



ESB ASSET DEVELOPMENT UK LIMITED

# MILLMOOR RIG WIND FARM

ENVIRONMENTAL IMPACT ASSESSMENT  
NON-TECHNICAL SUMMARY · 663320



# CONTENTS



INTRODUCTION	4
Background to the non-technical summary and proposed scheme	4
Introduction to the proposal	4
The project team	4
PLANNING PROCESS	5
Consents and authorisations	5
Environmental Impact Assessment	5
Consultation	5
Alternatives	5
Climate change, energy and planning policy	5
EXISTING ENVIRONMENT	5
THE PROPOSED DEVELOPMENT	7
APPROACH TO THE EIA	8
Landscape and visual amenity	9
Aviation lighting assessment	10
Archaeology and cultural heritage	11
Ecology	11
Ornithology	12
Geology, hydrology, hydrogeology and peat	12
Noise and vibration	13
Traffic and transportation	13
Socio-economic, land use and recreation	14
Aviation and radar	14
Telecommunications and electromagnetic interference	14
Shadow flicker	14
Climate change mitigation	15
Forestry	15
Population and human health	15
WHAT HAPPENS NEXT?	15
CONTACT DETAILS	16
FURTHER INFORMATION	16
FIGURES	
Figure 1. Site location	6
Figure 2. The Proposed Development	6
Figure 3. Site layout plan	7

# INTRODUCTION

## BACKGROUND TO THE NON-TECHNICAL SUMMARY AND PROPOSED SCHEME

This is the non-technical summary (NTS) of the Environmental Impact Assessment (EIA) Report for the proposed Millmoor Rig Wind Farm.

The NTS describes the proposed scheme in non-technical language, identifying the likely effects it may have on people and the receiving environment. It also describes the mitigation measures proposed by the applicant to avoid or reduce any of the potential adverse effects that have been identified, including how environmental issues will be managed during and after construction. The EIA Report presents the complete findings of the EIA and is the main document accompanying the application for consent

## INTRODUCTION TO THE PROPOSAL

ESB Asset Development UK Limited is part of ESB, Ireland's premier energy company which was established in 1927. ESB is a leading independent power generator in the UK market, with over 20 years of successful energy investment in the UK and Ireland, owning and operating wind farms with a current total generating capacity of 600 Megawatts (MW).

ESB Asset Development UK Limited (hereafter 'the applicant') has submitted an application for consent for the Millmoor Rig Wind Farm, located at Wauchope Forest, south of Bonchester Bridge in the Scottish Borders, as indicated by Figure 1. The Proposed Development area covers approximately 917 hectares and falls within the Scottish Borders Council (SBC) area.

The proposal is for up to 13 turbines, five with a maximum tip height of 180 metres (m), two with a maximum tip height of 200 m, four with a maximum tip height of 210 m and two with a maximum tip height of 230 m. The individual turbine generating capacity is anticipated to be approximately 6 MW, with the total installed capacity for the Proposed Development in excess of 50 MW. The application also includes approximately 20 MW of battery energy storage (BESS). Ancillary infrastructure will also be constructed, such as:

- a site entrance and new and upgraded access tracks;
- a substation and control building;
- 2 construction compounds;
- a temporary turbine layby area;
- hardstanding areas at the base of each turbine;
- telecommunications equipment;
- 3 borrow pit search areas; and
- buried cabling.

The proposals also include plans which seek to deliver habitat enhancement within the Proposed Development site, including planting native broadleaf trees and woodland along watercourses.

The Proposed Development is predicted to deliver total emissions savings of 119,547 tonnes of carbon dioxide (CO<sub>2</sub>) equivalent (CO<sub>2</sub>e) per year and 4,030,390 tonnes CO<sub>2</sub>e over its 35-year operational lifetime. The Proposed Development is anticipated to provide enough electricity to power the equivalent of 44, 197 households in Scotland each year<sup>1</sup>.

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## THE PROJECT TEAM

The applicant has appointed RSK Environment Ltd (RSK), an experienced environmental consultancy, as the lead consultant to carry out the EIA and related assessments which will accompany an application for planning consent to the Scottish Government's Energy Consents Unit (ECU). RSK was supported by:

- **STEPHENSON HALLIDAY** – provided specialist planning assessment
- **PEGASUS GROUP** – provided specialist landscape and visual modelling and assessment
- **MACARTHUR GREEN** – provided specialist ornithology surveys, modelling and assessments
- **HOARE LEA** – provided specialist noise modelling and assessment
- **WIND BUSINESS SUPPORT** – provided specialist aviation assessments
- **PAGER POWER** – provided specialist telecommunications and electromagnetic interference assessments.

<sup>1</sup> Calculating using the Scottish Government Renewable Energy Output Calculator <https://www.gov.scot/publications/renewable-and-conversion-calculators/>.

# PLANNING PROCESS

## CONSENTS AND AUTHORISATIONS

The applicant is seeking to secure approval for the Proposed Development by way of an application under Section 36 of the Electricity Act 1989 to Scottish Ministers. Environmental Impact Assessment.

## ENVIRONMENTAL IMPACT ASSESSMENT

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter 'the EIA regulations') applies where consent is being sought for developments under Section 36 of the Electricity Act 1989. In accordance with this, an EIA has been undertaken to identify the likely significant effects the Proposed Development could have on the receiving environment. The purpose of the EIA is to ensure that any effects on the environment are fully understood and are taken into account during the design, consenting and authorisation process. The methods and findings of the EIA are outlined within this NTS.

## CONSULTATION

Consultation has been integral to the design and development of the Proposed Development, as well as being key for the identification of existing environmental constraints and sensitivities, and the identification and assessment of the likely environmental effects of the Proposed Development.

Extensive consultation has been undertaken with key stakeholders. Consultation took place through following ways:

Extensive consultation has been undertaken with key stakeholders. Consultation took place through following ways:

- informal stakeholder liaison, including meetings and correspondence by letters, emails and by phone;
- Scoping, which involved the submission of a formal EIA Scoping request to the ECU, and statutory and non-statutory consultees;
- Community engagement, including two in-person public consultation events hosted within the local communities (Southdean and Bonchester Bridge) and a dedicated project website; and
- Attendance at community council meetings.

Full details of the community engagement process are included in the Statement of Community Consultation which is included as a supporting document to the application.

## ALTERNATIVES

As part of the design development, consideration has been given to a number of alternatives regarding layout, design and operational aspects.

Alternatives explored for the Proposed Development included a variety of potential turbine locations, varying turbine heights, and a number of access route options to and between development infrastructure.

