised as follows:

During Stage 1 - Site Preparation and Groundworks

For these 299 days an additional 121 PCUs will travel on the study network.

On these days the percentage increase in traffic volumes experienced on the study network compared to base traffic levels will be between +6.5% on the N59 between Ballymunnelly and Ballina, to +3.5% on the N59 just to the west of Ballymunnelly. Travelling south on the R314 toward Ballycastle it is forecast that traffic flows will increase by 11.5% while, due to the very low background traffic volumes on the Killerduff Road, traffic volumes are forecast to increase by 123.7% on these days.

During Stage 1 – Concrete Pouring

For these 22 days an additional 440 PCUs will travel on the study network.

On these days the percentage increase in traffic volumes experienced on the study network will be +17.0% on the N59 between Ballymunnelly and Ballina and +9.2% on the N59 just to the west of Ballymunnelly. Travelling south on the R314 toward Ballycastle it is forecast that traffic flows will increase by 30.1% while, again due to the very low background traffic volumes on the Killerduff Road, traffic volumes are forecast to increase by a factor of 5.5 (+449.7%).

During Stage 2 - Turbine Construction Stage – Delivery of large equipment using extended articulated vehicles

As stated previously, all of the deliveries for this stage will originate from the Port of Galway and will approach the site from the southwest, as shown in Figure 15-1.

The additional 140 PCUs (made up of cars and extended artics) will travel on the TDR over a period of 40 days. On the days this impact occurs, volumes will increase by between 1.0% on the M17 between Galway and Tuam, +1.2% on the N17 between Tuam and Claremorris to +2.0% on the N58 between Ballylahan and Foxford, to +5.4% on the N59 between Crossmolina and Bangor-Ennis. On the R314 just north of Ballycastle it is forecast that traffic flows will increase by 9.6%.%.

The most significant traffic impact may be experienced during these delivery periods primarily due to the slow speeds, size and geometric requirements of these vehicles. The provision of traffic management measures, including ensuring that these deliveries are made at night(as set out in Sections 15.1.7 and 15.1.10.6 and the Traffic Management Plan included as Appendix 15-2 of this EIAR), will be implemented in full to minimise the impact of development traffic on the study network on these days.

During Stage 2 - Turbine Construction Stage – Other deliveries using conventional articulated HGVs

For 22 days on the delivery route 55 additional PCUs (made up of cars and standard articulated HGV movements to the site and back) will travel on the study network. On the days this impact occurs, volumes will increase by between +0.5% on the M17 between Tuam and Claremorris to +0.8% on the N58 between Ballylahan and Foxford, to +2.1% on the N59 between Crossmolina and Bangor-Ennis. On the R314 just north of Ballycastle it is forecast that traffic flows will increase by 3.8%, while on the local Killerduff Road it is forecast that traffic volumes will increase by 56.2%.

Table 15-13 Development traffic during site preparation and groundworks 299 days – Stage 1

Link	Background PCUs			Development PCUs			Total PCUs (Background + Development)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1a. Killerduff Road to site	86	12	98	80	88	168	166	100	266
1b. R314 north of Ballycastle	1,349	114	1,463	80	88	168	1,429	202	1,631

Link	Background PCUs			Development PCUs			Total PCUs (Background + Development)		
2. N59 adjacent to L-52926	3,467	1,332	4,800	80	88	168	3,547	1,420	4,968
3. N59 between L-52926 and Ballina	2,324	269	2,593	80	88	168	2,404	357	2,761

Table 15-14 Effects of development traffic during turbine 22 days concrete pouring – Stage 1

Link	Background PCUs			Development PCUs			Total PCUs (Background + Development)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1a. Killerduff Road to site	86	12	98	80	360	440	166	372	538
1b. R314 north of Ballycastle	1,349	114	1,463	80	360	440	1,429	474	1,903
2. N59 adjacent to L-52926	3,467	1,332	4,800	80	360	440	3,547	1,692	5,240
3. N59 between L-52926 and Ballina	2,324	269	2,593	80	360	440	2,404	629	3,033

Table 15-15 Development traffic during turbine construction - extended artics (large turbine components) – Stage 2

Link	Background PCUs			Development PCUs			Total PCUs (Background + Development)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1a. Killerduff Road to site	86	12	98	NA	NA	NA	NA	NA	NA
1b. R314 north of Ballycastle	1,349	114	1,463	40	100	140	1,389	214	1,603
2. N59 adjacent to L-52926	3,467	1,332	4,800	40	100	140	3,507	1,432	4,940
3. N59 between L-52926 and Ballina	2,324	269	2,593	40	100	140	2,364	369	2,733

Link	Background PCUs			Development PCUs			Total PCUs (Background + Development)		
4. N26 between Foxford and Ballina	8,686	914	9,600	40	100	140	8,726	1,014	9,740
5. N58 between Ballylahan and Foxford	6,502	566	7,068	40	100	140	6,542	666	7,208
6. N5 between Swinford and Charlestown	6,013	970	6,984	40	100	140	6,053	1,070	7,124
7. N17 between Charlestown and Knock	6,819	898	7,716	40	100	140	6,859	998	7,856
8. N17 Tuam and Claremorris	10,604	1,143	11,747	40	100	140	10,644	1,243	11,887
9. M17 between N63 and M6	12,191	1,670	13,861	40	100	140	12,231	1,770	14,001

Table 15-16 Effect of development traffic during turbine construction – other deliveries (small turbine components) – Stage 2

Link	Background PCUs			Development PCUs			Total PCUs (Background + Development)		
	Car	HGV	Total	Car	HGV	Total	Car	HGV	Total
1a. Killerduff Road to site	86	12	98	40	15	55	126	27	153
1b. R314 north of Ballycastle	1,349	114	1,463	40	15	55	1,389	129	1,518
2. N59 adjacent to L-52926	3,467	1,332	4,800	40	15	55	3,507	1,347	4,855
3. N59 between L-52926 and Ballina	2,324	269	2,593	40	15	55	2,364	284	2,648
4. N26 between Foxford and Ballina	8,686	914	9,600	40	15	55	8,726	929	9,655
5. N58 between Ballylahan and Foxford	6,502	566	7,068	40	15	55	6,542	581	7,123

Link	Background PCUs			Development PCUs			Total PCUs (Background + Development)		
6. N5 between Swinford and Charlestown	6,013	970	6,984	40	15	55	6,053	985	7,039
7. N17 between Charlestown and Knock	6,819	898	7,716	40	15	55	6,859	913	7,771
8. N17 Tuam and Claremorris	10,604	1,143	11,747	40	15	55	10,644	1,158	11,802
9. M17 between N63 and M6	12,191	1,670	13,861	40	15	55	12,231	1,685	13,916

Table 15-17 Summary effect of development traffic during site preparation and ground works

Link	Background	Development	Total	% increase	Estimated No. of days
1a. Killerduff Road to site	98	168	266	171.7%	299
1b. R314 north of Ballycastle	1,463	168	1,631	11.5%	299
2. N59 adjacent to L-52926	4,800	168	4,968	3.5%	299
3. N59 between L-52926 and Ballina	2,593	168	2,761	6.5%	299

Table 15-18 Summary effect of development traffic during turbine concrete pouring – Stage 1

Link	Background	Development	Total	% increase	Estimated No. of days
1a. Killerduff Road to site	98	440	538	449.7%	22
1b. R314 north of Ballycastle	1,463	440	1,903	30.1%	22
2. N59 adjacent to L-52926	4,800	440	5,240	9.2%	22
3. N59 between L-52926 and Ballina	2,593	440	3,033	17.0%	22

Table 15-19 Summary effect of development traffic during turbine construction – extended artics (large turbine components)

Link	Background	Development	Total	% increase	Estimated No. of days
1a. Killerduff Road to site	98	NA	NA	NA	NA
1b. R314 north of Ballycastle	1,463	140	1,603	9.6%	40
2. N59 adjacent to L-52926	4,800	140	4,940	2.9%	40
3. N59 between L-52926 and Ballina	2,593	140	2,733	5.4%	40
4. N26 between Foxford and Ballina	9,600	140	9,740	1.5%	40
5. N58 between Ballylahan and Foxford	7,068	140	7,208	2.0%	40
6. N5 between Swinford and Charlestown	6,984	140	7,124	2.0%	40
7. N17 between Charlestown and Knock	7,716	140	7,856	1.8%	40
8. N17 Tuam and Claremorris	11,747	140	11,887	1.2%	40
9. M17 between N63 and M6	13,861	140	14,001	1.0%	40

Table 15-20 Summary effect of development traffic during turbine construction – other deliveries (small turbine components)

Link	Background	Development	Total	% increase	Estimated No. of days
1a. Killerduff Road to site	98	55	153	56.2%	22
1b. R314 north of Ballycastle	1,463	55	1,518	3.8%	22
2. N59 adjacent to L-52926	4,800	55	4,855	1.1%	22

Link	Background	Development	Total	% increase	Estimated No. of days
3. N59 between L-52926 and Ballina	2,593	55	2,648	2.1%	22
4. N26 between Foxford and Ballina	9,600	55	9,655	0.6%	22
5. N58 between Ballylahan and Foxford	7,068	55	7,123	0.8%	22
6. N5 between Swinford and Charlestown	6,984	55	7,039	0.8%	22
7. N17 between Charlestown and Knock	7,716	55	7,771	0.7%	22
8. N17 Tuam and Claremorris	11,747	55	11,802	0.5%	22
9. M17 between N63 and M6	13,861	55	13,916	0.4%	22

An assessment of the impact on link capacities in the study area was undertaken for the various construction stages as set out in Table 15-21, Table 15-22, and Table 15-23. The capacity for each link in the study area is shown in Table 15-21. The capacities range from a daily flow of 11,600 vehicles on the N17, N5 and N26, and 5,000 vehicles per day on the N58, N59 and R314, and are based on road widths and capacities set out in the TII Standards document DN-GEO-03031 Road Link Design, Table 6/1. The width of the local Killerduff Road leading to the site is of variable width less than 6.0m and is therefore <5,000 per day.

It is noted that the link capacities adopted from the TII guidelines correspond to a Level of Service D, which the guidelines describe as being the level where;

"Speeds begin to decline slightly with a slight increase of flows and density begins to increase somewhat more quickly. Freedom to manoeuvre within the traffic streams is more noticeably limited, and the driver experiences reduced comfort levels".

Background, or do nothing traffic flows, are compared to flows forecast for the various construction delivery stages in Table 15-22 with the percentage capacity reached for each link and stage shown in Table 15-23. Based on this assessment for a construction commencement year of 2028 the following points are noted;

- On the external network the N58 between Ballylahan and Foxford is the busiest road with the link capacity forecast to operate at 141% for the do-nothing scenario by the year 2028, increasing to a maximum of 144% during the 22 days that the abnormal loads are delivered to the site.
- The N17 between Tuam and Claremorris is also forecast to operate at capacity with this section of road forecast to operate at 101% for the do-nothing scenario by the year

2028, increasing to a maximum of 102% during the days that the abnormally sized loads are delivered to the site.

- The N59 to the west of Ballymunelly is forecast to operate at 96% for the do-nothing scenario by the year 2028, increasing to a maximum of 105% during the days that the concrete foundations are poured reducing to a maximum of 99% during the rest of the construction period.
- All other roads leading to the site are forecast to operate well within link capacity for all scenarios.

Table 15-21 Carriageway widths, link type and link capacity

Link	Width (m)	Link type	Link capacity
1a. Killerduff Road to site	3.0	Type 3 single	<5,000
1b. R314 north of Ballycastle	6.0	Type 3 single	5,000
2. N59 adjacent to L-52926	6.0	Type 3 single	5,000
3. N59 between L-52926 and Ballina	6.0	Type 3 single	5,000
4. N26 between Foxford and Ballina	7.5	Type 1 single	11,600
5. N58 between Ballylahan and Foxford	6.0	Type 3 single	5,000
6. N5 between Swinford and Charlestown	7.5	Type 1 single	11,600
7. N17 between Charlestown and Knock	7.5	Type 1 single	11,600
8. N17 Tuam and Claremorris	7.5	Type 1 single	11,600
9. M17 between N63 and M6	2 x 2 lane	Motorway	52,000

Table 15-22 Link capacity and summary of link flows by construction delivery stage

Link	Link capacity	Construction delivery stage				
		Background traffic	Concrete pour	Other site works	Turbine plant	Turbine equipment
1a. Killerduff Road to site	<5,000	98	538	219	238	153

Link	Link capacity	Construction delivery stage				
1b. R314 north of Ballycastle	5,000	1,463	1,903	1,584	1,603	1,518
2. N59 adjacent to L-52926	5,000	4,800	5,240	4,921	4,940	4,855
3. N59 between L-52926 and Ballina	5,000	2,593	3,033	2,714	2,733	2,648
4. N26 between Foxford and Ballina	11,600	9,600	10,040	9,721	9,740	9,655
5. N58 between Ballylahan and Foxford	5,000	7,068	7,508	7,189	7,208	7,123
6. N5 between Swinford and Charlestown	11,600	6,984	7,424	7,105	7,124	7,039
7. N17 between Charlestown and Knock	11,600	7,716	8,156	7,837	7,856	7,771
8. N17 Tuam and Claremorris	11,600	11,747	12,187	11,868	11,887	11,802
9. M17 between N63 and M6	52,000	13,861	14,301	13,982	14,001	13,916

Table 15-23 Link capacity and % of link capacity (Level of Service D) by construction delivery stage

Link	Link capacity	Construction delivery stage				
		Background traffic	Concrete pour	Other site works	Turbine plant	Turbine equipment
1a. Killerduff Road to site	3,000	3%	18%	7%	8%	5%
1b. R314 north of Ballycastle	5,000	29%	38%	32%	32%	30%

Link	Link capacity	Construction delivery stage				
2. N59 adjacent to L-52926	5,000	96%	105%	98%	99%	97%
3. N59 between L-52926 and Ballina	5,000	52%	61%	54%	55%	53%
4. N26 between Foxford and Ballina	11,600	83%	NA	NA	84%	83%
5. N58 between Ballylahan and Foxford	5,000	141%	NA	NA	144%	142%
6. N5 between Swinford and Charlestown	11,600	60%	NA	NA	61%	61%
7. N17 between Charlestown and Knock	11,600	67%	NA	NA	68%	67%
8. N17 Tuam and Claremorris	11,600	101%	NA	NA	102%	102%
9. M17 between N63 and M6	52,000	27%	NA	NA	27%	27%

15.1.6.2 Expected Traffic on Link Flows – During Operation

Once the wind farm is operational it is estimated that two to three visits per week will be made by operation and maintenance staff, with a similar number of vehicle tripsJunction Capacity Assessment – During Construction

Guidance relating to the requirement to undertake a detailed junction capacity assessment at junctions in the proximity of a Proposed Development is set out in Document PE-PDV-02045 Traffic and Transport Assessment Guidelines, TII, May 2014. The guidance states that a capacity assessment should be undertaken where the Proposed Development results in an increase in traffic volumes of 10% or greater, in situations where the network is not currently congested. As the traffic volumes on the R314 at the junction with Killerduff Road leading to the site are forecast to increase by greater than this threshold during the construction of the Proposed Development (+34.7% during the 22 concrete delivery days), a detailed capacity assessment was undertaken for the existing R314 / Killerduff Road junction.

