# Barnesmore Windfarm Repowering

## Non-Technical Summary

December 2019

www.scottishpowerrenewables.com

SCOTTISHPOWER RENEWABLES

# Table of contents



# Barnesmore Windfarm Repowering

## Non-Technical Summary

### NTS.1 Introduction

This Non-Technical Summary (NTS) summarises the Environmental Impact Assessment Report (EIAR) which accompanies the application for planning permission to 'repower' the Operational Barnesmore Windfarm, which is situated in the townlands of Keadew Upper, Cullionbuoy and Clogher, Co. Donegal. The Site is located approximately 10 km northwest of Donegal town as shown in **Figure NTS-1**. Repowering is the process of the removal of older, first generation wind turbines and their replacement with modern machines, which are generally quieter, and capable of producing more electricity, more efficiently.

ScottishPower Renewables (UK) Limited (referred to as 'the Applicant'), is part of the ScottishPower group of companies operating in the UK and Ireland under the Iberdrola Group, one of the world's largest integrated utility companies and world leader in wind energy. ScottishPower now only produce 100% green electricity – focusing on wind energy, smart grids and driving the change to a cleaner, electric future. The company is investing over €4.6 million every working day in 2019 to make this happen and is committed to speeding up the transition to cleaner electric transport, improving air quality and over time, driving down bills to deliver a better future, quicker for everyone.

Planning permission is being sought for the decommissioning of the Operational Barnesmore Windfarm and the subsequent erection and operation of up to 13 wind turbines (referred to as 'the Development'). The entire Development is located within the county of Donegal. The Site is identified in **Figure NTS-1** and **NTS-2**. The Development will have an installed capacity from 15 MW to over 65 Megawatts (MW) and will also include an ancillary Energy Storage Unit.

Permission for the initial Operational Barnesmore Windfarm was granted by An Bord Pleanála, following an appeal in August 1996. To date, the operational Barnesmore Windfarm has made an important contribution to Ireland's Renewable Energy targets and low carbon objectives, and the Applicant is seeking to secure and build on this contribution by repowering the scheme. International, UK and Irish Policy all provide a framework and targets for the development of more renewable energy.

The EIAR presents information on the identification and assessment of the potential significant environmental effects of the Development and reports the findings of the Environmental Impact Assessment (EIA) which has been undertaken in accordance with the Planning and Development Act 2000, as amended and the Planning and Development Regulations 2001, as amended. The EIAR comprises the following documents:

- This Non-Technical Summary (Volume I)
- The Main EIAR Report (Volume II)
- Supporting Figures and Drawings (Volume III)
- Supporting Technical Appendices (Volume IV)

These documents inform readers of the nature of the Development, likely environmental effects and measures proposed to protect the environment during each phase of the Development.

The Development will comprise the following phases:

- Decommissioning of the Operational Barnesmore Windfarm – removal of the existing turbines
- Construction of the Development – installation of the new turbines
- Operation of the Development
- Decommissioning of the Development – removal of the new turbines (final phase)

### NTS.2 Environmental Impact Assessment

EIA is required where there are likely to be significant effects on the environment due to the nature, size or location of a new development. Windfarms of the scale of the Development typically legally require an EIA to be carried out.

This EIAR has been prepared following a systematic approach to an EIA and project design, with knowledge of the potential effects being used to change the design so as to reduce those effects. The main EIA stages are:

- Scoping consultation (process of asking relevant organisations what they think should be included in the EIA) and how these topics are addressed
- Technical environmental assessments - baseline studies (understanding what the existing environmental conditions are), asking what potential significant environmental effects might occur, informing the design evolution and identification of measures to reduce undesirable effects
- Writing up the findings to include in the EIAR
- Submission of the planning application and EIAR

Scoping and pre-application consultation is important to the development of a comprehensive and balanced EIAR. Requests for Scoping Opinions were submitted to the prescribed bodies and key consultees in June 2019. The request was accompanied by a Scoping Report which described the Development, the proposed EIA methodology and the key areas to be 'scoped in' or 'scoped out' of any further assessment. Scoping Opinions received are included as **Technical Appendix 1.3**. This included agreement on excluding from the EIAR, assessment of effects on certain receptors or features, where it was agreed there was no potential for significant effects.

The applicant held two rounds of Public Information Days (PIDs) for the Development; 1 and 2 May 2019, and then 16 and 17 of October 2019, at Leghowney Community Hall and Mill Park Hotel (Round 1) and then Barnesmore Community Centre and Leghowney Community Hall (Round 2) respectively. The aim of the first round of information days was to invite comments and obtain feedback in the early design stages to ensure that local considerations helped to inform design decisions. The aim of the second round was to present the final design reached following the rigorous EIA process.

Environmental effects have been assessed in chapters of the EIAR, broadly with one chapter per technical discipline, generally representing a type of receptor of potential effects (e.g. birds). The assessments in each chapter follow a similar, systematic approach, to identify any effects that may be significant in the context of the EIA Regulations. The approach includes establishing the "baseline", this being the current state of the environment, to which the Development will be added. This identifies the key receptors, including how sensitive they are to the sort of change that might be caused by the Development. The potential size (or magnitude) of change caused by the Development is then assessed, and the sensitivity and magnitude are considered together to form a conclusion on significance. Effects can be desirable (or "positive", or "beneficial"), or undesirable (or "negative", or "adverse"). Mitigation is proposed where possible to prevent significant undesirable effects. The final, proposed effects are those after mitigation has been applied, and are the "residual effects".

In accordance with the EIA Regulations, the assessment has considered 'cumulative effects'. These are effects that result from cumulative changes caused by past, present or reasonably foreseeable actions together with the Development.

### NTS.3 Proposal for the Repowering of the Operational Barnesmore Windfarm

The layout of the Development is shown on **Figure NTS-2**. The Development will be comprised of the following main components:

- Decommissioning and removal of 25 existing 600 kW turbines (which will take place in tandem with the construction of the Development)
- Erection of 13 new circa five MW turbines with a higher hub height and larger rotor diameter up to 180 m overall height
- Construction of new or enlarging existing crane hardstand areas (using as much of existing hardstands as possible)
- Construction of new turbine foundations
- Upgrade of an existing 110 kV substation to connect to the national grid
- Upgrade of existing Access Tracks
- Erection of new Meteorological Mast (30 m) for monitoring wind speeds
- Construction of a new 15 MW energy storage facility
- Reinstatement of areas of existing infrastructure which are not being used for the Development

- Cabling onsite between the turbines and the 110 kV substation
- Undergrounding of a section of the existing 110 kV overhead line to within the site boundary
- Construction of a new temporary Site compound for use during the construction phase
- Upgrade of the existing public road network including the L-2095-6 / L-2051-1 junction and the L-2051-1 local road
- Removal of the existing "Golagh Tee" connection on the Cathaleen's Fall-Letterkenny 110kV overhead line to be replaced with a short section of undergrounded cable to Clogher Substation
- All ancillary works

A micrositing allowance of 20 m deviation (in all directions) from the indicative design footprint has been included in line with the Wind Energy Guidelines. Being able to move some elements of infrastructure nearer the time of construction, means that any unfavourable ground conditions or unforeseen environmental constraints can be further avoided at the request of an onsite ecologist or archaeologist.

### Wind Turbines

The 13 turbines will have a height from base to tip of up to 180 m, but the specific make and model is not yet fixed. The turbines will be of a typical modern, three blade, horizontal axis design, light grey in colour and the finish of the tower and blades will be semi-gloss and semi-matt respectively.

