3. CONSIDERATION OF REASONABLE ALTERNATIVES

3.1 Introduction

Article 5(1)(d) of Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) as amended by Directive 2014/52/EU (the EIA Directive) requires that the EIAR prepared by the developer contains *"a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment."*

Article 5(1)(f) of the EIA Directive requires that the EIAR contains *"Any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected."*

Annex IV of the EIA Directive states that the information provided in an Environmental Impact Assessment Report (EIAR) should include a *"description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*

As detailed in Section 1.1.1 in Chapter 1 Introduction, for the purposes of this EIAR, the various project components are described using the following references: 'Proposed Project', 'Proposed Wind Farm' and 'Proposed Grid Connection', the 'Site' and the 'Proposed Wind Farm site'. This section of the EIAR contains a description of the reasonable alternatives that were studied by the developer, which are relevant to the Proposed Project and its specific characteristics, in terms of site location and other renewable energy technologies as well as site layout incorporating size and scale of the project, connection to the national grid and transport route options to the Site. This section also outlines the design considerations in relation to the wind farm, including the associated substation and construction compound. It provides an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. The consideration of alternatives is an effective means of avoiding environmental impacts. As set out in the '*Guidelines on The Information to be Contained in Environmental Impact Assessment Reports' (Environmental Protection Agency, 2022),* the presentation and consideration of reasonable alternatives investigated is an important part of the overall Environmental Impact Assessment (EIA) process.

Hierarchy

EIA is concerned with projects. EPA, 2022 states that in some instances neither the applicant nor the competent authority can be realistically expected to examine options that have already been previously determined by a higher authority, such as a national plan or regional programme for infrastructure.

Non-environmental Factors

EIA is confined to the potential significant environmental effects that influence consideration of alternatives. However, other non-environmental factors may have equal or overriding importance to the developer of a project, for example project economics, land availability, engineering feasibility or planning considerations.

Site-specific Issues

EPA, 2022 states that the consideration of alternatives also needs to be set within the parameters of the availability of the land, i.e., the Site may be the only suitable land available to the developer, or the need for the project to accommodate demands or opportunities that are site-specific. Such considerations should be on the basis of alternatives within a site, for example design and layout.

3.2 Consideration of Reasonable Alternatives

3.2.1 Methodology

The EU Guidance Document on the preparation of EIAR (EU, 2017) outlines the requirements of the EIA Directive and states that, in order to address the assessment of reasonable alternatives, the Developer needs to provide the following:

- A description of the reasonable alternatives studied; and
- An indication of the main reasons for selecting the chosen option with regards to their environmental impacts.

There is limited European and National guidance on what constitutes a 'reasonable alternative', however, EU, 2017 states that reasonable alternatives "*must be relevant to the proposed project and its specific characteristics, and resources should only be spent assessing these alternatives*".

The guidance also acknowledges that "*the selection of alternatives is limited in terms of feasibility. On the one hand, an alternative should not be ruled out simply because it would cause inconvenience or cost to the Developer. At the same time, if an alternative is very expensive or technically or legally difficult, it would be unreasonable to consider it to be a feasible alternative*".

EPA, 2022 states that "*It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account is deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required.*"

Consequently, taking consideration of the legislation and guidance requirements into account, this chapter addresses alternatives under the following headings:

- 'Do-Nothing' Alternative;
- Alternative Site Locations;
- Alternative Renewable Energy Technologies;
- Alternative Turbine Numbers and Turbine Models;
- Alternative Turbine Layouts and Development Design;
- Alternative Design of Ancillary Structures;
- Alternative Grid Connection Route Options;
- Alternative Transport Route and Site Access; and
- Alternative Mitigation Measures.

Each of these is addressed in the following sections.

When considering a wind farm development, given the intrinsic link between layout and design, the two will be considered together in this chapter.

While environmental considerations have been at the core of the decision-making process for all of the project processes and infrastructure components, it should be noted that the majority of alternative options considered under the headings listed above are unlikely to have had significantly, greater environmental effects than the chosen option.

3.3 'Do-Nothing' Alternative

Article IV, Part 3 of the EIA Directive states that the EIAR should include "*an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge."* This is referred to as the "do-nothing" alternative. EU, 2017 states that this should involve the assessment of "*an outline of what is likely to happen to the environment should the Project not be implemented – the so-called 'do-nothing' scenario.*"

An alternative land-use option to the development of a renewable energy project at the Site would be to leave it as it is, with no changes made to the current land-use practices. Predominantly agricultural fields with areas in the north occupied by cutover and raised bogs would continue. In doing so, the environmental effects in terms of emissions are likely to be neutral.

By implementing this 'Do-Nothing' alternative, however, the opportunity to capture the available renewable energy resource would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. The opportunity to generate local employment, local authority development contributions, rates and investment in the local area would also be lost. Furthermore, the opportunity to create and further enhance the biodiversity of the surrounding area as part of the Proposed Project would also be lost.

As such, on the basis of the positive environmental effects arising from the project, when compared to the 'Do-nothing' alternative, the 'Do–nothing' alternative was not the chosen option. The existing surrounding land uses can and will continue in conjunction with this Proposed Project. A comparison of the potential environmental effects of the 'Do-Nothing' Alternative when compared against the chosen option of developing a renewable energy project at this site are presented in Table 3-1 below.

Table 3-1 Comparison of environmental effects when compared against the chosen option of developing a renewable energy project (the Proposed Project).

Environmental Consideration	'Do Nothing' Alternative	Developing a renewable energy project (Chosen option)
Population & Human Health	No increase in local employment and no long-term financial contributions towards the local community. No potential for shadow flicker and noise to affect sensitive receptors. No potential for long-term positive effects on air quality and climate change targets. No potential to supply an estimated 45,990 homes with clean renewable electricity No effects on residential visual amenity	Approximately 80-100 jobs could be created during the construction, operation, and decommissioning phases of the Proposed Project. A community contribution in the region of approx. €300,000/year for 15 years will have a direct positive impact for the local community. Based on the assessment detailed in Chapter 5 and the mitigation measures proposed, there will be no significant effects related to shadow flicker and noise from the Proposed Project. As detailed in the assessment in Chapter 10, the Proposed Project will have a Long-term Moderate Positive Impact on air quality.

Environmental Consideration	'Do Nothing' Alternative	Developing a renewable energy project (Chosen option)
		As detailed in the assessment in Chapter 11, the Proposed Project will have a Long-term Moderate Positive Impact on climate. As detailed in Chapter 12, residual effects from Noise and Vibration not significant for the construction and decommissioning phases. For the Operational Phase, the residual effects are not significant to imperceptible on sensitive receptors. As detailed in Chapter 13, there will be no significant residual Landscape & Visual effects. However, it should be noted that the Proposed Project will have a greater effect on the visual residential amenity than the 'Do-Nothing' scenario. The proposed turbine locations adhere to the recommended 500m set back distance in the 'Wind Energy Development Guidelines for Planning Authorities' (DoEHLG, 2006) (hereafter referred to as the '2006 Guidelines' (DoEHLG, 2006)) and also the 4 times tip height set-back distance set out in the 'Draft Wind Energy Development Guidelines' (December 2019) (hereafter referred to as the 'draft 2019 Guidelines' (DoHPLG, 2019)) for the purpose of protecting visual amenity.
Biodiversity (including Birds)	No habitat loss No potential for collision risk for birds and bats No biodiversity enhancement measures would be put in place.	As detailed in Chapter 6, the Proposed Project has been designed to avoid or mitigate impacts on biodiversity including bats and downstream aquatic receptors. The Proposed Project includes for a biodiversity net gain proposal providing a local boost to biodiversity. Please see Appendix 6-4 for details. As detailed in the Collision Risk Assessment (CRA) in Appendix 7-6, the impact of the Proposed Wind Farm site on birds corresponds to a Low - Very Low effect significance. With the implementation of the mitigation measures described in

Environmental Consideration	'Do Nothing' Alternative	Developing a renewable energy project (Chosen option)
		Chapter 7 Ornithology, the residual effects for collision risk are not significant. As detailed in the Bat Survey Report, Appendix 6-2, Provided that the Proposed Project is constructed and operated in accordance with the design, best practice and mitigation that is described within this report, the Proposed Project is not expected to result in significant effects on bats at any geographic scale
Land, Soils & Geology	No excavation of peat and spoil.	As detailed in the assessment in Chapter 8, peat, topsoil and subsoil excavation volumes will be managed within the Site, and the residual effects on peat, topsoil and subsoil are not significant. Geotechnical investigations followed by careful design will lead to no significant environmental impacts. The peat and spoil management proposals discussed in Chapter 4 sets out the optimal treatment for peat and spoil excavated/generated on site without creating significant impacts for biodiversity, hydrology, land use etc.
Geotechnical/Peat Stability	No potential for peat instability due to construction works.	While the construction of the Proposed Project does pose a risk of peat instability, the findings of the Peat Stability Assessment Report (Appendix 8-1) indicate that the Site has an acceptable margin of safety, a low risk of peat failure and is suitable for the Proposed Project.
Hydrology & Hydrogeology	Neutral	As detailed in the assessment in Chapter 9, no significant effects on surface water or groundwater quality will occur.
Air Quality and Climate	Will not provide the opportunity for an overall increase in air quality or significant reduction of greenhouse gases. No potential to assist in achieving the renewable energy targets set out in the Climate Action Plan 2025.	There will be short term, not significant negative effects on air quality and climate during the construction phase due to dust and greenhouse gas emissions. However, as detailed in the assessment in Chapter 11, Climate, over the proposed 35-year lifetime of the Proposed Project, 39,462 tonnes of

Environmental Consideration	'Do Nothing' Alternative	Developing a renewable energy project (Chosen option)
		carbon dioxide per annum will be displaced from traditional carbon-based electricity generation. Over the proposed 35 year lifetime of the project, therefore 1,381,176 tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation. The addition of an estimated 54-64.8MW clean renewable energy to the national grid will be a positive contribution to the States renewable energy targets set out in the Climate Action Plan 2025.
Noise & Vibration	No potential for noise impacts on nearby sensitive receptors.	Based on the assessment detailed in Chapter 12 and the mitigation measures proposed, there will be no significant effects on sensitive receptors due to an increase in noise levels from the Proposed Project during the construction, operational and decommissioning phases.
Cultural Heritage & Archaeology	Neutral. No potential for impacts on unrecorded, subsurface archaeology.	As detailed in the assessment in Chapter 13, there will be no significant direct or indirect effects on known or unknown archaeology and cultural heritage during the construction, operational and decommissioning phases. The significance of indirect effects on Cultural Heritage (archaeology, architecture and cultural heritage) will be Imperceptible to Moderate.
Landscape & Visual	No potential for effects on visual amenity due to the construction and operation of turbines.	As detailed in the assessment in Chapter 14, the lack of nearby highly sensitive landscape and visual receptors, and the strategic siting of infrastructure will mitigate any potential for significant landscape and visual effects.
Material Assets	No potential effects on material assets due to the construction, operation and decommissioning of the Proposed Project.	As detailed in Chapter 15, there will be a temporary negative slight impact on traffic volumes during the construction phase of the Proposed Project. A detailed Traffic Management Plan incorporating all the mitigation measures will be agreed with the roads authority prior to

Environmental Consideration	'Do Nothing' Alternative	Developing a renewable energy project (Chosen option)
		construction works commencing on site. The Telecommunications Impact Assessment concludes that there will be no significant effects on telecommunications links as a result of the Proposed Project.