As the impact on other junctions on the route are below this 10% threshold no further junctions were required to be the subject of a detailed capacity assessment.

The capacity of the R314 / Killerduff Road junction was assessed using the industry standard junction simulation software PICADY, which permits the capacity of a priority junction to be assessed with respect to existing or forecast traffic movements and volumes for a given period. The capacity for each movement possible at the junction being assessed is determined from geometric data input into the program with the output used in the assessment as follows:

- Queue – This is the average queue forecast for each movement and is useful to ensure that queues will not interfere with adjacent junctions.
- Degree of Saturation or Ratio of Flow to Capacity (% Sat or RFC) – As suggested, this offers a measure of the amount of available capacity being utilised for each movement. Ideally each movement should operate at a level of no greater than 85% of capacity.
- Delay – Output in minutes, this gives an indication of the forecast average delay during the time period modelled for each movement.

Scenarios Modelled

The most substantial effect will be experienced during peak hours when up to 80 workers (40 cars) will pass through it. It is noted that deliveries of materials to the site will take place during the day after the workers have arrived on site, and before they leave at the end of the day and will therefore not occur at the same time.

R314 / Killerduff Road Junction Capacity Test Results

The AM and PM peak hour traffic flows through the N59 / L-52926 junction was established from the classified turning counts and are shown for the year 2021 and for 2021 Covid-19 adjusted scenarios in Figures 15-4a and 15-4b respectively. Background traffic flows for the assumed construction year of 2028 are shown in Figure 15-4c. Traffic flows generated by the Proposed Development during the AM and PM peak hours are shown in Figure 15-4d while the year 2028 traffic flows with development generated traffic are shown in Figure 15-4e.

The results of the capacity assessment, as set out in Tables 15-24 and 15-25, show that additional car trips passing through the junction will be accommodated by the existing junction with the maximum ratio of flow to capacity (RFC) forecast to increase from 2.2% from the do nothing scenario to 10.6% with the Proposed Development construction traffic in place during the PM peak hour (for the exit from the Killerduff Road onto the R314), with an increase from 0.0% to 8.3% forecast during the AM peak hour % (right turn from the R314 into the Killerduff Road). All of these movements are forecast to operate well within the acceptable limit of 85% set by TII.

Table 15-24 Junction capacity test results, R314 / Killerduff Road junction, without and with construction staff, year 2028, AM peak hour

Period	Location	Without construction traffic			With construction traffic		
AM		RFC	Queue (vehicles)	Delay (minutes)	RFC	Queue (vehicles)	Delay (minutes)
	From local road	0.0%	0.00	0.00	0.0%	0.00	0.00

Period	Location	Without construction traffic			With construction traffic		
	From Killerduff Road	0.2%	0.00	0.11	0.2%	0.00	0.11
	Right turn into local access road	0.0%	0.00	0.00	0.0%	0.00	0.00
	Right turn into Killerduff Road	0.0%	0.00	0.00	8.3%	0.09	0.12

Table 15-25 Junction capacity test results, R314 / Killerduff Road junction, without and with construction staff, year 2028, PM peak hour

Period	Location	Without construction traffic			With construction traffic		
PM		RFC	Queue (vehicles)	Delay (minutes)	RFC	Queue (vehicles)	Delay (minutes)
	From local road	0.0%	0.00	0.00	0.0%	0.00	0.00
	From Killerduff Road	2.2%	0.02	0.13	10.6%	0.12	0.13
	Right turn into local access road	0.2%	0.00	0.10	0.2%	0.00	0.10
	Right turn into Killerduff Road	0.0%	0.00	0.00	0.0%	0.00	0.00

15.1.6.3 Junctions Capacity Assessment – During Operation

As discussed in Section 15.1.6.2 it is forecast that once operational, the development will generate approximately 2 to 3 trips per weekfor maintenance purposes and 20 trips recreational and amenity purposes. Therefore, the junction will operate will within the acceptable limit of 85%.

15.1.6.4 Expected Traffic on Link Flows – During Decommissioning

The traffic volumes that will be generated during decommissioning will be substantially less compared to those generated during the construction of the Proposed Development as set out in Section 15.1.6.1. Refer to Appendix 4-7 for details in relation to the decommissioning phase of the Proposed Development.

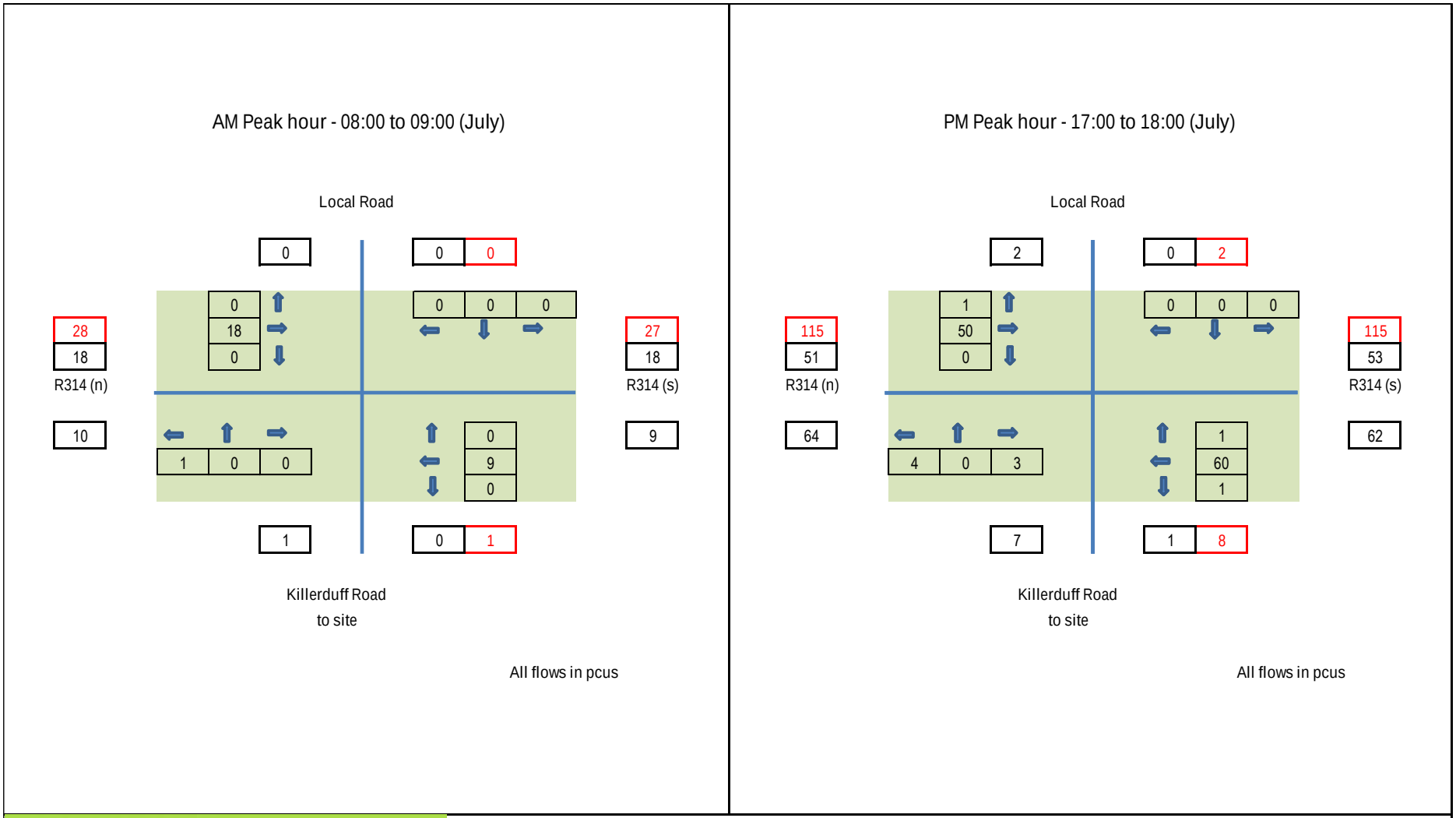

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Figure 15-4a Observed traffic flows at R314 / Killerduff Road junction, AM & PM peak hours, year 2021

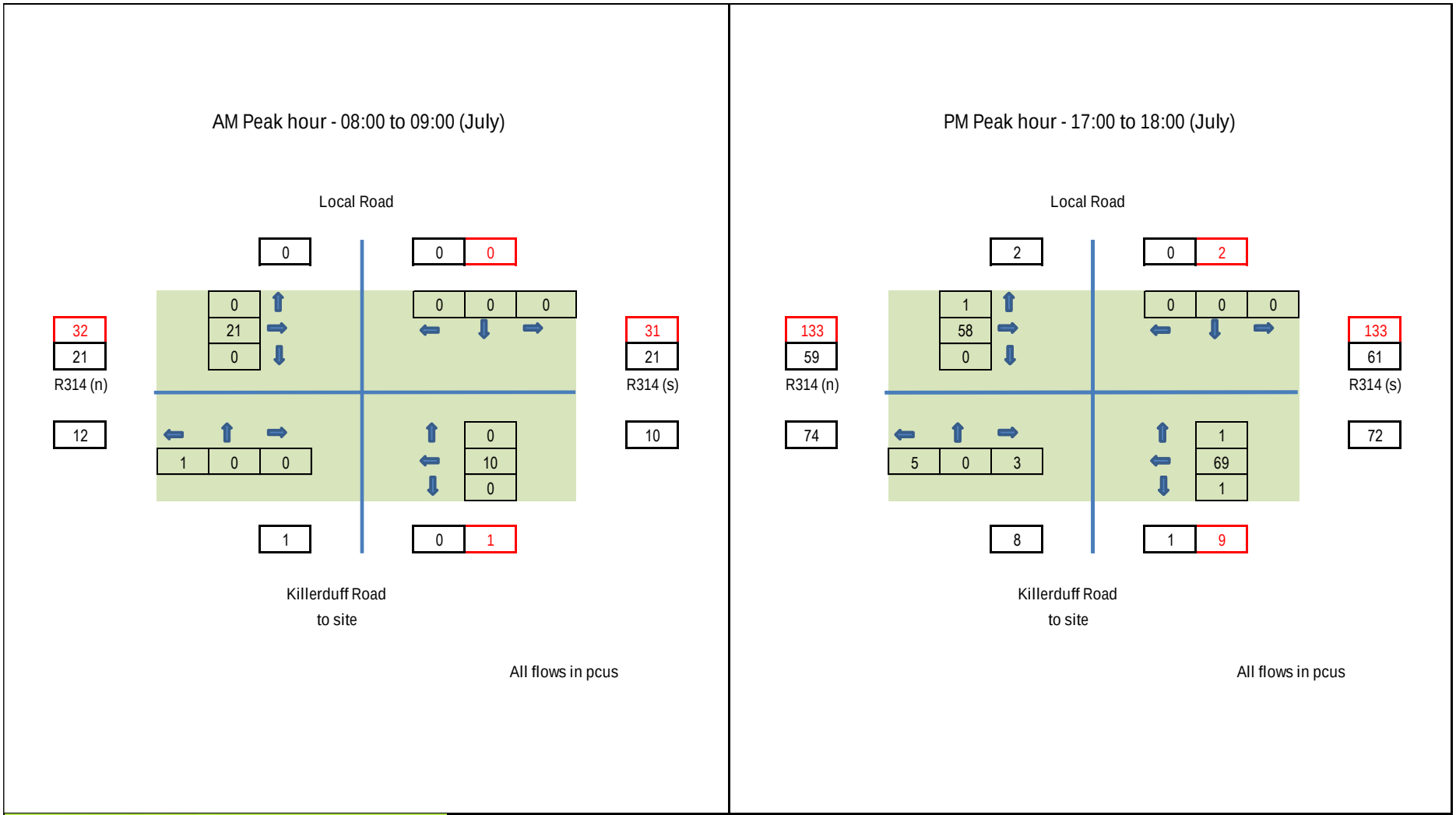

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Figure 15-4b Observed traffic flows at R314 / Killerduff Road junction, AM & PM peak hours, year 2021, Covid adjusted

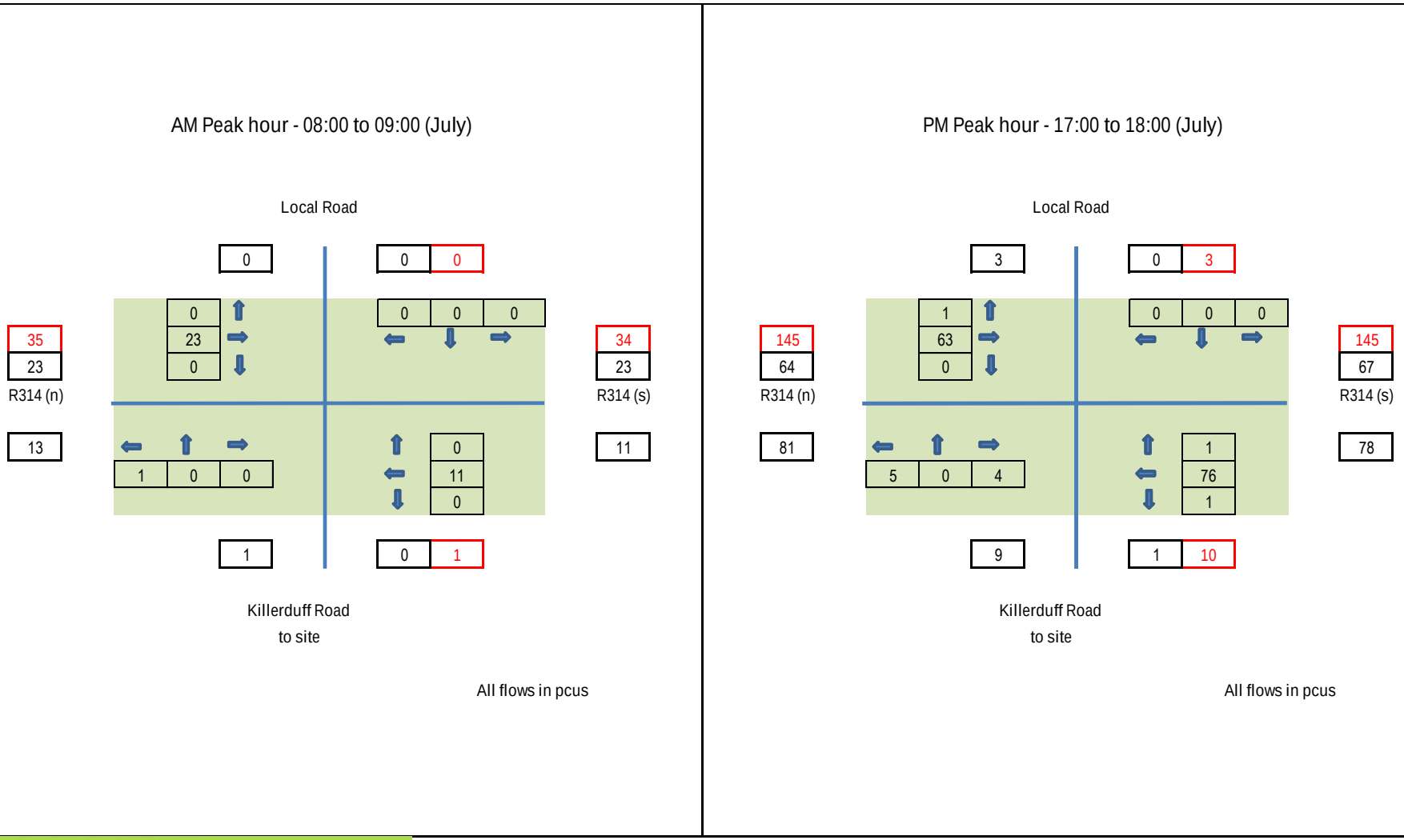

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Figure 15-4c Background traffic flows at R314 / Killerduff Road junction, AM & PM peak hours, year 2028