The proposed design and infrastructure layout evolved in response to environmental constraints identified throughout the EIA process and from consultation feedback. The main considerations that were taken into account during the design development included cultural heritage and landscape and visual effects.

During the EIA process, the Proposed Development went through four principal design iterations. Changes to the layout

included decreasing the number of turbines from 15 to 13, and siting and design of ancillary infrastructure, which was informed by further survey work, desk based assessments and a design workshop. Changes were made to the blade tip heights to maintain a balanced visual appearance and to maximise the energy generation onsite. This included the reduction of the height of several turbines, from 200 m to 180 m to blade tip height, and the increase in height of other turbines, from 200 m to 210 m or 230 m.

The final design layout can be seen in Figure 3.

## CLIMATE CHANGE, ENERGY AND PLANNING POLICY

The EIA identified and reviewed national policy guidance and local development plans that are relevant to the location and design of the Proposed Development to establish overall compliance with policy objectives.

National policy identifies a requirement to encourage the use of renewable technologies to tackle the issue of climate change, strengthen the economy and diversify energy supplies.

In September 2020, SBC declared a climate emergency and has since published the Climate Change Route Map, which commits SBC to reducing Net Zero emissions for the Scottish Borders over a 25-year flexible time period. Therefore, SBC supports renewable energy in principle and local planning policy states that SBC will consider the contribution that proposed developments make towards meeting renewable energy generation targets.

A Planning Statement will be prepared and submitted to support the application as additional information. This will allow the upcoming National Planning Framework 4 and the Onshore Wind Policy Statement to be considered fully as part of the application for consent.

## EXISTING ENVIRONMENT

The Proposed Development is located at Wauchope Forest, south of Bonchester Bridge in the Hawick and Denholm ward of the SBC area. The nearest settlements are Chesters, approximately 3.3 km to the north, and Bonchester Bridge, approximately 5.2 km to the north-north-west along the A6088 (measurements taken from the nearest turbine). The nearest group of properties are located at Southdean, approximately 2.1 km to the north and the site lies approximately 2.9 km from the Scotland-England border. Figure 2 illustrates the Application Boundary of the site in relation to the existing environment.

The Proposed Development is situated in the same location as a previous wind farm proposal, the now withdrawn Highlee Hill Wind Farm. Millmoor Rig Wind Farm has a different site boundary and is a wholly new project with no connection to the Highlee Hill Wind Farm proposal or the previous developer, who withdrew the wind farm proposal in May 2017.

The area is comprised entirely of commercial forestry plantation. The plantation is currently active with some sections being felled, and other areas presenting recent crop plantation, as well as mature stands. Only a few areas within the site are not within forestry.

The Proposed Development is situated on a gently sloping plateau that is bound by a ridge of higher ground to the south, west and east. The plateau slopes in a broadly north-easterly direction from an elevation of approximately 302 m Above Ordnance Datum (AOD) in its south-western corner, to approximately 197 m at its north-eastern corner.