3.4 Alternative Site Locations

The process of identifying a suitable wind farm site is influenced by a number of factors, while wind speeds, the area of suitable or available land, proximity to a grid connection point and planning policy are all very important, a wind farm project must be commercially viable/competitive, as otherwise it will never attract the necessary project finance required to build it.

The Proposed Wind Farm site has been identified as having potential for a wind energy development as a result of a nationwide search of suitable lands. The site selection process has been constraints and facilitators led. Facilitators are factors that give an advantage to a proposed project, while constraints are restrictions that inform the location and design of a project by highlighting sensitivities. A nationwide constraints analysis was undertaken and included avoidance of environmental designations (Natura 2000 sites), review of national, regional and local policies and objectives, suitable wind speeds, adequate setbacks from sensitive receptors, proximity to national grid nodes, avoidance of direct impacts on known cultural heritage assets, access and constructability.

3.4.1.1 Strategic Site Selection

As the cost of building each megawatt of electricity-generating capacity in a wind farm is in the region of €1.5 million, it is critical that the most suitable site for the Proposed Project was chosen.

As set out in Section 1.3 of this EIAR the applicant for the Proposed Project is Neoen, a French producer of renewable energy, with operations in Dublin, Ireland among its presence across fourteen countries with 8.9GW total capacity of electricity in operation or under construction at the end of 2024. Neoen operates eight wind farms and three solar farms in the Republic of Ireland, with a combined capacity of 112 MW in operation, and a portfolio of 1.7 GW in development.

Sites selected for the development of a wind farm must be suitable for consideration under a number of criteria, such as:

- **Local Policy:** Site location relative to Galway County Development Plan Wind Energy Capacity's classification of areas considered that have capacity for wind farm development from a planning policy perspective;
- **Environmental Sensitivities**: Located outside areas designated for protection of ecological species and habitats;
- **Grid Connection**: Access to the national electricity grid possible within a viable distance;
- **Sensitive Receptors**: Capable of complying with required setbacks from sensitive receptors.
- **Site Scale:** Sufficient area of unconstrained land that could potentially accommodate a wind farm development and turbine spacing requirements;

The criteria above will be explained further below in so far as they influenced the site selection exercise undertaken.

3.4.1.1.1 Planning Policy

The Site falls across the administrative area of Galway County Council and therefore, is subject to the planning policies and objectives set out in the Galway County Development Plan (GCDP) 2022-2028.

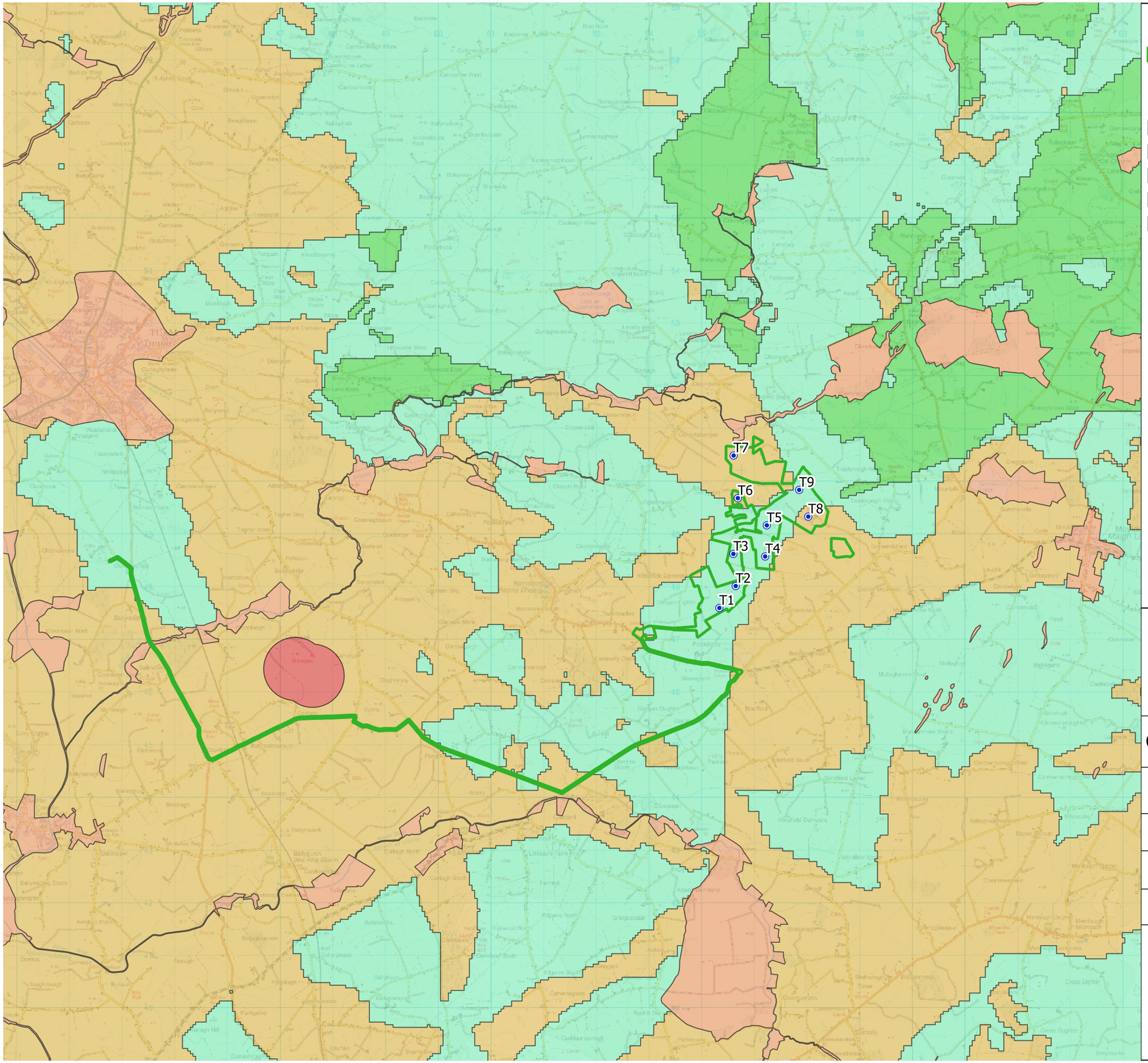
The Local Authority Renewable Energy Strategy (LARES) contained in Appendix 1 of the GCDP 2022-2028, identifies areas within Co. Galway for the hierarchy of most optimal areas for development of wind energy projects. The LARES identifies areas under the following categories:

- Strategic Areas
- Acceptable in Principle
- Open to Consideration
- Generally to be Discouraged
- Not Normally Permissible

As shown in Figure 3-1 below the Proposed Wind Farm site turbines are located mostly within an area designated as **'Open to Consideration'** with a small proportion of the Proposed Wind Farm site classed in **'Generally to be Discouraged'**.

Areas classified as "Open to Consideration" are defined as *"areas where wind energy development is likely to be favourably considered – subject to the results of more detailed assessment of policies and potential effects."* Areas classified as 'Generally to be Discouraged' are defined as *'areas where wind energy development is unlikely to be favourably considered on account of potential to adversely effect protected landscape, water, ecological resources and residential amenity'.*

As summarised in Section 2.5.4.3 of Chapter 2 Background, the Proposed Wind Farm site was examined against the relevant factors as opportunity and sensitivity as outlined in the LARES, and it was considered that the Proposed Wind Farm is in accordance with the aims and objectives of the LARES and represents an opportunity to increase the supply of renewable electricity to the national grid on a suitable site. Please see Section 2.5.4.3 and accompanying Planning Report for further information on the GCDP and County Galway LARES.



Map Legend

- EIAR Site Boundary
- Turbine Layout

Galway Wind Energy Strategy

- Acceptable in Principle
- Open to Consideration
- Generally to be Discouraged
- Not Normally Permissible
- Strategic Area

Drawing Title

County Galway Wind Energy Designations

Project Title

Cooloo Wind Farm, Co. Galway

Drawn By	Checked By
CF	BT
Project No.	**Drawing No.**
190723	Figure 3-1
Scale	**Date**
1:70,000	2025-09-23

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3.4.1.1.2 Environmental Sensitivities

The Site is not located within any Nationally Designated or Natura 2000 site.

The nearest Natura 2000 site to the Proposed Wind Farm site, i.e. Special Area of Conservation (SAC) or Special Protection Area (SPA) is the Lough Corrib SAC, which is located approximately 0.5km to the north of the Proposed Wind Farm site at its closest point (i.e., T07). The Lough Corrib SAC has many qualifying interests relating to riparian habitats and species. The nearest national designated site, i.e. Natural Heritage Area (NHA) or proposed Natural Heritage Area (pNHA) to the Proposed Wind Farm site is the Summerville Lough NHA which is located approximately 3.1km east of the Proposed Wind Farm site at its closest point (i.e., T08).

The nearest Natura 2000 site to the Proposed Grid Connection is the Lough Corrib SAC, which the Proposed Grid Connection crosses within the existing public road corridor approx. 1.8km south of the Cloon 110kV for approx. 95m. The nearest national designated site, i.e. Natural Heritage Area (NHA) or proposed Natural Heritage Area (pNHA) to the Proposed Grid Connection is the Belclare Turlough pNHA which is located approximately 5.3km west of the Proposed Grid Connection at its closest point.

Within the Site, Article 17 Annex 1 Active Raised Bog habitat has been identified through assessment of available resources and through comprehensive multi-season site surveys. The Proposed Wind Farm has been designed to avoid as much of the most sensitive areas as possible. A Biodiversity Management and Enhancement Plan (BMEP) is included in Appendix 6-4, which includes further detail on mitigation and enhancement measures proposed for this area.

3.4.1.1.3 Grid Connection

The Proposed Project intends to connect to the national grid via underground electrical cabling within the local and regional road network along the Proposed Grid Connection to the existing Cloon 110kV substation, in the townland of Cloonascragh, Co. Galway. Details regarding potential alternative grid connection options are considered and presented in Section 3.5.4.

3.4.1.1.4 Sensitive Receptors

The Applicant sought to identify an area with a relatively low population density. Having reviewed the settlement patterns in the vicinity, the study area has emerged as suitable to accommodate the Proposed Project. The population density of the Population Study Area in 2022 is 27.9 persons per square kilometre, as described in Chapter 5 of this EIAR. This is considerably lower than the national population densities of 73.3 persons per square kilometre and lower than the population density of County Galway, recorded at 47.11 persons per square kilometre. The proposed turbine positions also achieve the recommended setbacks in both the 2006 Guidelines (DoEHLG, 2006) and the draft 2019 Guidelines (DoHPLG, 2019).

The village of Barnaderg is located approx. 3.3km west of the nearest proposed turbine, and the village of Moylough is located approx. 5.3km east of the nearest proposed turbine.

3.4.1.1.5 Site Scale

The Site, covering a total of 355 hectares, comprises a mix of pastoral agriculture, peatlands, low-density residential, and small-scale commercial forestry and has an elevation range of 66m AOD to 85m AOD. The adjacent land use predominantly comprises the same. The Proposed Wind Farm site will be easily accessible via a new temporary construction site entrance off the R332 regional road to the south of the Proposed Wind Farm site and for the operational phase via L6301 local road in the centre of the Proposed Wind Farm site. The Proposed Wind Farm site comprises habitats of varying ecological

value; please note, all proposed infrastructure maintains appropriate setback distances from sensitive ecological receptors.

