3.0 CONSIDERATION OF REASONABLE ALTERNATIVES

3.1 INTRODUCTION

This chapter of the EIAR contains a description of the reasonable alternatives that were studied which are relevant to the proposed project and its specific characteristics and provides an indication of the main reasons for the option chosen, taking into account the effects of the proposed project on the environment.

Environmental Impact Assessment (EIA) Directive 2011/92/EU was amended by Directive 2014/52/EU. Article 5 of the EIA Directive, relating to the preparation of an EIAR by the developer, was amended to state the following should be included regarding alternatives:

"...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)(d)).

This is further reinforced in Annex IV of the amended EIA Directive (Information Referred to in Article 5(1) (Information for the EIAR)) which states that:

"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."

The Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report (European Union, 2017) states that reasonable alternatives

"must be relevant to the proposed project and its specific characteristics, and resources should only be spent on assessing these alternatives" and 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"*[1].

In addition as noted by the EPA in the Guidelines on the Information to be Contained in EIARs (May 2022) *"Analysis of high-level or sectoral strategic alternatives cannot reasonably be expected within a project level EIAR"* and *"that the amended Directive refers to 'reasonable alternatives... which are relevant to the proposed project and its specific characteristics'."*[2]

The EPA EIAR Guidelines (2022) also stipulates in Section 3.4 (consideration of alternatives) that *'The presentation and consideration of the various alternatives investigated by the developer is an important requirement of the EIA process'.*

[1] https://ec.europa.eu/environment/eia/pdf/EIA_guidance_EIA_report_final.pdf

[2] https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

In the same section the Guidelines go on to discuss the different types of alternatives that may be considered, including:

- Alternative locations;
- Alternative designs; and
- Alternative processes.

This chapter provides information on the consideration of alternatives, including 'do nothing' (Section 3.3.1), alternative locations (Section 3.3.2), alternative design and layout, (Section 3.3.4), and alternative processes (Section 3.3.5), amongst other alternative considerations discussed below.

3.1.1 Statement of Authority

This chapter was prepared by Oonagh Fleming, and John Staunton of TOBIN Consulting Engineers. Oonagh Fleming is a Graduate Environmental Scientist in TOBIN. Oonagh holds a BSc in Geography and Sociology. John Staunton PhD, is a Senior Project Manager and Environmental Scientist in TOBIN. John has more than fifteen years' postgraduate experience in both research and environmental consultancy. John holds a BSc and PhD in Environmental Science and has considerable experience in project managing wind energy developments and carrying out associated impact assessments including the assessment of alternatives. It was also reviewed by Orla Fitzpatrick, Technical Director in TOBIN. Orla has twenty years experience working in the delivery of EIA projects in environmental consultancy. She holds a BSc in Geophysics and MSc in Environmental Consultancy and has considerable experience as technical approver of environmental deliverables for major infrastructure projects.

3.2 METHODOLOGY

3.2.1 Standards and Guidance Documents

The following documents and guidance were reviewed in the preparation of this chapter:

- EPA, Guidelines on the Information to be contained in EIARs (2022);
- Environmental Impact Assessment of Projects - Guidance on the preparation of the EIAR (European Union, 2017);
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems (DoHPCLG, 2017);
- Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment; and
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).

Consideration was also given to the following as part of the literature review:

- Best Practice Guidelines for the Irish Wind Energy Industry (IWEA, 2012).

3.3 CONSIDERATION OF ALTERNATIVES

In accordance with Directive 2011/92/EU as amended by Directive 2014/52/EU and taking into account the above standards and guidance documents listed, including the EPA EIAR Guidelines (2022) this chapter addresses alternatives under the following headings:

- 'Do Nothing' Option, i.e. without the proposed project proceeding;
- Site Selection;

- Alternative Layouts/ Design;
- Alternative Technology;
- Alternative Timelines and Construction Methodology;
- Alternative Mitigation Measures.

Each of these is addressed in the following sections. When considering a wind farm development, given the intrinsic link between turbine layout and design, the two will be considered together in this chapter.

3.3.1 'Do-Nothing' Option

The "Do-Nothing" scenario is to not develop the proposed project and to leave the existing environment as it is, with no changes made to the current land-use practices.

In such a scenario, the prospect of capturing a valuable renewable energy resource would be lost and as a result the opportunity to contribute to meeting Government and EU targets to produce electricity from renewable resources and the reduction of greenhouse gas emissions would also be lost. Furthermore, the chance to generate additional local employment and investment would not occur, the local economy would remain less diverse, and continue to rely primarily on agriculture and forestry as its main source of income. The 2009 EU Renewable Energy Directive (2009/28/ EC) set Ireland a legally binding target to meet 16% of our energy requirements from renewable sources by 2020. In 2018, the Directive was recast (2018/2001/EU) to move the legal framework to 2030 targets, setting a new binding target of at least 32% with a clause for a possible upwards revision by 2023. At that time Ireland was committed to meeting 40% of electricity demand from renewable sources, with 10% for transport and 12% for heat. It is now established that Ireland had not met the 2020 renewable energy targets. Under the 'Do-Nothing scenario', there will be no opportunity to provide additional renewable energy into the electricity grid for this location.

Under the 2023 Climate Action Plan, which is discussed further in Chapter 4 of this EIAR (Policy Planning and Development), the following targets have been set out:

- Deliver an early and complete phase-out of coal and peat-fired electricity generation;
- Increase electricity generated from renewable sources to 80% by 2030, indicatively comprised of:
    - At least 5 GW of offshore renewable energy;
    - 8 GW of solar photovoltaic (PV) capacity including 2.5 GW of non-new grid solar; and
    - 9 GW of **onshore** wind capacity.

Under the "Do-Nothing" scenario, the Scart Mountain Wind Farm project would not go ahead, the development of wind turbines would not be pursued, and all lands associated with the proposed project would remain in their current uses (primarily forestry and agriculture). The prospect of creating sustainable energy would be lost at this site. The nation's ability to produce sustainable energy and reduce greenhouse gas emissions to meet EU targets and targets set out in the Climate Action Plan (2023) would be reduced.

The total annual GHG emission savings will amount to between 61,350 tonnes and 77,694 tonnes of CO_2eq , and the generation of 262 GWh to 331 GWh of renewable electricity to the national grid will result in a net saving in terms of GHG emissions, which would otherwise be released to the atmosphere through the burning of fossil fuels in the "Do-Nothing" scenario. Importation and use of fossil fuels would continue, and Ireland's energy security would remain vulnerable. According to EirGrid's All-island Generation Capacity Statement 2021 – 2030, the growth in energy demand for the next ten years will be between 18% (low demand scenario) and

43% (high demand scenario)[3]. In addition, the proposed project will provide employment both in the local area and to the wider economy through the construction and operational phases as described in Chapter 5 (Population and Human Health). It will also provide investment in the local community in terms of community benefit funds. Under the 'Do-Nothing' scenario, the socio-economic benefits associated with the proposed project will be lost.

In the scenario where the proposed project does not proceed, 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 would be lost.

Table 3-1: Environmental Impacts of the Do-Nothing Alternative relative to the Chosen Option

Environmental Consideration	Do Nothing Alternative
Human Health and Population	No increase in employment as a result of the project. No long-term investment in sustainability in the locality. No long-term provision of a community benefit fund locally. No potential for construction/operation phase impacts.
Biodiversity	Forestry would continue to be clear-felled / managed as part of the ongoing forestry growth cycle. Agriculture would continue to be practiced as it currently is, with continued high levels of pressure on the potentially valuable habitats on the wind farm site. The Annex I Raised Bog, Wet Heath and Dry Heath habitat will likely continue to degrade and dry out as burning and grazing by sheep and deer continues. Due to the more extreme nature of current weather patterns, it is also likely that drought and heavy rainfall will continue to increase erosion already present on Knocknanask. A tailored habitat management plan for the site focused on improving the condition of large areas of valuable habitats would not be implemented. No potential for construction/operation/decommissioning phase impacts associated with the wind farm and associated infrastructure.
Ornithology	No potential for construction/operation phase impacts to bird populations.
Land, Soils and Geology	Forestry works will be carried out as required. No potential for construction phase impacts.
Hydrology and Hydrogeology	Forestry works will be carried out as required. No potential for construction phase impacts.

[3] http://www.eirgridgroup.com/site-files/library/EirGrid/208281-All-Island-Generation-Capacity-Statement-LR13A.pdf

Shadow Flicker	No potential for shadow flicker, however, the applicant has committed to near zero shadow flicker, subject to the time it takes for the turbine rotor to come to a safe stop (between 1 and 2 minutes (see Chapter 10 – Shadow Flicker)).
Material Assets – Telecommunications & Aviation	Neutral - No potential for impacts on telecommunication links and aviation activity. However, the applicant has committed to avoiding impacts on telecommunications links. The availability of the airspace within and around the proposed wind farm site would have no restrictions for local air traffic, however there is no attraction for aircraft in the immediate area around the proposed wind farm.
Air Quality and Climate	Missed opportunity to contribute to the reduction of carbon and greenhouse gas emissions. No potential for construction phase impact such as dust emissions.
Noise and Vibration	No potential for additional noise at nearby sensitive receptors.
Cultural Heritage	No potential impacts on archaeology or local cultural heritage.
Landscape and Visual Impact	Existing landscape and visual amenity in the area will remain unchanged, though any cumulatively considered projects may continue to be built.
Traffic	No potential increased traffic volumes on local roads. No works required in other areas for turbine delivery or grid connection.

3.3.2 Site Selection

The project applicant, regularly examines potential land for candidate sites for wind energy development. In 2014, FEI's (under Coillte at the time) Renewable Energy Development Team undertook a detailed screening process of Coillte managed land through Geographical Information System (GIS) software, using a number of criteria and stages to assess the potential of a large number of possible sites (c. 441,000 hectares), suitable to accommodate a wind energy development. The GIS database drew upon a wide array of key spatial datasets such as forestry data, ordnance survey land data, house location data, transport, existing wind energy and grid infrastructure data, and environmental data such as ecological designations, landscape designations and wind energy strategy designations available at the time.