The final choice of turbines will be guided by an assessment of the wind conditions and will take account of the available technology at the time of construction. It is likely that turbines with around a 5 MW capacity may be available at the size proposed. For the purposes of the assessments, a hypothetical "candidate turbine" has been devised which reflects a machine that would have the worst-case environmental effects, i.e. tallest/loudest/longest blades etc. This precautionary approach ensures that the effects will only be as predicted or less.

Turbines are typically of a variable speed type, so that turbine rotor speed will vary according to the energy available in the wind. Turbines of the size proposed typically have a rotational speed of between 9 and 19 times per minute, depending on variations in wind speed, generating power for all wind speeds between c. 4 metres per second (m/s) (approximately 8 miles per hour) and c. 25 m/s (approximately 50 miles per hour). At wind speeds greater than c. 25 m/s, which are very unusual, the turbines will temporarily turn off to prevent any damage occurring.

The turbines are computer controlled to ensure that at all times, the turbine faces directly into the wind to ensure optimum efficiency. The rotors of all turbines will rotate in the same direction relative to the wind direction.

Each wind turbine needs an area of compacted stone adjacent to the turbine base, known as a hardstanding. This is used principally by the crane when erecting the turbine.

### Access to the Development

The Development will be accessed via the existing Access Track for the Operational Barnesmore Windfarm. It is currently proposed that the turbine nacelles, tower hubs and rotor blades will be landed at Killybegs Harbour in County Donegal. From there, they will be transported to the Site via the R263 and N56 to Donegal Town and then the N15 to the L2595, 2095 and onto the L2015 to the Site entrance. The final delivery route for the turbines will be confirmed by the turbine supplier and subject to their detailed route assessments. The potential effects of transporting them and other materials is set out in section NTS-14 and chapter 14 of the EIAR.

Where possible, the existing Access Tracks serving the Operational Barnesmore Windfarm will be kept, utilised and upgraded as necessary to access the proposed turbine locations. There will be one new section of Access Track required to access the location of Turbine T13 which will be c. 140 m long. Tracks required to access new elements of the Development will be retained throughout the operational life of the Development to enable maintenance of the turbines and replacement of any turbine components.

### Grid Connection

Underground cabling, laid where possible alongside the new Access Tracks, will link the turbine transformers to the onsite substation building. Where existing track is being re-used, the cables will be laid in a cable trench alongside the existing track.

The existing grid connection to the electrical grid will have to be reconfigured to accommodate the increased size of the Development. Based on initial discussions with EirGrid, it is possible that the Development substation would be upgraded, and the grid connection will be modified to connect directly to Clogher substation, which is approximately 3 km southwest of the Site, via the existing overhead lines. The final design will be determined by EirGrid.

### Energy Storage Unit

The Energy Storage Unit will be located adjacent to the substation compound. The units are likely to consist of ten containers each approximately 12 m in length and 5 m high.

The current energy storage technology favoured today is lithium-ion (Li-ion) batteries, which have characteristics that make them suitable for being connected to the grid. The final selection of energy storage technology used will be based on the most suitable technology available at the time of construction.

### Initial Decommissioning / Construction Phase

The construction phase of the Development will run in parallel with the initial decommissioning of the Operational Barnesmore Windfarm and take approximately 12 – 18 months in total, depending on the final layout and weather conditions. In general, working hours for decommissioning / construction activity will be from 07:00 to 19:00 throughout the week, with reduced working hours at weekends.

The first phase of the Development will comprise the decommissioning and removal of the existing turbines, external transformers and wind monitoring masts from the Site. It is anticipated that the turbines and external transformers will be carefully dismantled and transported offsite, possibly for resale in the second-hand market.

The turbines will be located across a wide area of hillside, however the land taken by the turbines and other infrastructure is a very small proportion of this, and substantial efforts have been made to re-use existing infrastructure rather than using new land. During the initial decommissioning/construction phases, the total land-take required for the Development will be 14.4 ha, including the 7.3 ha of land used by the Operational Barnesmore Windfarm. Around 1.2 ha of land would be reinstated from existing Access Tracks and Turbine Hardstand areas no longer required for the new turbines.

The Applicant will appoint a Civil Contractor who will have overall responsibility for management, including environmental management on the construction site. The Civil Contractor will ensure that decommissioning / construction activities are carried out in accordance with the mitigation measures outlined in the EIAR and as required by the planning permission, such as the Outline Construction Environmental Management Plan (CEMP) included in the EIAR as **Technical Appendix 2.1**. The services of specialist advisors will be retained as appropriate, such as an archaeologist and ecologist, to be called on as required to advise on specific environmental issues.

### Site Restoration

A draft Habitat Management Plan, included in the EIAR as **Technical Appendix 6.7**, sets out measures for soil management and restoration. Site restoration will involve the restoration of track and hardstanding verges and the temporary decommissioning and construction compound to provide a natural ground profile. Restoration will be undertaken at the earliest opportunity to minimise storage of turf and other materials.

### Operational Phase

During the operational phase of the Development, turbine and infrastructure maintenance will be ongoing and regular. This is expected to continue to employ approximately 2 or 3 people on a permanent basis for regular operational and maintenance activities.

No time limits are proposed on the operational lifespan for the Development. In the event that the Development requires to be decommissioned, the process would be similar to the decommissioning of the Operational Barnesmore Windfarm. Given the fewer number of turbines in the repowered scheme, the potential effects arising from its future decommissioning will be less than the effects arising as a result of the initial decommissioning of the existing turbines alone. The initial decommissioning/ construction phase therefore represent the worst-case parameters for assessment purposes.

## NTS.4 Site Selection and Design

The Operational Barnesmore Windfarm was constructed in 1997 and, whilst the turbines currently perform well, replacement of the existing turbines with newer turbines would increase the renewable energy generation capacity from 15 MW to up to 76 MW.

Repowering an existing windfarm not only increases renewable energy generation capacity, but also leads to lesser environmental effects compared to constructing a similar development on a new site. For example, when compared with a site of similar scale elsewhere that does not currently have windfarm development, repowering an existing site would have lesser landscape and visual effects as the wind turbines are already a feature in the landscape. Likewise, existing infrastructure such as hardstandings and Access Tracks can be reused, reducing the overall footprint of new infrastructure required to serve the Development. Therefore, repowering allows the Development to benefit from the use of the existing infrastructure, whilst also reducing associated environmental effects.

The Site layout design has evolved through a series of changes, to avoid or minimise potential effects, including effects on views, hydrology, peat, ecology and fisheries, ornithology, noise and archaeological features. Technical criteria such as wind speed, prevailing wind direction, existing infrastructure, topography and ground conditions were considered during the design process, in response to guidance documents, survey findings and responses from consultees. Overall it is considered that the proposal represents an optimum fit within the technical and environmental parameters of the project.

### NTS.5 Legal and Policy Framework

Chapter 4 of the EIAR sets out the relevant planning policy and legislative background to the planning application. The Development has had regard to The National Planning Framework, The Draft Regional Spatial and Economic Strategy (RSES) for The North West Regional Assembly and The County Donegal Development Plan 2018-2024. These documents are relevant to the determination of the planning application by An Bord Pleanála. A detailed assessment of the Planning Policy and Legislative Framework is provided in the Planning Statement which accompanies the planning application.

The Climate Action Plan 2019 set outs ambitious targets for Ireland. The goal is that Ireland will achieve its EU emission reduction targets for the year 2030. The Plan includes a new commitment to make Ireland 100 % carbon neutral by 2050 and contains 183 action points designed to achieve our national climate change targets. By 2030, 70 % of power generation will be from renewable energy – more than double the current position. The Development will contribute towards meeting those targets through the repowering of the Operational Barnesmore Windfarm which will result in an increased overall generating capacity, as well as securing continuity of renewable energy provision.