As such, with its proximity to grid, accessibility, and achievable setbacks from sensitive receptors, the Site affords a large-scale area that is sufficiently unconstrained to accommodate a 9-turbine wind farm development. The constraints and facilitators mapping process is outlined in Section 3.5.1

3.4.2 Alternative Renewable Energy Technologies

The Proposed Project will be located on a site where small-scale pastoral agriculture and peat cutting practices will continue to be carried out around the footprint of the Proposed Project.

Both onshore and offshore wind energy development will be required to ensure Ireland reaches the target set in the Climate Action Plan 2025 (CAP25) to source 80% of our electricity from renewable energy by 2030. It is not a case of 'either' 'or'. CAP25 has set out the following targets for electricity generation:

- Share of electricity demand generated from renewable sources to up to 80% where achievable and cost effective, without compromising security of electricity supply;
- Onshore Wind Capacity: up to 9GW
- Offshore Wind Capacity: 5GW (minimum)
- Solar PV Capacity: 8GW

When considering other renewable energy technologies in the area, the Applicant considered offshore wind and commercial solar energy production as an alternative on the Proposed Wind Farm site.

3.4.2.1 Offshore Wind

Although the screening exercise was based on identifying lands for onshore wind development; another alternative source of renewable electricity generation would be offshore wind energy.

However, it is considered that due to delays with the regulatory process for offshore development, a combination of both onshore and offshore wind farm development will continue to be required to deliver on the ambitious renewable energy targets set under the CAP25 which include focusing on onshore wind energy developments to reach the 2030 renewable energy targets. As such, Neoen (the Applicant)'s primary focus is onshore wind farms and delivering suitable sites onshore such as the Proposed Project.

The Applicant is committed to playing a key role in helping the State achieve its CAP25 objectives while building upon its proven record of generating clean renewable energy to the national grid. As such, the option of an offshore project is not considered to be a reasonable alternative at this time.

3.4.2.2 Solar Energy

Commercial solar energy production is the harnessing and conversion of sunlight into electricity using photovoltaic (PV) arrays (panels). Solar PVs have a smaller capacity factor than wind farms. The capacity factor of solar PV panels in the solar middle of Ireland is approximately 14.6%, compared to the wind capacity factor of the Site of 35%[1]. As discussed in Section 4.3.1.1.6 in Chapter 4 of this EIAR, the potential installed capacity of the Proposed Project will have a combined generating capacity of between 54 to 64.8 MW and therefore has the potential to produce between 165,564 MWh and 193,158

[1] *EirGrid, 2024 Enduring Connection Policy 2.3 Solar and Wind Constraints Report: Assumptions and Methodology* https://cms.eirgrid.ie/sites/default/files/publications/ECP-2.3-Solar-and-Wind-Constraints-Report-Assumptions-and-Methodology-v1.1.pdf
The Proposed Project is located within the B wind region for Ireland with an associated 2020 capacity factor of 35%.

MWh of electricity per year, which is sufficient to supply between 39,420 and 47,304 Irish households with electricity per year. A solar PV array with the same potential installed capacity would produce between 69,063.8 MWh and 82,876.6 MWh of electricity per year, or an electricity supply for between approximately 16,443 and 19,732 Irish households per year.

In order to supply the same number of households with electricity per year as the Proposed Project, a solar PV array would require a potential installed capacity of between 129.5 MW and 151 MW, thus requiring a development footprint approximately 6-7 times the Proposed Wind Farm site (At 0.7ha per MW for Solar PV, to achieve the same electricity output as the Wind Farm, between 90.7 ha and 105.7 ha would be required. In addition, as described in Table 3-2 below, a solar development, of this scale, would have a higher potential environmental effect on Hydrology and Hydrogeology, Traffic and Transport (construction phase) and Biodiversity and Birds (habitat loss, glint and glare) at the Site. A comparison of the potential environmental effects of the development of such a solar PV array against the chosen option of developing wind turbines at the Proposed Wind Farm site is presented in Table 3-2 below.

Table 3-2 Comparison of environmental effects when compared against the chosen option (wind turbines)

Environmental Consideration	Solar PV Array	Wind Turbines (Chosen option)
Population & Human Health (incl. Shadow Flicker)	Relatively lower long-term financial contributions towards the local community (i.e., community benefit fund) on a per MWh basis. No potential for shadow flicker to affect sensitive receptors. Potential for glint and glare impacts on local road users and residential receptors. Lower potential for noise and vibration effects. Lower potential for visual obstructions in the skyline due to solar farms being low lying structures. Based on the renewable energy outputs associated with solar PV, using solar PV at the Site would have a positive effect on human health due to the production of clean renewable energy and the offsetting of emissions (e.g., nitrogen, sulphur dioxide) which are produced from fossil fuel powered sources of electricity.	Higher long-term financial contributions towards the local community (i.e., community benefit fund) on a per MWh basis. Based on the assessment detailed in Chapter 5 and the mitigation measures proposed, there will be no significant effects related to shadow flicker from the Proposed Project. No potential for glint and glare impacts on local receptors. Greater potential for noise and vibration during construction, operational and decommissioning phases. Greater potential for visual effects during operational phase. No material difference between the two options during construction and decommissioning. No potential for glint and glare impacts on sensitive receptors. Based on the assessment included in Chapter 10

Environmental Consideration	Solar PV Array	Wind Turbines (Chosen option)
		and Chapter 11, the Proposed Project will have a long term moderate positive effect on human health due to the production of clean renewable energy and the offsetting of emissions (e.g., nitrogen, sulphur dioxide) which are produced from fossil fuel powered sources of electricity.
Biodiversity & Ornithology	Larger development footprint would result in greater habitat loss. No potential for collision risk for birds or bats. Potential for glint and glare impacts on birds.	As detailed in Chapter 6, the Proposed Project has been designed to avoid or mitigate impacts on biodiversity. As detailed in the Bat Report in Appendix 6-2 of this EIAR, taking into consideration the sensitive design of the project, the proposed best practice and adaptive mitigation measures, significant residual effects on bats are not anticipated. As detailed in Chapter 7, the Collision Risk Assessment (CRA) indicated that the impact of the Proposed Project on birds corresponds to a Low to Very Low effect significance. No potential for glint and glare impacts on birds.
Land, Soils & Geology	Shallower excavations involved in solar PV array developments would result in reduced volume of spoil to be excavated. Shallower excavations involved in solar PV array developments would decrease the potential for peat instability.	As detailed in the assessment in Chapter 8, no significant effects on soils and subsoils will occur. The findings of the Peat Stability Assessment Report indicate that the Site has an acceptable margin of safety, a low risk of peat failure and is

Environmental Consideration	Solar PV Array	Wind Turbines (Chosen option)
		suitable for the Proposed Project.
Hydrology & Hydrogeology	A solar PV array development would require a significantly larger area of forestry to be permanently felled and replaced with renewable energy development therefore increasing the potential for silt laden runoff to enter receiving watercourses. Shallower excavations involved in solar PV array developments would result in reduced volume of spoil to be excavated, therefore reducing the potential for silt-laden runoff to enter receiving waterbodies.	As detailed in the assessment in Chapter 9, no significant effects on surface water or groundwater quality will occur.
Air Quality	Increased potential for dust and other noxious emissions due to larger volume of transport movements to and from the Site and larger volume of plant and ground works on site due to the larger footprint.	Reduced potential for dust and other noxious emissions due to smaller volume of plant and ground works on site due to a smaller footprint. As detailed in the assessment in Chapter 10, no significant effects on air quality will occur.
Climate	Reduced capacity factor of solar PV array technology would result in less carbon offset.	Greater capacity factor of wind will result in a higher carbon offset and a shorter carbon payback period. As detailed in the assessment in Chapter 11, over the proposed 35-year lifetime of the Proposed Wind Farm site, 1,203,930 tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation. The addition of an estimated 54-64.8 MW of clean energy to the national grid will be a positive contribution to the States renewable energy targets set out in the National Climate Action Plan (CAP25).

Environmental Consideration	Solar PV Array	Wind Turbines (Chosen option)
Noise & Vibration	Potential for short term noise impacts on nearby sensitive receptors during the construction phase. Larger traffic movements and increased plant on site due to the larger footprint could lead to larger noise and vibration output during the construction phase.	Based on the assessment detailed in Chapter 12 and the mitigation measures proposed, there will be no significant effects on sensitive receptors due to an increase in noise levels from the Proposed Project during the construction, operational and decommissioning phases.
Landscape & Visual	Potentially less visible from surrounding area due to screening from forestry and topography.	As detailed in the assessment in Chapter 14, the lack of nearby highly sensitive landscape and visual receptors, and the strategic siting of infrastructure will mitigate any potential for significant landscape and visual effects.
Cultural Heritage & Archaeology	Larger development footprint would increase the potential for impacts on unrecorded, subsurface archaeology.	Smaller development footprint would decrease the potential for impacts on unrecorded, subsurface archaeology. As detailed in Chapter 14, following the implementation of best practice and mitigation measures, there will be no significant direct or indirect effects on known or unknown archaeology and cultural heritage during the construction, operation and decommissioning phases. Archaeological monitoring under licence of the smaller footprint will be implemented during the construction phase.
Material Assets	Potential for greater traffic volumes during construction phase due to the number of solar panels required to achieve the same output.	No material difference for impacts on gas, water, aviation. Buffers implemented on telecommunication links.

Environmental Consideration	Solar PV Array	Wind Turbines (Chosen option)
	Greater potential for impacts on waste management due to increased plant on site giving rise to increase in hazardous waste materials. No material difference for impacts on gas, water, aviation. No potential for impacts on telecommunications.	As detailed in Chapter 15, there will be short term negative imperceptible to slight impact on traffic volumes during the construction phase of the Proposed Project. A detailed Traffic Management Plan incorporating all the mitigation measures will be agreed with the roads authority prior to construction works commencing on site. There will be a positive effect on electricity supply with the provision of an estimated 54-64.8MW to the national grid and powering of between 39,420 and 47,304 Irish households with renewable electricity per year.

For the reasons set out above, the proposal for a wind energy development at the Site was considered to be the most efficient method of electricity production with a smaller development footprint and a lower potential for significant environmental effects than a solar energy development with the equivalent electricity supply capacity.

3.5 Alternative Turbine Layout and Development Design

The design of the Proposed Wind Farm has been an informed and collaborative process from the outset, involving the designers, developers, engineers, environmental, ecological, hydrological and geotechnical, archaeological specialists and traffic consultants. The design process has also taken account of the recommendations and comments of the relevant statutory and non-statutory organisations, near neighbours / the local community and local authorities as detailed in Section 2.7 and Section 2.8 of Chapter 2.

Throughout the preparation of this EIAR, the layout of the Proposed Wind Farm has been revised and refined to take account of the findings of all site investigations and baseline assessments, which have brought the design from its first initial layout iteration to the Proposed Wind Farm layout. The design process has also taken account of the recommendations and comments of the relevant statutory and non-statutory consultees, the local community and local authorities as detailed in Chapter 2 of the EIAR, while still seeking to ensure that a viable project can ultimately be constructed and connected to the national grid.

3.5.1 Constraints and Facilitators Mapping

The design and layout of the Proposed Project follow the recommendations and guidelines set out in the '*Wind Energy Development Guidelines'* (Department of the Environment, Heritage and Local Government, 2006) (the 2006 Guidelines) and the '*Best Practice Guidelines for the Irish Wind Energy Industry'* (Irish Wind Energy Association, 2012).