The following is a summary of the methodology used in this screening process.

Phase 1 – Initial Screening

This stage in the selection process discounted lands that were not available for development under a number of criteria, as follows:

- Committed lands for other developments;
- Millennium Sites (This is a Coillte environmental designation – these sites were planted and managed for provision of a tree for every household in the country as part of the Millennium tree planting project);
- Life Sites (This is a Coillte environmental designation – these former forested sites were cleared and are now managed for biodiversity);
- Wild Nephin Properties (This is a Coillte designation. Since 2014 these properties have been incorporated into National Parks);
- Farm Partnerships and Leased Lands;
- National Parks;
- Natura 2000 and Nationally Designated Sites (SAC, SPA, NHA, pNHA)

ands where the average wind speed at 100 metres above ground level is less than 6.5 m/s and, therefore, potentially not suitable for a commercially viable wind energy development were also discounted at this stage. In addition, sites with a contiguous area of less than 300 hectares were discounted.

Phase 2 – Grid Constraints

The electricity transmission system is the backbone of the nation's power system, efficiently delivering large amounts of power from where it is generated to where it is needed. As part of the site selection process it was necessary to consider the potential for grid connection, including such aspects as distance to potential connection nodes and grid capacity at the nodes to accommodate the connection.

Phase 3 – Screening

A screening process was conducted across the country in 2014 and again in 2017 which identified a number of suitable sites, which were then taken forward for detailed assessment. As these sites have all been brought forward to planning (or are in that process), and are subject to EIA, a description of the reasonable alternatives studied which are relevant to each project and its specific characteristics, together with an indication of the main reasons for selecting the chosen option with regards to their environmental impacts, are provided in the EIAR accompanying the applications for same.

Sites that emerged from the 2014 site selection process outlined above for which planning applications have been submitted are as follows:

- Croagh, County Leitrim;
- Carrownagowan, County Clare;
- Glenard, County Donegal;
- Bottlehill (Coom), County Cork; and
- Castlebanny, County Kilkenny.

As such, a description of the reasonable alternatives studied which are relevant to each project and its specific characteristics, together with an indication of the main reasons for selecting the chosen option with regard to their environmental impacts, is provided in the EIAR accompanying the planning application for each project.

In 2017, Coillte once again examined the lands under its stewardship for candidate sites for wind energy development using the same site selection process as described above, but this time, reducing the required contiguous site area from 300ha to 50ha.

The proposed sites that emerged from this process are as follows:

- Ballinagree Co. Cork;
- Croaghaun, Co. Carlow;
- Gortyrahilly, Co. Cork;
- Inchamore Co. Cork; and
- Lissinagroagh, Co. Leitrim.

Similar to the sites which emerged in 2014; these sites which emerged in 2017 are projects in their own right which are/will be subject to EIA.

As such, a description of the reasonable alternatives studied which are relevant to each project and its specific characteristics, together with an indication of the main reasons for selecting the chosen option with regards to their environmental impacts, is/will be provided in the EIAR accompanying the applications for same.

As stated above, Coillte conducted two reviews of its land in recent years in which it examined candidate sites for wind energy development. However, as also stated above FEI continuously assesses lands for wind opportunities and other sites also emerge periodically.

This site was not brought forward under the 2014 or 2017 screening processes as due to low wind speeds, it was not deemed to be commercially viable. This changed due to a number of factors in the interim which improved the financial viability of the project, such as advancements in turbine technology and the associated increase in energy production, and an increase in scale through the addition of adjoining private lands.

In our continuous review of the portfolio, other sites which have also emerged are as follows:

- Cummeennabuddoge wind farm
- Knockshanvo wind farm

Each are projects in their own right which are/will be subject to EIA. As such a description of the reasonable alternatives studied which are relevant to each project and its specific characteristics, together with an indication of the main reasons for selecting the chosen option with regards to their environmental impacts has will been / will be provided in the EIAR accompanying the applications for same.

It should be noted that FEI continuously assess lands for wind opportunities, on its own and in conjunction with other developers. Sites previously identified or not progressed for various reasons, including local county development wind designations or commercial viability, have been and will be brought forward as circumstances evolve. Such circumstances may include an increased national ambition for onshore wind development, changes on foot of cyclical review/updates to local wind energy policies in county development plans, or third party lands becoming available and resulting in new commercial opportunities/joint venture projects.

3.3.3 Alternative Layouts / Designs

During the development of the EIAR, environmental surveys of the proposed project site and surrounds were carried out to establish the baseline environment. All site constraints were identified and updated as further detailed assessment was undertaken. The locations of county roads, streams, residential dwellings, landowner boundaries, telecommunication links,

ecologically sensitive areas and archaeological sites were noted. Separation distances to identified constraints were determined using GIS (See Figure 3-1 for the Scart Mountain Wind Farm Constraints Map).

The scoping and consultation exercises (statutory and non-statutory bodies and the public) also fed into the site layout/design (See Section 1.8 of Chapter 1 (Introduction)), where, for example, information about ecological sensitivities on the site were flagged by the National Parks and Wildlife Service and the presence of telecoms links were highlighted by telecoms operators which was considered in the design of the turbine layout.

The site layout design stage considered the size, number and positioning of turbines and layout of associated site infrastructure i.e. internal access tracks, temporary construction compounds, substations, etc. Alternatives considered for each of these elements are documented in the following sections. It was an iterative process comprising input from the design team, environmental specialists, internal and external stakeholders. As an iterative process, potential environmental effects were reduced or eliminated through changes to the design, where possible. The constraints which were identified are provided as Figure 3-1.

Constraints and environmental sensitivities were first identified, and buffers applied in order to determine a viable area within the site to accommodate development. The constraints identified and resulting design solutions are listed in Table 3-2 below.