### NTS.6 Population and Human Health

The potential effects of the decommissioning/construction and operation phases of the Development on socio-economics, tourism and recreation and land use were identified and assessed in chapter 5 of the EIAR following desk-based collection of data and consultation with local stakeholders. Four geographical Study Areas were outlined for this assessment, namely, the area of the Development and environs (10 km), Donegal County (4,861 $km^2$), the North and West region (25,799 $km^2$) and the Republic of Ireland (70,275 $km^2$).

During the decommissioning/construction and operation phases, the effects of the Development on tourism and recreation receptors are considered imperceptible, as a result of the absence of direct effects and the very limited visual effects.

The existing permitted land use will not be altered by the decommissioning/construction, operation and decommissioning of the Development. During the operational phase, the land value would increase as a result of the Development, resulting in a minor beneficial effect on land use within the Site.

The local community are known to avail of the Operational Barnesmore Windfarm Access Tracks for recreational purposes, with the added gain of a wonderful panoramic view from the higher altitude and modified, easier access to Barnesmore peak. These tracks will remain in situ with a further extension of similar tracks that will encourage and benefit walkers with increased track length for walking, in otherwise difficult terrain. This is an amenity benefit that will continue during the operation of the repowered windfarm. The Development will contribute to the offset of burning of fossil fuels which has the potential to positively impact human health.

In advance of the decommissioning/construction phase, the Applicant will hold a series of ‘Meet the developer / Contractor’ events as early as possible, allowing local contractors to learn about opportunities to bid for contracts, time to upskill, and time to prepare prior to bidding. The Applicant has significant experience in organising these events and has a good understanding of the local area’s capacity, given that it currently operates Barnesmore Windfarm.

Effects on the economy during both the decommissioning/construction phase and the operational phase would be minor, both direct and indirect, and positive, due to the creation of job opportunities and subsequent spending of income in the local area and within Ireland as a whole. It is estimated that turnover generated by the operation and maintenance of the

Development could support two jobs in County Donegal. The overall impact is predicted to be a **moderate, positive, short-term** impact during the construction and decommissioning phases and **moderate, positive and long-term** during the operational phase.

Cumulatively, together with other proposed windfarm developments in the region, if these are progressed, the effects would be positive and of minor significance. There is predicted to be a short-term, positive impact in terms of employment from the Development, if construction periods overlap.

### NTS.7 Biodiversity

Chapter 6 of the EIAR assesses the potential impact of the Development on terrestrial and aquatic ecology. Surveys were undertaken within and adjacent to the site, in order to ascertain the status of ecological features, including habitats, terrestrial mammals, bats, fish and aquatic invertebrates (notably freshwater pearl mussel). The Development lies within and adjacent to the Barnesmore Bog Natural Heritage Area, as well as upstream of designated European Sites.

The main potential impacts of the initial decommissioning and construction, and operational phases of the Development on ecology are considered to be:

- Direct impact on the Barnesmore Bog NHA
- Direct loss of habitat
- Degradation of terrestrial habitat
- Degradation of aquatic habitat (watercourses) and potential downstream ecological impacts
- Disturbance of protected species
- Bat collision with turbines or barotrauma

Habitat surveys included general mapping and quadrat surveys, aimed at identifying important habitat types, including EU Habitats Directive Annex 1 habitats, either likely to fall under the footprint of the Development or with potential to be affected by it. The results of the survey highlighted that Annex 1 habitats occurred close to, or immediately adjacent to the existing (and therefore the proposed) infrastructure. Loss of Annex 1 habitats is therefore unavoidable.

A freshwater pearl mussel survey was undertaken along watercourses to both the west and east of the Development. The survey found no new populations of freshwater pearl mussel beyond the one already known within the Eske catchment and determined that, subject to appropriate mitigation, the species is unlikely to be affected by the Development.

Bat surveys were undertaken by the use of transects and, primarily, static detectors, with 3 deployments of a minimum 13 no. static detectors at the site. Results showed that the site is used by bats only to a very limited extent, and that bat collision or barotrauma risk is not significant at the site.

Surveys for protected mammals such as badgers and otter found that, although such mammals occurred on the Site, they were unlikely to be significantly affected by the Development, with no badger setts within 250 m of the proposed infrastructure for example. The site was found to hold a population of common lizard.

A number of mitigation measures are proposed that include minimisation of the works footprint, measures to time specific works to avoid disturbance or potential direct mortality of species (such as common lizard), measures to avoid downstream pollution, as well as habitat restoration and enhancement measures. Important documents in the delivery of these are an Outline Decommissioning/Construction Environmental Management Plan (which sets out work approaches and requirements during construction to avoid downstream water quality impacts) and a Draft Habitat Management Plan (which notably commits to habitat restoration and enhancement measures). A Surface Water Management Plan is also required in order to ensure no long-term impacts on water quality within the Eske freshwater pearl mussel catchment.

It is considered that the majority of the ecological impacts can be fully mitigated. The nature of the location and the Site, being partly within and adjacent to Barnesmore Bog NHA and holding Annex I habitats, means that some level of residual impact cannot be avoided at the site, notably in the shorter term until habitat restoration is in place and functioning in ecological terms. However, the combination of the use of the existing infrastructure, and the provision of habitat restoration and enhancement measures means that residual impacts on the NHA and Annex I habitats have been reduced as far as possible subject to successful mitigation / compensation in the form of habitat restoration.

### NTS.8 Ornithology

Chapter 7 of the EIAR assesses the potential effects of the Development on ornithology. The initial decommissioning and construction, and operational phases of the Development, have the potential to result in three main effects on birds:

- Habitat loss
- Collision with turbines
- Displacement

A qualified ornithologist undertook over two years of bird surveys at the existing windfarm to record data to establish the Site baseline, the distribution, and abundance of bird populations around the Site, including review of any surrounding designated sites for the wider hinterland up to 10 km. The Site is not located within a protected area for birds, although red grouse, golden plover and peregrine falcon are noted on the Site Synopsis for Barnesmore Bog NHA.

These surveys followed widely recognised best practice guidance on the methods, timings and species that are recorded. This information was used to inform the design of the windfarm layout and the assessment of potential effects. Since the Development follows the footprint of the existing windfarm very closely, with a reduction in the number of turbines and some of the overhead power lines removed, this design is predicted to limit the potential for direct effects for most bird species from habitat loss and collision.

While many species are present in and around the Site many of these have demonstrated habituation to the existing turbines, that is, that they are present on the Site, with snipe and red grouse breeding territories within 100 m from the operational windfarm.

The ornithological assessment suggested that there was more potential for significant effects relating to displacement during the decommissioning/construction phase of the Development. However, only small numbers of territories are predicted to be affected and these can be mitigated by applying best practise measures during construction which will form part of a Construction Management Strategy.

The further measures proposed to mitigate effects on peatland habitats and key ornithological receptors are outlined in a draft Habitat Management Plan. These measures will be implemented throughout the operation of the Development and will provide lasting benefits for many of the bird species present on the Site through the enhancement of breeding and foraging habitats in areas that are currently sub-optimal. These measures are expected mitigate for the predicted effects on hen harrier, snipe and golden plover in particular.