The 2006 Guidelines were subject to a targeted review 2013. Currently, the proposed changes to the development management standards associated with onshore wind energy developments are outlined in the Draft Revised Wind Energy Development Guidelines, December 2019 (draft 2019 Guidelines). The consultation on the draft 2019 Guidelines (DoHPLG, 2019) closed on 19th February 2020, but at time of writing, they have not yet been adopted. CAP25 states that new draft wind energy guidelines are intended to be adopted in Q1 2025, however the 2006 Guidelines remain the relevant guidelines for the purposes of Section 28 of the Act. Please see Section 1.2.2 of Chapter 1 for further information on the wind energy development guidelines.

An initial 9 no. turbine layout was proposed following a preliminary desk-based constraints assessment. A more detailed constraints mapping exercise was then carried out to inform the final proposed turbine layout.

The detailed constraints mapping process involved the placing of buffers (separation distance) around different types of constraints so as to identify clearly the areas within which no development works will take place. The size of the buffer zone for each constraint has been assigned using standards presented in the documents listed above. The constraints maps for the Site encompasses the following constraints and associated buffers:

- **Sensitive Receptors:** Residential dwellings plus a minimum 720 metre buffer (meeting the requirement of 4 x maximum tip height separation distance as required by the draft 2019 Guidelines. Although not adopted, the developer has applied the setback in this instance as it is considered best practice.) (Refer to Chapter 5 Population and Human Health of EIAR);
- **Designated Sites:** Natura 2000 sites plus 100 metre buffer
- **Habitats and Biodiversity:** Siting of infrastructure so as to minimise loss of habitats of Local Importance (higher value) and higher.
- **Hydrology:** Watercourses and waterbodies plus 50 metre buffer
- **Archaeology:** Recorded Archaeological Sites and Monuments/Protected Structures plus 50 metre buffer
- **Telecommunications:** Telecommunication Links plus operator specific buffer

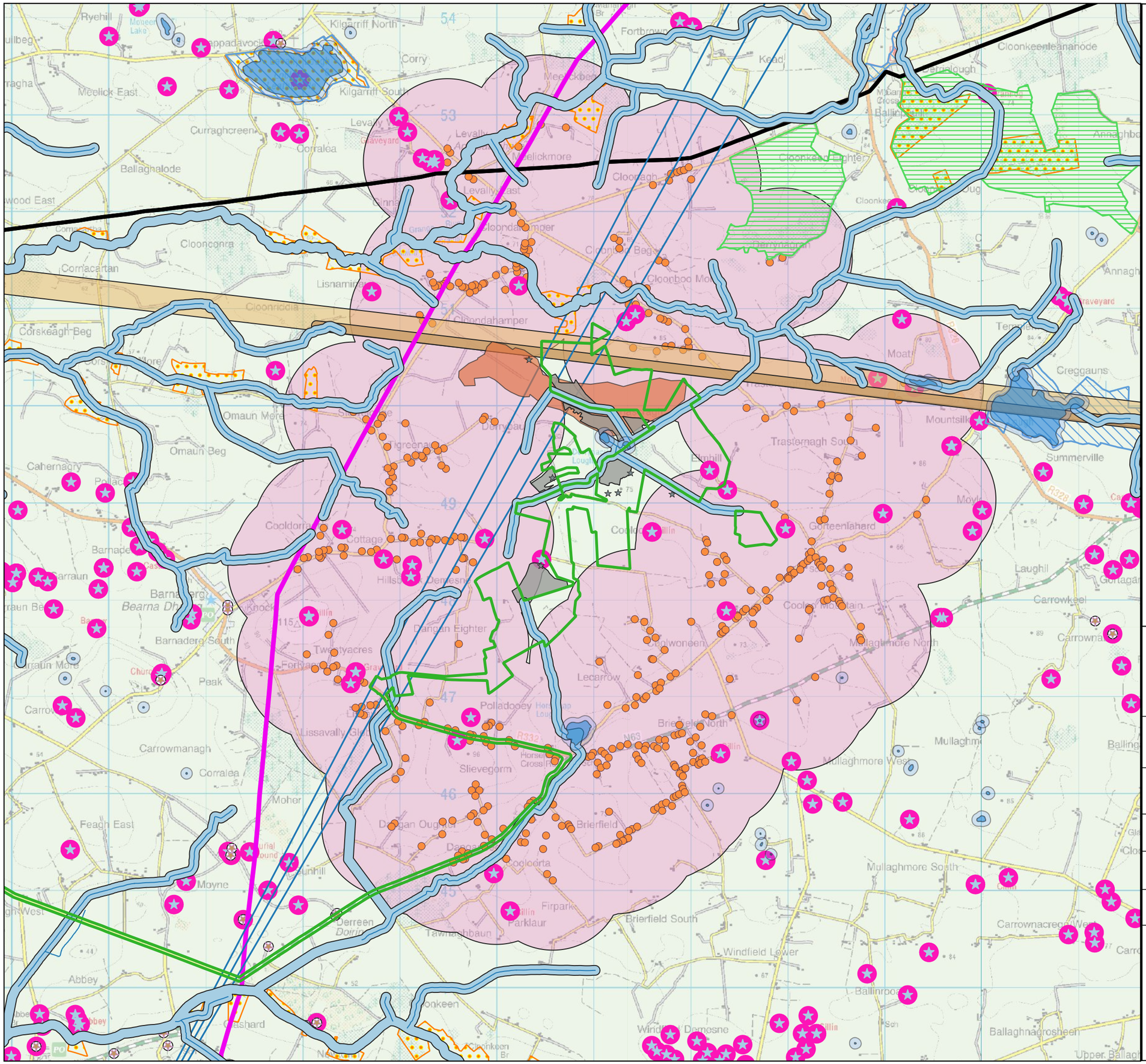
Facilitators at the Site build on the existing advantages and include the following:

- Available lands for development;
- Good wind resource; and
- Existing access points and general accessibility of all areas of the Site due to existing road infrastructure.
- Limited extent of constraints

The final proposed turbine layout was then developed to take account of all the constraints mentioned above including their associated buffer zones and the separation distance required between them. All constraints considered can be seen in Figure 3-2 below

Following the mapping of all known constraints described above, detailed site investigations were carried out by the project team. The ecological assessment of the Proposed Wind Farm site encompassed habitat mapping and extensive surveying of birds and other fauna. These assessments, as described in Chapters 6 Biodiversity and Chapter 7 Ornithology of this EIAR, informed the decision on the siting of turbines and the carrying out of any development works, such as the construction of roads.

The hydrological and geotechnical investigations of the Site examined the proposed locations for turbines, roads and other components of the Proposed Project, such as the substation, and the temporary construction compound. Where specific areas were deemed as being unsuitable (e.g., due to sensitive habitat, unmapped watercourse, poor ground conditions) for the siting of turbines or roads, etc., alternative infrastructure locations within the Proposed Wind Farm site were proposed and assessed, taking into account the areas that were already ruled out of consideration. The turbine layout for the Proposed Wind Farm was also informed by wind data and the results of noise and shadow flicker assessments as they became available.



Map Legend

- EIAR Site Boundary

Hydrological Constraints
- Rivers
- Streams
- Lakes
- 50m Lake Buff
- 50m River Buffer

Ecological Constraints
- Marsh Fritillary Possible Habitat
- Raised Bogs
- Article 17 Habitat

Grid Constraints
- Existing 220kV OHL
- Existing 110kV OHL

Telecomunication Constraints
- ESB links
- 131m Imagine buffer
- 50m Three Networks Buffer

Designated Sites
- SAC
- SPA
- pNHA
- NHA

Housing Constraints
- Dwellings (within 2km)
- 720m Dwellings buffer

Arcaeological & Hertiage Constraints
- NIAH Sites
- National Monuments
- 50m NIAH Sites buff
- 50m national monuments

N

Drawing Title

Constraints Map

Project Title

Cooloo Wind Farm, Co. Galway

Drawn By	Checked By
CF	BT
Project No.	Drawing No.
190723	Figure 3-2
Scale	Date
1:38,000	2025-09-24

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3.5.2 Turbine Layout

The final proposed turbine layout takes account of all identified site constraints as outlined in Section 3.5.1 above. The layout is based on a combination of the results of all site investigations and surveys that have been carried out during the EIAR process and the EIA scoping process with statutory and non-statutory consultees. As information regarding the Proposed Wind Farm site was compiled and assessed, the proposed layout has been revised and amended to take account of the physical constraints of the Proposed Wind Farm site and the requirement for buffer zones and other areas in which no turbines could be located. The selection of the turbine number and layout has also had regard to wind-take and the separation distance to be maintained between turbines, as well as landscape and visual, noise and shadow flicker impacts. The EIAR and Proposed Wind Farm design process was an iterative process, where findings at each stage of the assessment were used to further refine the design, always with the intention of minimising the potential for environmental impacts.

The development of the final Proposed Wind Farm layout has resulted following feedback from the various studies and assessments carried out as well as ongoing negotiations and discussions with landowners and the local community.

There were a number of reviews by the wind farm design team of the specific locations of turbines during the optimisation of the Proposed Wind Farm layout. The initial constraints study identified a significant viable area within the overall study area of the Proposed Wind Farm site. Please refer to Figure 3-3 to Figure 3-5 to see the evolution of the turbine layout for the Proposed Wind Farm throughout the design process.

3.5.2.1.1 *Proposed Turbine Layout Iteration No. 1*

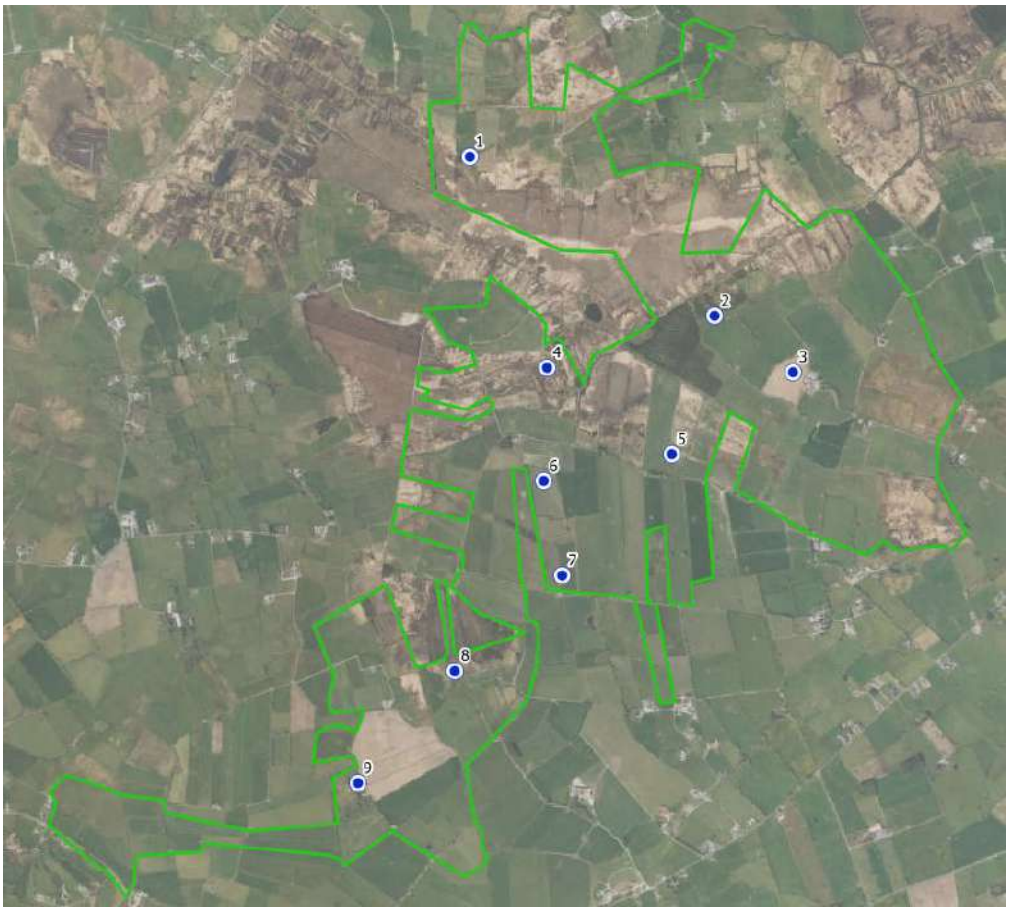

Figure 3-3 Layout Iteration No. 1

The initial turbine layout which was based on a preliminary constraints mapping exercise and the identification of a viable area for turbine siting, which allowed for the siting of 9 no. turbines within the overall study area. This initial layout was examined against constraints from a desk-based perspective where it was identified that the proposed Turbine 1 encroached on an identified telecommunications link buffer. The decision was made to microsite the Turbine 1 location in order to avoid any interruptions to telecommunications services.