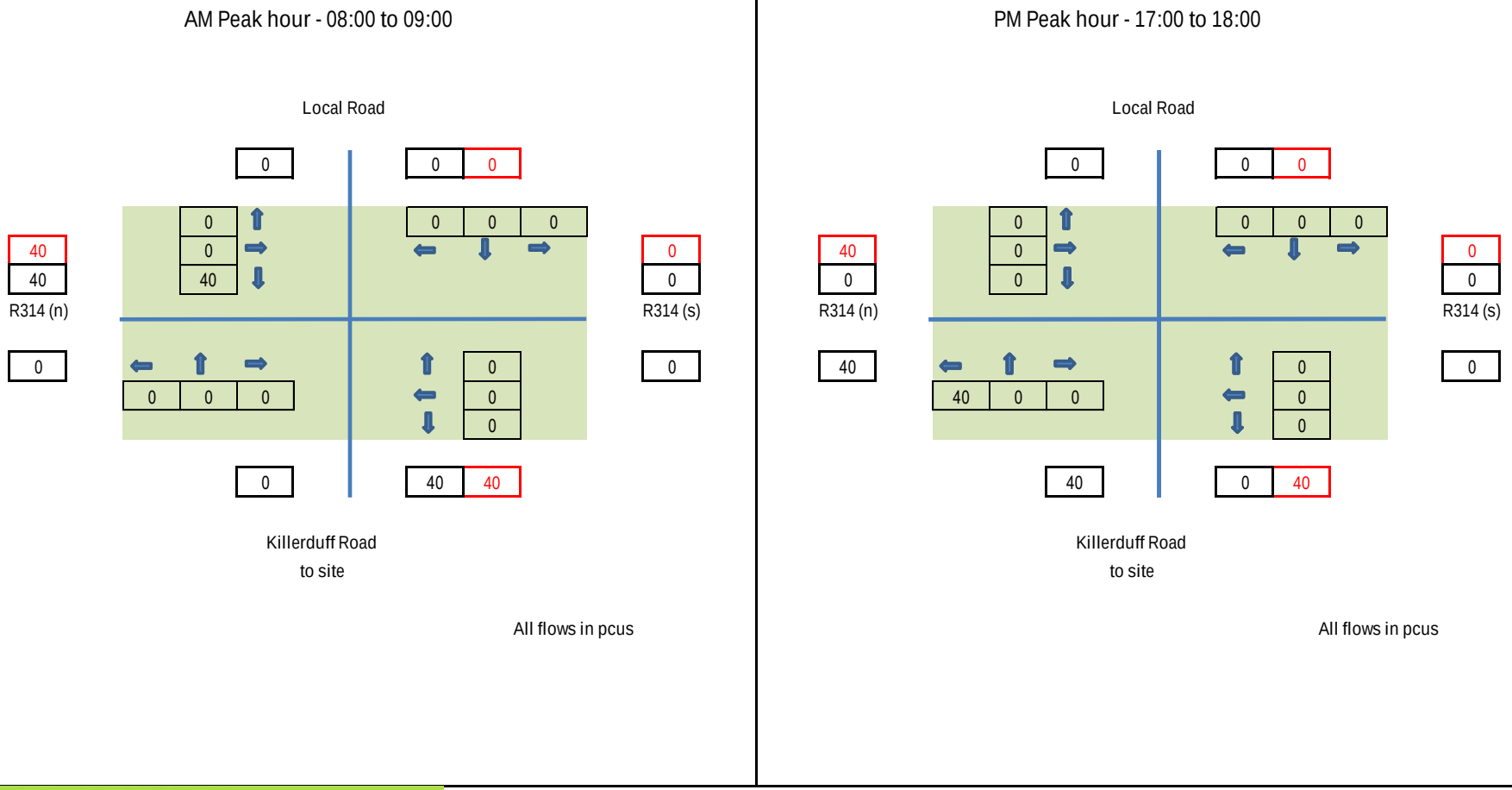

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Figure 15-4d Development generated traffic flows at R314 / Killerduff Road junction, AM & PM peak hours

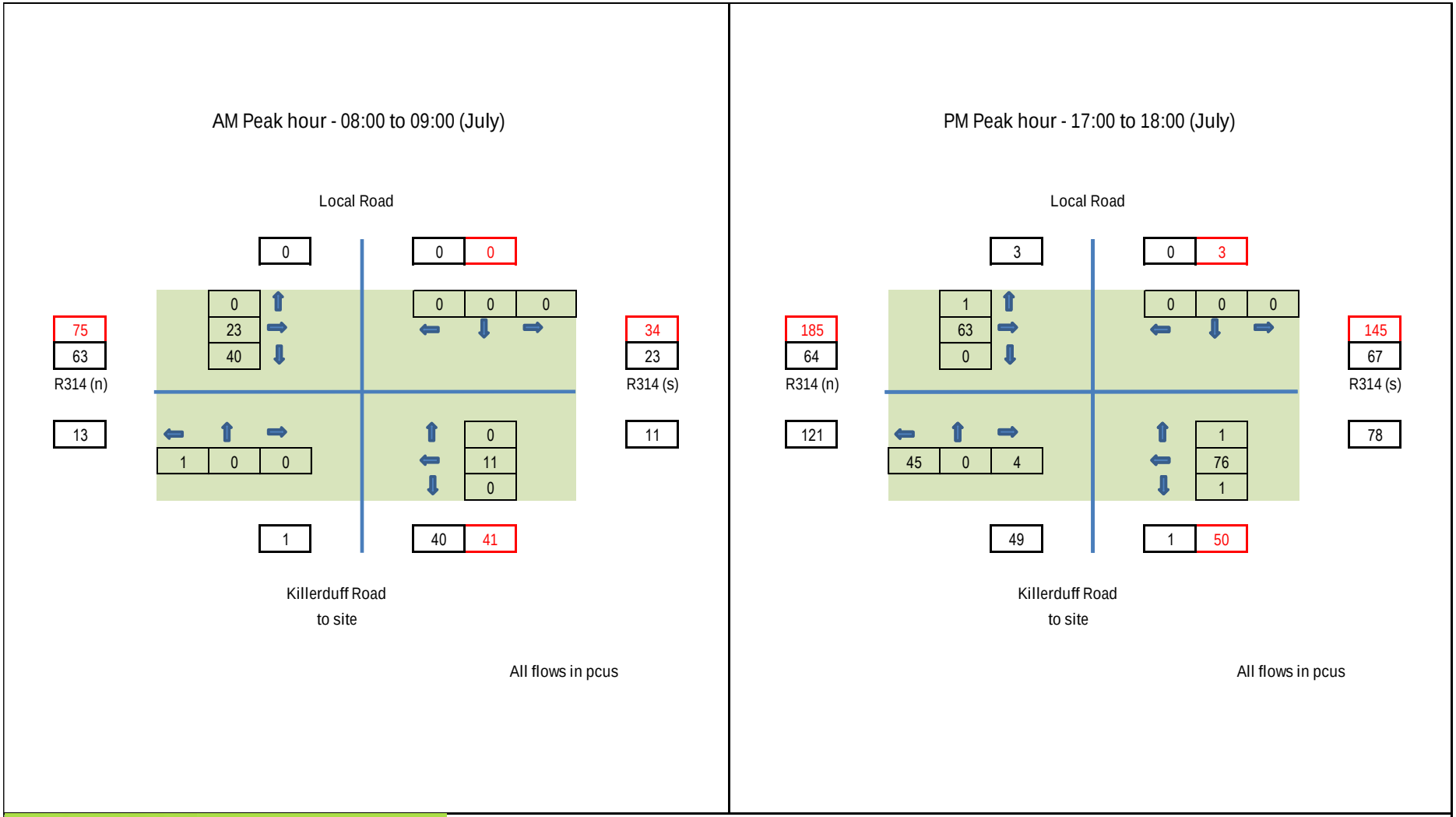

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Figure 15-4e With development traffic flows at R314 / Killerduff Road junction, AM & PM peak hours, year 2028

15.1.6.5 Impact on Traffic during Construction of Grid Connection

A detailed description of the grid connection is provided in Appendix 4-5 of this EIAR.

It is proposed that the 110kV on-site electrical substation is connected by means of an underground 110kV electrical cable to the existing 110kV Tawnaghmore electrical substation located in the townland of Tawnaghmore Upper. The proposed underground electrical cabling route is approximately 28.4km in length and is located predominately within the public road corridor. For the extent of the underground electrical cabling route that will impact on the public road network the grid connection is considered in 8 sections (Sections 2 to 9, with Sections 1 and 10 being on a local track and off road respectively), as indicated in Figure 15-5 of the EIAR.

Table 15-26 Grid connection link summary, link length (km), construction duration (days) and diversion during construction

Grid route section	Length (kms)	Construction Duration (days)	Length with Diversion (kms)	Additional length due to diversion (kms)
Section 1 – Local forest track and off road	4.7	31	No diversion – accommodation if required	0.0
Section 2 – Local Ballyglass Road	1.1	7	6.2	5.1
Section 3 – Local Ballyglass Road	0.5	3	2.0	1.5
Section 4 – R314	0.4	3	No diversion – "stop-go" possible	0.0
Section 5 – R315	7.5	50	14.5	7.0
Section 6 – L-52925	8.4	56	13.9	5.5
Section 7 – Local road	1.0	7	1.0	0.0
Section 8 – Local road	3.0	20	7.0	4.0
Section 9 – R314	0.4	3	No diversion – "stop-go" possible	0.0
Off road connection to Tawnaghmore substation	1.4	9	No diversion – within site of Tawnaghmore substation	0.0
Total	28.4kms	189		

The sections of the route and the likely impact on general traffic during the construction of the grid connection are summarised in Table 15-26 and are as follows;

Section 1

Section 2

Section 3

Section 4

Section 5

Section 6

Section 7

Section 8

Section 9

Section 10

Proposed Substation

Glenora Wind Farm

Tawnaghmore Powerstation

BALLYCASTLE
Baile an Chaisil

KILLALA
Cill Ala

Lackan Bay

Benwee or Kilcummin Head
Ceann Chill Chuimin

Maumakeogh
Mám an Cheo

Rathlackan
Ráth Leacáin

Western Way
Slí an Iarthair

KEY

Proposed grid route

NOTES:

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Figure 15-5 Proposed cable grid connection route

PROJECT:	Glenora Wind Farm		
CLIENT:	SSE	SCALE:	NTS
PROJECT NO: 9351	DATE: 23.11.23	DRAWN BY:	AL

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Section 1 – (length 4.7kms) – The proposed onsite 110kV electrical substation will be situated within the Proposed Development site with the cable route linking into an existing forestry road. For this section of the underground electrical cabling route the carriageway width of the forestry track is narrow and a local road closure at the location where the section of the underground electrical cabling route is being constructed will be required. Based on an average rate of 150m of cable being constructed in one day, it is estimated that this section of the underground electrical cabling route will take up to 31 days to complete. The location of the construction will be transient in nature with the extent of the section of road closed kept to a minimum. There is no alternative route for this section of the cable route so access to the site will be restricted during this period with local accommodation works put in place to facilitate access as required.

Section 2 – (length 1.1kms) – The underground electrical cabling route then continues east along the Local Ballyglass Road for approximately 1.1kms. The carriageway is narrow and will require a full road closure during the approximately 7 days required for construction. The potential diversion route shown in Figure 15.6a will result in a diversion of 5.1kms for a small number of local trips.

Section 3 – (length 0.5kms) – The underground electrical cabling route continues further east on the Local Ballyglass Road for approximately 0.5kms. The potential diversion route for 3 construction days is shown in Figure 15.6b and will result in a diversion of 1.5kms for a small number of local trips.

Section 4 – (length 0.4kms) – The underground electrical cabling route then travels southeast for approximately 0.4kms on the R314. During the construction of this section of the electrical cable grid route 2-way, or one-way with a "stop and go" facility will be retained during the approximate 3 days of construction, with no traffic diversions required on this section.

Section 5 – (length 7.5kms) – This section continues south on the R315 for approximately 7.5kms and will take approximately 50 days to construct. A full road closure will be required during the construction of this section of the underground electrical cabling route. The diversion to local traffic, is shown in Figure 15.6c, will be approximately 7.0 kms.

Section 6 – (length 8.4kms) – The underground electrical cabling route continues southeast on the L-52925 for approximately 8.4kms. The potential diversion route for 56 construction days is shown in Figure 15.6d and will result in a diversion of 5.5kms for local trips.