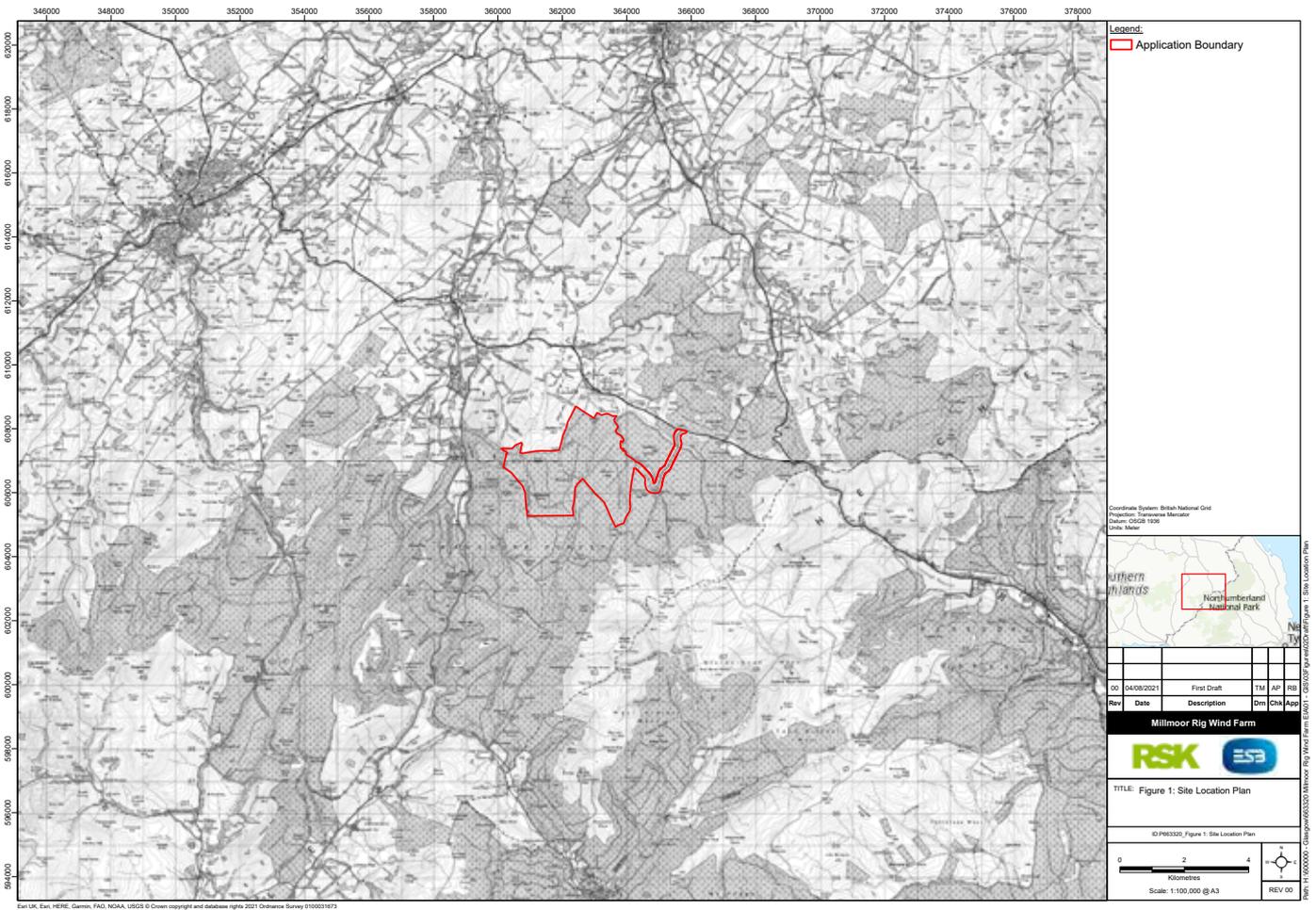


FIGURE 1. SITE LOCATION

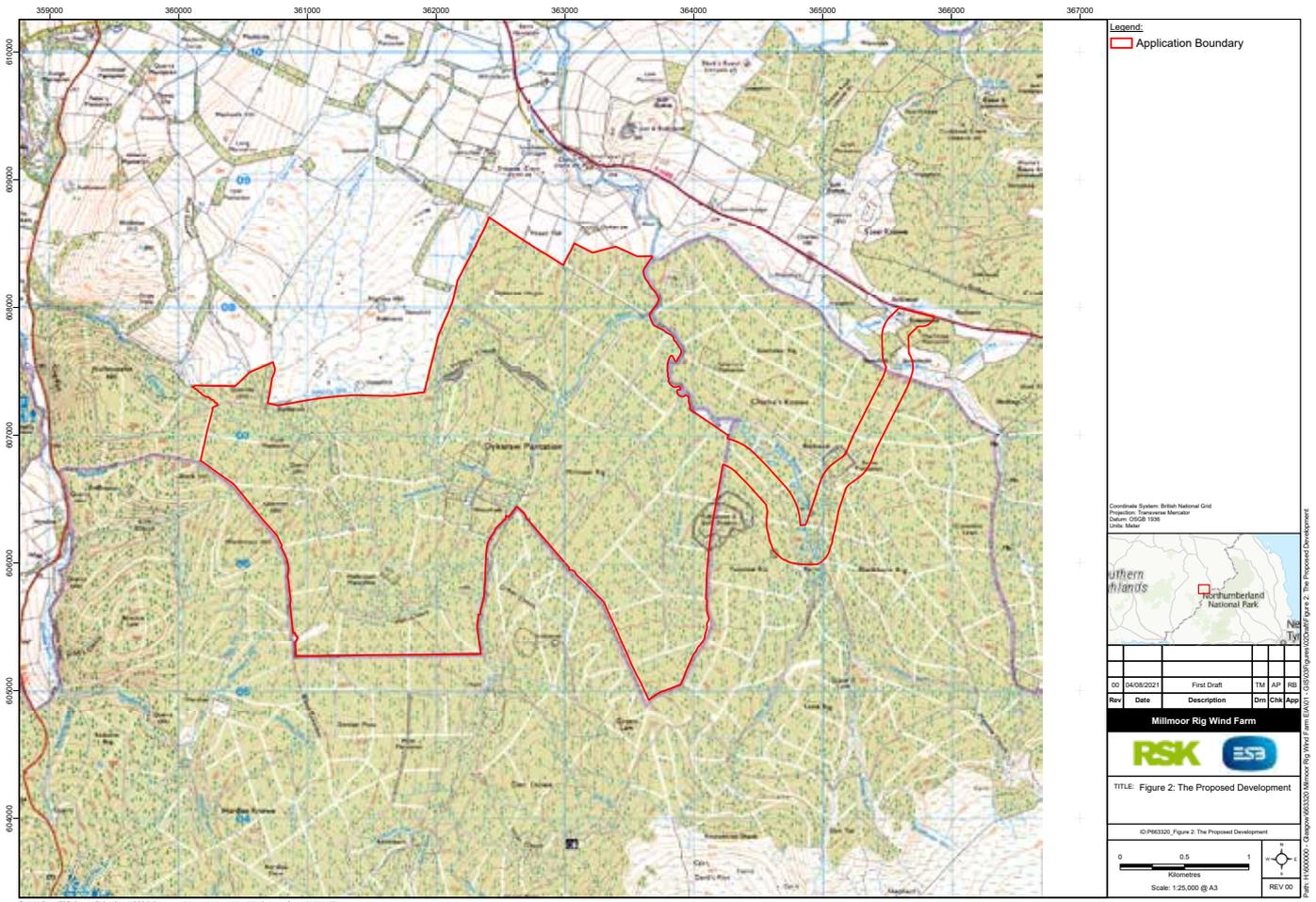


FIGURE 2. THE PROPOSED DEVELOPMENT

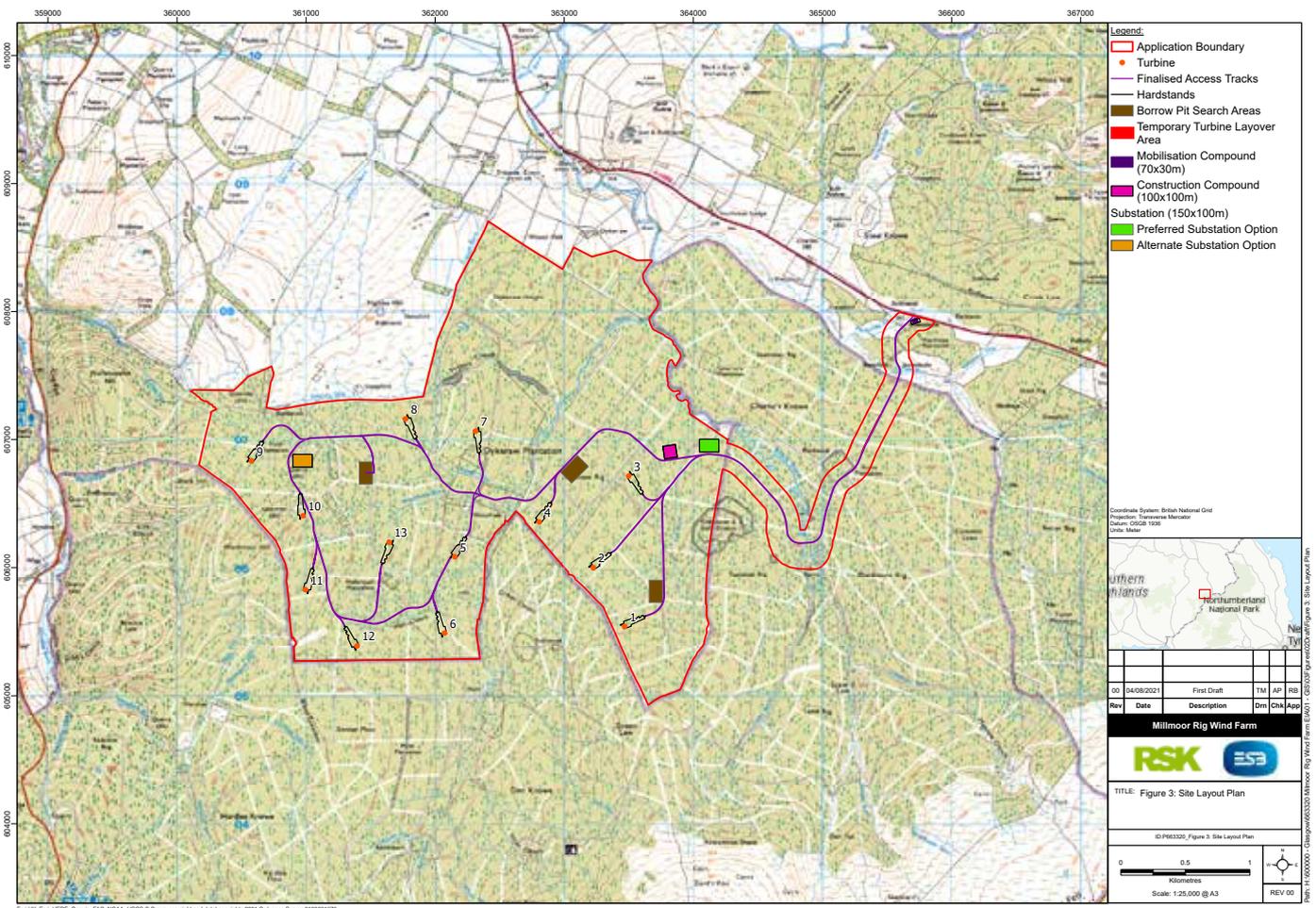


FIGURE 3. SITE LAYOUT PLAN

There are a number of watercourses across the Proposed Development site that are upstream sections and tributaries of the Jed Water. Also, across the Site, the Jed water flows into a tributary of the River Tweed SAC and SSSI.

The site is crossed by an extensive network of man-made tracks that provide access for forestry vehicles from the A6088 to the north and the B6357, to the west of the site. Several major public roads are situated in close proximity to the site, as the A68, A6088, A7 and A698 are within 15 km of the nearest turbine.

## THE PROPOSED DEVELOPMENT

The Proposed Development will comprise up to 13 turbines, approximately 6 MW each and 78 MW in total. There would be 5 turbines with have a maximum tip height of 180 m, 2 turbines with a maximum tip height of 200 m, 4 turbines with a maximum tip height of 210 m and 2 turbines with a maximum tip height of 230 m. Approximately 20 MW of battery energy storage is proposed to be located within the site. The layout of the Proposed Development is outlined in Figure 3.

The Proposed Development seeks permission to operate for 35 years, after which the wind farm would be decommissioned, and the turbines dismantled and removed, unless permission is sought to extend the operational lifespan.

The construction of the Proposed Development is anticipated to take approximately 21 months from mobilisation to completion. During the construction period, up to two temporary construction compounds will be required, which includes an onsite construction compound within the turbine area, and a mobilisation compound located within the access area.

## TYPES OF IMPACT CONSIDERED

Direct impacts may occur when some aspect of a development physically impinges upon a valued resource, for instance the proposed construction of a house may result in loss of ecological habitat, or an archaeological site.

Indirect impacts could occur in either time, or location, from the source, for instance construction works on a slope could result in heavy rainfall washing exposed soil into a nearby watercourse, which could damage aquatic life.

Cumulative impacts are defined as:

- impacts that result from changes caused by a proposed development, together with other past, present or future developments; and
- impact interactions that may arise from a combination of separate impacts on one or a small number of receptors, due to the same proposed development.

Information on possible future developments was gathered through the research of relevant planning documentation. The possibility of cumulative impacts arising has been considered in each of the technical chapters of the EIA report.