The implementation of a Construction Management Strategy and a draft Habitat Management Plan together is considered sufficient to reduce the level of any potential effects to levels that are considered to be not significant, while providing wide ranging benefits to species found on the Site. There are considered to be no specific cumulative operational effects on individual species or territories as a result of the Development. The ornithological assessment is based upon the observed field data and findings, published information and research and best practice guidance. Overall, the Development is predicted to have no residual significant effects on ornithology.

### NTS.9 Hydrology, Geology and the Water Environment

Chapters 8 and 9 of the EIAR evaluates the effects of the Development arising from the construction/decommissioning and operational phases on the hydrology, hydrogeology and geology resource within and surrounding the Site. The hydrological, hydrogeological and geological assessment for the Development was based on desk studies and Site surveys.

The desk study assessment included consultation with the following organisations via online map viewers and databases:

- Environmental Protection Agency (EPA) (Republic of Ireland)
- Northern Ireland Environment Agency (NIEA)
- Geological Survey of Ireland (GSI)
- Met Eireann (MET)
- National Parks & Wildlife Services (NPWS)
- Office of Public Works (OPW)
- The National Biodiversity Data Centre (NBDC)
- Water Framework Directive (WFD)

There are statutory designated sites within the study area that are hydrologically connected to the Development, including Barnesmore Bog NHA, which the Site is situated within. Other associated designated sites downgradient of the Site include: Lough Eske and Ardnamona Wood SAC (West of the Site within Donegal Bay North Catchment) and River Foyle Tributaries & Tributaries SAC (East of the Site within Foyle Catchment). Furthermore, the WFD status of the surface water network associated with the Site ranges from Moderate to High and is considered highly sensitive in general.

A Flood Risk Assessment (Stage 1) was carried out and indicates that the estimated net increase of surface water runoff (0.05% relative to the area of the Site) is imperceptible, in turn the risk of increased flood risk arising as a product of the Development is imperceptible.

There are no mapped wells, springs or boreholes within 6 km of the Site. Furthermore, potential for any non-mapped wells being impacted by the Development is low considering the groundwater aquifer in the region is mapped as being Poor, productive only at a local scale.

Peat depth was measured at a total of 666 locations during soil surveys, which indicated that peat within the study area is generally less than 2.0 m deep, with some areas of deeper peat (up to 5.7m depth) detected particularly at relatively low elevation areas. Areas of deeper peat have been avoided by the Development layout.

A Slope Stability Risk Assessment was carried out and indicates that the risk of significant mass movement of soils or landslides occurring is Negligible to Low within the footprint of the Development. However, an assessment of the peat quality indicates that there remains the potential for peat stability issues to arise at a localised scale, for example; within excavations.

Standard, good-practice measures will be implemented to minimise the potential for effects such as pollution, erosion or changes to groundwater and surface water flows at the Development to occur. These established and effective measures are described in **Chapter 8: Soils and Geology – Section 8.5 Mitigation Measures and Residual Effects** and **Chapter 9: Hydrology and Hydrogeology – Section 9.5 Mitigation Measures and Residual Effects** and will be included in detail in the Outline Decommissioning/Construction Environmental Management Plan (**Technical Appendix A6.x**) which the Applicant will be committed to undertake through conditions of the planning consent.

With mitigation measures in place, the Development has been assessed as having the potential to result in effects of varying significance, however many are considered avoidable with the exception of the following unavoidable effects:

- There will be a change in ground conditions at the Site with the replacement of natural materials such as peat, subsoil and bedrock by concrete, subgrade and surfacing materials. This is a localised, negative, moderate significance at a local scale, Imperceptible weighted significance at the scale of the Site, direct permanent change to the materials composition at the Site.

- Excavation works during the construction phase of the Development can lead to elevated levels of solid material (soils/grit) being suspended in surface water runoff from the Site. While some level of suspended solids in runoff is unavoidable, if precautionary and mitigation measures described in this report are implemented, concentrations of suspended solids can be reduced to acceptable levels prior to runoff being intercepted by the surface water network associated with the Site. Achieving this implies minimal effects on surface water features, this is considered a likely, neutral to negative, imperceptible to slight significance, Imperceptible weighted significance, transboundary impact of the development which conforms to baseline (when considering areas of peat cutting).

- There will be some local changes to how water flows at the Site, this is considered a likely, neutral to negative, slight to moderate significance, localised impact of the development which conforms to baseline.

Other potential effects have the potential to be significantly adverse, for example, a significant fuel spill, however applying the precautionary principal, mitigation measures, and proper planning, the likelihood and significance of such potential effects can be dramatically reduced.

It is not possible for proposed turbines T3 and T13 and associated hardstanding areas to avoid being located within 50 m of surface water buffer zones. Particular attention will be required to implement drainage measures that achieve good water surface water runoff quality, by slowing the flows and allowing the solids to settle before it is intercepted by the surface water network. Additional mitigation measures have been proposed at these locations including for example, pumping surface water runoff to areas where attenuation can be achieved.

It has been necessary to place the proposed turbines T4, T5 and T11 and associated hardstanding areas within or adjacent to areas with deeper peat (Moderately Deep >2.0 m), however areas of Deep (>3.5m) or Extremely Deep (>5.0 m) peat have been avoided. This implies that particular attention is required to establish an excavation methodology which will reduce the risk of localised stability issues, and reduce the area impacted by excavation practices during the construction phase of the Development.

During the decommissioning / construction and operational phases of the Development, a number of established good practice measures will be put in place to minimise peat disturbance, peat stability, and loss and compaction of soils. With effective and well managed mitigation measures in place, no significant residual effects on geology and peat are predicted as a result of the Development.

### NTS.10 Noise

Chapter 10 of the EIAR presents an assessment of the noise effects of the Development.

Noise will be emitted temporarily by equipment and vehicles used during the initial decommissioning/construction phases. However, as the Development consists of the repowering of an existing windfarm, a number of elements of the existing Site infrastructure such as Access Tracks will be reused, thereby minimising the amount of construction works required. Decommissioning of the existing turbines will be carried out and will run in parallel with construction activity. Decommissioning noise levels are assumed to be in the same order as construction levels and will be of temporary duration. All construction works will be carried out using best practice measures and within planning guidelines. Construction and decommissioning works will typically be more than 1.3 km from the nearest property (noise receptor) and 1.8 km from nearest sensitive receptor, making the potential for noise and vibration impacts considered to be negligible.

The main sound heard from wind turbines is the 'swish' from the movement of the blades through the air. Modern turbines are designed to minimise noise and planning conditions are used to ensure compliance with specified noise limits. The repowered windfarm will reduce the number of turbines from 25 to 13. It is predicted that the noise levels from the repowered windfarm will be no more than the existing Barnesmore Windfarm. The assessment of operational noise has been undertaken in accordance with best practice and following the latest guidelines. It has been shown that noise due to the Development, including cumulative effects with operational and consented windfarms will meet all current guidelines at all local properties.

The Development includes an energy storage facility. Such facilities emit very low levels of noise, with the primary noise sources being the air conditioning units used to keep the facility cool. Given this, coupled with the substantial (in excess of 1300 m) separation distance between the energy storage facility and the closest property, no significant effects are anticipated.

### NTS.11 Landscape and Visual

Chapter 11 of the EIAR presents a Landscape and Visual Impact Assessment for the Development. This has been carried out by a qualified and experienced landscape architect to identify significant effects predicted to arise as a result of the Development. It considers separately the effects on landscape and visual receptors, as well as the cumulative effect of the Development in combination with other windfarm developments.