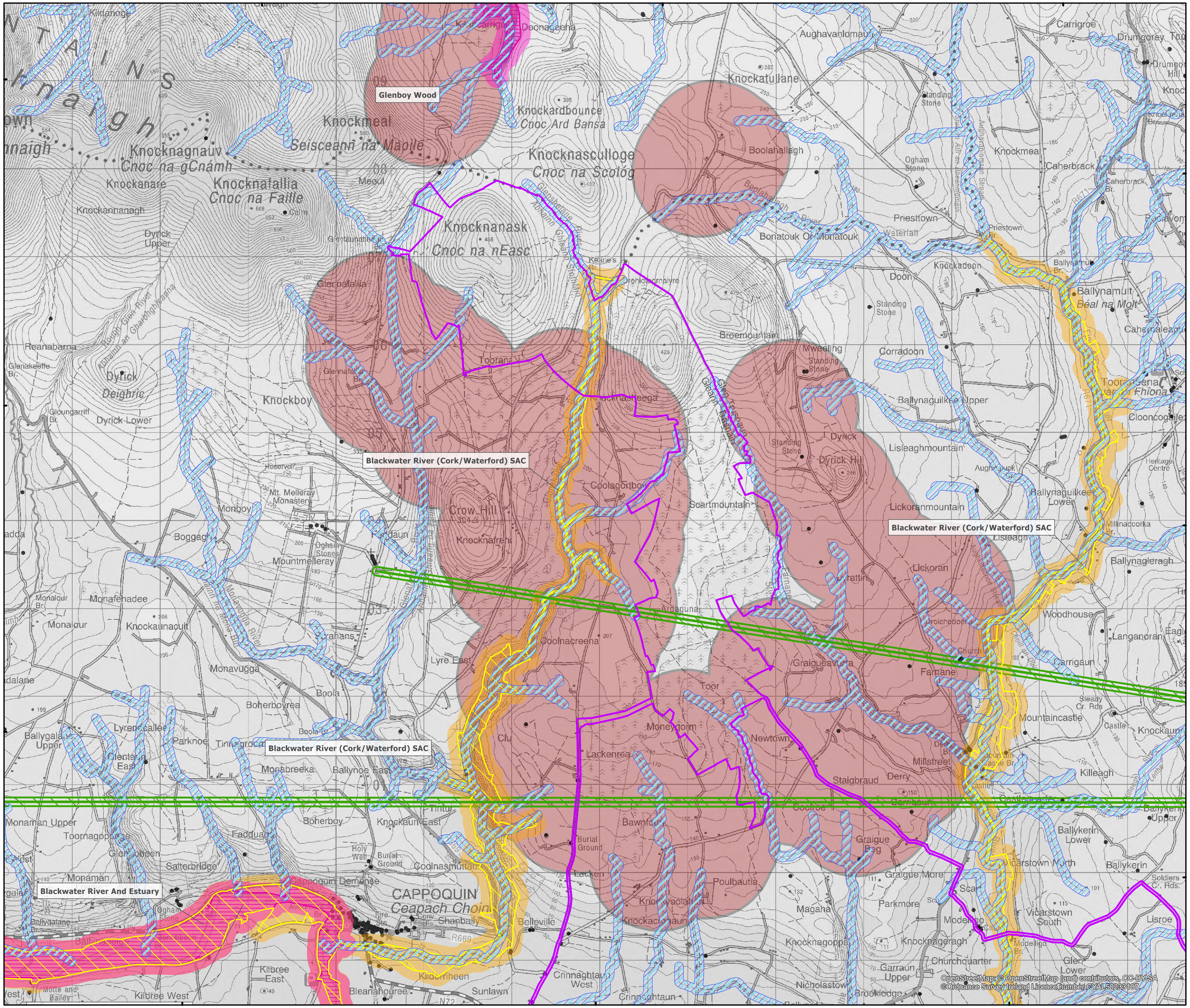
Table 3-2 Environmental Considerations

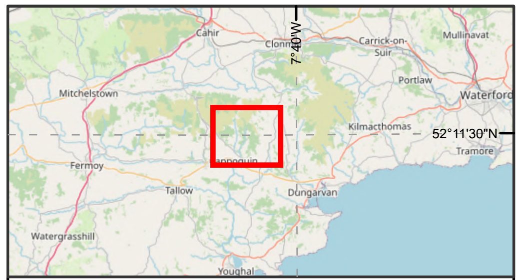
Environmental Consideration	Required Setback/Constraint	Design solutions
Residential Amenity	The existing 2006 Wind Energy Development Guidelines (WEDGs) and the 2019 Draft Revised WEDGs indicate that a 500 m or a 4 times tip height setback distance (whichever is greatest) should be sufficient.	In order to minimise potential noise effects and impacts on residential amenity, it was decided early in the design process that a set-back of 740m would be appropriate. The proposed layout has achieved a high level of separation between dwellings and turbines by providing a minimum separation distance of >740m. The closest dwelling is located approximately 804m away from proposed turbine T14, which is more than 4x times the maximum tip height in the proposed turbine range (in this case 4 x 185m) , in line with the setback requirements in the 2006 and Draft 2019 WEDGs.
Flora and Fauna	Mitigation by avoidance measures to avoid significant potential impacts on species and habitats.	The potential effects on Flora and Fauna as outlined in Chapter 6 (Biodiversity) shows that the proposed project will have no significant effect on ecological features. The presence of sensitive flora and fauna is limited across much of the site, with majority of the site occupied by conifer plantation. Consideration has been given to identify sensitive areas on the site (for example, annex I habitat and bird nesting locations) and potential impacts to these areas will be avoided insofar as possible. In addition, a program of habitat enhancement is proposed both within the wind farm site (to improve areas of annex I habitat that is currently in poor condition) and in the wider landscape. The onsite areas of annex I habitat are primarily on the

Environmental Consideration	Required Setback/Constraint	Design solutions
		northern Knocknanask Mountain, though as mentioned, these were found to be in poor condition.
Ornithology	Avoidance of nesting area, foraging sites and migratory routes.	As per Chapter 7 (Ornithology) mitigation measures were designed to reduce any impacts to bird populations, including: • Construction Disturbance Mitigation; • Mitigation of Operational Disturbance; • Mitigation of Displacement impacts; and • Post Construction Monitoring These are described further in Chapter 7 (Ornithology).
Soils and Geology	Avoid areas of peat.	The proposed site is not a sensitive site in terms of soils and geological environment, due to commercial forestry and the site's low geological value. Topography, along with the soils and underlying geology varies throughout the site. Generally, the site comprises glacial till subsoils. Some parts of the site have shallow peat but where it does occur it is mostly less than 0.5m (only rarely was greater than this found, and then it was less than 1m with the exception of a single location where an artificial heap of peat was encountered approx. 1.6m deep). Bedrock in the region is quite shallow and commonly occurs at the surface or at very shallow depths. There is no evidence of soil or peat instability on the site as a result of any previous development. The proposed infrastructure does not overlay any deep peat. The principal risks associated with soil and geology at the site are the management of soils, and the loss of construction and operational materials (concrete, fuel and oil, etc) to water. These risks have been fully mitigated through the adoption of construction and operational good practice.
Hydrology	Avoid impact on existing drainage regime.	In identifying and avoiding direct impacts on drainage features the proposed development has implemented 'avoidance of impact' measures. Examples include bottomless culverts or clear span structures for all drainage crossings and replicating drainage width, side slopes and substrate in proposed drainage channels where any existing site drains need to be rerouted.
Water Quality	Minimum setback from significant rivers and streams and appropriate mitigation designed to avoid siltation during construction.	There will be 3 no. watercourse crossings for site access roads on the wind farm site. All will avoid in-stream works. A 50m setback from main infrastructure (turbines, substation, borrow pits, compounds) to watercourses will be maintained. Before any ground works are undertaken, double silt fencing (or triple near the Glenshelane crossing) will be placed upslope of the watercourse channel along the 50m buffer zone boundary.

Environmental Consideration	Required Setback/Constraint	Design solutions
Noise and Vibration	The 2006 WEDGs states that 'a lower fixed limit of 45dB(A) or a maximum increase of 5dB(A) above background noise at nearby noise sensitive locations is considered appropriate to provide protection to wind energy development neighbours.' Similarly, these guidelines indicate "*A fixed limit of 43dB(A) will protect sleep inside properties during the night*."	The proposed layout has achieved a high level of separation between dwellings and turbines by providing a minimum separation distance of >740m. The closest sensitive dwelling is > 800 m away from proposed turbine T14, which is more than 4x times the maximum tip height in the proposed turbine range (in this case 4 x 185m) , in line with the setback requirements in the 2006 and Draft 2019 WEDGs. The appropriate day and night noise criteria will be adhered to by the proposed development while in operation, as described in Chapter 12 (Noise & Vibration).
Shadow Flicker	Near Zero shadow flicker.	The proposed project has committed to near zero shadow flicker[4] as described in Chapter 10 (Shadow Flicker). This is compliant with the 2006 WEDGs and is in line with both the emerging best practice and 2019 WEDGs.
Cultural Heritage	No direct impact on recorded archaeological monuments or architectural sites.	The final layout has been designed to ensure that there is no direct impact on recorded archaeological monuments or architectural sites.
Material Assets	No significant impacts to any telecommunications networks or aviation in the area.	The final layout has been designed to ensure that there is no direct impact on telecommunication links. It has also been found that the proposed project will have no significant impact on aviation related activities.

[4] There may be a very short period of shadow flicker as the turbine comes to a controlled stop. See Chapter 10 (Shadow Flicker) of this EIAR for further information.





Legend

- Proposed project
- Vodafone Antenna Locations
- Vodafone Links - 30m buffer to blade tip
- Telecom links - ENET
- Watercourses - 50m Buffer
- Special Areas of Conservation (SACs)
- Proposed National Heritage Areas (pNHAs)
- pNHA - 100m Buffer
- SAC - 100m Buffer
- SPA - 100m Buffer
- Archaeology - 20m Buffer
- ENET Telecom - 50m Buffer
- Housing (curtilages) - 740m Buffer

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Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY \ WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

A	13/12/2024	First issue	S.P	J.S
Rev	Date	Description	By	Chkd.

Client: FuturEnergy Ireland

Project: Scart Mountain Wind Farm

Title: Figure 3-1: Constraints Map

Scale @ A3: 1:40,000

Prepared by:	Checked by:	Date:
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Map Ref: 11303-001-C.BUFF-OSI-TOB-A

Draft: A

Within the buildable viable area which emerged from the above constraint analysis two main alternative design options (to the proposed option) were considered throughout progressive stages of the design. These alternative designs / layouts are illustrated in Figure 3-2 (Figure 3-2 Site Layout Design History Map – Turbine Locations).

The location of individual turbines is influenced by a range of design constraints. As information regarding the proposed site was compiled and assessed, the number, size and location of turbines were revised and amended to take account of the existing constraints of the site. These constraints (and their associated buffer zones) included visual constraints, noise constraints, ecological constraints, telecoms, topography (slope), etc.

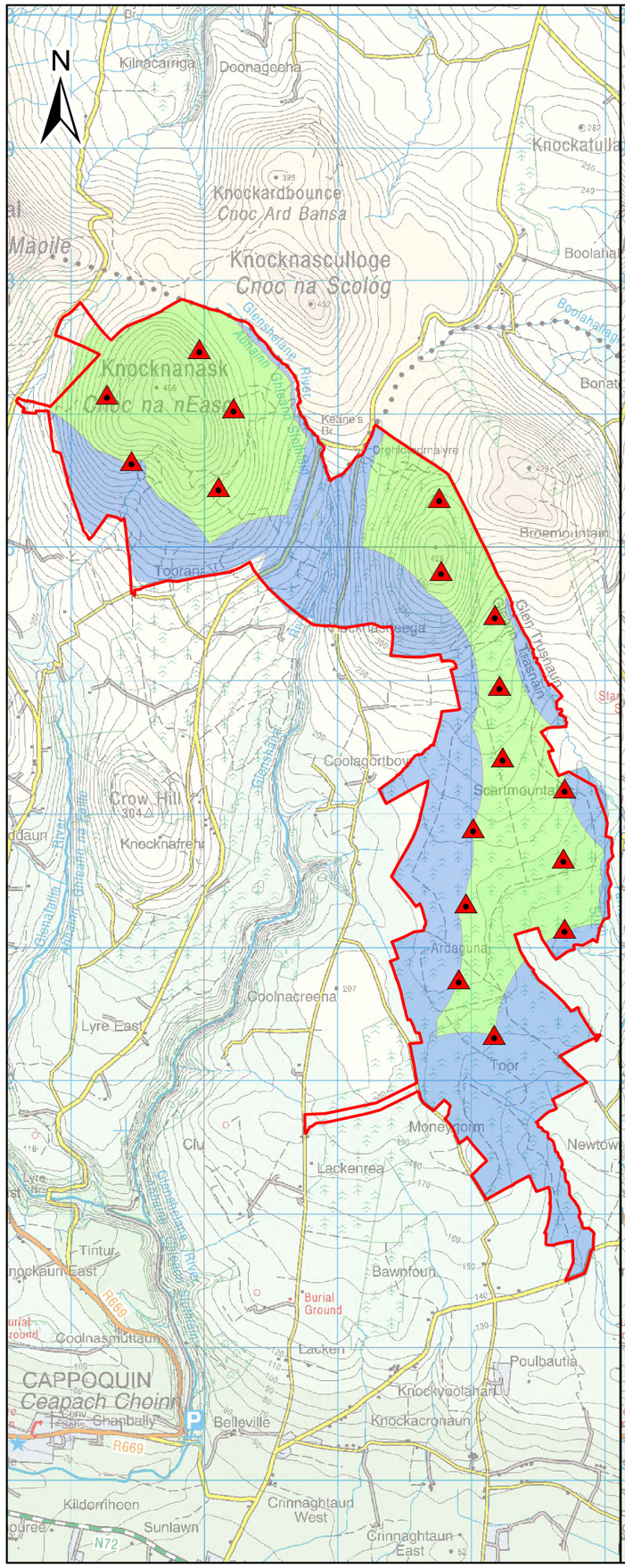
The proposed wind turbine layout has been optimised using appropriate wind farm design software to optimise the energy yield from the site, while maintaining sufficient distances between the proposed turbines to ensure turbulence and wake effects do not compromise turbine performance. Development of the final proposed wind farm layout has resulted from information contained in these assessments, carried out during preparation of this EIAR, and received during the scoping and consultation exercises described in Chapter 1 (Introduction) (See appendix 1-8).