Movement of construction vehicles and heavy goods vehicles (HGVs) will be required, moving to, from and around the Proposed Development site to deliver the turbine components, works machinery and materials. Following the construction phase, temporary construction compounds will be reinstated. Site entrance and access to the Proposed Development would be taken from the A6088 to the east, using existing forestry tracks as far as possible. The internal access track linking the turbines and ancillary infrastructure would predominantly make use of the existing track network; however, some new access track would be required including a new watercourse crossing of the Black Burn. The existing tracks will be upgraded to allow for the construction and operation of the Proposed Development. Tracks used by construction vehicles will be retained throughout the lifetime of the Proposed Development, for use by maintenance vehicles. The track would be unpaved (stone surface), of 5.5 m running width, with a 1 m shoulder verge to either side. The track may be wider for short sections, such as passing places, laydown areas and sharp bends. The infrastructure layout of the Proposed Development can be seen in Figure 3.

## APPROACH TO THE EIA

An EIA is a systematic process to identify, predict and evaluate the environmental effects of proposed developments.

The requirements of the EIA were informed by a Scoping process which considered the potential for environmental effects to occur as a result of the Proposed Development, given the nature of the receiving environment.

The Scoping exercise involved a review of available documentation, consultation with statutory and non-statutory organisations, and desk-based and site-based surveys.

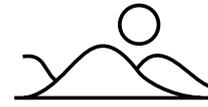
The Scoping process concluded that the following aspects would require further assessment, in form of an EIA, due to their potential to cause environmental effects:

- LANDSCAPE AND VISUAL IMPACTS
- ARCHAEOLOGY AND CULTURAL HERITAGE
- ECOLOGY
- ORNITHOLOGY
- GEOLOGY, HYDROLOGY, HYDROGEOLOGY AND PEAT
- NOISE AND VIBRATION
- TRAFFIC AND TRANSPORTATION
- AVIATION AND RADAR
- SOCIO-ECONOMICS, LAND-USE AND TOURISM
- TELECOMMUNICATIONS AND ELECTROMAGNETIC INTERFERENCE
- SHADOW FLICKER
- CLIMATE CHANGE
- FORESTRY.

The main stages of the EIA that were followed are illustrated opposite. It should be noted that for the Proposed Development different technical assessments adopt this same broad approach, but vary in the detail of how they are applied, such as study areas, established guidance or assessment criteria.

Any significant residual effects that the EIA identifies as arising from the Proposed Development are key to understanding the outcome of the EIA process, because these are given the greatest weight by decision makers and stakeholders when considering an application for consent.

# THE MAIN STAGES OF THE MILLMOOR RIG WIND FARM EIA



## LANDSCAPE AND VISUAL AMENITY



### DATA GATHERING

#### Project data gathering

Data to describe the construction and operation of the development, including identification of the project activities, materials to be used, discharges and emissions that are likely to occur.

#### Environmental data gathering

Collection of available information on the existing environment within a suitable area of search



#### Identification of environmental sensitivities

Identification of receptors and their environmental sensitivity, which could be affected by the proposed development.