The Site and its immediate landscape context are comprised of rolling upland hills, up to an elevation of 390 m in elevation, interspersed with numerous small lakes including Lough Golagh, Lough Nabrackboy, Lough Namaddy and Lough Slug. Further to the west of the Site on the opposite side of the Barnesmore Gap is the Tawnawully Mountains, which merge with the Bluestacks mountains around 4 km to the west of the Site. The study area comprises of a wide mix of land uses, the two most prevalent of which are naturalistic mountain moorland / blanket bog in upland areas and agricultural farmland in lowland areas. Marginal upland grazing and forest plantations tend to cloak the transitional slopes between. The Site context also contains the 25 existing Barnesmore wind turbines and the associated substation and Access Tracks.

The principal Study Area for the Development covers a radius of 20 km in accordance with the Wind Energy Development Guidelines (2006), however, the radius is extended to 30 km just for the consideration of cumulative impacts. The landscape assessment considers potential effects on the receiving and surrounding landscape with reference to a range of landscape character areas (LCAs) and criteria published in various technical documents, while the visual assessment considers effects upon visual receptors (as agreed with consultees through the EIA Scoping process) including scenic amenity designations, transport routes, as well as 29 viewpoints from representative / sensitive visual receptor locations. Photomontages have been

prepared for the viewpoints and the figures also include a wireline of the Development on its own and a wireline with all other cumulative developments. These visualisations have helped assist in the assessment process.

In respect of landscape sensitivity designations, the precise area containing the Operational Barnesmore wind turbines and Access Tracks, is identified as being of 'Moderate Scenic Amenity' (MSA) – the lowest of three categories applied by the Council, which together cover all of County Donegal. Otherwise encompassing the Site is an area of High Scenic Amenity (HSA), the median of the three scenic amenity classifications. Immediately to the north of the Site, associated with the Barnesmore Gap and Bluestack range, is an area of Especially High Scenic Amenity (EHSA) – the highest scenic amenity category. These scenic amenity classifications highlight that this is a zone of transition in terms of landscape character, but also that the character and sensitivity is influenced by the presence of the existing turbines.

In terms of direct landscape effects, there will be additional physical impacts on the land cover of the Site as a result of the Development, but these will be very small areas of blanket bog in the context of this upland plateau site and the existing track and hard stand network, which will be utilised insofar as possible. With respect to landscape character, this scale of development can be comfortably assimilated into this upland plateau landscape context without undue conflicts of scale with underlying landform and the combination of both naturalistic and anthropogenic land use patterns. By far the most important factor in respect of the impact on landscape character is the fact that the repowering project will replace an existing windfarm, reducing the number of turbines by half, albeit with turbines that are significantly taller. Thus, the key consideration is the balance between the intensity of the current layout and the vertical scale of the proposed one. Overall, it is considered that the larger turbines of the Development will have the greater impact on landscape character because they are a more prominent feature within the landscape. Nonetheless, the Development is not considered to give rise to significant landscape effects.

The 29 viewpoints assessed are grouped and summarised in chapter 11 in terms of geographical setting rather than by receptor type (more typical), because there is such a strong distinction between the various landscape context / visual settings of this diverse study area. These geographical settings and relevant viewpoints are:

- N15 Corridor and Barnesmore Gap (VP4, VP5, VP11, VP10, VP15, VP16)
- Lough Eske Environs and Bluestacks Way (VP9, VP14)
- Donegal Town and Drumlin Hinterland (VP18, VP20, VP21, VP22, VP23, VP24, VP27)
- Upland Plateau - Croaghnameal uplands / Killeter Uplands (VP6, VP8, VP19)
- Lough Derg Monastic Site (VP26, VP26a)
- Outer Study Area (VP1, VP2, VP3, VP7, VP12, VP13, VP17, VP25, VP28, VP29)

The highest visual impact significance attributed in respect of the Development is 'Moderate' and this occurs at three locations; VP5 'N15 Scenic View at Lough Mourne'; VP9 'Blue Stack Way at Greenan" and, VP14 'Blue Stack Way at Lough Eske'. The first two of these viewpoint locations are considered to be of 'High' sensitivity and VP14 is deemed to be of 'High-medium' sensitivity and it is this generally high order sensitivity that contributes to the significance because the magnitude of impact generated by the Development is considered to be Medium-low at all three of these locations.

Whilst around eight of the existing Barnesmore turbines are visible from VP5, the majority of proposed turbines will be visible and at a more prominent scale above the ridgeline to the left of the Barnesmore Gap. Indeed, it is the visual relationship of the proposed windfarm and the Gap that is the most critical aspect of this view. The nearest proposed turbine lies just to the left of the base of the distinctive dome shaped peak that serves as the marker and sentry to the Gap. The profile of the windfarm also remains subservient to the same domed peak and for these reasons the increased visual impact is still not deemed to be significant.

The 'Moderate' significance in the case of both VP9 and VP14 is applied for similar reasons. That is, the Development will replace a smaller, but more intensive stacking of twice as many existing turbines and will form a visually and thematically legible backdrop to this complex vista across a landscape that is settled, managed and naturalistic in equal measure. The most important features of the view, being the peaks of the Blue Stack range to the north and Lough Eske in the lower middle distance are not impeded or unduly intruded upon by the proposed turbines, which lie in a section of the view where wind energy development is already and established feature. It is for these reasons that the visual impact at VP9 and VP14 is not considered to be significant.

In the case of all 26 other viewpoints, the range of visual impact significance is Moderate-slight to Imperceptible and generally decreases with distance from the Development.

As the Development replaces an existing windfarm the existing pattern of windfarm development in the landscape will remain consistent. Although the repower turbines are more conspicuous than their existing counterparts, there is nearly half the number of them, which reduces the overall number of turbines within the study area. Aesthetically, the taller proposed turbines also compare more readily with the surrounding turbines from the closest sites at Meenbog and Meenadreen than the Operational Barnesmore Windfarm.

In summary, the Development will give rise to increased landscape, visual and cumulative impacts relative to the Operational Barnesmore Windfarm, but there are balances afforded by the fewer / taller proposed turbines and overall it is considered that the impacts will not be significant.

### NTS.12 Material Assets and Other Issues

Chapter 12 of the EIAR considers a number of other issues associated with the windfarm development, including potential effects on fisheries, agriculture, telecommunications, grid connections, shadow flicker, aviation and radar and air and climate.

### Fisheries

The chapter on biodiversity noted that '*the watercourses on and within the immediate environs of the Site offer low potential for most fish, except for resident brown trout'*. Nonetheless, mitigation measures have been outlined in the EIAR and the Natura Impact Statement, a report that accompanies this planning application and deals with measures to protect Atlantic salmon.

### Agriculture

The Site currently functions as an operational windfarm and is not used for agricultural purposes. The Natural Heritage Area (NHA) designation surrounding the windfarm precludes the Site from being exploited for commercial agricultural purposes. The Development given its nature, is unlikely to result in indirect effects within its immediate footprint, and therefore effects on agriculture are unlikely.

### Telecommunications

Operators of microwave communication links were contacted during the EIA. Mitigation measures were adopted during the layout design to avoid impacting communication links. Disruption to television reception is considered unlikely following the switchover to digital broadcasting, as the signals are less susceptible to interference from turbines.

### Grid Connection

A 1.15 km section of overhead electricity line within the existing Windfarm will be relocated underground along a 1.20 km stretch of existing Access Track. It is proposed to connect to the national grid via the existing 110 kV lines from the Site to Clogher Substation. EirGrid have been consulted on the proposal and confirmed that the proposed design is viable. The existing 110kV onsite Substation will be upgraded to allow for the additional capacity. There is no anticipated effect upon the grid network outside of the infrastructure for Barnesmore windfarm itself.