As previously mentioned, consideration was also given to relevant guidance, namely the current WEDGs (2006), the IWEA Guidelines (2012), the EPA EIAR Guidelines (2022), including the Draft Revised WEDGs (DoEHLG, 2019), in particular with regards to setback distances to dwellings.

The initial constraints study identified a significant viable area within the proposed project site (Figure 3-2 Site Layout Design History Map – Turbine Locations), in which potential turbine layouts were developed. These turbine layouts were then refined a number of times following feedback from the project team, as a result of information obtained from site investigations and from engagement with the relevant consultees. At the initial stage, a project design was drafted which would maximise the wind energy potential of the site.

The resulting draft layout consisted of 17 no. turbines with initial distances to houses of >740 m. This layout was based on turbine tip heights of 179.5-185 m and rotor diameter of approximately 149-163 m. This layout maximised the available area within the site whilst staying out of key constrained areas. The turbine range proposed made the most of the wind resource on site. Prior to the first layout being drafted, turbines with a tip height of up to 200m were considered, however feedback from the landscape specialist resulted in these being discounted at this early stage to avoid undue cumulative issues (see Chapter 13)

This layout was reviewed by the project design team following initial site visits and surveys by the project team, as well as considering feedback from the scoping consultation exercise and public consultation. and from the EIAR specialist consultants following further site and desk studies. After this design review exercise, a decision was made to reduce the number of turbines to 16 no. This was primarily based on reducing the potential for impacts to ecological and ornithological receptors on the site such as annex habitats and bird species.



Legend

- Proposed Wind Farm Site
- Buildable Area
- Non Buildable Area
- 15 Turbines
- 16 Turbines
- 17 Turbines

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY \ WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

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Client: Ireland FuturEnergy

Project:

Scart Mountain Wind Farm

Title:

Figure 3-2:
Site Layout Design History Map - Turbine Locations

Scale @ A3:

Prepared by:	Checked by:	Date:
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This second layout was the subject of a further detailed design review by all of the project specialists. Landscape & Visual specialist consultants Macroworks undertook a review which was focussed on landscape and visual impacts. The review considered draft photomontages from a number of different locations. These locations were selected as a combination of the most sensitive views, population centres and fullest views of the proposed project. The review concluded that there was one turbine in particular that was considered to be prominent on the landscape. This was located on the northern side of Knocknasheega. Whilst this turbine did not block or obstruct the main aspect of visual amenity along this section of the scenic route, it did have the potential to notably distract the viewer due to its scale, further accentuated by its uphill nature from the local road. Thus, it was recommended that turbine T6, located along the slopes of Knocknasheega Hill, be removed thus informing the final iteration of layout design (i.e. the current 15 no. turbine design).A summary of the designs considered is set out in Table 3-3 below:

Table 3-3 Layout Design Changes

	Initial 17 no. turbine Consideration	16 no. turbine Consideration	Current Design Proposal
Distance to houses	>740m	>800m	>800m
Shadow Flicker	Near zero	Near zero	Near zero
No. of Turbines	17 no.	16 no.	15 no.
Turbine Height	179.5-185 m	179.5-185 m	179.5-185 m
Potential Output	Between 96.9-122.4 MW	Between 91.2-115.2 MW	Between 85.5-108 MW

The adjustments through each layout iteration resulted in placement changes to turbines to ensure sufficient distances were maintained from sensitive receptors and constraints, and to maintain the required separation distances between turbines. The potential environmental effects of the initial layout (17 no. turbines) and the second layout (16 no. turbines) when compared with the current proposed project, are provided in Table 3-4 below.

Table 3-4: Table of potential environmental effects relative to proposed design layout of 15 no. turbines

Environmental Consideration	17 no. turbines – First proposed layout	16 no. turbines – Second proposed layout
Human Health and Population	Potential for the greatest impact on sensitive receptors due to longest construction period for the greater number of turbines. Due to the bigger footprint there is potential for closer proximity of dwellings to some turbines.	Potential for a slight increase of impact on sensitive receptors, in comparison to the proposed project due to a slightly longer construction period and slightly closer proximity of dwellings to some turbines.
Biodiversity & Ornithology	The largest infrastructure footprint would result in the greatest loss of habitat, with more potential for significant effects on the bat and bird population. .	Larger infrastructure footprint than the proposed project would result in greater loss of habitat, with potential for impacts on bats and bird populations.

Land, Soils and Geology	The larger number of turbines will give rise to more areas requiring excavation and further disturbance of soil onsite, in addition to requiring more crushed stone for construction. This would therefore have the greatest level of impact.	The turbine numbers will give rise to further excavations and disturbance of soil onsite than the proposed project, in addition to requiring more crushed stone for construction. This would therefore have an increased potential for impact.
Hydrology and Hydrogeology	The larger number of turbines will give rise to more areas requiring excavation and further disturbance of soil onsite. This would therefore have the greatest level of impact.	The turbine numbers will give rise to further excavations and disturbance of soil onsite, than the proposed project. This would therefore have an increased potential for impact.
Shadow Flicker	Neutral - No significant difference in impact as the project has committed to achieving near zero shadow flicker at sensitive receptors.	Neutral - No significant difference in impact as project has committed to achieving near zero shadow flicker at sensitive receptors.
Telecommunications & Aviation	Neutral	Neutral
Air and Climate	Due to the increased number of turbines with this layout there is potential for greater contribution to carbon reduction targets overall during the lifetime of the proposed project.	In comparison to the proposed project , there is potential for greater contribution carbon reduction targets over the lifetime of the proposed project.
Landscape & Visual Impact	The largest number of turbines resulted in a development which was not optimal for the site. This would have the greatest impact compared to the proposed project.	The number of turbines resulted in a development which was not optimal for the site, in comparison to the proposed project. Slightly increased impact compared to the proposed project.
Noise and Vibration	Some receptors would have slightly higher noise levels predicted although all would be within recommended noise limits.	Some receptors would have slightly higher noise levels predicted although all would be within recommended noise limits.
Cultural Heritage	The largest site footprint gives rise to the highest potential for negative impacts on unknown sites of archaeological potential although all known sites of interest would be avoided.	The larger site footprint gives rise to a higher potential for negative impacts on unknown sites of archaeological potential, in comparison to the proposed project although all known sites of interest would be avoided.

Traffic	The greatest number of turbines will require the most deliveries to site, slightly increasing potential for traffic impacts.	The greater number of turbines will require more deliveries to site than the proposed project, slightly increasing potential for traffic impacts.

3.3.3.1 Turbine Delivery

Port of Entry

The port of entry chosen for turbine delivery to this site is Belview Port in south County Kilkenny, which, in comparison to other alternative ports, minimises the distance and therefore the associated traffic and air quality impacts arising from the delivery vehicles. However, given the location of the site near the national road network in the south of the country, a number of reasonable alternatives are feasible and were studied as part of this EIAR, including Dublin, Cork and Foynes. The selection of any of these ports is less favourable due to some challenging pinch points on each and the longer delivery route to the proposed project site.

It was found that the use of Dublin Port would likely require significant works at the M50/M7 interchange, and due to the impacts this would have on traffic at such a busy location, this was viewed as a least preferred option. The use of either the Port of Cork or Foynes Port were also considered, but due to the lack of a clear connection between M7 or M8 and the N72, and the associated potential traffic impacts as a result of any required improvements to the national road network , it was decided that both of these ports would also be less preferred options. All of these alternative options (Dublin Port, Port of Cork and Foynes Port) would involve a longer transport route along busy road networks with more works, and therefore would have the potential to cause increased traffic impacts compared to the currently proposed option. Delivery via Belview Port allows for the shortest and more direct route to site, with the lowest number of pinchpoints. It therefore has the lowest potential impact.

Table 3-5: Table of potential environmental effects relative to proposed port of entry (with associated delivery route)

Environmental Considerations	Alternative A – Route from Dublin harbour	Alternative B – Route from Cork harbour	Alternative C – Route from Foynes harbour
Human Health and Population	Significantly longer route which would require more enabling works (widening of the road, removal/ movement of street furniture, etc. at pinch points on very busy roads around Dublin and at motorway interchanges) to get to site, resulting in a greater impact to residents along the route. The route also requires the same	Longer route which would require more enabling works (widening of the road, removal/ movement of street furniture, etc. at pinch points on very busy roads near Cork City and at motorway interchanges) to get to site, resulting in a greater impact to residents along the route. The route also requires the same accommodation works	Longer route which would require more enabling works (widening of the road, removal/ movement of street furniture, etc. at pinch points on very busy roads near Foynes and at motorway interchanges) to get to site, resulting in a greater impact to residents along the route. The route also requires the same accommodation works

	accommodation works as the proposed option between the N72 and the wind farm itself. This option would be anticipated to have the greatest impact of any option.	as the proposed option between the N72 and the wind farm itself. This option, along with option C would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.	as the proposed option between the N72 and the wind farm itself. This option, along with option B would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.
Biodiversity	Significantly longer route which would require more enabling works at pinch points, resulting in a greater potential impact to biodiversity along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option would be anticipated to have the greatest impact of any option.	This is a longer route which would require more enabling works at pinch points, resulting in a greater potential impact to biodiversity along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option C would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.	This is a longer route which would require more enabling works at pinch points, resulting in a greater potential impact to biodiversity along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option B would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.
Land, Soils and Geology	Significantly longer route which would require more enabling works at pinch points, resulting in a greater potential impact to land soils and geology (mostly through soil disturbance) along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option would be anticipated to have the greatest impact of any option.	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact to land soils and geology (mostly through soil disturbance) along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option C would be anticipated to have a slightly lesser impact	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact to land soils and geology (mostly through soil disturbance) along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option B would be anticipated to have a slightly lesser impact