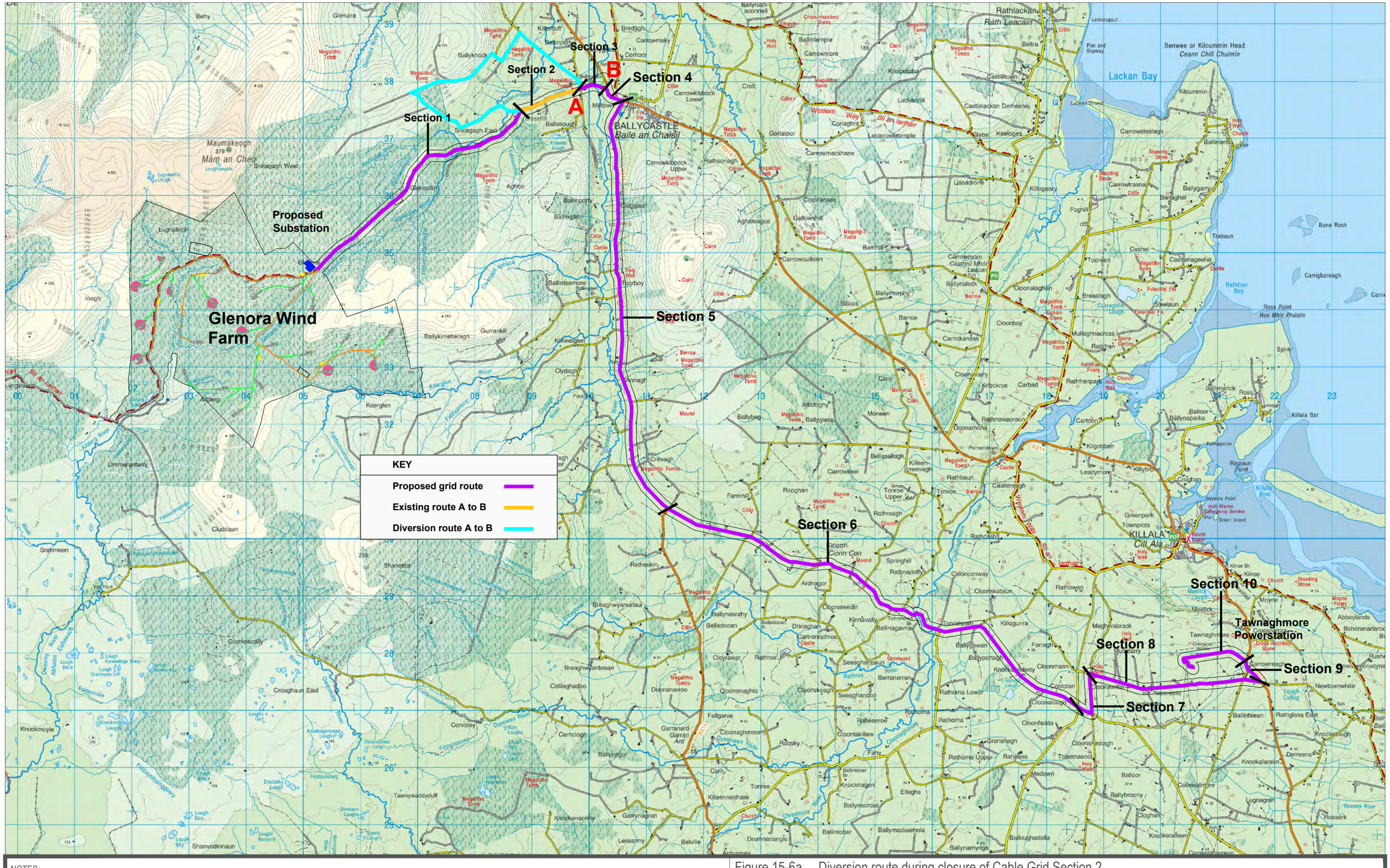
Section 7 – (length 1.0kms) – The underground electrical cabling route continues north on the local road for approximately 1.0kms. The local diversion route shown in Figure 15.6e is approximately the same length and will therefore result in no increase in trip length for local trips during the 7 construction days.

Section 8 – (length 3.0kms) – The underground electrical cabling route continues east on the local road for approximately 3.0kms. The potential diversion route for 20 construction days is shown in Figure 15.6f and will result in a diversion of 4.0kms for local trips.

Section 9 – (length 0.4kms) – The underground electrical cabling route then travels northwest for approximately 0.4kms on the R314. During the construction of this section 2-way, or one-way with a "stop and go" facility will be retained during the approximate 3 days of construction, with no traffic diversions required.

Section 10 – (1.4km) – The final section of the route heads west within the site of the Tawnaghmore 110 kV Substation. This section of the cable route is approximately 1,4kms in length and will take 9 days to construct. No diversion to local traffic will be required for this off-road section of the grid cable route.

It is estimated that the underground electrical cabling route will take 189 days, or 9 months to construct based on 1 construction team laying approximately 150 metres of cable per day. The construction period could be reduced to approximately 95 days should 2 construction teams operate at either end of the Grid Connection route. With respect to the traffic volumes that will be generated during the



NOTES:

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Figure 15-6a Diversion route during closure of Cable Grid Section 2

PROJECT:	Glenora Wind Farm		
CLIENT:	SSE	SCALE:	NTS
PROJECT NO: 9351	DATE: 23.11.23	DRAWN BY:	AL

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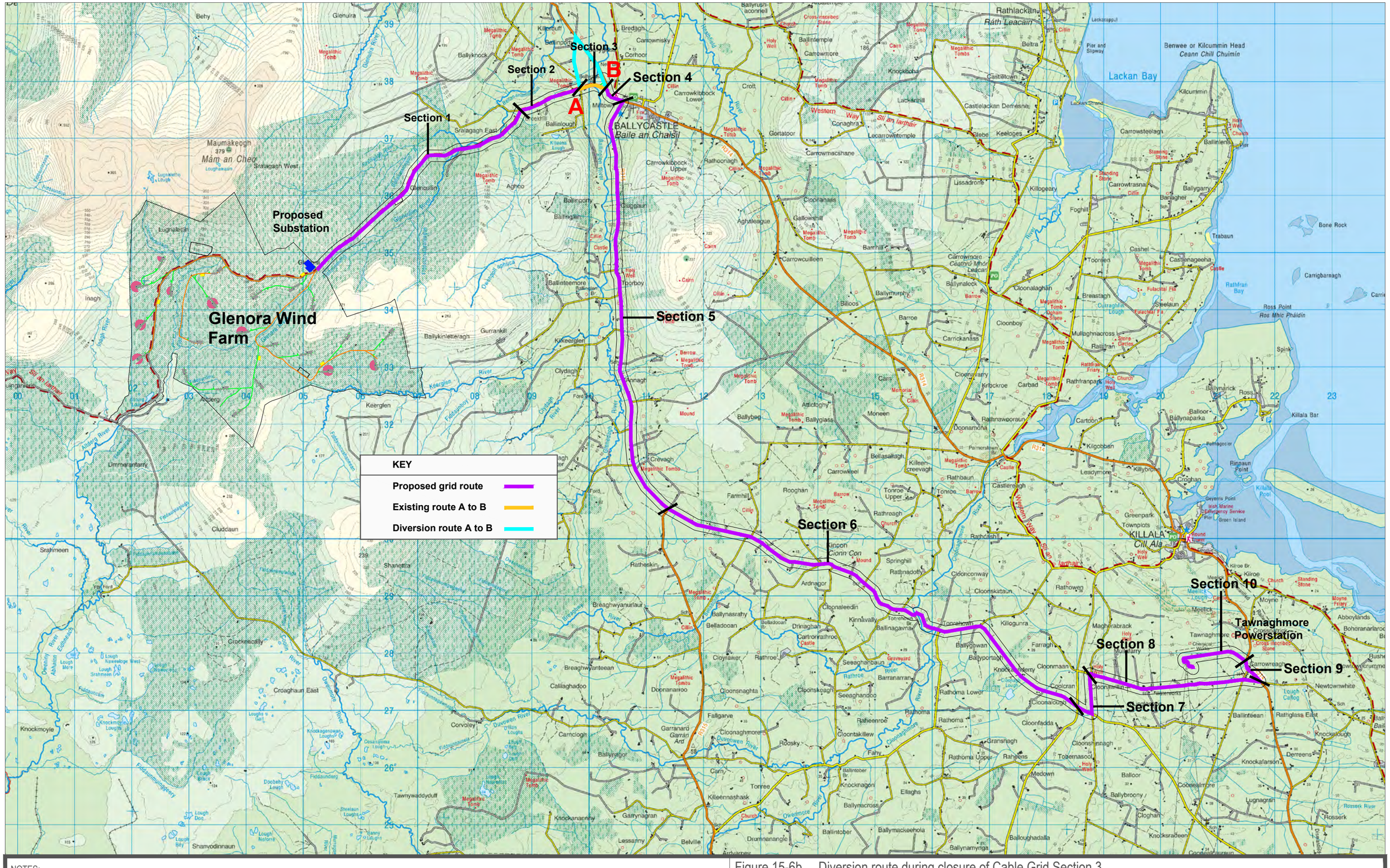

NOTES:

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Figure 15-6b Diversion route during closure of Cable Grid Section 3

PROJECT:	Glenora Wind Farm		
CLIENT:	SSE	SCALE:	NTS
PROJECT NO: 9351	DATE: 23.11.23	DRAWN BY:	AL

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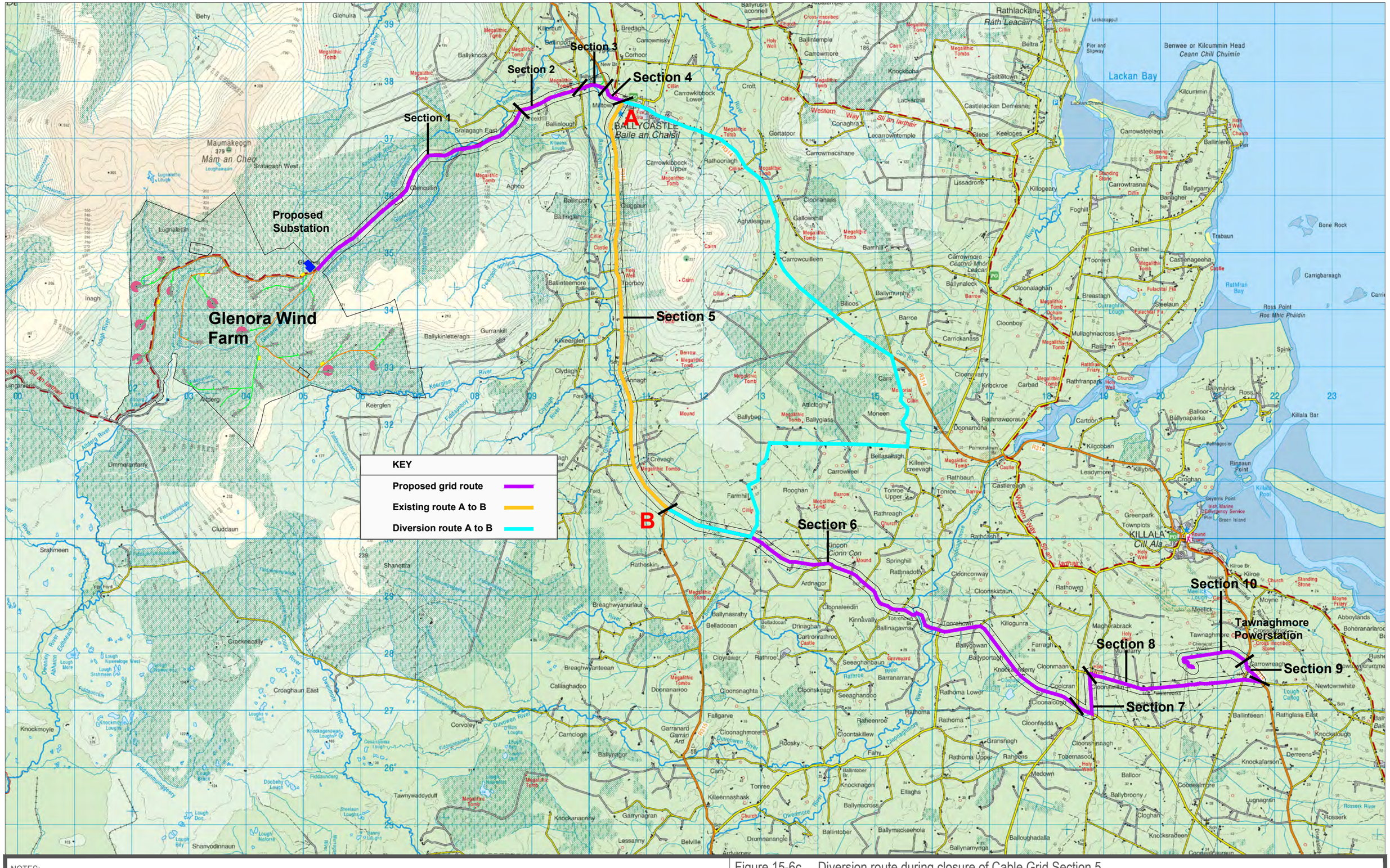

NOTES:

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Figure 15-6c Diversion route during closure of Cable Grid Section 5

PROJECT:	Glenora Wind Farm		
CLIENT:	SSE	SCALE:	NTS
PROJECT NO: 9351	DATE: 23.11.23	DRAWN BY:	AL

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Section 1
Section 2
Section 3
Section 4
Section 5
Section 6
Section 7
Section 8
Section 9
Section 10
Proposed Substation
Glenora Wind Farm
Tawnaghmore Powerstation
A
B
B

KEY

Proposed grid route

Existing route A to B

Diversion route A to B

NOTES:

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Figure 15-6d Diversion route during closure of Cable Grid Section 6