### Air Navigation

Operating windfarms have the potential to cause a variety of effects on aviation. Rotating wind turbine blades may impact on radar operations, although it is not likely at Barnesmore. The physical height of turbines can cause obstruction to aviation and the overall performance of communications, navigation and surveillance equipment. All structures over 150 m in height are required to have lighting to warn aviation traffic.

Consultation with aviation operators was undertaken and the Irish Aviation Authority responded. They requested an obstacle warning light system for the Development, the provision of coordinates of each turbine and tip height, and to notify them 30 days prior to any crane operations commencing.

The turbine locations will be added to aviation maps prior to construction, and all requests from the Aviation Authority carried out to ensure aviation safety protocols are followed. Therefore, effects on aviation as a result of the development will be negligible.

### Air and Climate

This section assessed the effect of the Development on air quality, given the potential for peat disturbance and dust emissions, and the likely carbon dioxide reduction effects of the Development in operation. The Environmental Health Service was consulted and responded with concerns about dust from construction activity. Mitigation measures for the reduction of dust are outlined in Chapter 14, Section 14.6. The nearest inhabited residential dwellings are located over 2 km from the Site

Boundary (north of the Site). After mitigation, the residual effects were assessed as being short-term in nature and slight to imperceptible.

The Development layout design considered the reuse of the existing infrastructure as much as possible to minimise the disturbance of active peat. From an ecological point of view, foremost in Site selection has been the avoidance of Barnesmore Natural Heritage Area (NHA Site Code 002375), designated for its complex mosaic of upland blanket bog, wet heath and flushes, in as far as possible. The selection of breaking new ground and impacting on natural habitat has been kept to a minimum.

The Development does not contain any element, which will produce GHG emissions or odorous emissions in operation. Indeed, the Development will contribute to a net national reduction in the emissions of greenhouse and other gases resulting from the combustion of fossil fuels.

Savings of carbon dioxide arise principally from the generation of electricity from the Development, such that generation from other sources (which emit carbon dioxide|) are offset. The estimated savings depend of the assumption of which source of electricity is displaced and the savings range from 72,000 to 102,000 tonnes of carbon dioxide per annum. The number of homes that the Development could power per annum ranges from 32,284 to 45,670 homes[1].

Ireland has set a target of 40% of electricity to come from renewable sources by 2020. The target for 2030 is to generate 70% of the country's electricity from renewable sources. The Development will contribute up to 76 MW of installed capacity. The cumulative effect with other Irish renewable generation is considered to be a fundamental change in the climate effects of Ireland's energy supply, which is a major, positive effect, that is significant under the EIA Regulations and will contribute to Ireland's binding emission reduction targets. The Development has been assessed as having a slight, positive, long-term effect in terms of helping Ireland meet its international obligations to reduce GHG emissions.

### Shadow Flicker

Shadow Flicker is the effect of light levels in a sunlit room noticeably varying as a result of the shadow of a turbine blade passing a window, causing a nuisance. Industry standard software was used to model the potential for shadow flicker to occur, based on the proposed turbine locations and dimensions and the locations of residential properties. The defined study area was based on the 2006 Guidelines which is for properties within 10 Rotor Diameters (1,580 m) which resulted in one property being assessed. It should be noted that the dwelling is an abandoned house which is currently used for livestock, the front and back of the house do not face the turbines and there is a row of trees/vegetation on the eastern side of the house that faces the windfarm. It has been determined that this property will potentially experience less than 30 hours of shadow flicker per year but greater than 30 minutes per day in a worst-case scenario.

Where significant shadow flicker effects are predicted to affect a sensitive receptor, these can be mitigated by either introducing additional screening or adapting turbine control systems to stop the offending turbine when shadow flicker conditions are present. Both methods can be used to completely eliminate the effect in line with the draft guidelines.

In this instance, no mitigation is proposed as the single affected receptor is not considered sensitive, due to the property being derelict, not facing the turbines and has existing vegetative screening, and the predicted effects are below the current guidance levels.

There are no operational or consented windfarm developments in the vicinity of the Development with the potential to cause significant shadow flicker effects at the identified property. Therefore, no cumulative shadow flicker impacts are possible. This assessment identified no significant effects, given the projected total hours per year occurrences of shadow flicker in the absence of sunlight satisfy the recommended 30-hour guidance limit and the house is derelict.

### NTS.13 Cultural Heritage

Chapter 13 of the EIAR presents a baseline study of and impact assessment on, the cultural heritage of the Site and the surrounding region. Site visits and desk studies were undertaken to identify and record any archaeological, architectural and

[1] Sustainable Energy Authority of Ireland (2018) *Energy in the Residential Sector 2018 Report*. "In *2016, the average dwelling consumed 18,325 kWh of energy, based on climate corrected data, indicating 4.2% annual growth. This comprised 13,697 kWh (74.7 %) of non-electric and 4628 kWh (25.2%) of electricity*." Therefore, the Development can be expected to meet the average electricity consumption of (149,411 MWh (energy produced) x 1000 = 149,411,000 kWh / 4628 kWh) = 32,284 homes.

cultural heritage assets which may be affected by the Development. The significance of effect on an asset is considered by establishing the asset's value/sensitivity, and how that may be impacted based on the proposed design of the Development.

There are no known archaeological, architectural or cultural heritage remains within the footprint of the Development, and as such there will be no direct physical effects on any known archaeological or heritage features during any phase of the Development.

The Site has fair potential for the presence of unknown archaeological remains at locations not currently occupied by the Operational Barnesmore Windfarm. Should the presence of archaeological features be revealed during the initial Decommissioning/Construction phase, the remains would be likely to suffer high magnitude impact. As such, mitigation is proposed for potential slight/moderate effects on unknown archaeological remains, in the form of a qualified archaeologist providing onsite monitoring of all infrastructural works that require ground reduction/topsoil stripping at areas not currently occupied by the existing Barnesmore Operational Windfarm footprint. This archaeological monitoring programme shall facilitate identification of any remains that may be present at the earliest opportunity and record their features prior to any damage occurring.

There are two sites of archaeological interest located near to the Site Boundary, and a recorded archaeological and built heritage pilgrimage site at Lough Derg *c.* 10 km south of the Development; all of which have been identified as having indirect slight (visual) significance of effect at Operational phase (including Residual Impact). Given the slight effect, no mitigation measures are deemed necessary.

The assessment does not predict any likely cumulative effects on cultural heritage resources that are significant in terms of the EIA Regulations.

### NTS.14 Access, Traffic and Transport

Chapter 14 of the EIAR sets out the effect that decommissioning/construction traffic would have on the road network, and the consequent effects that that could have on people and communities nearby.

Potential effects associated with windfarm development are presented in two key forms: those from the transport of wind turbine components, and those as a result of the import of construction material, equipment and personnel.

**Technical Appendix 12.1**: A computer model of the turbine delivery vehicles is used to identify locations along the Turbine Component Haul Route where road improvements will be required to facilitate delivery of the largest turbine components from Killybegs Harbour. This is considered suitable, subject to minor, upgrade works and alterations to street furniture (such as signs, bollards, etc.). These components would be transported with an escort vehicle as standard practice, to help ensure safe passage.