		than option A, but greater than the proposed option.	than option A, but greater than the proposed option.
Hydrology and Hydrogeology	Significantly longer route which would require more enabling works at pinch points, resulting in a greater potential impact to surface and ground water quality along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option would be anticipated to have the greatest impact of any option.	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact to surface and ground water quality along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option C would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact to surface and ground water quality along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option B would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.
Climate and Air Quality	Significantly longer haul route leading to greater potential for emissions both from works and from the longer haulage. The route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option would be anticipated to have the greatest impact of any option.	Longer haul route leading to greater potential for emissions both from works and from the longer haulage. The route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option C would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.	Longer haul route leading to greater potential for emissions both from works and from the longer haulage. The route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option B would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.
Landscape & Visual	The additional accommodation works required along the longer route may have a greater potential visual impact, however this would be temporary and very localised in nature, so	The additional accommodation works required along the longer route may have a greater potential visual impact, however this would be temporary and very localised in nature, so	The additional accommodation works required along the longer route may have a greater potential visual impact, however this would be temporary and very localised in nature, so

	would not be significant. This option would be anticipated to have the greatest impact of any option.	would not be significant. This option, along with option C would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.	would not be significant. This option, along with option B would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.
Noise and Vibration	Significantly longer route which would require more enabling works at pinch points, resulting in a greater potential impact from a noise and vibration perspective along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option would be anticipated to have the greatest impact of any option.	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact from a noise and vibration perspective along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option C would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact from a noise and vibration perspective along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option B would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.
Cultural Heritage	Significantly longer route which would require more enabling works at pinch points, resulting in a greater potential impact to archaeology and cultural heritage along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option would be anticipated to have the greatest impact of any option.	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact to archaeology and cultural heritage along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option C would be anticipated to have a slightly lesser impact than option A, but	Longer route which would require more enabling works at pinch points, resulting in a greater potential impact to archaeology and cultural heritage along the route than the proposed option. This route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option B would be anticipated to have a slightly lesser impact than option A, but

		greater than the proposed option.	greater than the proposed option.
Traffic and Transportation	Significantly longer route which would require more enabling works (widening of the road, removal/ movement of street furniture, etc. at pinch points on very busy roads around Dublin and at motorway interchanges) to get to site, resulting in a greater potential impact to road users along the route. The route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option would be anticipated to have the greatest impact of any option.	Longer route which would require more enabling works (widening of the road, removal/ movement of street furniture, etc. at pinch points on very busy roads near Cork City and at motorway interchanges) to get to site, resulting in a greater potential impact to road users along the route. The route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option C would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.	Longer route which would require more enabling works (widening of the road, removal/ movement of street furniture, etc. at pinch points on very busy roads near Foynes and at motorway interchanges) to get to site, resulting in a greater potential impact to road users along the route. The route also requires the same accommodation works as the proposed option between the N72 and the wind farm itself. This option, along with option B would be anticipated to have a slightly lesser impact than option A, but greater than the proposed option.

Turbine Delivery Route

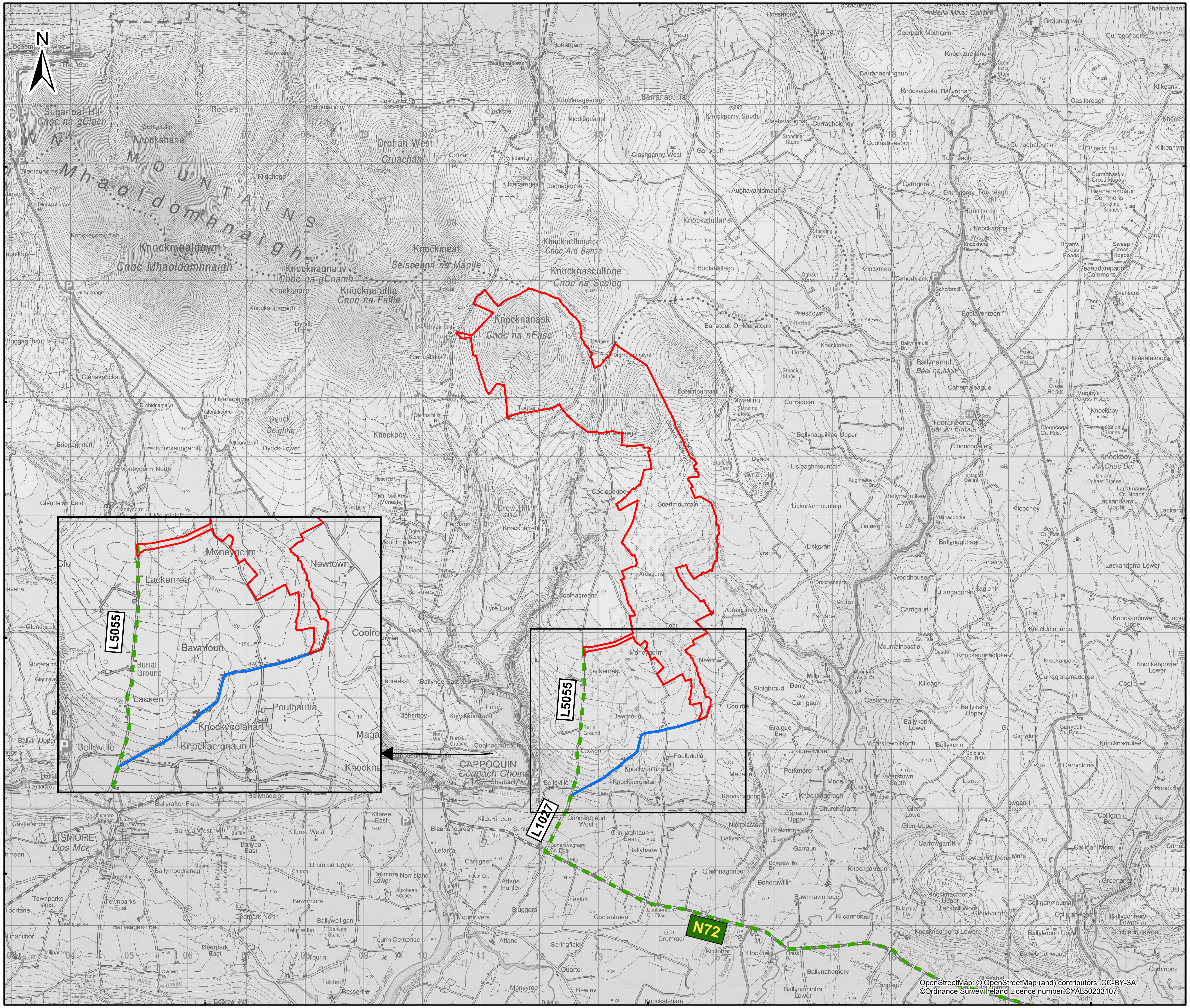
As described in Chapter 2 (Description of the Proposed Project) and viewed in Figure 1-1 of this EIAR, the proposed TDR runs from Belview Port and heads north from the port on the N29 to the N25 where it turns westwards. The route then continues generally south-westwards on the N25 to the junction with the N72, where it makes a westerly turn in the direction of Cappoquin. The route continues westwards to the Bogheravaghera Cross Roads (also known as Affane Cross) where it turns northwards onto the L1027. It continues northwards, turning onto the L5055 for the final approach to the proposed wind farm site entrance. The route is discussed further in Chapter 2 (Description of the Proposed Project) and Chapter 16 (Traffic and Transportation) of this EIAR.

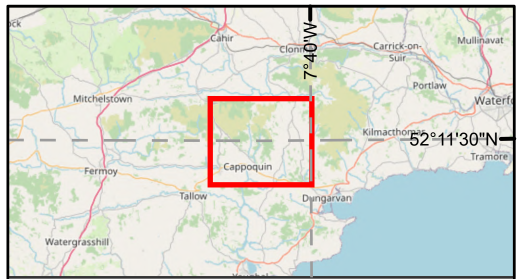
Given the proximity to the proposed project and the relatively straight-forward access between the site and the N72 National Road, and subsequent access from the National Road network to Belview Port (via the N25 and N29), it was determined that any delivery route for oversized loads would need to use the N72 to minimise the potential for impacts on smaller roads.

Between the N72 and the site of the proposed wind farm, there was one alternative option considered. This was to remain on the L1027 until it meets the southern tip of the wind farm

site, however it was found that there was a critical pinch point there and would have required additional junction / road improvement works to gain access.

An alternative route option was considered from Belview Port to the site as described above and alternative port options with routes from Dublin Port, Port of Cork, and Foynes Port were also considered as described in Table 3-6 and illustrated in Figure 3-3.





Legend

- Proposed Wind Farm Site
- Proposed Turbine Delivery Route
- Alternative Turbine Delivery Route

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Rev	Date	Description	By	Chkd.