PROJECT:	Glenora Wind Farm		
CLIENT:	SSE	SCALE:	NTS
PROJECT NO: 9351	DATE: 23.11.23	DRAWN BY:	AL

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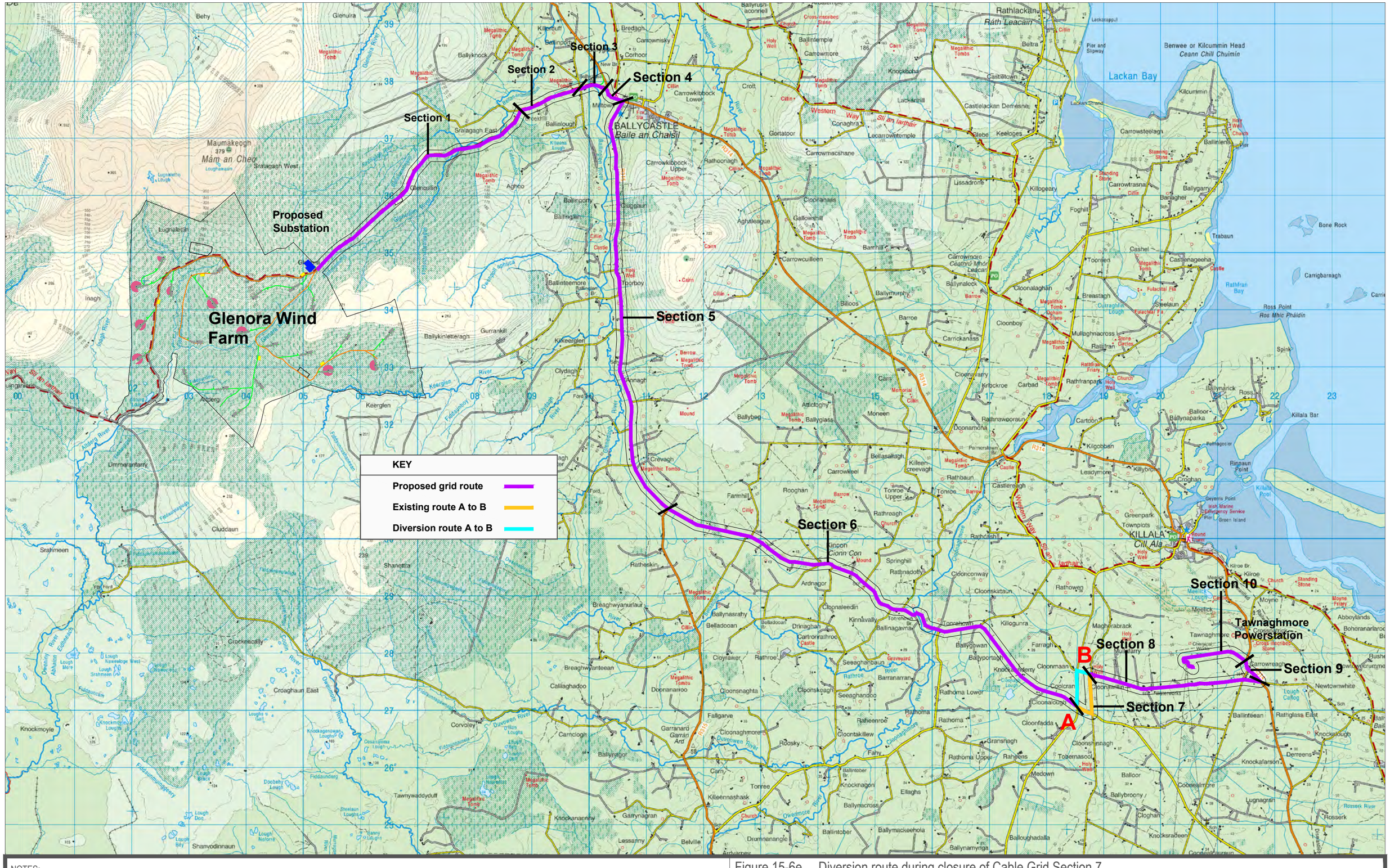

NOTES:

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Figure 15-6e Diversion route during closure of Cable Grid Section 7

PROJECT:	Glenora Wind Farm		
CLIENT:	SSE	SCALE:	NTS
PROJECT NO: 9351	DATE: 23.11.23	DRAWN BY:	AL

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Proposed Substation

Glenora Wind Farm

Section 1

Section 2

Section 3

Section 4

Section 5

Section 6

Section 7

Section 8

Section 9

Section 10

A

B

Tawnaghmore Powerstation

BALLYCASTLE
Baile an Chaisil

KILLALA
Cill Ala

Lackan Bay

Benwee or Kilcummin Head
Ceann Chill Chuimin

Rathlackan
Ráth Leacain

Maumakeogh
Mám an Cheo

Western Way
Slí an Iarthair

KEY

Proposed grid route	
Existing route A to B	
Diversion route A to B	

NOTES:

PLANNING DRAWING ONLY - NOT FOR CONSTRUCTION PURPOSES

Figure 15-6f Diversion route during closure of Cable Grid Section 8

PROJECT:	Glenora Wind Farm		
CLIENT:	SSE	SCALE:	NTS
PROJECT NO: 9351	DATE: 23.11.23	DRAWN BY:	AL

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construction of the underground electrical cabling route, it is estimated that there will be approximately 14 daily return trips made by a truck transporting materials, and 4 made by a car to transport 10 construction staff to and from the Site.

The proposed grid connection construction methodology is set out on Appendix 4-5 of this EIAR.

The construction methodology of providing a cable route under and along local road networks is well established and accepted nationwide. There are in excess of 300 wind farms currently operational in Ireland and the majority of these are connected to the national grid via underground cable connections predominantly along the public road networks.

The additional traffic volumes that are forecast to be generated during the construction of the grid connection cable route are included in the assessment presented in Section 15.1.4. This is based on materials travelling to the site via the delivery routes previously discussed (Figure 15-1) and accessing the site via the main access junction.

15.1.7 Traffic Management for Large Deliveries

The greatest effect on the road network will likely be experienced on the anticipated 40 days during which the 5 large loads comprising the tower sections, the blades and the nacelles are delivered to the site.

Traffic management measures are included in Section 15.1.10.6, below, and include the following:

- Identification of a delivery schedule,
- Details of the alterations required to the infrastructure identified in Section 15.1.8 of this report and any other minor alteration identified,
- A dry run of the route using vehicles with similar dimensions.

The transport of large components is challenging and can only be done following extensive route selection, route proofing and consultation with An Garda Síochána and the various local authorities. Turbine components will be transported at night when traffic is lightest and this will be done in consultation with the roads authorities and An Garda Síochána, and special permits will be obtained as required.

It is not anticipated that any sections of the local road network will be closed. It is confirmed below that these abnormally sized loads will be delivered during nighttime hours, as is the norm for such deliveries. A dry run using a vehicle with the dimensions as per the blade delivery vehicle will be undertaken by the haulage company prior to the construction phase.

15.1.8 Abnormal Load Route Assessment

A route assessment was undertaken covering the proposed delivery route for the abnormal loads (TDR), with the route and assessment locations shown in Figures 15.2a to 15.2?. The route assessment discussed in this section, undertaken by Collett & Sons Ltd, indicates that the optimum route to the site is from the port of entry in Galway followed by the N6 and N17 to Tuam, the N17 to Charlestown, the N5 to Ballyvary, the N58 to Foxford, the N26 to Ballina, followed by the N59 to Bangor Erris, followed by the R313 and L1204 to Bellagelly, the R314 east to Ballycastle followed by the local road network to the site access. This route was therefore selected as the transport route for the abnormally sized loads. All locations along the route referred to in this section are highlighted in Figures 15.2a to 15.2d. For these locations, preliminary road and junction alignments, based on site surveys, were supplied by the project team. A swept path analysis was then undertaken using Autotrack in order to establish the locations where the wind turbine transport vehicles will be accommodated, and the locations where some form of remedial measure may be required.

Although the accommodation works required at the N17/N5 junction in (Location 8) are assessed in this EIAR, it should be noted that they will be applied for in a separate planning application. The locations discussed are as follows;

Co. Galway

- Location 1 (Dwg No. 348276-045F1.1) – Junction of Monivea Road and Connolly Avenue
- Location 2 (Dwg No. 348276-050F1.1) – Junction of Connolly Avenue and Tuam Road R336
- Location 3 (Dwg No. 348276-055F1.1) – Tuam Road (R336) / N6 junction
- Location 4 (Dwg No. 348276-056F1.1) – Left turn in N6 through Coolagh Roundabout
- Location 4 (Dwg No. 348276-056F1.2) – Left turn in N6 through Coolagh Roundabout using slip road
- Location 5 (Dwg No. 348276-057F1.1) – Kilmore Roundabout, Tuam Bypass N17
- Location 6 (Dwg No. 348276-070F1.1) – Mountpotter Roundabout, Tuam Bypass N17

Co. Mayo

- Location 7 (Dwg No. 348276-100F1.1) – Bracklagh Roundabout – N17/N5 slip road, Charlestown
- Location 8 (Dwg No. 348276-110F1.1) – Westbound N5 Slip road from N17, Charlestown
- Location 9 (Dwg No. 348276-120F1.1) – N5 / N58 junction, Ballyvary
- New Location (Dwg No. 348276-130F1.1) – Right bend on N58, Rathrushel
- New Location (Dwg No. 348276-140F0.1) – Transition point, Foxford
- Location 10 (Dwg No. 348276-141G1.1) – Right turn on N58, Foxford
- Location 11 (Dwg No. 348276-142G1.1) – N58 / N26 junction, Foxford
- Location 12 (Dwg No. 348276-143G1.1) – River Moy Bridge Crossing on N26, Foxford
-
-
- Location 13 (Dwg No. 348276-154G1.1) – Junction of Killala Road R314 / Sli Ectra, Ballina
- Location 14 (Dwg No. 348276-160G1.1) – Junction of Sli Ectra / L1119 McDermott Street, Ballina
- Location 15 (Dwg No. 348276-170G1.1) – Gurteens Roundabout, Ballina
- Location 16 (Dwg No. 348276-180G1.1) – Roundabout junction, Crossmolina
- Location 17 (Dwg No. 348276-181G1.1) – S Bend on N59 Church Street, Crossmolina
- Location 18 (Dwg No. 348276-200G1.1) – Right bend on N59 at Bellacorick
- Location 19 (Dwg No. 348276-300G0.1) – Bend on N59 west of L52926, Ballymunnelly
- Location 20 (Dwg No. 348276-315G1.1) – Junction of R313 / L1204 near Attavalley
- Location 21 (Dwg No. 348276-330G0.1) – Right bend on L1204 at Glencullen Lower
- Location 22 (Dwg No. 348276-340G1.1) – Left bend on L1204 at Glemturk More Bog
- Location 23 (Dwg No. 348276-350G1.1) – S bend on L1204 at Bellagelly South
- Location 24 (Dwg No. 348276-360G1.1) – Junction of L1204 / R314 at Bellagelly South
- Location 25 (Dwg No. 348276-380G1.1) – Right bend on R314 at Belderrig More
- Location 26 (Dwg No. 348276-381G1.1) – Right bend on R314 at Belderrig More
- Location 27 (Dwg No. 348276-382G1.1) – Left bend on R314 at Belderrig More
- Location 28 (Dwg No. 348276-390G0.1) – Right bend on R314 at Belderrig More 2
- Location 29 (Dwg No. 348276-400G1.1) – Right bend on R314 at Belderrig 3
- Location 30 (Dwg No. 348276-401G0.1) – Right bend on R314 at Belderrig 3
- Location 31 (Dwg No. 348276-402E1.1) – U bend on R314 at Belderrig 3

- Location 32 (Dwg No. 348276-410G0.1) – Left bend on R314 at Glenurla
- Location 33 (Dwg No. 348276-411G0.1) – Right bend on R314 at Glenurla
- Location 34 (Dwg No. 348276-420G1.1) – Left bend on R314, junction with Belmullet Redloop at Muingelly
- Location 35 (Dwg No. 348276-421G1.1) – Right bend on R314 at Muingelly
- Location 36 (Dwg No. 348276-430G0.1) – S bend on Killerduff
- Location 37 (Dwg No. 348276-450G0.1) – Proposed junction off R314 near Ballycastle
- Location 38 (Dwg No. 348276-460G0.1) – Y junction on unnamed road near Ballyglass

The following text summarises the findings of the swept path analysis for Locations 1 to 38. The assessment undertaken by Collett & Sons Ltd is included as Appendix 15-1.

All of the works that are required on the public road network highlighted in the following text will be temporary in nature and will be required during the period that the abnormally sized loads are delivered to the site only. On completion of this stage all locations requiring temporary measures will be reinstated. It is estimated that these measures will be in place for a total of 40 nights spread over a 20 week period.

Location 1 – Junction of Monivea Road and Connolly Avenue

Collett Drawing No 348276-045F1.1

The autotrack assessment based on a surveyed base shows that oversail of footpaths will be required on both sides of the junction and that a lamp post and traffic light column will be temporarily removed during the delivery of the abnormal loads.

Location 2 – Junction of Connolly Avenue and Tuam Road

Collett Drawing No 348276-050F1.1

The autotrack assessment shows that temporary over-run of the footpath and verge will be required in addition to oversail on both sides of the junction. Two lamp posts will be temporarily removed.

Location 3 – Tuam Road (R336) / N6 junction

Collett Drawing No 348276-055F1.1

The autotrack assessment shows that temporary oversail of the western carriageway of the Tuam Road and the southeastern corner of the junction will be required. One lamp post and two road signs on the nearside prior to the junction will be temporarily removed. A lamp post, a traffic light on the offside, and pedestrian guard rails on both sides of the slip road will be removed on order to accommodate the abnormally sized loads.

Location 4 – Left turn on N6 through Coolagh Roundabout

Collett Drawing No 348276-056F1.1 and F1.2 (2 options)

Temporary oversail will be required on both sides of the southbound N6 approach to the roundabout and over a small section of the centre island. Road signs and 2 lamp posts will also be temporarily removed.

Location 5 – Kilmore Roundabout, Tuam

Collett Drawing No 348276-057F1.1

The autotrack assessment shows that temporary oversail will occur on the nearside of both the entry and exits of the roundabout, the N83 splitter island and the roundabout island. Three lamp posts and 2 road signs on the nearside, and 2 road signs on the roundabout island will be removed on a temporary basis.

Location 6 – Mountpotter Roundabout, Tuam

Collett Drawing No 348276-070F1.1

The autotrack assessment indicates that the blade will require temporary oversail of the nearside entry and exit, at the entry and exit splitter island, at the opposing carriageway on the offside, and the roundabout island. The temporary removal of 2 lamp posts, and a road sign on the nearside, and 2 road signs on the central reservation will also be carried out.

Location 7 – Bracklagh Roundabout – N17/N5 slip road, Charlestown

Collett Drawing No 348276-100F1.1

The assessment indicates that an area of 3rd party land will be required for over-sail on the southeast corner of the roundabout in order that the blade transporter may negotiate this location. Road widening will be required on the offside of the roundabout entry. Temporary oversail will also occur on both sides of the entry to the roundabout, at both splitter islands, and the roundabout island. Two lamp posts, 2 road signs on the offside and 3 roads signs on the 2 splitter islands will require to be removed on a temporary basis. Shrub and trees on the offside will be trimmed / removed on a temporary basis during the delivery phase for the abnormally sized loads.

Location 8 – Westbound N5 Slip road from N17, Charlestown

Collett Drawing No 348276-110F1.1

Third party land will be required on both sides of this junction to accommodate localised road widening, while the southwest corner will be levelled in order that the blade can oversail at this location. In addition, the blade tip will oversail into the opposing traffic lane. Trees and vegetation will be trimmed / removed and road signs will be removed temporarily during the delivery period.

Location 9 – N5 / N58 junction, Ballyvary

Collett Drawing No 348276-120F1.1

Third party land will be required on the nearside of the N5 to allow the rear projection of the blade to oversail. Trees and hedges behind the wall on the nearside will be removed or lowered. The splitter island on the nearside of the N5 will be removed temporarily. Oversail will also occur on the nearside of the junction.

Two lamp posts, a bollard, the wall and four road signs will require to be removed from the grass verge on the offside of the junction of the N5 and N58 on a temporary basis. The footpath on the nearside of the N58 will require temporary ramping to allow the abnormally sized vehicles to over-run the footpath.