3.5.2.1.2 *Proposed Turbine Layout Iteration No. 2*

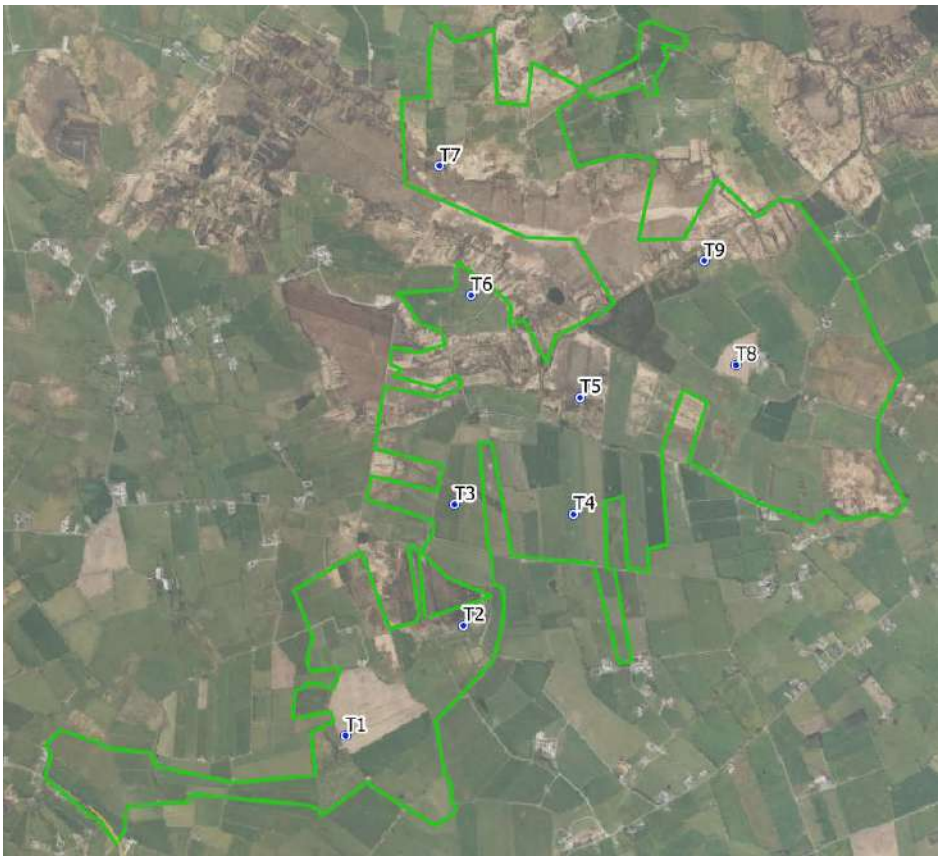

Figure 3-4 Layout Iteration No. 2

Proposed Layout Iteration No. 2, which is presented in Figure 3-9 also considered 9 No. turbines in combination with land availability and preliminary siting of ancillary infrastructure (see Section 3.5.3 below for further detail). The turbine numbering was also relabelled. The layout derived from the Proposed Layout Iteration No. 2 was then presented to the project team for initial site investigations and assessments. These investigations included detailed habitat surveys and mapping, ecological surveys, hydrological and geotechnical investigations of the Proposed Wind Farm site. Following these initial site investigations, the location of the now relabelled T6 was relocated approx. 260m to the northwest in order to avoid areas of deeper peat. Land availability also allowed for now relabelled T9 to be relocated approx. 250m northeast. The locations of now relabelled T3, T4 and T5 were subsequently microsited within the remaining viable area in order to improve the overall efficiency to capture wind energy. The now relabelled T8 was also microsited approx. 215m west in order to maintain the required setback from an identified sensitive receptor.

3.5.2.1.3 *Proposed Turbine Layout Iteration No. 3*

Figure 3-5 Layout Iteration No. 3

Proposed Layout Iteration No. 3, presented in Figure 3-7, comprised the same 9 No. turbines and was presented to the project team for detailed investigations and assessment. These investigations included further habitat mapping, ecological surveying, hydrological and intrusive geotechnical investigations, including trial pits and boreholes of the Proposed Wind Farm site.

Following a telecommunications impact assessment by Ai Bridges (see Section 15.2 in Chapter 15 Material Assets), T7 was relocated approx. 80m north to avoid all potential interactions with telecoms links.

The final chosen turbine layout is considered the optimal layout given it has the least potential for environmental effects.

A comparison of the potential environmental effects of initial iterations of the turbine layout as compared against the final turbine layout are presented in Table 3-3 below.

Table 3-3 - Comparison of environmental effects of the Proposed Wind Farm site layout when compared to the chosen option.

Environmental Consideration	Initial Proposed Wind Farm Layout Iterations and all associated Infrastructure	Chosen Option of the Final 9 Turbine Layout and all associated infrastructure
Population & Human Health (incl Shadow Flicker)	Shadow flicker effects would likely be similarly for Proposed Layout Iteration No. 1, 2 and 3 (9 turbine layout).	There is no potential for significant shadow flicker effects from the proposed turbines. Shadow flicker effects can be mitigated to meet threshold criteria. There is no potential for significant noise and vibration effects from the proposed turbines. Furthermore, noise emissions can be curtailed to meet threshold criteria. As stated in Chapter 13 Landscape, there will be no significant visual effects on residential visual amenity in the landscape surrounding site and 'Moderate' residual visual effects will only occur for a relatively small number of properties in the area as a result of the Proposed Wind Farm. Based on the assessment detailed in Chapter 5, Chapter 12, Chapter 13, and the mitigation measures proposed, there will be no significant effects on population and human health from shadow flicker, noise and vibration and visual amenity during the construction, operation and decommissioning phases of the Proposed Project.
Biodiversity (including Birds)	Greater potential impact on identified sensitive ecological receptors due to location of infrastructure within designated set-back buffers for marsh fritillary and Article 17 Annex 1 habitat in Proposed Wind Farm site Layout Iteration no. 1, 2, and 3	As detailed in Chapter 6 Biodiversity, the development has been designed to avoid or mitigate impacts on biodiversity including birds and sensitive ecological habitats. The Proposed Project includes for a BMEP, providing a local boost to biodiversity. Please see Appendix 6-4 for details. As detailed in Chapter 7, the Collision Risk Assessment (CRA) indicated that the impact of the Proposed Wind Farm site on birds corresponds to a **Low - Very Low** effect significance. With the implementation of the mitigation measures described in Chapter 7

Environmental Consideration	Initial Proposed Wind Farm Layout Iterations and all associated Infrastructure	Chosen Option of the Final 9 Turbine Layout and all associated infrastructure
		Ornithology, the residual effects for collision risk are not significant.
Land, Soils & Geology	Greater potential impact on peat, topsoil, and subsoil due to location of infrastructure for Proposed Wind Farm site Layout Iteration No. 1 and 2. Geotechnical investigations followed by careful design would lead to no significant environmental impacts.	As detailed in the assessment in Chapter 8, peat, topsoil and subsoil excavation volumes will be managed within the Site, and the residual effects on peat, topsoil and subsoil are not significant. Geotechnical investigations followed by careful design would lead to no significant environmental impacts. The peat and spoil management proposals discussed in Chapter 4 sets out the optimal treatment for peat and spoil excavated/generated on site without creating significant impacts for biodiversity, hydrology, land use etc.
Hydrology and Hydrogeology	Potential for runoff is neutral for Proposed Turbine Layout Iteration no. 1 and 2. Increased potential for impacts on groundwater schemes due to the location of infrastructure. Project design specific drainage design removes the potential for significant environmental effects.	Project design specific drainage design removes the potential for significant environmental effects. As detailed in the assessment in Chapter 9, no significant effects on surface water or groundwater quality will occur.
Air Quality	Air quality emission effects are neutral for Proposed Wind Farm site Layout Iteration no. 1 and 2.	As detailed in Chapter 10, there will be no significant effects on air quality during the construction, and decommissioning phases. There will be a Long-term Moderate Positive Impact on air quality by during the operational phase.
Climate	Climate related emission effects (losses and savings) are neutral for Proposed Turbine Layout Iteration no. 1 and 2.	As detailed in the assessment in Chapter 11 Climate, over the proposed 35-year lifetime of the Proposed Wind Farm site, 1,381,176 tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation. The addition of an estimated 54-64.8MW clean energy to the national grid will be a positive contribution to the States renewable energy targets set out in CAP25.

Environmental Consideration	Initial Proposed Wind Farm Layout Iterations and all associated Infrastructure	Chosen Option of the Final 9 Turbine Layout and all associated infrastructure
Noise & Vibration	The noise impacts are neutral for Proposed Turbine Layout Iteration no. 1 and 2.	Potential for decreased noise levels at nearby sensitive receptors due to increased separation distance between sensitive receptors and turbine locations. Based on the assessment detailed in Chapter 12, there will be no significant effects on sensitive receptors during the construction, operational and decommissioning phases from the Proposed Project.
Landscape & Visual	Greater potential impact on visual receptors due to location of infrastructure within designated set-back buffers for Proposed Turbine Layout Iteration no. 1 and 2	The final layout ensures a setback in excess of the required setback set out in the draft 2019 Guidelines (DoHPLG, 2019). The nearest inhabitable dwelling is 720m from the nearest turbine (T08).
Cultural Heritage & Archaeology	The cultural heritage impacts are neutral for Proposed Wind Farm site Layout Iteration no. 1 and 2.	As detailed in the assessment in Chapter 14, there will be no significant direct or indirect effects on known or unknown archaeology and cultural heritage during the construction, operation and decommissioning phases. Archaeological monitoring under licence will be implemented during the construction phase.
Material Assets – Traffic and Transport **Material Assets- Utilities, Waste Management, Telecommunications and Aviation**	Traffic impacts are neutral for Proposed Turbine Layout Iteration no. 1 and 2. Potential for interference with telecommunication links for Proposed Layout Iteration No. 1 and 2.	As detailed in Chapter 15, there will be short term negative imperceptible to slight impact on traffic volumes during the construction phase of the Proposed Project. A detailed Traffic Management Plan (Appendix 15-2) incorporating all the mitigation measures will be agreed with the roads authority prior to construction works commencing on site. No material difference between the Proposed Wind Farm site layout Iteration no. 1, 2 and 3 for gas, water, waste management and aviation.
Vulnerability to Major Accidents Natural Disasters	Impacts from major accidents and natural disasters are considered to	As detailed in Chapter 16 the risk of a major accident and/or disaster during the construction of the Proposed

Environmental Consideration	Initial Proposed Wind Farm Layout Iterations and all associated Infrastructure	Chosen Option of the Final 9 Turbine Layout and all associated infrastructure
	be neutral for Proposed Turbine Layout Iteration no. 1 and 2.	Project is considered 'low'. The highest risk scenarios to the Proposed Project (i.e., contamination and fire/explosion) are considered to be unlikely to occur at any phase of the Proposed Project. A detailed risk assessment on potential risks relating to major accidents and natural disasters is provided in Section 16.4 of Chapter 16 of this EIAR.