Client: FuturEnergy Ireland

Project: Scart Mountain Wind Farm

Title: Figure 3-3: TDR options from belview port (between N72 and proposed wind farm site)

Scale @ A3: 1:60,000

Prepared by:	Checked by:	Date:
S.Pezzetta	J.Staunton	December 2024

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Map Ref: 11303-003-TDR.Opt-S.BO-TOB-A

Draft: A

Table 3-6: Table of potential environmental effects relative to proposed TDR (between the N72 and the site of the proposed wind farm)

Environmental Considerations	Alternative A – Route from the N72 via the L1027 only
Human Health and Population	This would have a negative impact on residents along the L1027 as there would be significant additional works required to allow turbine passage there.
Biodiversity	This would require additional works through greenfield lands to bypass a pinch point so would have a greater potential impact to biodiversity.
Land, Soils and Geology	This would require additional works through greenfield lands to bypass a pinch point so would have a greater potential impact for land, soils and geology.
Hydrology and Hydrogeology	This would require additional works to bypass a pinch point so would have a greater potential for impacts to hydrology and hydrogeology.
Climate and Air Quality	This would require additional works to bypass a pinch point so would have a potential for greater potential impacts to air quality and climate.
Landscape & Visual	This would require additional works to bypass a pinch point so would have a greater potential for greater potential impacts on landscape and visual amenity.
Noise and Vibration	This would require additional works to bypass a pinch point so would have a greater potential for impact from a noise and vibration perspective.
Cultural Heritage	This would require additional works to bypass a pinch point so would have a greater potential for impacts to archaeology and cultural heritage.
Traffic and Transportation	This would require additional works to bypass a pinch point so would have a greater potential for impacts to traffic and transport.

The current proposal minimises such impacts and involves the shortest route possible.

3.3.3.2 Site Entrances

The proposed wind farm site will be accessed only via the L5505 local road using a single access point for the construction phase (See Access Point 1 in Figure 3-4). Construction traffic will not be permitted to enter or exit the wind farm site at any crossing locations for public roads, and all traffic will need to use the main wind farm entrance for that phase (as discussed in Chapter 16 Traffic & Transportation). The main construction phase site entrance is located in the townland of Lackenrea, while the crossing points are located in the townlands of Moneygorm, Knocknasheega and Tooranaraheen. The proposed site entrances on the L5505 and L5054 will have adequate visibility as also discussed in Chapter 16 (Traffic & Transportation).

An alternative construction phase site entrance(marked as Alternative Entrance 1 on Figure 3-4) was considered to the south of the current one (see Figure 3-4), and this alternative had three associated options for site access tracks into the site (labelled as Alternative Options 1-3 on Figure 3-4) from the L5505 but it was found to be less suitable due to the need to build a significantly longer access track, with associated felling of forestry, etc. with two of these options (2 and 3) also passing in close proximity behind, beside and in front of a house.

The use of L5054 had also been considered as the main site entrance (marked as Alternative Entrance 2 on Figure 3-4) for all vehicles during the construction and operational phases. Upon reviewing the local road network, it was quickly found that the local road network to this entrance would not be suitable without a significant amount of upgrades to allow the required passage of oversize loads and HGVs. It is currently proposed to only use this access for light vehicles during the operational phase. It was found that although the use of the site entrance by HGVs would be very infrequent, the road network here was only suitable for light vehicles, which would only be used in small numbers. It was decided that diverting HGVs along the proposed internal site access track to the L5505 on the occasional times they do come to site would be the most appropriate measure.

7°50'0"W
7°45'0"W
52°13'20"N
52°10'0"N
608000
601000
609050
617100

Knockmeal
559.5 m
Knockscullogе
432.60 m
Knocknafallia
666.5 m
Knocknanask
486 m
Broemountain
430.4 m
Knocknasheega
430.4 m
Knockboy
Crow Hill
Glenafallia River
Glenshelane
Woods
Cappoquin
Finisk
R669
R671
R672
N72
L1018
L510
Black Hill

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Legend

- Proposed project
- Alternative Site Entrances

Alternative Site Entrance Routes

- Alternative Option 1
- Alternative Option 2
- Alternative Option 3

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Client: Ireland FuturEnergy

Project:

Scart Mountain Wind Farm

Title:

Figure 3-4:
Alternative Site Entrance Options

Scale @ A3: 1:40,000

Prepared by:	Checked by:	Date:
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Map Ref: 11303-037-AI..S.ENTR-S.BO-TOB-A

Draft: A

Table 3-7 Table of potential environmental effects relative to the proposed site entrances (construction and operational)

Environmental Considerations	Construction Phase: Alternative site entrance (marked as Alternative Entrance 1 on Figure 3-4) on the L5505)	Construction and Operational Phase: Alternative site entrance – (marked as Alternative Entrance 2 on Figure 3-4) on the L5054	Operational phase: Having only one operational phase site entrance – (marked as Alternative Entrance 2 on Figure 3-4) on the L5054
Human Health and Population	Neutral – There would be a slightly longer section of public road used, but the site entrance would be in front of and directly alongside a house (rather than just passing on the road corridor in front of it)	This would result in a need for greater works to improve the local road, to ensure that it was of a sufficient standard to allow the site traffic during construction in particular get to the site. This would have a greater potential impact as a result of increased disruption to traffic, dust, noise, etc.	This would result in occasional operational phase HGV traffic using a narrow public local road network, increasing the potential for impacts in terms of health and safety
Biodiversity	This entrance would require a long additional new site track through forestry, increasing landtake and potential impacts on habitat.	This would result in a need for greater works to improve the local road, thereby increasing the potential impacts to local biodiversity as a result of habitat loss/disturbance. There would be slightly less felling of forestry required on the site in this scenario, but the forest here is a commercial crop, and will be felled regardless once it reaches maturity.	Neutral
Land, Soils and Geology	This entrance would require a long additional new site track through forestry, increasing potential impacts due to increased landtake.	This would result in a need for greater works to improve the local road, thereby increasing the potential impacts to local soils and geology as more soils would need to be moved around/excavated. There	Neutral

		would be slightly less felling of forestry required on the site in this scenario, but the forest here is a commercial crop, and will be felled regardless once it reaches maturity.	
Hydrology and Hydrogeology	This entrance would require a long additional new site track through forestry, increasing the potential for silt-laden run-off.	This would result in a need for greater works to improve the local road, thereby increasing the impacts to local water receptors, as there would be more potential for silted runoff. There would be slightly less felling of forestry required on the site in this scenario, but the forest here is a commercial crop, and will be felled regardless once it reaches maturity.	Neutral
Climate and Air Quality	This entrance would require a long additional new site track through forestry, increasing the potential for impact due to loss of larger area of trees and greater requirement for construction materials.	This would result in a need for greater works to improve the local road, thereby increasing the impacts to local sensitive receptors, as there would be more potential for dust generation. There would be slightly less felling of forestry required on the site in this scenario, but the forest here is a commercial crop, and will be felled regardless once it reaches maturity.	Neutral
Landscape & Visual	Neutral	This would result in a need for greater works to improve the local road, thereby slightly increasing the impacts to local views and landscape.	Neutral
Noise and Vibration	This entrance would require a long additional new site track through forestry, which bypasses existing residential properties thereby reducing impacts on these receptors.	This would result in a need for greater works to improve the local road, thereby increasing the potential impacts to local sensitive receptors, as there would be more	Neutral

		potential for noise generation.	
Cultural Heritage	This entrance would require a long additional new site track through forestry, increasing the potential for impacts due to greater landtake.	This would result in a need for greater works to improve the local road, thereby increasing the potential for direct impacts to local previously unlisted monuments.	Neutral
Traffic	Additional stone would be required to make the longer site entrance road, potentially increasing impacts on the local road network.	This would result in a need for greater works to improve the local road, thereby increasing the potential negative impacts to local traffic movements during improvement works. The improved road would also provide better and safer access to the area for the future, which would be a slight positive permanent impact.	This would result in occasional operational phase HGV traffic using a narrow public local road network, potentially increasing the impacts

New roadways will have a running width of approximately 5 metres. The proposed new roadways incorporate passing bays to allow traffic to pass easily while traveling around the site.

Road Construction Details are included in drawings of Appendix 1-1.

3.3.3.3 National Grid Connection Points and Grid Connection Routes

The initial screening process highlighted the nearby existing electrical grid infrastructure and the available capacity in the area. Based on the scale of the proposed project, it was known that a 110 kV connection would be required to accommodate the likely output from the project. The Dungarvan 110kV substation was the most proximal 110kV substation option, and it has capacity for connecting to the national grid.

The current proposal comprises one onsite 110kV substation which will provide a connection point between the wind farm and the proposed grid connection point at the existing 110kV Dungarvan substation (via approximately 16 km of cables See Figure 2-6, Chapter 2 (Description of the Proposed Development)). The proposed grid connection is mostly within the public road corridor and only goes off road at each end (entering the substations) and around the Colligan river crossing (See Figure 2-6 and drawings in Appendix 1-1 of this EIAR).

There were a number of alternative routes to the Dungarvan substation considered (see Table 3-8). The first grouping of options made maximum use of the National Road network, following the local roads down the N72 and following this back to the Dungarvan substation. However this was found to create a larger impact on the N72 road and its traffic. The second grouping of options mostly utilised the local and regional road network, exiting the eastern side of the site, with some off road elements and a short section on the N72. This was found to be longer and a number of logistically problematic watercourse crossings were found. Transport Infrastructure Ireland also raised a concern with drilling under their bridges along the N72 corridor.

The alternative grid connection options are shown In

5.