Location 10 – Right turn on N58, Foxford

Collett Drawing No 348276-141G1.1

Third party land will be required on the nearside of the N58 prior to the right turn to allow the rear of the blade to oversail. Temporary over-run of the footpath will be required on both sides of the junction. Overhead wires crossing the N58 will be temporarily re-located.

Location 11 – N58 / N26 junction, Foxford

Collett Drawing No 348276-142G1.1

Third party land is required on the offside of the N58 to allow the rear of the blade to oversail. Temporary over-run of the footpath will be required on the nearside of the junction. A lamp post on the offside of the N58 will require to be temporarily relocated.

Location 12 – River Moy Bridge Crossing on N26, Foxford

Collett Drawing No 348276-143G1.1

Third party land will be required on the nearside of the road. The assessment shows that overhead wires crossing the road will require to be temporarily relocated on order to accommodate the elevated blade.

Location 13 – Junction of Killala Road R314 / Sli Ectra, Ballina

Collett Drawing No 348276-154G1.1

The assessment shows that oversail into third party land will be required in order to accommodate temporary oversail on the eastern side of the R314. The elevated blade will also over-sail on the nearside of the R314 and the offside of Sli Ectra. Overhead wires will require to be temporarily relocated during the delivery period.

Location 14 – Junction of Sli Ectra / L1119 McDermott Street, Ballina

Collett Drawing No 348276-160G1.1

Road widening will be required on the offside of the junction. Oversail on an area of land on the nearside of Sli Ectra will be required at this location on a temporary basis during the turbine delivery phase. The blade will temporarily oversail at the junction on both sides of Sli Ectra and the nearside of McDermott Street.

Location 15 – Gurteens Roundabout, Ballina

Collett Drawing No 348276-170G1.1

Temporary over-run of islands will be required on the offside of the entry to the roundabout, through the roundabout and the exit splitter island in order to accommodate the abnormally sized vehicles. Street furniture and the sculpture will require to be removed from the roundabout and splitter islands on a temporary basis. The first overhead wires crossing the N59 will require to be temporarily relocated. The blade will then be lowered to pass underneath the subsequent overhead wires.

Location 16 – Roundabout junction, Crossmolina

Collett Drawing No 348276-180G1.1

Temporary oversail of the rear of the blade will occur on the nearside of the road at the junction with Chapel Street.

Location 17 – S Bend on N59 Church Street, Crossmolina

Collett Drawing No 348276-181G1.1

Temporary over-run areas will occur on both sides of the road. Rear projection of the blade will occur on both sides of the road prior to the bend and the vehicle will temporarily over-sail the footpath on both sides of the road after the bends. No third party issues are raised at this location. Overhead wires crossing the road will be temporarily relocated.

Location 18 – Right bend on N59 at Bellacorick

Collett Drawing No 348276-200G1.1

The autotrack assessment undertaken at this location is based on the temporary road that bypasses the sharp bend recently constructed for a previous wind farm development. Road widening will be required at both sides of the start of the temporary road and the offside of the exit. Oversail will occur on both sides of the N59 prior to the junction and both sides of the temporary road. A road sign on the offside of the temporary road will be removed temporarily.

Location 19 – Bend on N59 west of L52926, Ballymunnelly

Collett Drawing No 348276-300G0.1

The elevated blade tip will over-sail slightly on the northeastern side of the N59 at this location.

Location 20 – Junction of R313 / L1204 near Attavalley

Collett Drawing No 348276-315G1.1

A temporary over-run area will be required on the west side of the junction on order to accommodate the elevated blade transporter. Over-sail of the footpath will occur on both sides of the road and overhead wires will require to be moved on a temporary basis. Street furniture will also be relocated.

Location 21 – Right bend on L1204 at Glencullen Lower

Collett Drawing No 348276-330G0.1

An area of over-sail of the western verge will occur at this location. Street furniture will be temporarily removed.

Location 22 – Left bend on L1204 at Glemturk More Bog

Collett Drawing No 348276-340G1.1

An area of over-sail of the eastern verge will occur at this location. Trees and vegetation will be pruned, and overhead wires crossing the L1204 will be moved on a temporary basis.

Location 23 – S Bend on L1204 at Ballagelly South

Collett Drawing No 348276-350G1.1

Over-sail will occur on both sides of the road and overhead wires crossing the L1204 will be moved on a temporary basis.

Location 24 – Junction of L1204 / R314 at Ballagelly South

Collett Drawing No 348276-360G1.1

An area of Third Party Land is required on the southeastern corner of the L1204 / R314 junction in order to accommodate the oversail of the elevated blade. Slight over sail of the blade tip will also be required on the eastern side of L1204. Street furniture, a fence and existing vegetation will also be temporarily removed.

Location 25 – Right bend on R314 at Belderrig More

Collett Drawing No 348276-380G1.1

An area of over-sail of the northwestern edge of the R314 will occur at this location. Overhead wires crossing the R314 will be moved on a temporary basis.

Location 26 – Right bend on R314 at Belderrig More

Collett Drawing No 348276-381G1.1

The autotrack assessment indicates that the elevated blade tip will over-sail slightly on both sides of the R314 at this location. Overhead wires crossing the R314 and street furniture will be removed on a temporary basis.

Location 27 – Left bend on R314 at Belderrig More

Collett Drawing No 348276-382G1.1

Over-sail will occur on the southern side of the R314 through this bend. Overhead wires crossing the R314, and street furniture will be temporarily removed.

Location 28 – Right bend on R314 at Belderrig More 2

Collett Drawing No 348276-390G0.1

Over-sail will occur on the northern side of the R314 through this bend.

Location 29 – Right bend on R314 at Belderrig 3

Collett Drawing No 348276-400G1.1

A temporary over-run area is required on the western side of the R314, and the blade tip will over-sail into third party land on the northern side of the road. Over-sail will occur on both sides of the road. Overhead wires will be temporarily relocated during the delivery period and the hedge row on the western side of the road will also be trimmed.

Location 30 – Right bend on R314 at Belderrig 3

Collett Drawing No 348276-401G0.1

The blade tip will require over-sail into third party lands on the east side of the R314 at this location. There will also be minor overhang outside the carriageway on the west side of the road.

Location 31 – U bend on R314 at Belderrig 3

Collett Drawing No 348276-402E1.1

The blade tip will over-sail into third party lands on the southeast corner of this U bend on the R314 at this location. There are also various locations where the blade tip will over-sail outside the carriageway to the west and south of this section of the R314.

Location 32 – Left bend on R314 at Glenurla

Collett Drawing No 348276-410G0.1

Temporary over-run areas and local widening will be required both sides of the bridge in order to accommodate the transporter vehicles with the elevated blades. In addition, over-sail of the blade tip into third part lands will occur on the southeast corner of this bend on the R314.

Location 33 – Right bend on R314 at Glenurla

Collett Drawing No 348276-411G0.1

The blade tip will over-sail into third party land on the western side of the road and there will also be a slight overhang of the vehicle outside the carriageway boundary on the eastern side of the road. Overhead wires will be temporarily relocated during the delivery period.

Location 34 – Left bend on R314 (junction with Belmullet Redloop at Muingelly

Collett Drawing No 348276-420G1.1

The blade tip will be required to over-sail into third party land on the southern side of the R314 and there will also be a slight overhang of the verge on the east side as the vehicle heads north through the bend. Overhead wires and road signs will be temporarily relocated during the delivery period.

Location 35 – Right bend on R314 at Muingelly

Collett Drawing No 348276-421G1.1

Over-sail will occur on both sides of the road. Overhead wires crossing the R314 will be temporarily removed at this location.

Location 36 – S bend at Killerduff

Collett Drawing No 348276-430G0.1

An area of third Party Land is required on both the western side of northern bend, and the east side of the southern bend, in order to accommodate the oversail of the elevated blade. Slight over sail of the blade will also be required on the southern side of the R314 . Overhead cables will be temporarily removed and trees and vegetation will require to be trimmed on both sides of the road.

Location 37 – Proposed temporary link between R314 and the Ballyglass local for Abnormal Loads only

Collett Drawing No 348276-450G0.1

An area of third party land is required on order to provide a new road between the R314 and the Ballyglass local road. Overhead cables crossing the Ballyglass local road will be temporarily relocated.

Location 384 – Y junction on unnamed road near Ballyglass

Collett Drawing No 348276-460G0.1

An area of third party land is required on the southeast side of the junction in order to provide the temporary over-run area required for the blade transporter to turn left at this location. Over-sail will occur on the west side of the unnamed road. A temporary over-run strip will also be required on the eastern side of the unnamed local road. Vegetation will require to be trimmed on both sides of the road and existing ditches will be culverted.

15.1.9 Provision for Sustainable Modes of Travel

15.1.9.1 Walking and Cycling

The provision for these modes is not relevant during the construction stage of the development as travel distances will likely exclude any employees walking or cycling to work.

15.1.9.2 Public Transport

There are no public transport services that currently pass the site.

15.1.10 Likely and Significant Effects and Associated Mitigation Measures

15.1.10.1 "Do Nothing" Scenario

If the Proposed Development does not proceed, there will be no additional traffic generated or accommodation works carried out on the local road network as a result of the Proposed Development and therefore no direct or indirect effects on roads and traffic will occur.

15.1.10.2 Construction Phase Effects

On the 22 days when the concrete foundations are poured construction generated traffic will result in an increase in traffic levels between +17.0% on the N59 between Ballymunnelly and Ballina, to +9.2% on the N59 just to the west of Ballymunnelly. On the R314 just to the north of Ballycastle it is forecast that traffic flows will increase by 30.1%. Travelling towards the site on the Killerduff Road, due to background traffic volumes being low, it is forecast that traffic volumes will increase by a factor of 6. As a result of the additional 440 pcus that will travel on the network on these days it is forecast that there will be a temporary, slight, negative impact on general traffic using the surrounding road network.

During the remaining 299 days for the site preparation and ground works when deliveries to the site will take place, the effect on the surrounding road network will be negative and will be between 6.5% on the N59 between Ballymunnelly and Ballina and +3.5% just to the west of Ballymunnelly. On the R314 just to the north of Ballycastle it is forecast that traffic flows will increase by 11.5%. Travelling towards the site on the Killerduff Road it is forecast that traffic volumes will increase by 171.7%. As a result of the additional 121 pcus that will travel on the network on these days it is forecast that there will be a temporary, slight, negative impact on general traffic using the surrounding road network.

During the 40 nights when the various component parts of the wind turbine plant are delivered to the site using extended articulated HGVs, the effect of the additional traffic on these days will be moderate due to the size of vehicles involved, resulting in increased traffic volumes between +1.2% on the N17 between Tuam and Claremorris to +2.0% on the N58 between Ballylahan and Foxford, to +5.4% on the N59 between Crossmolina and Bangor-Ennis. On the R314 just to the north of Ballycastle it is forecast that traffic flows will increase by 9.6%.

The assessment assumes that the large turbine components will be delivered during daytime hours and reflects the most conservative scenario. The direct effect will be reduced from moderate to slight if the delivery of the large plant will be done during nighttime hours, as is proposed. As it is the industry norm to make these deliveries during nighttime hours the impacts incurred by existing traffic on the local highway network will be negative, temporary (over 20 nights) and will be slight.

During the 22 days of the turbine construction stage when general materials are delivered to the site, the additional 55 PCUs on the road network will result in increased traffic volumes between +0.5% on the N17 between Tuam and Claremorris to +0.8% on the N58 between Ballylahan and Foxford, to +2.1% on the N59 between Crossmolina and Bangor-Ennis. On the R314 just to the north of Ballycastle it is forecast that traffic flows will increase by 3.8% and on the local Killerduff Road by 56.2%.

The effect during this period will be temporary and will be imperceptible.

Of all of the links assessed on the delivery route it was determined that the N58 between Ballylahan and Foxford is forecast to operate over link capacity (141%) by the year 2028 for the do-nothing scenario. It is forecast that during the construction of the Proposed Development, the most substantial impact will occur during the 40 days when the abnormal turbine loads are delivered to the site, when this is forecast to increase to 144%. For the majority of the construction phase there will be no impacts on this link as concrete and general construction material will be sourced closer to the site. While the

assessment indicated that this section of the N58 will operate over capacity by the year 2028, the impacts of the construction traffic generated by the Proposed Development will be negative, slight and will be temporary.

It was determined that the junction between the R314 and Killerduff Road will operate within capacity for all days within the construction period.

During the construction of the Grid Connection there will be closures along the route for a total of 189 days. As traffic volumes are relatively low, the direct effect to existing traffic will be negative, temporary and slight.

15.1.10.3 Operational Phase Effects

During the operational phase the direct effect on the surrounding local highway network, including junctions, will be neutral and long term given that there will be approximately two maintenance staff travelling to site at any one time, resulting in typically two visits to the site on any one day made by a car or light goods vehicle, two to three times per week.

Should the proposed wind farm be consented and developed, the recreational and amenity proposals set out in Chapter 4, Section 4.6 will be implemented which means that there will be traffic accessing the site for amenity use during the operational stage. The proposed amenity car park will be accessed via the main site access junction. The volumes are likely to be small (up to a maximum of 20 car trips per day) based on information from other similar wind farm developments. Given the capacity of the local highway network there is no significant effects anticipated on roads and traffic.

15.1.10.4 Decommissioning Phase Effects

When the site is decommissioned, cranes will disassemble each turbine tower and all equipment.

All turbine infrastructure including turbine components will be separated and removed off-site for re-use, recycling and waste disposal.

It is proposed that turbine foundations and hardstanding areas will be left in place and covered with soil/topsoil. It is proposed to leave the access roads, visitor car park and walkways in situ at the decommissioning stage. It is considered that leaving the turbine foundations, access tracks and hardstanding areas in situ will cause less environmental damage than removing and recycling them.

The substation and the grid connection cable will remain in-situ as permanent infrastructure of the national grid network.

The effects on the network during decommissioning will be less significant compared to those during the construction phase as presented in this section of the EIAR as the volume of materials transported to and from the site will be significantly less.

15.1.10.5 Cumulative Effects

A detailed assessment of all developments at varying stages in the development process (from pre-planning to operational), is set out in Section 2.8 with an assessment of the potential cumulative traffic effects with the proposed subject wind farm assessed on the following criteria;

- Project status (pre-planning to operational)
- Degree of overlap with the Proposed Development delivery highway network (low to high)
- Traffic volumes (low to high).

Other wind farms

From a review of all existing and approved wind farms set out in Section 2.8 it has been determined that the potential for cumulative impacts will only occur with other wind farms that have yet to be constructed as the traffic generation for existing operational wind farms is very low.