The final Proposed Wind Farm layout takes account of all site constraints (e.g. ecology, ornithology, hydrology, archaeology, material assets, etc) and design constraints (e.g. setback distances from houses and distances between turbines on site etc). The layout also takes account of the results of all site investigations and baseline assessments that have been carried out during the EIAR process.

As part of the final design iteration, enhancement and replanting measures were proposed in order to ensure that the Proposed Project had a positive effect on local biodiversity. Measures such as bog woodland scrub, replanting, native woodland replanting, and habitat enhancement for peatland and marsh fritillary have been proposed as part of the Proposed Wind Farm, with further details being available in Appendix 6-4 BMEP.

The peat and spoil management areas underwent detailed multidisciplinary site-surveys to ensure that the proposed areas were suitable from a geotechnical, hydrological, and ecological perspective. After all surveys were completed, the proposed peat and spoil management areas were redesigned and reduced in size to ensure that they do not encroach on any ecological constraints or hydrological buffers

3.5.3 Alternative Design of Ancillary Infrastructure

The ancillary structures required for the Proposed Project include roads, temporary construction compound, meteorological (met) mast, peat and spoil repository areas, onsite 110kV substation, battery energy storage system (BESS) compound, and associated underground cabling.

3.5.3.1 Road Layout

Access tracks are required onsite in order to enable transport of infrastructure and construction materials within the Proposed Wind Farm. Such tracks must be of a gradient and width sufficient to allow safe movement of equipment and vehicles. It was decided at an early stage during the design of the Proposed Wind Farm that maximum possible use would be made of existing access tracks where available to minimise the potential for impacts by using new roads as an alternative.

It was then determined that using large sections of the public road, particularly the L6301 local road would have a larger negative effect on local traffic and access to local road users. To address this, it was decided to include only include crossings points along the L6301 local road and sections of proposed new roads would be utilised rather than upgrades to the existing public road corridor.

As the Proposed Wind Farm layout was finalised, the most suitable routes between each component of the development were identified, taking into account the existing roads and the physical constraints of the Proposed Wind Farm site. Locations were identified where upgrading of the existing road would be required and where new roads are to be constructed, in order to ensure suitable access to and linkages within the Proposed Wind Farm site and minimise the footprint. Additionally, turning areas were

designed and sited for minimum environmental effect along internal roads. The road layout was designed to avoid sensitive ecological receptors and reduce effects on local traffic.

Initially, the Applicant considered utilising the proposed site access off the R332 regional road to the south of the Proposed Wind Farm site as the site access point for all construction and operational phase activities. Upon review, this access for the operational phase was deemed inappropriate from a traffic management perspective. Therefore, access and egress points off the L6301 local road were proposed in order access the Proposed Wind Farm site for all vehicles during the operation, with the construction site entrance off the R332 regional road being reduced in size and gated for security upon completion and used only for the delivery of abnormal loads (i.e., turbine component replacement) if required.

3.5.3.2 Temporary Construction Compound

The temporary construction compound will be used for the storage of all construction materials, turbine components, staff facilities and car-parking areas for staff and visitors. The use of one temporary construction compound was deemed preferable to the alternative of two large compounds across the Proposed Wind Farm site, as this would allow for a smaller development footprint. Earlier iterations of the layout proposed one temporary construction compound to the south of the Proposed Wind Farm site, alongside the L6301 local road. Following further iterations to the site layout design, the temporary construction compound was sited in close proximity to the proposed temporary construction site entrance. The rationale for this was to continue to limit the amount of construction traffic utilising the existing public road network, and as this site entrance is proposed to be used during the construction phase only, its temporary nature benefited the addition of the temporary construction compound being located strategically within this section of the Proposed Wind Farm site, which facilitates the construction of the various infrastructure components As a result, vehicle emissions and the potential for dust arising will be reduced.

3.5.3.3 Alternative Internal Site Cabling Route

The internal /33kV underground cabling route will follow the internal road network throughout the Site, connecting all 9 no. turbines to the proposed onsite 110kV substation. While this means that a longer cabling route will be needed, it was considered the more environmentally prudent option. The alternative to this would be to lay the cables 'as the crow flies' between the turbines and the onsite 110kV substation, however, this would lead to a greater environmental disturbance and a greater volume of peat and spoil generated.

3.5.3.4 Alternative Meteorological Mast Location

The meteorological mast is located in the southern section of the Proposed Wind Farm site along an existing access track off the L62312 proposed to be upgraded. While other locations to situate the proposed met mast within the Proposed Wind Farm site were examined, the above location was deemed to be most suitable due to the low ecological value of the habitat, appropriate setback from proposed turbines and its location southwest in the Proposed Wind Farm site to reflect the prevailing wind direction.

3.5.3.5 Onsite 110kV Substation and Battery Storage Compound

The proposed onsite 110kV substation and BESS compound is located in the south of the Proposed Wind Farm site and forms part of the Proposed Grid Connection.

3 no. potential locations were identified were considered at the early stage of the design of the Proposed Project, as shown in Figure 3-6:

- Option A – located approx. 670m southeast of T08 in the northeast of the Proposed Wind Farm site

- Option B – located approx. 230m west of T08 in northeast of the Proposed Wind Farm site
- Option C- located approx. 560m northeast of T01 in the south of the Proposed Wind Farm site

Option A and B are positioned further from the proposed construction site entrance, thus increasing the length of internal cabling required compared to Option C. Option B is also within Eirgrid's minimum clearance distance of twice the falling distance from a turbine and therefore was not progressed following the final siting of T08.

The onsite 110kV substation and BESS compound locations were also subject to detailed habitat surveys and mapping, ecological surveys, hydrological and geotechnical investigations. Option B was identified to be within a sensitive ecological habitat and as a result was no longer progressed. This area was instead included within the Biodiversity Management and Enhancement Plan included as Appendix 6-4.

Option C is located strategically within the Proposed Wind Farm site, providing proximity to the public road network in which the Proposed Grid Connection underground cabling route is primarily located within an agricultural grassland field. This grassland is of low ecological value and proposed enhancement measures will facilitate screening from sensitive receptors.

This location was deemed to be suitable due to the habitats it is located on, proximity to the local road network in which to facilitate the connection of the Proposed Wind Farm site to the national grid, and the existing ground conditions.

A comparison of the potential environmental effects of the alternative location when compared against chosen location is presented in Table 3-4 below.

Table 3-4 Comparison of environmental effects for onsite 110kV substation and BESS compound options

Environmental Consideration	Option A	Option B	Option C
Population & Human Health	Potential for slight increase vehicular and dust emissions from increased traffic movements within the Site, due to requirement for a longer grid connection route.	Potential for slight increase vehicular and dust emissions from increased traffic movements within the Site, due to requirement for a longer grid connection route.	Less Potential for slight increase vehicular and dust emissions from increased traffic movements within the Site, due to shorter grid connection route.
Biodiversity & Ornithology	Increased potential for habitat loss in sensitive ecological area	Less potential for habitat loss in sensitive ecological area	Less potential for habitat loss in sensitive ecological area
Land, Soils & Geology	Less potential for increase in volume of peat and spoil to be excavated due to shallower peat depths.	Potential for increase in volume of peat and spoil to be excavated due to deeper peat depths.	Less potential for increase in volume of peat and spoil to be excavated due to shallower peat depths.

Environmental Consideration	Option A	Option B	Option C
Hydrology and Hydrogeology	Increased potential for silt laden runoff to enter watercourses due to requirement for longer grid connection route and additional watercourse crossings.	Increased potential for silt laden runoff to enter watercourses due to requirement for longer grid connection route and additional watercourse crossings.	Less potential for silt laden runoff to enter watercourses due to shorter grid connection route and fewer watercourse crossings.
Air Quality	Potential for slight increase vehicular and dust emissions from increased traffic movements within the Site, due to requirement for a longer grid connection route.	Potential for slight increase vehicular and dust emissions from increased traffic movements within the Site, due to requirement for a longer grid connection route.	Less potential for slight increase vehicular and dust emissions from increased traffic movements within the Site, due to shorter grid connection route.
Climate	Potential for slight increase vehicular emissions from increased traffic movements within the Site, due to requirement for a longer grid connection route.	Potential for slight increase vehicular emissions from increased traffic movements within the Site, due to requirement for a longer grid connection route.	Less potential for slight increase vehicular emissions from increased traffic movements within the Site, due to shorter grid connection route
Noise & Vibration	Neutral	Neutral	Neutral
Landscape & Visual	Neutral	Neutral	Neutral
Cultural Heritage & Archaeology	Neutral	Neutral	Neutral
Material Assets	Potential for slight increase traffic volumes during construction phase due to requirement for a longer underground electrical cabling route.	Potential for slight increase traffic volumes during construction phase due to requirement for a longer underground electrical cabling route.	Less potential for slight increase traffic volumes during construction phase due to shorter underground electrical cabling route.

Map Legend

- EIAR Site Boundary
- Substation and BESS Option A
- Substation and BESS Option B
- Substation and BESS Option C

N

Drawing Title
Alternative Onsite 110kV Substation and BESS Compound Options

Project Title
Cooloo Wind Farm, Co. Galway

Drawn By	Checked By
CF	BT
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3.5.3.6 Transport of Materials from Nearby Quarries

In order to facilitate the construction of the Proposed Project, materials will need to be imported from nearby quarries. The quarries that could potentially provide stone and concrete for the Proposed Project are as follows;

- Smyth Sand and Concrete
- Castle Quarry Crushing & Plant Hire Limited
- Harrington Concrete & Quarries'
- McTigue Quarries

The locations of these quarries and Ready-Mix Concrete (RMC) batching plants together with the routes to the Site are shown in Figure 4-24 of Chapter 4. Deliveries of stone and ready-mix concrete for use in construction of the Proposed Wind Farm site and Proposed Grid Connection, are discussed in further detail in Chapter 15 of this EIAR.

An initial review of the Site following all site investigation works was carried out to determine if it would be feasible to provide onsite borrow pits as an alternative to sourcing materials from nearby quarries. The use of onsite borrow pits would eliminate the need to transport large volumes of construction material along the local public road network to the Site. However, when considering the characteristics of the Site, including topography, ground conditions, and surface features, it was determined that onsite borrow pits would not be feasible as they would create a larger local impact than the traffic generation associated with deliveries of materials from off-site sources to the Site.

A comparison of the potential environmental effects of the chosen option of obtaining all stone material offsite when compared to the alternative of using onsite borrow pits is presented in Table 3-5 below.