Table 3-8: Table of potential environmental effects of alternatives relative to proposed grid connection option

Environmental Considerations	Alternative connection routes mostly via the N72 (see black and pink in Figure 3-5)	Alternative connection routes via local/regional roads from the eastern side of the proposed wind farm site (see orange in Figure 3-5)	Alternative connection routes – short sections (see light blue, grey and dashed red in Figure 3-5)	Alternative connection routes – (see turquoise in Figure 3-5)
Human Health and Population	Greater potential impacts due to the level of works within a busy public road	Greater potential impacts due to the works required for watercourse crossings and works in busy public roads	Greater potential impacts due to the works required for watercourse crossings and slightly longer length of works in public roads, including the N72	Greater potential impacts due to the works required for watercourse crossings and greater length of works in public roads
Biodiversity	This route had a shorter total length with less off road length, resulting in a slightly reduced impact potential	Neutral	Longer route with slightly greater potential for impacts to biodiversity	Similar potential impacts as the proposed route - Neutral
Land, Soils and Geology	This route had a shorter total length with less off-road length, resulting in a slightly reduced impact potential	Slightly greater potential impacts due to the works required for watercourse crossings	Longer route with slightly greater potential for impacts for land soils and geology	Similar potential impacts as the proposed route - Neutral
Hydrology and Hydrogeology	This route had a shorter total length with less off-road length, resulting in a	Greater potential impacts due to the works required for watercourse crossings	Longer route with slightly greater potential for impacts to hydrology and hydrogeology	Similar potential impacts as the proposed route - Neutral

	slightly reduced impact potential			
Aviation & Telecoms	Neutral	Neutral	Neutral	Neutral
Visual Impact	Neutral	Neutral	Neutral	Neutral
Noise and Vibration	This route had a shorter total length, resulting in a slightly reduced impact potential	Neutral	Neutral	Neutral
Cultural Heritage	This route had a shorter total length with less off-road length, resulting in a slightly reduced impact potential	Slightly greater potential impacts due to the works required for watercourse crossings	Similar potential impacts as the proposed route - Neutral	Similar potential impacts as the proposed route - Neutral
Traffic	Greater potential impacts due to the level of works within a busy public national road. Also potential issues with drilling under bridges on national road network.	Greater potential impacts due to the works within a busy public national road and regional road. Also potential issues with drilling under bridges on national road network.	There is a slightly longer route in the public road, with the very easternmost end briefly entering the N72 corridor, so there are greater potential impacts on road networks.	There is a slightly longer route in the public road, so there are greater potential impacts on road networks..

7°50'0"W
7°45'0"W
7°40'0"W
52°13'20"N
52°10'0"N
52°6'40"N
608000
601000
594000
609050
617100
625150
N

Legend

- Proposed Wind Farm Site
- Proposed Grid Connection Route
- Alternative Grid Connection Route - Option 1
- Alternative Grid Connection Route - Option 2

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Project: Scart Mountain Wind Farm

Title: Figure 3-4: Alternative Grid Route Options

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Prepared by:	Checked by:	Date:
S.Pezzetta	J.Staunton	December 2024

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Map Ref: 11303-004-AGR.Opt-S.BO-TOB-A

Draft: A

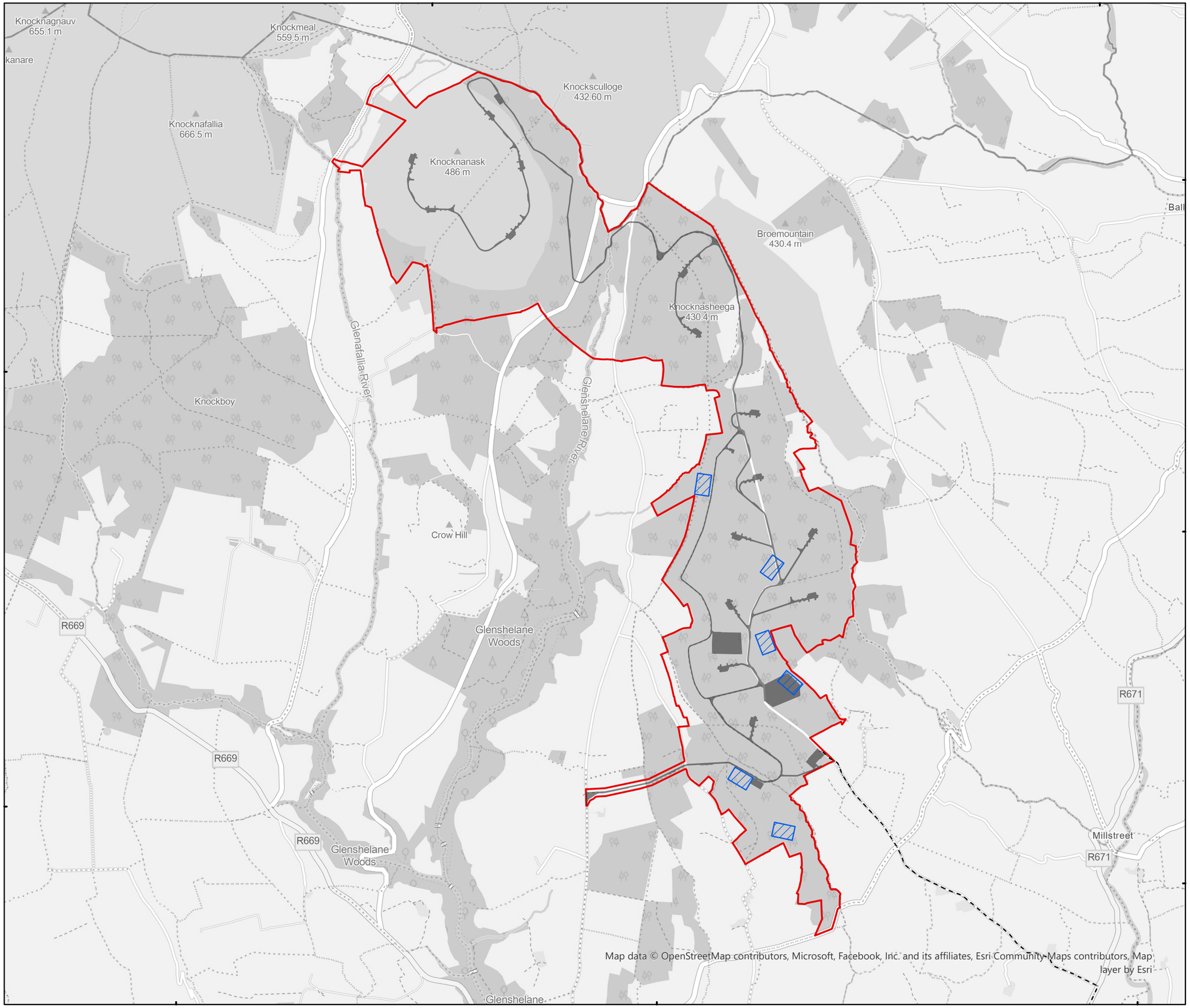
3.3.3.4 Site Substation

The proposed onsite 110kV substation site was chosen following an analysis of the site constraints (setbacks from watercourses, turbine locations and avoidance of unsuitable ground conditions such as steep terrain). There were a number of other locations briefly considered at the outset (see Figure 3-6), but the preferred/proposed location was chosen, as it minimised the length of the main grid connection, it reduced the chance of derating of the grid connection as a result of crossing any internal cables, it was adjacent to the existing site access road network (which would be used for the wind farm), it avoided sensitive habitats and maintained a 50m setback from natural watercourses and was located on relatively flat ground that was not prominent on the landscape.

Table 3-9: Table of potential environmental effects of the considered alternative substation locations relative to the proposed onsite substation

Environmental Considerations	Alternative Substation Location A	Other alternative onsite Substation locations (B-F)
Human Health and Population	There is a slightly higher potential impact associated with Alternative Substation location A due to the visibility and proximity to sensitive receptors.	No alternative locations are near sensitive receptors. More elevated locations may be more visible from the surrounding landscape which may negatively impact on residential amenity.
Biodiversity	There would be no significant difference with regard to Biodiversity or Ornithology anticipated.	All locations are within commercial forestry plantations. The more northerly locations would need a longer grid connection cable, increasing the potential impacts associated with its construction.
Land, Soils and Geology	There would be no significant difference with regard to Land, Soils & Geology anticipated.	Some of the alternative substation locations are on more sloped terrain, which would require more earthworks, with greater associated impacts to soils and geology. The more northerly locations would need a longer grid connection cable, increasing the potential impacts associated with its construction
Hydrology and Hydrogeology	There would be no significant difference with regard to Hydrology & Hydrogeology anticipated.	Some of the alternative substation locations are on more sloped terrain, which would require more earthworks, with greater associated potential impacts to water receptors through silt laden runoff. The more northerly locations would need a longer grid connection cable, increasing the potential impacts associated with its construction
Climate and Air Quality	There would be no significant difference with regard to air quality or climate anticipated.	There would be no significant difference with regard to air quality or climate anticipated.
Landscape & Visual	There is a slightly higher potential impact associated with Alternative Substation location A due to the visibility from the surrounding landscape.	The more elevated alternative locations may be more visible from the surrounding landscape, resulting in a greater potential impact.
Noise and Vibration	Alternative Substation location A is slightly closer to sensitive receptors, but no significant operational phase difference would be anticipated as it is still >200m from this.	No locations are near sensitive receptors, so no significant difference would be anticipated.

	Construction phase would have a slightly higher potential impact.	
Material Assets	There would be no significant difference with regard to Material Assets anticipated.	Most alternative locations would be more likely to require crossings with internal site cables, which may negatively impact on the exported power. All locations are within commercial forestry plantations.
Cultural Heritage	There would be no significant difference with regard to Cultural Heritage anticipated.	The more northerly locations would need a longer grid connection cable, increasing the potential impacts associated with its construction. There would be no other difference with regard to Archaeology or Cultural Heritage anticipated.
Traffic & Transport	There would be no significant difference with regard to Traffic & Transport anticipated.	There would be no significant difference with regard to Traffic & Transport anticipated.



Legend

- Proposed Wind Farm Site
- Proposed infrastructure footprint within the proposed wind farm site
- Alternative Substation Locations
- Proposed Grid Connection Route

0 0.75 1.5
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE\
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY \ WORK COMMENCES\
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Chkd.
A	13/12/2024	First issue	S.P	J.S

Client: FuturEnergy Ireland

Project: Scart Mountain Wind Farm

Title: Figure 3-6: Alternative Substation Locations

Scale @ A3:	1:30,000	
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3.3.3.5 Site Access Roads

The proposed project will include the construction of approximately 12 km of new internal site access roads and upgrading of 7.2 km existing site (forestry) roads, which will include passing bays. The presence of existing forestry site roads played an important role in determining where the proposed site roads would be located. They were used where possible to minimise the length of new site access roads to be constructed.

There were a number of alternative site access road locations (or routes) considered during the site layout design. These are shown on Figure 3-7.