The haul route is proposed as:

- From the Harbour onto the R263 to the N56
- The N56 to Donegal Town (Drumlonagher Roundabout)
- Onto the N15 to the junction with the L2595 and exit onto the L2595
- Continue on L2595 and onto L2095
- Continue on L2095 to L2015 and onto the Site

HGVs carrying materials such as rock and concrete are likely to come from the Ballintra / Laghey area south of Donegal Town and use the N15 to Donegal Town (Drumlonagher Roundabout) and then use the same route. HGVs may also come from Killybegs and / or Mountcharles west of Donegal Town and use the same route as the abnormal loads vehicles.

Current traffic flows on the N15 have been estimated from measured data from Traffic Infrastructure Ireland (TII) and the road is currently at 64 % capacity. The route along the Local Roads (L2595 and L2095) was used by the nearby 38 turbine Meenadreen Windfarm without any significant issues and is also used by HGVs for periodic maintenance at the Operational Barnesmore Windfarm and therefore this is a proven route for abnormal loads and HGVs. The amount of traffic that will be generated by the initial decommissioning/construction phases of the Development and potential effects on people and nearby communities were assessed as negligible, except for the following:

- Driver delay during the short periods of time when the abnormal loads are moving, at points highly localised to the Turbine Components Haul Route
- Pedestrian and vulnerable road users along the L2595 (including past Barnesmore Montessori School) and L2095 and L2015
- Severance of communities either side of a road that is made busy, in this case through the Bruckless, Dunkineely and Tinnycahill
- Mud and debris on the local road network from HGVs entering and egressing from the construction Site
- Vibration caused by large vehicles, either airborne or ground-based as a result of a rough road surface

A number of mitigation measures are proposed to minimise effects, including:

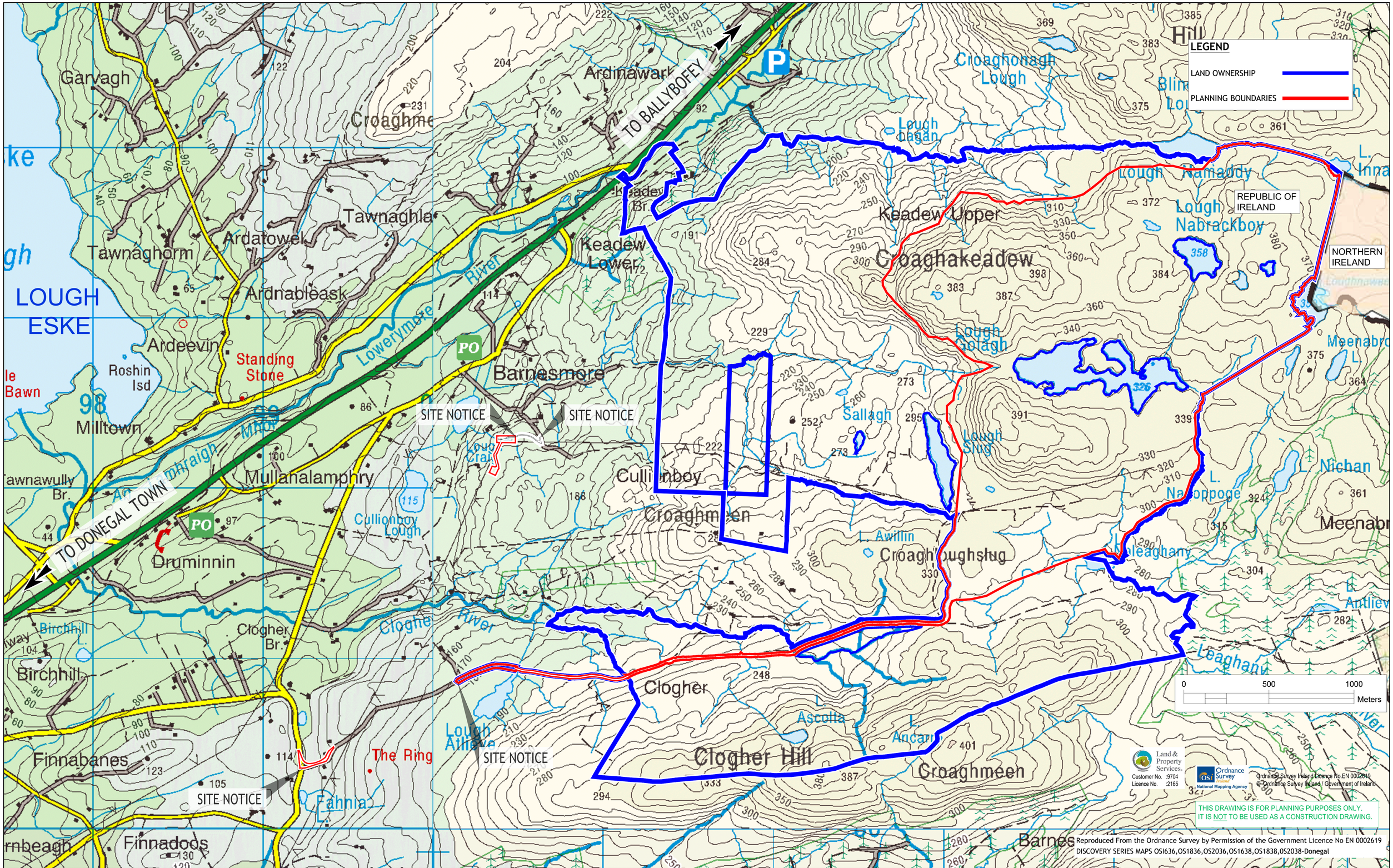
- As far as reasonably possible, deliveries should be scheduled outside of school opening and closing times in particular at Barnesmore Montessori School.
- Drivers of all delivery vehicles should be made aware of the presence of schools and other sensitive receptors and that formal pedestrian crossing facilities are not present.
- Wheel cleaning facilities will be provided at the entrance to the site.
- The local road network will be monitored and maintenance will be carried out as required with any repairs undertaken at the cessation of the construction phase.
- The L2015 Road to be resurfaced with a double layer of tar and chip in accordance with IAT guidelines for a distance of four kilometres from the junction with the L-2095-6 towards the Site.

A detailed Traffic Management Plan will be agreed with the relevant authorities and will detail the measures to be implemented during the temporary decommissioning / construction phases.

No significant effects related to operational phase traffic will occur due to the minimal traffic that would be generated during that phase of the Development.

### NTS.15 Summary

Chapter 15 of the EIAR provides a summary of the significant effects from each EIAR chapter and also summarises the mitigation measures proposed to reduce either the likelihood or magnitude of these effects to an acceptable level, for ease of reference.