Table 3-5 Comparison of environmental effects when compared against the chosen option (Deliveries of Materials from Nearby Quarries)

Environmental Consideration	Obtaining all stone from onsite borrow pits	Chosen Option of obtaining all stone material offsite (Deliveries of Materials from Nearby Quarries)
Population & Human Health	Less potential for impact on residential amenity when compared to quarries, due to vehicular and dust emissions from additional traffic associated with movement of material on and off-site. Potential for increased impact on residential amenity due to increased noise and dust emissions associated with excavation of material at onsite borrow pits.	Potential for increased impact on residential amenity due to increased vehicular and dust emissions from increased traffic movements. Potential for reduced impact on residential amenity due to reduced noise and dust emissions associated with the absence of excavation of material at onsite borrow pits. Based on the assessment detailed in Chapter 5 and the mitigation measures proposed, there will be no significant effects on residential amenity from the Proposed Project.
Biodiversity (including Bids)	Larger development footprint which would result in larger amounts of habitat loss due to onsite excavations.	No borrow pit exaction therefore no habitat loss. As detailed in Chapter 6, the development has been designed to avoid or mitigate impacts on biodiversity.

Environmental Consideration	Obtaining all stone from onsite borrow pits	Chosen Option of obtaining all stone material offsite (Deliveries of Materials from Nearby Quarries)
Land, Soils & Geology	Potential for increased impact on lands, soils and geology due to excavation of material at onsite borrow pits.	No borrow pit exaction therefore no impact on land, soils and geology. As detailed in the assessment in Chapter 8, no significant effects on peat, topsoil and subsoils will occur. The peat and spoil management proposals discussed in Chapter 4 sets out the optimal treatment for peat and spoil excavated/generated on site without creating significant impacts for biodiversity, hydrology, land use etc.
Water	A drainage plan for onsite borrow pits would be required to be incorporated into project drainage design.	No borrow pit therefore no requirement for drainage from onsite borrow pits to be incorporated into Proposed Project drainage design. As detailed in the assessment in Chapter 9, no significant effects on surface water or groundwater quality will occur.
Air Quality	Potential for less vehicular exhaust emissions and dust emissions if all stone was sourced onsite compared to delivery of stone to the Site. Potential for increased exhaust and dust emissions from excavation activities associated with the extraction of material from an onsite borrow pit.	Potential for increased vehicular exhaust emissions and dust emissions, along the construction haul route, due to increased traffic associated with delivery of material. Potential for reduced dust emissions due to the absence of onsite excavation of borrow pits. As detailed in the assessment in Chapter 10, no significant effects on air quality will occur.
Climate	Potential for less vehicular exhaust emissions if all stone was sourced onsite compared to delivery of stone to the Site. Potential for increased exhaust emissions from excavation activities associated with the extraction of material from an onsite borrow pit.	Potential for increased greenhouse gas emissions, along the construction haul route, due to increased traffic associated with delivery of material. As detailed in the assessment in Chapter 11, no significant effects on climate will occur. Over the proposed 35-year lifetime of the Proposed Wind Farm site, 1,381,176 tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation.
Noise & Vibration	Potential for increased noise and vibration impacts on nearby	Potential during construction phase for reduced noise impacts on nearby sensitive

Environmental Consideration	Obtaining all stone from onsite borrow pits	Chosen Option of obtaining all stone material offsite (Deliveries of Materials from Nearby Quarries)
	sensitive receptors due to excavation of material from onsite borrow pits. Potential during construction phase of reduced noise and vibration impacts on nearby sensitive receptors due to reduced traffic movements.	receptors due to the absence of excavation of material from onsite borrow pits. Potential during construction phase for increased noise and vibration impacts on nearby sensitive receptors due to increased traffic movements. Based on the assessment detailed in Chapter 12 and the mitigation measures proposed, there will be no significant effects on sensitive receptors due to an increase in noise levels from the Proposed Project, during the construction phase.
Landscape & Visual	During the construction phase, potential for increased visual effects on nearby residential receptors due to open rock face being visible. During the operational phase, the use of an onsite borrow pit is neutral as the onsite borrow pits would be reinstated following use.	During the construction phase, potential for increased visual effects on nearby residential receptors due to increased HGV traffic delivering construction material from local authorised quarries. No effect on landscape and visual during the operational phase.
Cultural Heritage & Archaeology	Larger development footprint, therefore increasing potential for impacts on sub-surface archaeology	No borrow pit excavation onsite, therefore no potential for additional potential impacts on sub surface archaeology. As detailed in the assessment in Chapter 14, the significance of direct effects will be imperceptible - moderate and no significant effects will occur. There will be no significant direct or indirect impacts on Cultural Heritage.
Material Assets	Less potential for impact on public road network and users compared to delivery all stone to the Site which would give rise additional traffic.	Increased potential for impact on public road network compared to the development of an on-site borrow pit however as detailed in Chapter 15, the impact will be slight and temporary. A detailed Traffic Management Plan incorporating all the mitigation measures will be agreed with the roads authority prior to construction works commencing on site.
Vulnerability of Major Accidents and Natural Disasters	No material difference between the two options.	No material difference between the two options.

3.5.4 Alternative Grid Connection Cabling Route Options

The Proposed Grid Connection includes connection to the national grid via underground electrical cabling, located primarily within the public road corridor to the Cloon 110kV substation. Underground electrical cables will transmit the power from each wind turbine to the proposed onsite substation. The power from the proposed onsite 110kV substation will be transmitted to the existing Cloon 110kV substation, via an underground electrical cabling route, measuring approximately 20.9km in length. The Proposed Grid Connection will be subject to a separate planning application but has been assessed within this EIAR.

The Megawatt (MW) output of the Proposed Project is such that it needs to connect to a substation or an existing overhead line with voltage of 110kV substation at a minimum, however it can also connect into 220kV substations. There is one existing 110kV electricity substation and one existing 220kV electricity substation located within 25km of the Proposed Project, namely:

- Cloon 110kV Substation
- Cashla 220kV Substation

A key consideration in determining the grid connection method for a proposal wind energy development is whether the cabling is underground or run as a new overhead line (OHL). An alternative to the c.20.9km underground cabling route would be to construct an approx. 11.1km OHL from the proposed onsite 110kV substation to the existing Cloon 110kV substation or construct approx. 2.1km of overhead line from the proposed onsite 110kV substation to the existing 220kV OHL to Cashla 220kV substation west of the Proposed Wind Farm site. While OHLs are less expensive and more accessible for easier repairs when required, underground lines will have no visual impact. For this reason, it was considered that underground lines would be a preferable alternative to new OHLs. The Wind Energy Guidelines (the 2006 Guidelines) also indicate that underground cables are the preferred option for connection of a wind energy development to the national grid. The underground electrical cabling will follow the route of existing public roads, thereby minimising the amount of ground disturbance required.

Therefore, underground grid connection cabling routes to each of these existing substations were considered and assessed in order to determine which route would be brought forward as the grid connection route to be assessed as part of the Proposed Project within the EIAR. The two routes considered are shown in Figure 3-7 and are detailed below.

The chosen underground electrical cabling route will follow existing public roads and new/existing track across private land, and thereby have a reduced permanent visual impact due to the placement of the cabling route underground, with no above ground infrastructure visible in the operational phase.

Option A is an underground cabling route connecting the Proposed Grid Connection onsite substation to the existing Cloon 110kV substation. The Cloon 110kV substation is located approximately 11.1km west of the Proposed Grid Connection onsite substation. The underground cabling route primarily within the public road corridor and approx. 2.6km of proposed new/upgrades to existing access tracks. The cabling route measures approximately 20.9km in length.

Option B is an underground grid connection cabling route, connecting the Proposed Grid Connection onsite substation to the existing Cashla 220kV substation. The Cashla 220kV substation is located approx. 22.2km southwest of the Proposed Grid Connection onsite substation. The underground cabling route primarily within the public road corridor and approx. 2.6km of proposed new/upgrades to existing access tracks. The cabling route measures approximately 35.5km in length.

Option B is approx. 14.6km longer than Option A, which passes by more residential dwellings than Options A and therefore has the potential to cause greater, short-term nuisance to local residents in terms of access, traffic volumes, noise and dust emissions during the construction phase. Option B

therefore has the potential to cause greater, long-term habitat loss, while Option A involves the crossing of more EPA mapped watercourses (5 no.) than Option B (4 no.).

Option B involves the crossing of the Irish Rail railway at 2 no. locations, the M6 motorway via an overpass and 1 no. high pressure gas line and therefore has potential to cause greater impacts on material assets than Option A, which does not cross any mapped built services and utilities.

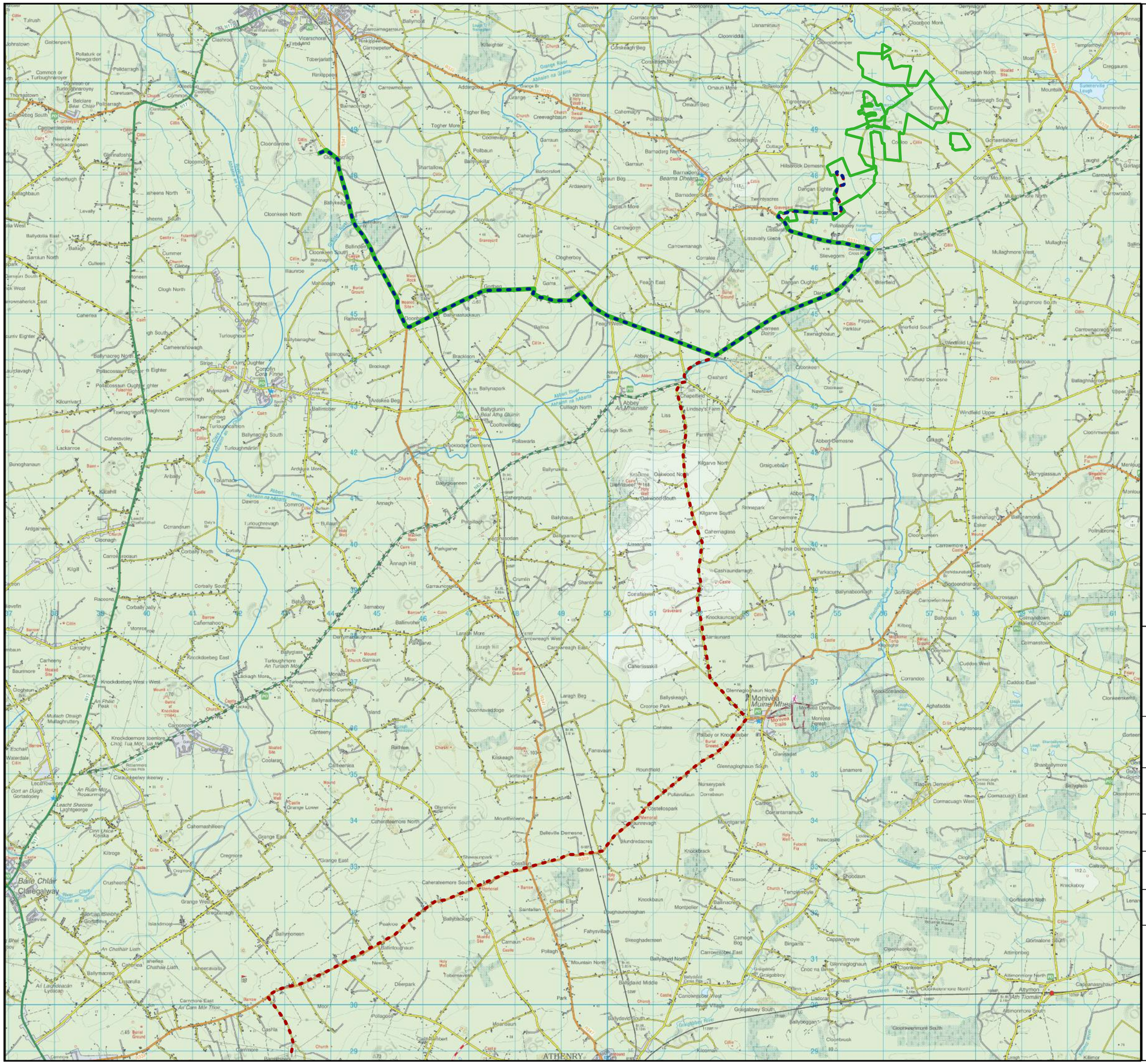
Based on the environmental considerations outlined above, Grid Connection Option A was the most favoured option of the two options.