### SCOPING AND SURVEY

Consultation with regulatory authorities to discuss aspects associated with the proposed project activities.

#### Site survey work

Surveys of the existing environmental conditions to fill gaps in data, to ensure sufficient and adequate data are available and form a suitable baseline for the determination of impacts.



### ASSESSMENT

#### Environmental impact assessment

Detailed assessment of the identified potential impacts associated with project activities.

#### Evaluation of significance

Evaluation of significance, including qualitative and where possible quantitative estimation of magnitude and severity of effects.



### MANAGEMENT

#### Mitigation measures

Identification of measures to be applied to eliminate, minimise or manage the potential significant environmental effects.



### COMPILE EIA REPORT

Presentation of the findings of the EIA in a systematic way, including determining the significance of the residual effect on the environment; schedule of environmental commitments and monitoring requirements.

The Landscape and Visual Impact Assessment (LVIA) considers the potential effects of the Proposed Development on individual landscape features and elements, landscape character, specific views and more generally people who view the landscape. It considers the potential effects during construction, operation and decommissioning.

The assessment considers the landscape and visual resources of the site and the surrounding study area (35 km from the outermost turbines). The assessment focuses on locations where receptors are likely to be affected by the Proposed Development and has been informed by Zone of Theoretical Visibility (ZTV) maps showing where the Proposed Development will be theoretically visible from an extensive field study.

Landscape character and resources are considered to be of importance in their own right. Effects on views and visual amenity, as perceived by people, are clearly distinguished from, although closely linked to, effects on landscape character and resources. Effects on views and visual amenity have been assessed through the use of 21 representative daytime viewpoints from where people are likely to experience views towards the Proposed Development and 5 night time viewpoints (to consider effects in relation to visible aviation lighting which is required for structures above 150 m in height).

Landscape and visual considerations, including the appearance of the Proposed Development from key viewpoints, played a key role in the progression of the design. Consideration was given to the location and scale of the turbines, as well as all supporting ancillary infrastructure. Mitigation has been designed into the proposed aviation lighting scheme to reduce intensity when possible and to reduce light travelling downwards. Best practice guidance was considered throughout the design process.

#### LANDSCAPE EFFECTS

The Proposed Development would result in significant effects on the landscape resource of the site and surrounding area (up to 5 km). This includes the following landscape character types (LCT): Southern Uplands Forest Covered – Wauchope/Newcastleton, in which the Proposed Development site is located; Southern Uplands with Scattered Forest – Cauldcleuch Head Group; and, Cheviot Hills – Falla Group.

For most commercial wind farms, having some residual significant landscape (and visual) effects is unavoidable, and the level and distribution of assessed significant landscape and visual effects for the Proposed Development are considered to be no more than would be expected for a commercial size wind farm.

The decommissioning effects of the Proposed Development on landscape character are deemed to be not significant. Once decommissioning is complete, there would be no further effects upon landscape character.

#### VISUAL EFFECTS

Theoretical visibility is variable across the study area with the landform and commercial forestry providing screening from some locations.

The assessment found that the Proposed Development would be visible from various nearby properties, settlements as well as the surrounding road and footpath network.

It was assessed that there would be significant visual effects experienced at 11 of the 21 representative viewpoints during daylight hours.

In relation to settlements, the assessment found that residents of Chesters would experience significant visual effects during daylight and dark sky hours.

The assessment of routes found there would be significant effects experienced from limited parts of the Bonchester Bridge & Hill Promoted Path, as well as from the informal various routes and rights of way which pass within 5 km of the site.

The assessment of roads found there would be significant visual effects for an approximate 2.3 km section of the B6357, as the road climbs through Wauchope Forest. Road users would experience intermittent sequential significant effects from sections of the A6088, with westbound travellers experiencing these effects for a slightly greater proportion of the route during daylight hours, compared to eastbound travellers.

The decommissioning effects would be temporary in nature and are unlikely to all occur at the same time during this phase.

The decommissioning effects of the Proposed Development on visual amenity are not deemed to be significant.

#### EFFECTS ON DESIGNATED LANDSCAPES

There are no national landscape designations covering the Proposed Development site. The Northumberland National Park is situated approximately 6.3 km to the east of the nearest turbine. The Teviot Valleys Special Landscape Area (SLA) is situated approximately 3.5 km to the north of the Proposed Development. The Cheviot Foothills SLA is situated approximately 3.6 km to the north-east of the Proposed Development.

The assessment found that the Proposed Development will not compromise the overall integrity of any landscape designations by negatively altering the special qualities for which they have been designated.

#### CUMULATIVE LANDSCAPE EFFECTS

In the case that the other consented and in-planning schemes formed part of the baseline, against which the effects of the Proposed Development were assessed, it was concluded that there would be a slight reduction in the extent of significant effects on the Southern Uplands with Scattered Forest LCT.

In terms of the total effect on landscape character, there would be a notable overall effect on the character of Southern Uplands Forest Covered – Wauchope/Newcastleton LCT and that, collectively, the character area would become one in which the presence of occasional wind farms was a recognised characteristic feature. However, wind turbines would not become the single dominant characteristic feature of the LCT.

In relation to the Southern Uplands with Scattered Forest – Cauldcleuch Head Group LCT, the number of turbines would have a characterising effect on the northern part of the LCT. However, this would occur regardless of the Proposed Development, which would only reinforce this existing effect.

There would be no additional cumulative effects of the Proposed Development on the Cheviot Foothills – Falla Group LCT, due to its location relative to the other consented and in-planning schemes.

#### CUMULATIVE VISUAL EFFECTS

The assessment found there would be no change to the identified visual effects resulting from the Proposed Development and, in terms of the total effect on visual amenity, the addition of the Proposed Development would not result in the overall cumulative impact of turbines being dominant or oppressive in views experienced at various points within the area.

#### RESIDENTIAL VISUAL AMENITY

An assessment of the effects on views from residential properties within 3 km of the nearest wind turbine of the Proposed Development was undertaken.

Having considered the relationship between the proposed turbines and the residential properties within the 3 km study area, the assessment concluded that 8 of the properties would experience a significant visual effect on the view from a part of their house, garden, or principal access route.

However, in all cases, the properties would all continue to have other views available that are not affected by the proposed turbines and it is not the case that any of the visual effects would be of such a scale that they would become dominant or overbearing.



#### AVIATION LIGHTING ASSESSMENT

An assessment of the landscape and visual effects in relation to visible aviation lighting is included in the Landscape and Visual Impact Assessment. Six of the turbines are proposed to have visible aviation lighting which consists of a medium intensity 2000 candela light mounted on the turbine hub (with the option to dim these lights to 200 candela in clear weather conditions).