SCOTTISHPOWER RENEWABLES

ScottishPower Renewables
320 St Vincent Street
Glasgow
G2 5AD

Email: info@scottishpowerrenewables.com
Web: www.scottishpowerrenewables.com

Notes

1. This drawing is the property of ScottishPower Renewables UK Ltd. It is a confidential document and must not be copied, used, or its contents divulged without prior written consent.
2. Scale 1:10,000 @ A1 ,1:20,000 @ A3

| Rev. | Date | By | Amendments |
|---|---|---|---|
| | | | |

Project

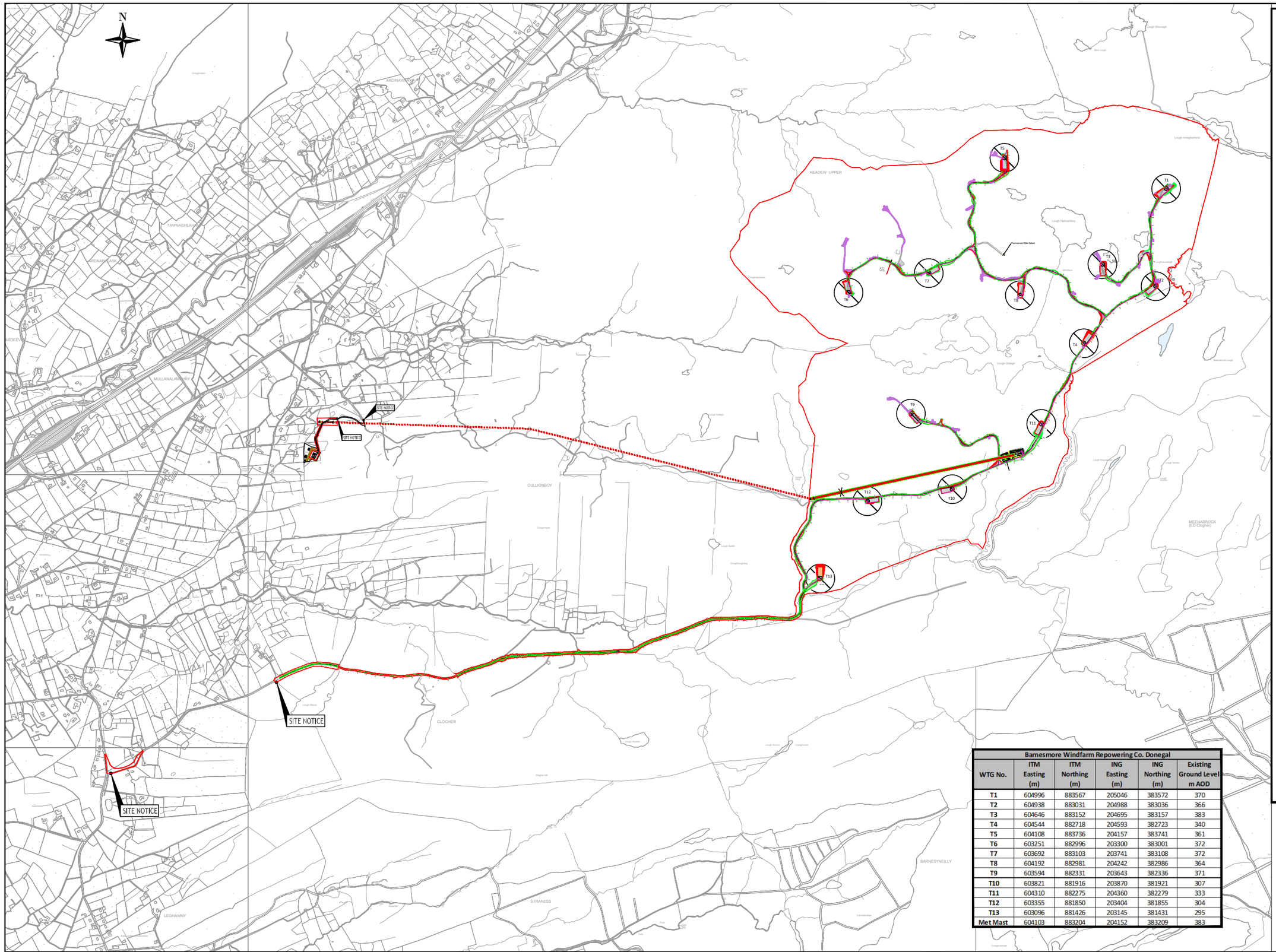
BARNESMORE WINDFARM
REPOWERING

Title

SITE LOCATION MAP

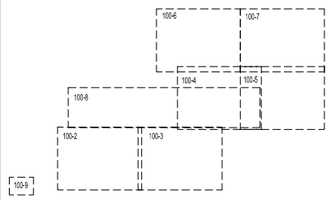
FIGURE NTS - 1

| Issue Details | | | | Office Use Only | |
|---|---|---|---|---|---|
| Designed: | JOD | Information | | Drawing Number: | |
| Drawn: | AMcC | Approval | X | 5952-000-000 | |
| Checked: | S.M. | Tender | | Date: | Rev. |
| Approved: | D.K. | Construction | | 30/10/2019 | |
| Scale: | AS NOTED | Record | | | |




LEGEND

- Planning Boundary
- Turbine Sweep Area & Foundation
- Existing Substation To Be Upgraded
- Proposed Temporary Contractors Compound & Energy Storage Unit
- Proposed Upgrading Of Existing Site Roads
- Redundant Site Roads To Be Reinstated
- Proposed New Site Road
- Proposed Hardstand
- Fill
- Cut
- Stream and 50m Buffer Area
- Proposed Met Mast Location
- C1 Indicative Wind Farm Power Cabling Route
- 100 Contours
- Existing 110 kV Overhead Power Line (Golagh Tee)
- Undergrounding Of Existing 110 kV Overhead Power Line
- Proposed UG Grid Connection




KEYPLAN

**Barnesmore Windfarm Repowering Co. Donegal**

| WTG No. | ITM Easting (m) | ITM Northing (m) | ING Easting (m) | ING Northing (m) | Existing Ground Level m AOD |
|---|---|---|---|---|---|
| T1 | 604996 | 883567 | 205046 | 383572 | 370 |
| T2 | 604938 | 883031 | 204988 | 383036 | 366 |
| T3 | 604646 | 883152 | 204695 | 383157 | 383 |
| T4 | 604544 | 882718 | 204593 | 382723 | 340 |
| T5 | 604108 | 883736 | 204157 | 383741 | 361 |
| T6 | 603251 | 882996 | 203300 | 383001 | 372 |
| T7 | 603692 | 883103 | 203741 | 383108 | 372 |
| T8 | 604192 | 882981 | 204242 | 382986 | 364 |
| T9 | 603594 | 882331 | 203643 | 382336 | 371 |
| T10 | 603821 | 881916 | 203870 | 381921 | 307 |
| T11 | 604310 | 882275 | 204360 | 382279 | 333 |
| T12 | 603355 | 881850 | 203404 | 381855 | 304 |
| T13 | 603096 | 881426 | 203145 | 381431 | 295 |
| Met Mast | 604103 | 883204 | 204152 | 383209 | 383 |

0 250 500 Meters



THIS DRAWING IS FOR PLANNING PURPOSES ONLY.
IT IS NOT TO BE USED AS A CONSTRUCTION DRAWING.

SCOTTISHPOWER RENEWABLES

ScottishPower Renewables
320 St Vincent Street
Glasgow
G2 5AD

Email: info@scottishpowerrenewables.com
Web: www.scottishpowerrenewables.com

Notes

1. This drawing is the property of ScottishPower Renewables UK Ltd. It is a confidential document and must not be copied, used, or its contents divulged without prior written consent.
2. Scale As Noted

| Rev. | Date | By | Amendments |
|---|---|---|---|

Project: BARNESMORE WINDFARM REPOWERING

Title: SITE LAYOUT FIGURE NTS - 2

| Issue Details | | | | Office Use Only |
|---|---|---|---|---|
| Designed: JOD | Information | | | Drawing Number: 5952-100-101 |
| Drawn: A.McC | Approval | X | | |
| Checked: S.M | Tender | | | |
| Approved: DK | Construction | | Date: 19/11/19 | Rev. |
| Scale: 20,000 (A3) | Record | | | |

**Barnesmore Windfarm Repowering Project Team**
ScottishPower Renewables
ScottishPower House
9th Floor
320 St Vincent Street
Glasgow
G2 5AD

Tel: +0044 141 614 3075

barnesmorewindfarmrepower@scottishpower.com

SCOTTISHPOWER
RENEWABLES