A comparison of the potential environmental effects of the alternative grid connection cabling routes when compared against the chosen option (Option A) is presented in Table 3-6 below.

Table 3-6 Comparison of environmental effects along underground cabling route options

Environmental Consideration	Option A	Option B
Population & Human Health	The route passes by fewer residential dwellings and therefore, there is less potential for nuisances for local residents to occur in relation to dust emissions from vehicle movements and excavations which could have adverse health effects.	The route passes by more residential dwellings and therefore, there is more potential for nuisances for local residents to occur in relation to dust emissions from vehicle movements and excavations which could have adverse health effects.
Biodiversity & Ornithology	Reduced potential for habitat loss due to smaller development footprint.	Increased potential for habitat loss due to larger development footprint.
Land, Soils & Geology	Less volume of peat, spoil and tar to be excavated due to shorter route.	Increased volume of peat, spoil and tar to be excavated due to longer route.
Geotechnical	Neutral.	Neutral
Water	Higher number of EPA mapped watercourse course crossings within public road corridor.	Lower number of EPA mapped watercourse course crossings within public road corridor.
Air & Climate	Reduced Potential for increased vehicular and dust emissions traffic movements along the cable route due to the greater length of the route and the requirement for the construction of new access road.	Potential for increased vehicular and dust emissions traffic movements along the cable route due to the greater length of the route and the requirement for the construction of new access road.
Noise & Vibration	Reduced potential for increased noise and vibration nuisances during construction phase on sensitive receptors (residential dwellings) located along the	Greater potential for increased noise and vibration nuisances during construction phase on sensitive receptors (residential dwellings) located along the public road sections of the cable route.

	public road sections of the cable route.	
Landscape & Visual	Neutral	Neutral
Cultural Heritage & Archaeology	Smaller development footprint would decrease the potential for impacts on unrecorded, subsurface archaeology.	Larger development footprint would increase the potential for impacts on unrecorded, subsurface archaeology.
Material Assets	Potential for lower traffic volumes during construction phase due to larger development footprint and requirement for more construction materials. No interactions with existing built services.	Potential for greater traffic volumes during construction phase due to larger development footprint and requirement for more construction materials. Interactions with existing built services including railways, motorways and gas lines.



Map Legend

- EIAR Site Boundary
- Option A - Underground Cabling Route to Cloon 110kV Substation
- Option B - Underground Cabling Route to Cashla 220kV Substation

Drawing Title

Alternative Underground Cabling Route

Project Title

Cooloo Wind Farm, Co. Galway

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3.5.5 Alternative Transport Route and Site Access

Wind turbine components (blades, nacelles, and towers) are not manufactured in Ireland and therefore must be imported from overseas and transported overland to the Site. With regard to the selection of a transport route to the Site, alternatives were considered in relation to turbine components, general construction-related traffic, and site access locations.

3.5.5.1 Port of Entry

The alternatives considered for the port of entry of wind turbines into Ireland for the Proposed Project include Port of Galway, Shannon Foynes Port and Dublin Port. Shannon Foynes Port is the principal deepwater facility on the Shannon Estuary and caters for dry bulk, break bulk, liquid, and project cargoes. Port of Galway and Dublin Ports also offers a roll-on roll-off procedure to facilitate import of wind turbines. All three ports and indeed others in the state, offer potential for the importing of turbine components. The primary chosen port of entry is Galway Port due to its proximity from the port to the M17 motorway, in which the exit to the national and regional roads towards the Proposed Project is accessible.

3.5.5.2 Delivery to Site

For turbine components and construction material transport, cognisance was taken of the haul routes that were previously used for other wind farm developments in the wider area in addition to the general preference to minimise the requirement for significant accommodation or widening works along the public road network and associated environmental effects.

From the selected Port of Entry, Galway Port, the turbines will be transported along the M6 before exiting at north Junction 18 onto M17 Motorway to Tuam. The turbines will exit at Junction 19 onto the N63 National Road. The proposed route will utilise the approx. 2.1km of new national secondary road along the N53 as proposed in the consented N63 Liss to Abbey Realignment Scheme (Pl Ref: ABP 312877-22). The route then continues on to join via a proposed accommodation area onto the R332 Regional Road in for approx. 2.1km towards Proposed Project entrance.

In assessing the most suitable route for turbine transport, two options (as outlined in Figure 3-12) were considered from the end of the N17 Tuam by-pass shown in Figure 3-8 below:

- Option 1: Take the N63 exit onto the L2128 and L6324 to bypass Abbeyknockmoy and continue on the N63 to the R332 in Slievegorm
- Option 2: Take the N63 via the consented N63 Liss to Abbey Realignment Scheme and continue to the R332 in Slievegorm

An assessment of the options was carried out, taking account of criteria such as third-party land requirements, existing road upgrades, new road construction requirements and associated environmental effects. Option 2 was chosen over Option 1 as Option 2 had fewer identified pinch points and would require fewer junction accommodation works along the proposed turbine delivery route to be constructed. Option 1 would have required the turbine delivery vehicles to overrun into adjacent lands at 2 no. locations along the L6324 in the townlands of Feagh West and Moyne and would have also required additional third party lands in which to successfully manoeuvre these aforementioned turning locations.

Option 2 was chosen over Option 1 due to the shortened delivery route to the Proposed Wind Farm site and reduced number of required accommodation areas in third party lands following the use of the consented N63 Liss to Abbey Realignment Scheme.

Option 2 has been proven suitable for the transport of turbine components, and the transport analysis (as presented in Chapter 15 of this EIAR), shows that only accommodation works at the N63/R332 junction will be required to accommodate the proposed turbines. The turbine delivery transport route will utilise the motorway network, national and primary roads available to ensure the road network holds the capacity to manage large loads. When considering turbines transport routes, alternative routes comprising of a more direct route with greater stretches of secondary and local roads were considered less optimal due to the increased possibility of road and roadside disruption and a greater need to carry out works.

All construction traffic will use designated haul routes only, as agreed with the local authority. An alternative to this would be to allow for more direct access to the Site using multiple approach routes; however, this is more likely to give rise to additional traffic and road impacts.

The delivery of turbine components including blades, tower sections and nacelles is a specialist operation owing to the oversized loads involved. As detailed in Section 15.1 of this EIAR, turbine blades will be delivered to the Site using a Super Wing Carrier. When considering turbines transport routes, alternative modes of transport were also considered. Depending on the selected turbine delivery route and the turbine manufacturer, a blade adapter or blade transporter may also be used, if deemed appropriate, for delivery of turbines to the Proposed Wind Farm site.

It should be noted that all component deliveries (abnormal loads) will be undertaken as described in the Traffic Management Plan which will be submitted and agreed with the local authorities and roads authorities upon consent of this application. All component deliveries will be subject to garda escort. All manoeuvres around junctions and into site entrances will be supervised by a qualified team of turbine delivery experts. The proposed new site entrance will be widened to facilitate the delivery of abnormal loads, after the construction phase this entrance will be reduced in size and gated for security and will be used as an operational phase entrance. However, should replacement components be required, this entrance will be temporarily widened to facilitate such works. Please see Section 15.1 of Chapter 15 Material Assets for further details.

Table 3-7 Comparison of environmental effects when compared against the chosen option (Turbine Delivery Routes)

Environmental Consideration	Option 1	Option 2
Population and Human Health	Greater potential for impacts on human health as more accommodation works would be required along the route, giving rise to more vehicular emissions, dust emissions, noise and traffic disruption.	Less potential for impacts on human health as fewer accommodation works would be required along the route, giving rise to less vehicular emissions, dust emissions, noise and traffic disruption.
Biodiversity (including Birds)	Neutral	Neutral
Land, Soils and Geology	Greater potential impact on soil and subsoils as more accommodation works would be required.	Less potential impact on soil and subsoils as fewer accommodation works would be required.
Hydrology and Hydrogeology	Neutral	Neutral

Air Quality	Greater potential for impacts on air quality as more accommodation works would be required along the route giving rise to more vehicular and dust emissions.	Less potential for impacts on air quality as fewer accommodation works would be required along the route giving rise to less vehicular and dust emissions.
Climate	Greater potential for impacts on climate as more accommodation works would be required along the route giving rise to more vehicular emissions.	Less potential for impacts on climate as fewer accommodation works would be required along the route giving rise to less vehicular emissions.
Noise and Vibration	Greater potential for impacts in relation noise and vibration as more accommodation works would be required along the route giving rise to more noise emissions and potential vibration.	Less potential for impacts in relation noise and vibration as fewer accommodation works would be required along the route giving rise to less noise emissions and potential vibration.
Cultural Heritage	Greater potential for impacts on unrecorded, sub-surface archaeology due to more accommodation works being required, and therefore excavations, along this route.	Less potential for impacts on unrecorded, sub-surface archaeology due to fewer accommodation works being required, and therefore excavations, along this route.
Landscape and Visual	Neutral	Neutral
Material Assets	Greater potential for impacts in relation to traffic as more accommodation works required which could give rise to traffic disruption.	Less potential for impacts in relation to traffic as fewer accommodation works required which could give rise to traffic disruption.
Vulnerability to Major Accidents Natural Disasters	Greater potential for impacts in relation to major accidents and natural disasters as more accommodation works are required which could give rise to a larger degree of land disturbance.	Less potential for impacts in relation to major accidents and natural disasters as fewer accommodation works are required.

For the reasons set out above, the chosen turbine delivery route (Option 2) was determined to have the least amount of environmental effects when compared to other proposed routes.

Map Legend

- EIAR Site Boundary
- M17 Motorway
- Option 1 - Turbine Delivery Route
- Option 2 - Turbine Delivery Route

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Drawing Title

Alternative Turbine Delivery

Project Title

Cooloo Wind Farm, Co. Galway

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3.5.6 Alternative Mitigation Measures

Mitigation by avoidance has been a key aspect of the Proposed Project's evolution through the selection and design process. Avoidance of the most ecologically sensitive areas of the Site limits the potential for environmental effects. As noted above, the site layout aims to avoid any environmentally sensitive areas. Where loss of habitat occurs in the Site, this has been mitigated with the proposal of habitat enhancement and improved habitat connectivity with hedgerow replanting on the Proposed Project. Any forestry felled within the footprint of the Proposed Project will be replaced offsite, with no net loss. The alternative to this approach is to encroach on the environmentally sensitive areas of the Site and accept the potential environmental effects and risk associated with this.

The best practice design and mitigation measures set out in this EIAR will contribute to reducing any risks and have been designed to break the pathway between the Site and any identified environmental receptors. The alternative is to either not propose these measures or propose measures which are not best practice and effective and neither of these options is sustainable.