As set out in Table 15-27 there are 10 Wind Farm developments within 20km of the Proposed Development, with 6 not yet constructed, that have the potential to cause cumulative effects in relation to traffic and transport. For 4 of these proposed developments; Sheskin Wind Farm (permitted), Oweninny Wind Farm Phase 3 (awaiting decision by ABP) , Kilsallagh Wind Farm (pre-planning stage, Sheskin South Wind Farm (planning submitted), all are located within relatively close proximity of the Proposed Development and with respective TDRs sharing common sections of the N59, and with some, the L1204 and R314..

As the majority of delivery routes for the abnormally large turbine deliveries and for general construction traffic are common to the 4 developments described above and the Proposed Development, in the event that the construction of the Proposed Development coincides with any or all of these developments, then traffic related cumulative impacts would be negative, short-term and moderate for the 4 wind farm developments, based on the overlap of TDRs and associated traffic generation. It is therefore proposed that the construction phase of the Proposed Development will be scheduled, where possible, to avoid the construction phases of these other wind farms. This will ensure that the potential for cumulative effects is minimised.

For the remaining 2 wind farm developments located within a 20km radius of the Proposed Development, Tirawley Wind Farm and Keerglen Wind Farm, both are at an early stage in the pre-planning stage with insufficient information to determine the potential for cumulative impacts.

Table 15-27 Summary of other wind farms considered in cumulative assessment and potential for cumulative traffic effects with Proposed Development

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential cumulative traffic effects
1 – Sheskin Wind Farm	Permitted	High	Medium	Medium
2 - Bellacorick Wind Farm	Operational	High	Medium	None, already constructed
3 – Bunnahowen Wind Farm	Operational	High	Medium	None, already constructed
4 – Kilalla Wind Farm	Operational	High	Medium	None, already constructed
5 – Oweninny Phase 1 Wind Farm	Operational	High	Medium	None, already constructed
6 – Oweninny Phase 3 Wind Farm	Awaiting ABP decision	High	Medium	Medium

Project	Status	Degree of overlap of highway network (low / medium / high)	Traffic volumes (low / medium / high)	Potential cumulative traffic effects
7 – Kilsallagh Wind Farm)	Pre-planning stage	High	Medium	Medium
8 – Sheskin South Wind Farm	Planning application submitted	High	Medium	Medium
9 – Tirawley Wind Farm	Pre-planning stage	High	Medium	Medium
10 – Keerglen Wind Farm	Pre-planning stage	High	Medium	Medium

Other development applications in the planning system

In addition to the Wind Farm Developments discussed above there is a hydrogen storage plant that is permitted which will be located near the Bellacorick substation located within close proximity of the Proposed Development. Based on the location and the low volumes of traffic associated with the hydrogen facility, it is considered that potential for cumulative impacts between the Proposed Development and the hydrogen storage facility will be negative, will be temporary and will be slight.

A planning search was undertaken by MKO of the Mayo County Council planning register for all development planning applications within 2km of the Proposed Development site, all of which relate to the provision and/or alteration of one-off rural housing and agricultural buildings, as described in Planning History, Section 2.5 of this Chapter. Based on the scale of these developments it is considered that there will be no potential for cumulative impacts with these developments.

It is noted that all general forestry activity will be curtailed on the site during the construction of the proposed development.

15.1.10.6 Mitigation Measures

This section summarises the mitigation measures to minimise the effects of the Proposed Development during the construction, operational and decommissioning stages.

Mitigation Measures During the Construction Stage

The construction of this development will require significant coordination and the following comprehensive set of mitigation measures will be put in place before and during the construction stage of the project in order to minimise the effects of the additional traffic generated by the proposed wind farm.

Delivery of abnormal sized loads

The following are the main measures that will be implemented for these deliveries. These will take place during nighttime hours and will comply with the following process :

- The delivery of turbine components is a specialist transport operation with the transportation of components carried out at night when traffic is at its lightest and the impact minimised.
- The deliveries will be made in consultation with the Local Authority and An Garda Síochána.

- It is estimated that 198 abnormal sized loads will be delivered to the site, comprising 40 convoys of 5, undertaken over 40 separate nights.
- These nights will be spread out over an approximate period of 20 weeks and will be agreed in advance with the relevant authorities
- In order to manage each of the travelling convoys, for each convoy there will be two police escort vehicles that will stop traffic at the front and rear of the convoy of 5 vehicles.
- There will also be two escort vehicles provided by the haulage company for each convoy.

Other traffic management measures

A **Traffic Management Plan (TMP)** is provided specifying details relating to traffic management and as Appendix 15-2 this EIAR. Prior to the commencement of the construction phase of the Proposed Development a detailed Traffic Management Plan will be prepared by the Contractor in accordance with the measures proposed in the TMP, for agreement with the relevant local authorities and An Garda Síochána . The TMP includes measures which will include the measures below as a minimum requirement, for the following:

- **Traffic Management Coordinator** – a competent Traffic Management Co-ordinator 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.
- **Delivery Programme** – a programme of deliveries will be submitted to the County Council in advance of deliveries of turbine components to site. Liaison with the relevant local authorities and Transport Infrastructure Ireland (TII) will be carried out where required regarding requirements such as delivery timetabling. The programme will ensure that deliveries are scheduled in order to minimise the demand on the local network and minimise the pressure on the access to the site.
- **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. temporary lane/road closures (where required) or delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided.
- **A Pre and Post Construction Condition Survey** – Where required by the local authority, a pre-condition survey of roads associated with the Proposed Development will be carried out immediately prior to construction commencement to record an accurate condition of the road at the time. A post construction survey will be carried out after works are completed to ensure that any remediation works are carried out to a satisfactory standard. Where required the timing of these surveys will be agreed with the local authority. All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.
- **Liaison with the relevant local authority** - Liaison with the County Councils and An Garda Síochána, will be carried out during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. Once the surveys have been carried out and "prior to commencement" status of the relevant roads established, (in compliance with the provisions of the CEMP), the Roads section will be informed of the relevant names and contact numbers for the Project Developer/Contractor Site Manager as well as the Site Environmental Manager.
- **Implementation of temporary alterations to road network at critical locations** – at locations highlighted in section 15.1.8. In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will also be used where deemed practicable.
- **Identification of delivery routes** – These routes will be agreed with the County Councils and adhered to by all contractors.

- **Delivery times of large turbine components** - The management plan includes the commitment to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage.
- **Travel plan for construction workers** – While the assessment above has assumed the worst case in that construction workers will drive to the site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of routes to / from the site.
- **Additional measures** - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including wheel washing facilities on site and sweeping / cleaning of local roads as required. These are set out in the CEMP which is contained in Appendix 4.3.
- **Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.

Mitigation Measures During Operational Stage

Due to the very low volumes of traffic forecast to be generated during this stage no mitigation measures are required.

Mitigation Measures During Decommissioning Stage

When the Proposed Development is decommissioned, a decommissioning plan will be prepared for agreement with the local authority, as described in Section 4.11 of Chapter 4. This plan will include a traffic management plan and other similar mitigation measures to those implemented during the construction phase. In terms of traffic effects, the decommissioning stage will generally mirror the constructions stage although the effects will be significantly reduced as the volumes of materials removed from the site will be less and there will be no abnormally sized loads.

15.1.10.7 Residual Impacts

Construction Stage

During the 18-month construction stage of the Proposed Development, it is forecast that the additional traffic that will appear on the delivery route indicated in Figure 15.1 will have a negative and temporary impact on existing road users, which will be minimised with the implementation of the mitigation measures included in the proposed traffic management plan. The effects will be slight to imperceptible during all of the construction stage, with the exception of the delivery of the abnormal loads, which will reduce from moderate to slight if these deliveries are undertaken during the night, as proposed.

Operational Stage

As the traffic impact of the Proposed Development will be imperceptible during the operational stage, no mitigation is required and the residual effects will also be imperceptible.

Decommissioning Stage

As stated above, a decommissioning plan will be prepared and implemented in order to minimise the residual impacts during this stage. The residual effect will be less than for the construction stage as set out above and will be slight to imperceptible.

15.1.10.8 Significance of Effects

Based on the above assessment it is concluded that the Proposed Development will have no significant effects in relation to background traffic movements or on the existing road network.

15.2 Other Material Assets

This section of the EIAR assesses the likely significant effects of the proposed Glenora wind farm and the intended substation and grid connection route and turbine delivery route accommodation works (collectively referred to as the "Proposed Development")on other material assets such as utilities, telecommunications and aviation assets.

15.2.1 Introduction

The Proposed Development is located within existing commercial forestry properties in Glenora and adjacent townlands, approximately 6 kilometres (km) southwest of the village of Ballycastle, Co. Mayo. The site location context is shown in Figure 1-1a and Figure 1-1b of this EIAR. The site is located in a rural setting with a low population density with a low volume of built services. The purpose of this section is to determine the potential for impact on other material assets by the Proposed Development during the construction, operation and decommissioning phases and to determine the residual effects once mitigation, where required, has been implemented.

15.2.1.1 Methodology and Guidance

This section of the assessment focuses particularly on the scoping and consultation exercise conducted with relevant stakeholders such as Irish Water, Eirgrid, ESB and various telecommunications operators and aviation authorities. Scoping was carried out in line with the above EPA 2022 guidelines, and the '*Best Practice Guidelines for the Irish Wind Energy Industry'* (Irish Wind Energy Association, 2012), which provides a recommended list of telecommunications operators for consultation, and Section 3.3 of the EPA 2022 Guidelines. A full description of the scoping and consultation exercise is provided in Section 2.6 of Chapter 2 of this EIAR. Consultation with the telecommunications operators and aviation bodies was undertaken as part of the constraints mapping process, which in turn informed the layout of the Proposed Development, as described in Chapter 3 of the EIAR.

The assessment of likely significant effects on material assets uses the standard methodology and classification of impacts as presented in Section 1.7.1 of Chapter 1 of this EIAR. The detailed description of the Proposed Development is provided in Chapter 4 of this EIAR.

15.2.1.2 Statement of Authority

This section of the EIAR has been prepared by Edward Ryan, and reviewed by Eoin McCarthy, of MKO. Edward holds a B.Sc. (Hons) in Environmental Science from the University of Limerick and a M.Sc. (hons) in Environmental Systems from Atlantic Technological University: ATU (formally GMIT). Edward is an Environmental Scientist with over 4 years of consultancy experience. Eoin is a Senior Environmental Scientist with over 12 years experience and holds a B.Sc. (Hons) in Environmental Science from the University of Galway. His project experience includes a significant range of energy infrastructure having managed and co-ordinated the EIAR preparation and planning application process for circa 700MW of wind energy projects.

15.2.2 Utilities

15.2.2.1 Water Supply

A scoping request letter was issued to Irish Water in March 2021. A follow-up scoping request was issued in June and August 2021. No response to any of the requests has been received to date.

The GSI maintain a groundwater database of wells drilled throughout Ireland. There are no groundwater wells abstractions within the EIAR site boundary. The nearest source of public water supply is at Belderrig, c. 6 km to the northwest of Proposed Development, outside subcatchments that are linked with the Proposed Development. It is noted that the nearest town, Ballycastle, receives water supply from the Ballina distribution network which is sourced from Lough Conn. An assessment of the potential effects of the Proposed Development on water supply (water quality) is included in Chapter 9 of this EIAR.

15.2.2.2 Electricity

15.2.2.2.1 *Infrastructure*

Two 110kV lines cross the underground grid connection of the Proposed Development in the townland of Lisglennon. These 110kV lines travel in a southerly direction from Tawnaghmore 110kV substation to the Moy 110kV substation. These overhead lines cross the proposed underground grid connection route that travels from the proposed Glenora Wind Farm Substation and the existing Tawnaghmore 110kV substation. A scoping request was issued to Eirgrid in March 2021 and again in December 2021. No response has been received to date.

15.2.2.2.2 *Supply*

Ireland faces significant challenges to its efforts to meet European Union (EU) targets for renewable energy by 2030 and its commitment to transition to a low carbon economy by 2050. The need to decarbonise the economy and reduce emissions has always been imperative, however in recent years the urgency involved has become clearer to all stakeholders. The primary driver behind the Proposed Development is the need to provide additional renewable energy to offset the use of fossil fuels within the electricity generating sector. Further detail can be found in Chapter 2 and Chapter 11 of this EIAR. The Proposed Development comprises the provision of a wind farm of 22 no. wind turbines, which is capable of generating a maximum of 198MW of renewable energy onto the national grid and capture an additional part of County Mayo's valuable renewable energy resource.

15.2.3 Telecommunications and Aviation

The following section describes the way in which the proposed wind turbines can potentially interfere with telecommunications signals or aviation activities.

15.2.3.1 Background

15.2.3.1.1 *Broadcast Communications*

Wind turbines, like all large structures, have the potential to interfere with broadcast signals, by acting as a physical barrier or causing a degree of scattering to microwave links. The most significant effect at a domestic level is a possible flicker effect caused by the moving rotor, affecting, for example, radio signals.

The most significant potential effect occurs where the wind turbines are directly in line with the transmitter radio path.

15.2.3.1.2 Domestic Receivers

Depending on local topography, a domestic receiver may receive broadcast signals from more than one location. The strength of the signals varies with distance from the transmitter, and the receiver's antenna is generally always directed towards the most local, and usually strongest, broadcasting station.

There are two types of potential electromagnetic interference to domestic receivers, depending on the location of the receiver in relation to a wind farm. 'Shadowed' houses are located directly behind a wind farm, relative to the location from where the signal is being received. In this case, the main signal passes through the wind farm and the rotating blades can create a degree of signal scattering. In the case of viewers located beside the wind farm (relative to the broadcast signal direction), the effects are likely to be due to periodic reflections from the blade, giving rise to a delayed signal.

In both cases, i.e., shadowed houses located behind the wind farm and those located to the side of it, the effects of electromagnetic interference may depend to some degree on the wind direction, since the plane of rotation of the rotor will affect both the line-of-sight blockage to viewers located behind the wind farm and the degree of reflection to receivers located to the side.

15.2.3.1.3 Other Signal Types

Wind turbines have the potential to affect other signal types used for communication and navigational systems, for example tower-to-tower microwave communication links, and airborne and ground radar systems. Interference with radar systems occurs when wind turbines are located close to an airport or directly in line with the instrument landing approach.

The nearest airports to the Proposed Development site are Ireland West Airport in Knock, County Mayo, located approximately 54 kilometres southeast of the site and Sligo Airport, also located approximately 54km to the northeast.

Potential effects on broadcast communications can be reduced, avoided or mitigated bydetailed micro-siting of turbines in order to avoid alignment with signal paths or by the use of repeater relay links out of line with the wind farm.

15.2.3.2 Preventing Electromagnetic Interference

15.2.3.2.1 National Guidelines

Both the adopted 2006 and the 2019 draft 'Wind Energy Development Guidelines for Planning Authorities' produced by the Department of the Environment, Heritage and Local Government (DOEHLG) state that interference with broadcast communications can be avoided entirely or reduced by the installation of deflectors or repeaters where required.