The Proposed Development would result in significant effects during dark hours on the landscape resource of the site and surrounding area (up to 5 km). This includes the following landscape character types (LCT): Southern Uplands Forest Covered - Wauchope/Newcastleton, in which the Proposed Development site is located; Southern Uplands with Scattered Forest - Cauldcleuch Head Group; and, Cheviot Hills - Falla Group.

It has been assessed that there would be significant visual effects experienced at 10 of the 21 representative viewpoints during the hours of darkness. In relation to settlements, the assessment found that residents of Chesters would experience significant visual effects during dark sky hours. The assessment of routes found there would be significant effects experienced at night from limited parts of the Bonchester Bridge & Hill Promoted Path, as well as from the informal various routes and rights of way which pass within 5 km of the site. Road users would also experience intermittent sequential significant effects from sections of the A6088, with eastbound travellers experiencing significant sequential effects over a slightly greater proportion of the route during the hours of darkness than westbound travellers.



## ARCHAEOLOGY AND CULTURAL HERITAGE

A desk based assessment and assessment of setting were undertaken to identify known heritage assets and the potential for currently unrecorded assets within the Proposed Development site. A final list of receptors were agreed with Historic Environment Scotland (HES) and taken forward for assessment as part of the EIA.

Direct construction impacts upon known heritage assets would be limited to potential impacts upon non-designated trackways of the Wheel Causeway (non-designated section) and Croft Plantation Holloway within the turbine area, and non-designated Martinlee Sike Archaeological Landscape and Scheduled Monument SM6602 Martinlee Sike, farmstead, field system and assart bank within the access area. With the inclusion of mitigation, including avoidance of groundworks within the scheduled monument, demarcation of known heritage assets prior to construction and a programme of archaeological works, which would be described in a written scheme of investigation and agreed with SBC and HES as appropriate, potential impacts are considered to be negligible and therefore not significant.

Overall, the Proposed Development site is of generally low archaeological potential; however, this may be up to medium potential in the vicinity of known heritage assets. With the inclusion of a programme of mitigation to offset any potential direct effects on previously unknown heritage assets which may exist within the application boundary, the potential direct construction impacts on unknown Cultural Heritage assets are considered to be negligible and therefore not significant.

Indirect construction effects would be temporary and not significant.

Operational effects on the setting of heritage assets have been considered. The visual change to heritage assets has been assessed through desk-based study and through site visits to confirm their existing setting and how this contributes to their significance. This has found the Proposed Development would have a minor adverse effect on seven Scheduled Monuments and one non-designated heritage asset; however, these would not constitute a significant effects. A cumulative assessment also found there would be no significant operational effects with cumulative wind farms.

No significant residual decommissioning effects have been identified.



## ECOLOGY

Baseline ecological conditions to inform the design and assessment of the Proposed Development have been established through a desk study review of existing information and ecological field surveys, informed through consultation with NatureScot, species specialists and biological recording groups.

There are four statutory designated sites within 2 km of the Proposed Development site, including the River Tweed Special Area of Conservation (SAC), Borders Wood SAC, Cragbank and Wolfhopelee Site of Special Scientific Interest (SSSI) and Kielderhead Moors SSSI. Baseline studies have established the habitat onsite comprises bare ground, mature and immature coniferous plantation, clear fell, open water and plantation broadleaved woodland, which are of low botanical interest. Individual areas of botanical interest have been identified across the Proposed Development site, such as discrete bog habitat.

Low levels of bat activity were recorded on-site during baseline surveys, with habitats considered to provide limited roosting and foraging opportunities for bats. Desk-based surveys established the use of the site by otter and badger, as well as the presence of common reptiles and amphibians. Water vole and red squirrel were considered to be absent and watercourses intersecting the site were considered to be of low value for fish.

The site layout has inherently sought to minimise losses of sensitive habitats. The design of the Proposed Development has also sought to minimise potential impacts on protected species. Consideration was given to the location of key bat habitat features (such as watercourses and woodland edges), with appropriate stand-off buffers adopted between turbines and such features in accordance with NatureScot guidance. The number of watercourse crossings has been minimised, and the track layout designed to avoid potential impacts on a badger sett.

Good practice measures, including preconstruction surveys and appointment of a suitably qualified Environmental Clerk of Works (ECoW), will also ensure the protection of protected species during the construction and operational phases of the Proposed Development.

The ecological assessment predicted no significant residual effects upon any important ecological features (alone or cumulatively with any other wind farm development), when mitigation measures were taken into account.

Furthermore, habitat management measures will be undertaken in accordance with a Construction Environmental Management Plan (CEMP). The Proposed Development provides an opportunity to deliver notable habitat improvements within the Proposed Development site, including planting native broadleaves and riparian woodland. Such mitigation and habitat improvement measures are set out in an Outline Habitat Management Plan, which is included as part of the EIA Report.



## ORNITHOLOGY

Baseline ornithological conditions to inform the design and assessment of the Proposed Development have been established through a desk study review of existing information and ornithological field surveys, informed through consultation with NatureScot, species-specialists and ornithological recording groups.

The desk-based study has identified a Special Protection Area (SPA), Langholm-Newcastleton Hills, and two SSSIs (one of which underpins the SPA), Kielderhead Moors, within 20 km of the Proposed Development. However, given the distance from the designated sites compared to the foraging distance of the qualifying ornithological species it is considered that there is no potential for significant effects on designated sites.

Based on the survey data, the only species considered to be an Important Ornithological Feature was goshawk. Potential impacts, including cumulative impacts, on Goshawk during construction (including disturbance and habitat loss), operation (including collision risk and displacement), and decommissioning were assessed.



During construction, there would be the potential for one goshawk territory to be impacted, as a worst case. Although felling may result in a slight reduction of nesting and foraging habitat it could also create opportunities for nesting and foraging due to the opening up of forestry and provision of better vantage points for birds. In addition, displacement effects are unlikely given the similarity between the construction of the Proposed Development and the existing forestry operations. Therefore, potential habitat loss and construction displacement impacts are considered to be negligible and low respectively, and therefore not significant in EIA terms.

During operation, potential impacts resulting from aviation lighting are considered negligible given that Goshawks, as a predominantly woodland species, would be screened from aviation lighting by trees surrounding nest sites. Collision risk impacts are also considered to be negligible owing to hunting flights typically occurring below the collision height and potential nest sites unlikely to occur within the turbine area, Goshawk are also considered to be adept at avoiding collisions.