7°50'0"W

7°45'0"W

52°12'0"N

607000

604000

601000

609200

613300

617400

Knocknagnauv
655.1 m

Knockmeal
559.5 m

kanare

Knocknafallia
666.5 m

Knocksculloge
432.60 m

Knocknanask
486 m

Broemountain
430.4 m

Knocknasheega
430.4 m

Ball

Glenatallia River

Glenshelane River

Knockboy

Crow Hill

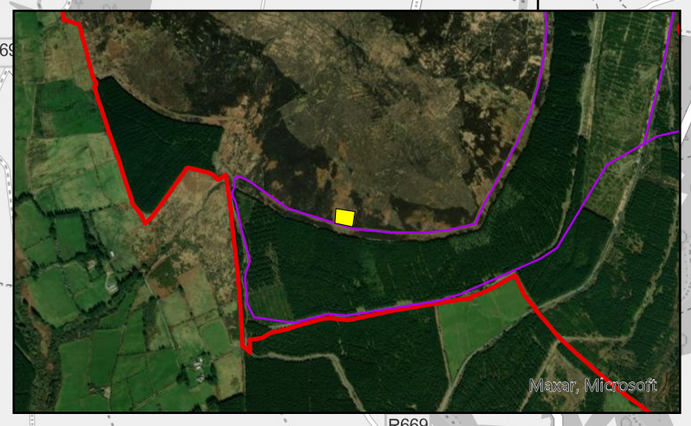
R669

Glenshelane
Woods

R671

Millstreet

Glenshelane



Legend

- Proposed Wind Farm Site
- Proposed Grid Connection Route
- Proposed Construction Compounds
- Alternative Site Tracks
- Alternative Site Compound

0 0.75 1.5
Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING\
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Rev	Date	Description	By	Chkd.
A	13/12/2024	First issue	S.P	J.S

Client: Ireland FuturEnergy

Project:

Scart Mountain Wind Farm

Title:

Figure 3-7:
Alternative Site Access Tracks and
Alternative Construction Compound location

Scale @ A3: 1:30,000

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These alternative routes were found to be unfavourable for a number of reasons. In relation to the connection between Scart Mountain (ie turbine nos. 6-15) and Knocknanask (ie turbine no. 1-5), the use of existing public roads was initially considered (see "Public Road Section" on Figure 3-7), but following an assessment of the route, it was found that the existing bridge (known as Keane's Bridge) was a major constraint, along with the unavailability of lands to develop required infrastructure.

There was an alternative route considered to access Knocknanask from the Glenshelane River valley (see "Knocknanask Section" on Figure 3-7). This utilised a lengthy existing site road, and while it did reduce the length of new access road required, the significant level of additional upgrades meant that it would have had a larger impact as well as being significantly more expensive. The proposed new road route was chosen as a way to minimise the potential impacts.

In the area around T8 and T9, it was initially considered to utilise the existing site roads, and to have a differently oriented hardstand for these turbines. This was subsequently found to need a large level of cut and fill as a result of the topography. Although the current layout does not use all of the existing site roads, it results in a reduced level of material cut/fill requirements, and therefore a reduced level of impact.

Table 3-8: Table of potential environmental effects of alternatives relative to proposed site road layout

Environmental Considerations	Alternative route to Knocknanask via public roads (see "Public Road Section" in Figure 3-7)	Alternative route to Knocknanask via new roads (see "Knocknanask Section" in Figure 3-7)	Alternative route at T8 (see "T8 Section" in Figure 3-7)	Alternative route at T9 (see "T9 Section" in Figure 3-7)
Human Health and Population	Greater level of potential impacts due to the level of works within a public road	Longer impact duration due to the additional works required	Neutral	Neutral
Biodiversity	Slight positive – works would be required at Keanes Bridge and at other corners but no new river crossing would be required	Greater potential impact due to the increased footprint of the works	Neutral – once the longer roads are compared to the cut and fill requirements, the impact is similar	Neutral – once the longer roads are compared to the cut and fill requirements, the impact is similar
Land, Soils and Geology	This route had a shorter off-road length, resulting in a slightly	Greater potential impact due to the increased footprint of the works	Neutral – once the longer roads are compared to the cut and fill requirements,	Neutral – once the longer roads are compared to the cut and fill

	reduced impact potential		the impact is similar	requirements, the impact is similar
Hydrology and Hydrogeology	This route had a shorter off-road length, resulting in a slightly reduced impact potential	Greater potential impact due to the increased footprint of the works	Neutral – once the longer roads are compared to the cut and fill requirements, the impact is similar	Neutral – once the longer roads are compared to the cut and fill requirements, the impact is similar
Aviation & Telecoms	Neutral	Neutral	Neutral	Neutral
Visual Impact	Neutral	Neutral	Neutral	Neutral
Noise and Vibration	Neutral	Greater potential impact due to the increased footprint of the works	Neutral – once the longer roads are compared to the cut and fill requirements, the impact is similar	Neutral – once the longer roads are compared to the cut and fill requirements, the impact is similar
Cultural Heritage	This route had a shorter off-road length, but would require modifications to the historical bridge, resulting in a higher impact potential	Greater potential impact due to the increased footprint of the works	Neutral – once the longer roads are compared to the cut and fill requirements, the impact is similar	Neutral – once the longer roads are compared to the cut and fill requirements, the impact is similar
Traffic	This route had a more works within the public roads, resulting in a slightly higher impact potential	Greater potential impact due to the increased footprint of the works which would require additional material to be brought to site	Neutral	Neutral

3.3.3.6 Temporary Construction Compounds

There are two temporary construction compounds proposed for the proposed wind farm construction phase. The location of the southern one is beside the proposed substation, and this is the same location that was always considered there. For the northern one, there was an alternative location considered (See Figure 3-7 showing the alternative compound location in bright green). This was found to be redundant when the final site road layout was determined.

The proposed location for the northern temporary construction compound utilises an existing clearing and avoids sensitive habitats.

3.3.4 Alternative Technology

The process selection for alternative renewable energies, was carried out after the proposed project site was chosen as a suitable site for wind energy development. As described previously the site selection process was driven by the suitability of areas within the Coillte landbank for wind energy and site assessment of private land holdings for potential wind farm development.

While solar energy could in theory be implemented at the site as a reasonable alternative to wind energy, it would be less productive in terms of energy output for the same footprint and would contribute less towards meeting Ireland's renewable energy targets. It would also be restricted in certain parts of the site which have steeper slopes. The environmental and financial impacts would be more extensive in terms of the area of forestry required to be felled and replanted elsewhere to accommodate a solar farm. The capacity factor[5] of solar energy is significantly lower than that of onshore wind energy, requiring approximately 3 times the capacity of the proposed wind farm development, (approx. 256.5-297MW) to produce the same amount of energy. Based on the requirement of solar farms needing 1.6-2 hectares per MW[6], the land area required to be permanently felled would be in the region of 410 to 594 hectares. This area of land would also have to be acquired and replanted elsewhere. There are likely to be increased effects on land use, geology, and hydrology as well as biodiversity, as a result of increased felling works. For these reasons, solar was not considered as an option at the proposed wind farm site.

3.3.5 Alternative Timelines and Construction Methodology

Throughout the design and assessment process other aspects of the proposed project underwent consideration in order to finalise the design. A summary of this process is provided here..

The construction methods for the proposed project are dependent on a number of factors specific to the site and design, and have been considered in relation to ground conditions, foundation installation and turbine erection. Site-specific information gathered through intrusive site investigation and environmental surveys was taken into consideration when reviewing alternative methodologies for construction.. Alternative stream crossing methodologies for the grid connection were considered at the outset, such as trenching with over-pumping, but this was quickly considered to be too risky for water quality in the area and was thus ruled out. Directional drilling will be used instead to avoid disturbance and minimise risks to the watercourses. The use of floating access roads was no longer considered once the site investigations confirmed that peat was generally either absent of extremely shallow (<0.5m). In the event that greater peat depths had been found, they would have been utilised to minimise impacts on the peat.

Alternative shorter timelines for the proposed project in terms of operational lifespan were not considered as modern turbines are now expected to have a 35 year lifespan, so any shorter of a timeline would reduce efficiency, resulting in unnecessary waste production and reduced contribution of energy

[5] Capacity factor for solar is a measure of how much energy a solar system produces compared to the maximum energy that can be produced.

[6] https://voltaic.ie/faqs/solar-farms/#:~:text=How%20much%20land%20is%20required,around%204%2C000%20panels%20per%20MW). Accessed on 01/09/23.

The operational lifespan of the wind farm turbines was discussed when reviewing the different turbine types and specifications available on the market. Turbines are generally designed to last for 35 years therefore the operational lifespan of the proposed project was centred around this.

3.4 CONCLUSIONS

A study of the reasonable alternatives in terms of project design, technology, location, size and scale has been undertaken and presented in this chapter. The options which are relevant to the proposed project and its specific characteristics asf a large-scale wind farm in an upland rural area have been discussed. The overriding reason for selecting the chosen options is to maximise the renewable energy production from the site while minimising the environmental impact. For each alternative, a comparison of the potential environmental effects has been provided, showing the reasons for the chosen option being favoured relative to the others.

As discussed above the siting and design of the proposed wind farm project has evolved through the consideration of alternatives and allowing for stakeholder input into the process (See Section 1.8 of Chapter 1 on this EIAR (Introduction)). This included initial consideration of the need for renewable energy, the site selection process, the consideration of alternative layouts, scales, and design processes.

Reasonable alternatives were considered with specific regard to the characteristics of the project. Comparisons of environmental effects were noted. The alternatives chosen focused on mitigation by design in order to avoid the potential for such effects on the environment.

When weighed against all of the alternatives and constraints/facilitators outlined in this chapter, the proposed Scartmountain Wind Farm site has been found to be a highly suitable location for a wind farm site with regard to a number of criteria including:

- wind speed,
- environmental effects,
- distance from dwellings and
- landscape character.

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