Developers are advised to contact individual local and national broadcasters and mobile phone operators to inform them of proposals to develop wind farms. This consultation has been carried out by MKO as part of the assessment of the Proposed Development as summarised below; full details are provided in Section 2.6 in Chapter 2 of this EIAR.

The layout and design of the Proposed Development has taken into account nearby telecommunications links.

15.2.4 Scoping and Consultation

As part of the EIAR scoping and consultation exercise, MKO contacted the relevant national and regional broadcasters, fixed and mobile telephone operators, aviation authorities and other relevant consultees. Consultation was also carried out with ComReg to identify any other additional licensed operators in the vicinity of the proposed site to be contacted, who may not have been on the list of main operators. These operators were subsequently scoped, and their responses are summarised below in Table 15-28.

Table 15-28 Telecommunications and Aviation Scoping Responses

Consultee	Response	Potential for Interference Following Consultation Exercise
Broadcasting Authority of Ireland	Received 5th February 2021	No
ComReg (Commission for Communications Regulation)	Received 9th March 2021	No
Department of Defence	Received 14th April 2021	See Section 15.2.8.3
Eir	Received 5th February 2021	No
EMR Integrated Solutions	Received 5th February 2021	No
eNet	Received 22nd January 2021	No
ESB Telecoms	Received 28th January 2021	No
Ireland West Airport Knock	Received 24th May 2021	See section 15.2.4.3
Imagine Group	Received 22nd January 2021	No
Irish Aviation Authority	Received 14th April 2021	See section 15.2.4.3
Openeir	Received 22nd January 2021	No
Ripplecom	Received 24th May 2021	No
RTÉ Transmission Network (2rn)	Received 5th February 2021	See Section 15.2.4.1
Sligo Airport	Received 24th May 2021	See Section 15.2.4.3
Tetra Ireland Communications (Emergency Services)	Received 12th February 2021	No
Three Ireland Ltd	Received 26th January 2021	No
Towercom Ltd.	Received 1st June 2021	N/A
Viatel	Received 25th January 2021	No
Virgin Media	Received 26th January 2021	No

Consultee	Response	Potential for Interference Following Consultation Exercise
Vodafone Ireland	Received 25th January 2021	No

The scoping responses from the telecommunications and aviation consultees are described below. Relevant copies of scoping responses are provided in Appendix 2-1.

15.2.4.1 Broadcasters

RTÉ Transmission Network (operating as 2rn), replied on the 5th of February 2021 to a scoping request from MKO stating that the operation of the Proposed Development will not have any impact on RTÉ fixed links. However, 2rn have stated that there is a risk of interference to digital terrestrial television services in the area around the Proposed Development and have requested a protocol agreement between the telecoms Operator (2rn) and the Applicant should the permission for the Proposed Development be granted.

Virgin Media replied on the 26th of January 2021 to scoping requests from MKO stating that the Proposed Development will have no impact on their presence in the area.

15.2.4.2 Other Operators

Of the scoping responses received from telephone, broadband and other telecommunications operators (see table above), no potential interference concerns have been raised in relation to the Proposed Development.

15.2.4.3 Aviation

As noted in Table 15-28 above, in terms of aviation consultees, a scoping response was received from the Department of Defence, the Irish Aviation Authority and Sligo Airport. An automated response was received from Ireland West Airport (Knock).

Department of Defence

The Department of Defence (DOD)replied to a scoping request from MKO Ireland on the 14th of April 2021

1. *All turbines or tall structures should be illuminated by high intensity obstacle lights that will allow the hazard be identified and avoided by aircraft in flight.*
2. *Obstruction lights used should be incandescent or of a type visible to Night Vision Equipment. Obstruction lighting fitted to obstacles must emit light at the near Infra-Red (IR) range of the electromagnetic spectrum specifically at or near 850nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light.*
3. *Due to the nature of flight operations by the Irish Air Corps the above lighting requirements are separate to ICAO and IAA lighting requirements.*

In response to the lighting requirements requested by the Department of Defence, the proposed turbines will be included on mapping, fitted with the required specifications as proposed by the DOD and entered into aircraft navigation databases to ensure they will be avoided during flight.

Sligo Airport

A scoping response was received from Sligo Airport on the 24th May 2021. The response noted that the development falls outside of the area that would be of concern to the airport but recommend the IAA is contacted.

Ireland West Airport, Knock

Ireland West Airport was issued a scoping request on the 24th May 2021. An automated response was received on the same day with a list of phone numbers. Further attempts were made via phone call however no representative for the airport was reached.

Irish Aviation Authority

The Irish Aviation Authority (IAA) replied to a scoping request on the 14th of April 2021. The IAA noted that as the proposed turbine dimensions and locations were not provided at that stage a full review could not be complete. They stated however that since the nearest airports, Sligo Airport and Ireland West Airport were 54km and 54km Iaway from the Proposed Development (specifically the wind turbines), respectively, and therefore the following general observations would be proffered during a formal planning process:

1. *agree an aeronautical obstacle warning light scheme for the wind farm development,*
2. *provide as-constructed coordinates in WGS84 format together with above mean sea level tip height elevations at each wind turbine location*
3. *notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.*

The final turbine coordinates and dimensions were issued to the IAA on the 17th December 2021. An acknowledgment response was received on the same day. The above requests will be complied with should the Proposed Development receive a grant of planning permission.

15.2.5 Existing Waste Management Services

There are no EPA-licensed or local authority-authorised waste facilities or activities located within the EIAR site boundary. The closest, authorised municipal waste facility is located approximately 22km southeast of the Proposed Development site, at Ballina, Co. Mayo.

The CEMP, Appendix 4-3 of this EIAR, includes a waste management plan (WMP) which outlines the best practice procedures during the demolition, excavation and construction phases of the Proposed Development. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Development. Disposal of waste will be seen as a last resort.

15.2.6 Likely Significant Effects and Associated Mitigation Measures

15.2.6.1 'Do-Nothing' Scenario

If the Proposed Development were not to proceed, there would be no change to existing built services, telecommunications and aviation operations in the area.

15.2.6.2 Construction Phase

15.2.6.2.1 *Water Supply*

Pre-Mitigation Impact

There are no public water schemes or private wells within 5km of the Proposed Development (specifically the proposed wind farm). While the grid connection route has been designed to avoid all known underground utilities, there is the potential for the construction of the grid connection route to necessitate the relocation of water supply services. This would have a short-term, negative impact on water supply.

Mitigation Measures

In advance of any construction activity for the grid route, the contractor will undertake pre-commencement surveys of the proposed route to confirm the presence or otherwise of any services such as water supply. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works. In the event that water mains are encountered the water supply will be turned off by the utility so work can commence on diverting the service. The section of existing pipe will be removed and will be replaced with a new pipe along the new alignment of the service. The works will be carried out in accordance with the specifications of the relevant utility provider.

Residual Impact

There will be a short-term imperceptible negative residual effect on water supply.

Significance of Effects

There will be no significant direct or indirect effect on water supply from the Proposed Development.

15.2.6.2.2 *Electricity*

Pre-Mitigation Impact

Two 110kV overhead lines traverse the local road in the townland of Lisglennon along the proposed underground grid connection route. There is potential for these lines to be impacted through interference or breakage during the construction phase, specifically during the laying of grid connection cables along the local road in the townland of Lisglennon. This would have an unlikely but temporary, moderate negative impact on local electricity supply.

Mitigation Measures

In advance of any construction activity for the grid route, the contractor will undertake pre-commencement surveys of the proposed route to confirm the presence of overhead lines. If found to be present, the following measures will be followed

- Goal posts will be established under the two overhead lines for the entirety of the construction phase. They will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks
- The suitability of machinery and equipment for use near power lines will be risk assessed.
- All staff will be trained on the routes and operating voltages of overhead electricity lines running across the local road in the townland of Lisglennon All staff will be trained to be aware of the risks associated with overhead lines.
- Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire.
- Prior to the delivery of turbines to the Proposed Development site, a dry run of the route using vehicles with similar dimensions. Please see Section 15.1 above for details.
- When activities must be carried out beneath overhead lines, e.g. component delivery or grid cable laying, a site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used is undertaken prior to any works. Overhead line proximity detection equipment is fitted to machinery when such works are required.
- Information on safe clearances will be provided to all staff and visitors.
- Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on site.
- All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2006'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan.
- All health and safety measures as detailed in Chapter 5: Population and Human Health will be adhered to during the construction, operation and decommissioning phases.

Residual Impact

With the implementation of the above measures, the residual impact is considered to be a temporary, slight negative impact on local electricity supply.

Significance of Effects

There will be no significant direct or indirect effect on electricity supply from the Proposed Development during the construction phase.

15.2.6.2.3 *Telecommunications and Aviation*

The potential for electromagnetic interference from wind turbines occurs only during the operational phase of the Proposed Development. There are no electromagnetic interference impacts associated with the construction phase of the Proposed Development, and therefore no mitigation required.

15.2.6.3 Operational Phase

15.2.6.3.1 *Water Supply*

Pre-Mitigation Impact

No interactions with water supply are foreseen during the operational phase therefore no impact will occur.

Significance of Effects

There will be no significant direct or indirect effect on water supply from the Proposed Development during the operational phase.

15.2.6.3.2 *Electricity*

Electricity Infrastructure

Pre-Mitigation Impact

No interactions with electricity infrastructure are foreseen during the operational phase therefore no impact will occur.

Significance of Effects

There will be no significant direct or indirect effect on electricity infrastrucre from the Proposed Development during the operational phase.

Electricity Supply

Pre-Mitigation Impact

The Proposed Development will the connected into the existing Tawnaghmore 110kV substation, approx. 14.1km southeast of the development site. The Proposed Development has the potential output of 132MW to 198MW. Turbines of the exact same make, model and dimensions can also have different power outputs depending on the capacity of the electrical generator installed in the turbine nacelle. At maximum installed capacity of 198MW, the Proposed Development therefore has the potential to produce up to 607,068 MWh (megawatt hours) of electricity per year, offsetting the use of fossil fuels within the electricity generating sector. Therefore, the electricity produced by the Proposed Development will be sufficient to supply approximately 144,540 Irish households with electricity per year (refer to Section 4.3.1.5 of Chapter 4 of this EIAR).

Mitigation Measures

None are proposed

Residual Impact

There will be a long-term slight positive residual effect on electricity supply during the operational phase.

Significance of Effects

The Proposed Development will have a slight positive effect on national electricity supply.

15.2.6.3.3 *Telecommunications*

Pre-Mitigation Impact

Consultation regarding the potential for electromagnetic interference from the Proposed Development was carried out with the relevant national and regional broadcasters, fixed line and mobile telephone operators and other operators. The existence of a microwave link and a point to multi point link was highlighted by the relevant operators.

Mitigation Measures

In the event of further scoping responses being received from the EIA consultees, the comments of the consultees and any proposed mitigation measures will be implemented in the construction and operation of the Proposed Development, subject to a grant of planning permission.

In the event of interference occurring to telecommunications, the Department of the Environment, Heritage and Local Government Wind Farm Planning Guidelines (2006) state that these effects can be reduced, avoided or mitigated by the use of divertor relay links out of line with the proposed wind turbines.

Residual Impact

The Proposed Development will have no residual impact on the telecommunications signals of any other operator, due to distance from or absence of any links in the area.

Significance of Effects

There will be no significant effect on telecommunications from the Proposed Development.

15.2.6.3.4 *Aviation*

Pre-Mitigation Impact

No scoping response was received from Ireland West Airport. Sligo Airport indicated no potential for impact due to the separation distance between the airport and the Proposed Development site. The IAA indicated that due to the separation distance between the Ireland West Airport and Sligo Airport, just general observations regarding lighting and as built turbine coordinates are to be provided. The scoping response of the Department of Defence and IAA requested that standard lighting requirements be used at the proposed wind farm.

Mitigation Measures

IAA noted that given the distance from the site to the airports (Ireland West Airport and Sligo Airport), general observations pertaining to lighting and turbine coordinate provision should be followed. The Department of Defence provided general observations pertaining to lighting specifications. Please see Section 15.2.4.3 above.

In relation to aviation safety lighting, there are a number of lighting schem options available that will ensure compliance with the requirements of IAA and DoD while also avoiding any significant impact on potentially sensitive receptors (i.e. ecological receptors or visual receptors).

Residual Impact

The Proposed Development will have no residual impact on aviation as all lighting requirements will be met by the applicant.

Significance of Effects

There will be no significant effect on aviation during the operational phase.

15.2.6.4 Decommissioning Phase

15.2.6.4.1 *Water Supply*

The impact assessment outcome of the decommissioning phase on water supply is considered to be the same as the operational phase. There will be no significant effect on water supply during this phase.

15.2.6.4.2 *Electricity*

Pre-Mitigation Impact

During the decommissioning phase, the removal of turbine components from the site will be required. Therefore, impacts during the construction phase are considered to be the same as the decommissioning phase.

Mitigation Measures

The measures outlined for the construction phase are considered the same for the decommissioning phase.

Residual Impact

The residual impact for this phase is considered the same as the construction phase.

Significance of Effects

There will be no significant effect on electricity supply with the decommissioning of the Proposed Development.

15.2.6.4.3 *Telecommunications and Aviation*

The potential for electromagnetic interference from the proposed wind turbines occurs only during the operational phase of the Proposed Development. There are no electromagnetic interference impacts associated with the construction or decommissioning phases of the Proposed Development, and therefore no mitigation required.

15.2.6.5 Cumulative Effect

Chapter 2, Section 3.8 of this EIAR describes the methodology used in compiling the list of projects considered in the assessment of cumulative effects, and provides a description of each project, including current status. Although there are 4 operational wind farms (Bellacorick Wind Farm, Oweninny Wind Farm Phase 1 & 2, Bunnahowen and Kilalla Wind Farm), 1 permitted (Sheskin Wind Farm ABO) and 3 proposed (Kilsallagh Wind Farm and Oweninny Wind Farm Phase 3,) within 10 kilometres of the proposed Glenora Wind Farm.

There will be a significant positive cumulative effect on electrical supply with the commission of all granted and proposed wind farms. There are no public water supplies or wells within the site boundaries of any of the above proposed, permitted or under construction wind farms therefore no significant cumulative effects are foreseen.

During the development of any large project that holds the potential to effect telecommunications or aviation, the Developer is responsible for engaging with all relevant Telecoms Operators and the relevant Aviation Authorities to ensure that the proposal will not interfere with television or radio signals by acting as a physical barrier. In the event of any potential impact, the Developer for each individual project is responsible for ensuring that the necessary mitigatory measures are in place. Therefore, as each project is designed and built to avoid impacts arising, a cumulative impact cannot arise.