Decommissioning effects are considered to be similar to construction effects but of shorter duration and therefore not significant.

Given the predicted impacts, no significant effects were found in relation to ornithology during the construction, operation and decommissioning stages of the Proposed Development.



## GEOLOGY, HYDROLOGY HYDROGEOLOGY AND PEAT

The Proposed Development has been assessed in relation to the potential impacts on hydrology, hydrogeology, geology and peat during the construction, operational and decommissioning phases. Information on the study area was compiled using data gathered within a desk study and verified by an extensive programme of fieldwork.

A detailed programme of peat depth and condition surveying has been completed and the results used to inform the site design and a Peat Management Plan has been produced for the Proposed Development. As a result, areas of peat have been avoided as far as possible and peat resources will be safeguarded.

Site design has also ensured that all excavation works requiring removal of bedrock or superficial deposits have been kept to a practical minimum, including use of existing tracks and existing watercourse crossings as far as possible.

The applicant is committed to undertaking additional mitigation for other potential impacts. This includes adherence to best practice measures in the excavation, storage and re-establishment of soil and peat; implementation of sediment control mechanisms and water quality monitoring of surface water and groundwater; installation of water control measures and drainage ahead of excavation works and around long-term infrastructure; regular monitoring and maintenance programme to ensure that project infrastructure remains fully operational and in good condition; and adherence to guidance and legislation for pollution prevention.

Flood risk within the site is shown to be minimal. River flooding would be confined to the main channels of the Jed Water, Black Burn and Carter Burn, which have a high likelihood of flooding. There are also small isolated locations of flood risk scattered across the site. Downstream of the site, high flood risk is present within the Jed Water flood plain and along the Catlee Burn and Rule Water. With the implementation of the proposed mitigation measures, there would be no change from natural pre-development runoff so the potential effect is considered negligible.

Potential groundwater-dependent terrestrial ecosystems (GWDTE) have been identified within the Proposed Development site and assessed on a case-by-case basis to determine their level of groundwater dependency and potential impacts from development. Location-specific mitigation measures are provided to manage potential impacts arising from construction where it has not been possible to avoid these areas.

It has been assessed, as a consequence of the site design and proposed mitigation, that the Proposed Development would not result in any significant impacts on hydrology, hydrogeology, geology and peat.



## NOISE AND VIBRATION

Noise will be emitted by equipment and vehicles used during the construction and decommissioning of the Proposed Development, and by the turbines during operation. The level of noise emitted by the sources and the distance from those sources to the receptor locations are the main factors determining levels of noise at receptor locations.

Construction noise has been assessed by a desk-based study of a potential construction programme and by assuming the Proposed Development is constructed using standard and common methods. Noise levels have been calculated for receptor locations closest to the areas of construction and compared with guideline and baseline values.

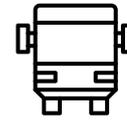
Construction noise (including construction traffic), by its very nature, tends to be temporary and highly variable and, therefore, it is much less likely to cause adverse effects. No significant construction effects are predicted, good practice measures would be implemented through the CEMP.

Operational turbines emit noise from the rotating blades when they pass through the air, which is sometimes described as having a regular 'swish' sound. The amount of noise emitted tends to vary depending on the wind speed. When there is little wind, the turbine rotors will turn slowly and produce lower noise levels than during high winds when the turbine reaches its maximum output and maximum rotational speed. Background noise levels at nearby properties will also change with wind speed, increasing in level as wind speeds rise due to factors, such as wind passing through trees and around buildings, making the noise from the turbines less perceptible.

The assessment found, during the operation of the Proposed Development, the noise immission level would not exceed the ETSU-R-97 limit at any of the noise sensitive receptors. Therefore, the operation of the Proposed Development would cause no significant noise effect and no mitigation would be required.

Decommissioning is likely to result in less noise than during construction of the Proposed Development. The construction phase has been considered to have minor noise effects, therefore decommissioning will, in the worst case, also would have no significant effects.

As a result of the large separation distance between the Proposed Development and the closest noise sensitive receptors, the assessment concluded there would be no significant vibration effects during construction, operation and decommissioning.



## TRAFFIC AND TRANSPORTATION

The potential effects of the Proposed Development on the road network and its users was assessed in the EIA. Potential construction and decommissioning impacts were assessed. Decommissioning impacts were scoped out as decommissioning is likely to comprise a reversal of the construction activities and any effects would not be greater.

The assessment approach followed industry good practice and focuses upon the changes in traffic flows along specific sections of roads along which general and HGV construction traffic will pass.

The main construction traffic access routes would be predominantly from the north, via the A68, A696 and A6088. The access routes for abnormal loads associated with the delivery of wind turbine generator components to the Proposed Development site would be from the south-east, from the Port of Blyth, via the A1, A696, A68 and A6088.

The assessment was undertaken taking account of consultation responses from SBC and Transport Scotland. The method adopted included desk-based assessment, site visits and traffic modelling.

The main impact upon traffic from the Proposed Development is predicted to be during the construction phase as a result of the increased number of HGV movements. To minimise adverse traffic and transport effects during construction, a Construction Traffic Management Plan (CTMP) will be prepared by the applicant and agreed with SBC in advance of measures being put in place. With this mitigation, the assessed environmental effects on traffic and transportation are predicted to be negligible.

After the construction of the Proposed Development, there would be very little change in baseline traffic volumes. Only occasional access for maintenance will be required, therefore, operational effects were not considered in the assessment.

To mitigate any adverse issues that could affect the public road network throughout the operational life of the site, the site entrance would be well maintained and monitored, with regular maintenance being undertaken to keep the track drainage systems fully operational and the road surface in good condition.



STOCK IMAGE



## SOCIO-ECONOMIC, LAND USE AND RECREATION

An assessment of the potential socio-economic effects of the Proposed Development and the likely significance of these on tourism, recreation, land use economic output, employment generation and other indirect effects was undertaken.

Based on the installed capacity, the assessment of the Proposed Development's socioeconomic impact found that:

- the development expenditure during the construction phase is estimated to be approximately £114.6 million, approximately £11.3 million of which would be spent in the local (Scottish Borders) economy and approximately £36.9 million in Scotland as a whole;
- during the 21 months construction phase, the Proposed Development is expected to directly and indirectly support approximately 74.9 jobs locally and 319.7 jobs nationally;
- the local economy would be expected to be boosted by a total of £5.5 million of net Gross Value Added (GVA) during the construction phase. The Scottish economy would benefit by £21.2 million net GVA;
- the development expenditure during the operational phase is estimated to be approximately £4.7 million per annum. It is estimated that £2 million would be spent each year in the local economy and £2.7 million would be spent each year in the national economy;
- during the operational phase, the Proposed Development is expected to directly and indirectly support 9.7 jobs locally and 20.9 nationally;
- during the operational phase (assessed over a 35-year life) the Proposed Development would contribute lifetime GVA of around £42 million for the local area and £56 million for Scotland as a whole.

Furthermore, the Proposed Development has committed to annual community funding of £5,000 per MW during the operational life of the Proposed Development. The total community funding would be around £390,000 per year, which would equate to £13.6 million for a 35-year lifetime.

Overall, the Proposed Development is expected overall to have minor or negligible beneficial socio-economic effects, with no significant adverse effects on tourism and land use. Benefits arising through spending by construction workers and operational staff, as well as through the community funding package, would support local businesses and communities as part of a wider cumulative benefit to the economy through the development of renewables and green jobs.



## AVIATION AND RADAR

Wind turbines, in common with other tall obstacles such as pylons or television masts, have the potential to impact on flying interests. Radars are designed to detect movement; hence a turbine's rotating blades can be interpreted as aircraft, with the potential to then affect air traffic management. The potential for the Proposed Development to impact on aviation and radar assets was assessed. At an early stage, relevant stakeholders such as National Air Traffic Services (NATS), Police Scotland and Scottish Air Ambulance, the UK Civil Aviation Authority (CAA), the Ministry of Defence (MoD) and Edinburgh and Newcastle Airports were consulted. As a result of the consultation and assessment work undertaken, suitable mitigation has been agreed and no impacts on any aviation interests are predicted.



## TELECOMMUNICATIONS AND ELECTROMAGNETIC INTERFERENCE (EMI)

Radio waves and microwaves are used in a variety of communications. Structures such as wind turbines have potential to interfere with their reception. As part of the EIA process, consultation was undertaken with bodies that are responsible for managing and maintaining telecommunications networks. No impacts on any telecommunications assets were identified.



## SHADOW FLICKER

Shadow flicker can occur under certain combinations of geographical position and time of day, when the sun passes behind the rotors of a wind turbine and casts a shadow over neighbouring properties. Rotating wind turbine blades can cause brightness levels to vary periodically at locations where they obstruct the sun. As the blades rotate, the shadow flicks on and off which causes the shadow flicker effect. When modelled using a worst case scenario, it was found that properties with potential for shadow flicker would not receive shadow flicker effects for more than the reference limit of 30 minutes per day and/or 30 hours per year. Therefore, no significant effects are predicted.



## CLIMATE CHANGE MITIGATION

In addition to the value that wind farms provide in terms of the renewable electricity they generate; they also provide an important mechanism for the reduction of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases into the atmosphere.

Operational wind farms achieve emissions savings by reducing the consumption of fossil fuel generated mains electricity. However, during their manufacture, construction and decommissioning, wind farms can result in the emission of greenhouse gases, particularly in such instances as where natural carbon stores such as forestry and/or peat are present and potentially impacted by the development.

The Scottish Government has prepared a carbon assessment tool for wind farms to help ensure such cases are avoided, and this assessment tool has been applied to the Proposed Development.

The Proposed Development has been carefully designed to minimise disturbance of areas of peat and requirement for tree felling required to make way for turbines and infrastructure delivery and construction. As such, the carbon calculator confirms that the largest source of carbon emissions associated with the Proposed Development will stem from the manufacture, construction and decommissioning of turbines (189,569 tonnes of CO<sub>2</sub>e), with total emissions, due to the Proposed Development estimated at 179,957 tonnes of CO<sub>2</sub>e.

Once operating, the Proposed Development is predicted to save around 95,748 tonnes CO<sub>2</sub>e per annum. Construction phase carbon emissions will be offset within 1.3 years. A total carbon saving of around 4,030,390 tonnes of CO<sub>2</sub>e is predicted over the lifetime of the wind farm (35 years), which is considered to be a significant positive effect.



## FORESTRY

The Proposed Development site is comprised of commercial forestry plantation. Felling will be required to make way for turbines and infrastructure delivery and construction. Site design has minimised the felling requirement through keyhole felling and the use of existing infrastructure where possible.

Commercial forestry is dynamic and changes to its structure occur regularly as part of normal operations. Commercial forestry is not typically considered a receptor for EIA purposes. However, given the changes to the forest structure and the existing felling and restocking plans, the Forestry Felling and Restocking Plan for the Proposed Development will become the long term forestry plan for the site.

There is also a requirement for compensatory planting for all trees cleared for the Proposed Development under the Control of Woodland Removal policy. The assessment found that there would be 81.96 ha of trees either temporarily or permanently removed. The equivalent of this area would be replanted either onsite or at an alternative site.

As part of the OHMP, there are proposals to replant an existing area of sitka spruce, which would be felled for construction of the Proposed Development, with riparian woodland and to conduct enrichment planting in areas of existing natural reserve.



## POPULATION AND HUMAN HEALTH

The 2017 EIA Regulations state that an assessment of population and human health should be considered during the EIA process. At Scoping stage, it was proposed that this requirement be covered through the findings of other assessments undertaken as part of the EIA process and so no dedicated EIA chapter will be produced. Particular aspects of population and human health are therefore addressed in the Noise, Landscape and Visual, Traffic and Transportation, Aviation and Radar and Other Issues chapters of the EIA Report, as well as in Chapter 2 "Proposed Development". No significant effects are predicted.

## WHAT HAPPENS NEXT?

The Scottish Government Energy Consents Unit will consider the findings of the EIA, of which this NTS forms a part, together with other documents submitted as part of the Section 36 application for the Proposed Development. Once the application has been submitted comments can be made to the Energy Consents Unit – see details below.

If Scottish Ministers were to grant consent for the Proposed Development, then it is envisaged that construction of the Proposed Development could begin in 2027, becoming operational around 2029.



## CONTACT DETAILS

Representations, expressions of support or opposition, and opinions on the Proposed Development should be sent to:

Energy Consents Unit  
4th Floor, 5 Atlantic Quay  
150 Broomielaw  
Glasgow  
G2 8LU

Email: [representations@gov.scot](mailto:representations@gov.scot)

Website: [www.energyconsents.scot/Register.aspx](http://www.energyconsents.scot/Register.aspx)

## FURTHER INFORMATION

Further information can be found on the Millmoor Rig Wind Farm project website at:

<https://www.esbenergy.co.uk/millmoor-rig-wind-farm>

Should you wish to request any further information, please contact:

Email: [millmoorrig@esb.ie](mailto:millmoorrig@esb.ie)

