Artfield Forest Wind Farm

Environmental Impact Assessment Report

Volume 1: Non-Technical Summary

March 2021

Introduction

Artfield Forest Wind Farm Ltd (the Applicant) has applied for consent to construct and operate a generating station incorporating wind turbine generators, energy storage and associated infrastructure with generation capacity of greater than 50 megawatts (MW). The project is referred to as Artfield Forest Wind Farm ('the Proposed Development').

Introduction

The Proposed Development will include up to 12 wind turbines on a site located approximately 8 km northwest of Kirkcowan and 15 km west of Newton Stewart, in Dumfries and Galloway, Scotland. The Site location is shown in Figure 1 (p.3).

An Environmental Impact Assessment Report (EIAR) has been prepared to accompany the application for consent, to assess and report on any likely significant effects of the Proposed Development, and, where it has been possible, sets out how these effects have been reduced or mitigated. This document provides a Non-Technical Summary (NTS) of the EIAR.

Purpose of the NTS

The aim of the NTS is to summarise the content and main findings of the EIAR in a clear and concise manner to assist the public in understanding what the likely significant environmental effects of the Proposed Development are, and where it has been possible, how they have been reduced or mitigated.

The EIAR comprises the following volumes:
- Volume 1: Non-Technical Summary (NTS);
- Volume 2: Main Report;
- Volume 3a: Figures;
- Volume 3b: Visualisations;
- Volume 4: Technical Appendices; and
- Volume 5: Confidential Information.

The Application is accompanied by the following additional documents:
- Planning Statement;
- Design and Access Statement; and
- Pre-Application Consultation Report.

Consultation on the Scope of the EIA

A consultation exercise was undertaken in May 2020 which invited comments from consultees regarding the key environmental issues to be addressed in the EIAR. This process allowed the EIAR to focus on the main areas of interest raised by the various consultees. It was agreed with consultees that impacts which are not likely to be significant could be scoped out of further assessment.

Copies of the EIAR

Paper copies of the EIAR and other documentation are normally made available to view at publicly accessible locations; however the usual requirements have been suspended in response to the COVID-19 pandemic[1]. As such, the EIAR, including all figures, technical appendices and accompanying documents are available to view on the project website (www.artfield-forest.co.uk).

The application documents will be available via the Scottish Government energy consents portal (https://www.energyconsents.scot/Default.aspx).

For anyone who has difficulty accessing the documentation online, a CD or USB copy can be made available on request by calling 0800 772 0668.

Commenting on the Application

When the application for the Proposed Development is lodged with Scottish Government the applicant will advertise the application in accordance with legislation in local and national press. The advertisement will provide details of the date by when representations should be made. The Scottish Government will invite formal representations on the Proposed Development, which will be taken into account before any decision is reached on the application.

Any representations in relation to the application should be made to the Energy Consents Unit mail box, at representations@gov.scot, via the Energy Consents website at www.energyconsents.scot or by post to The Scottish Government, Energy Consents Unit, 4th Floor, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU, identifying the Proposed Development and specifying the grounds for representation. Written or emailed representations should be dated, clearly stating the name (in block capitals), full return email and postal address of those making representations

[1] In accordance with The Electricity Works (Miscellaneous Temporary Modifications) (Coronavirus) (Scotland) Regulations 2020

Site Location

The Proposed Development Site ('the Site') covers an area of approximately 800 hectares (ha) and is located approximately 8 km northwest of Kirkcowan and 15 km west of Newton Stewart, Dumfries and Galloway, Scotland (approximate OS Grid Reference for site centre: (NX 24367 66928) as illustrated in Figure 1.

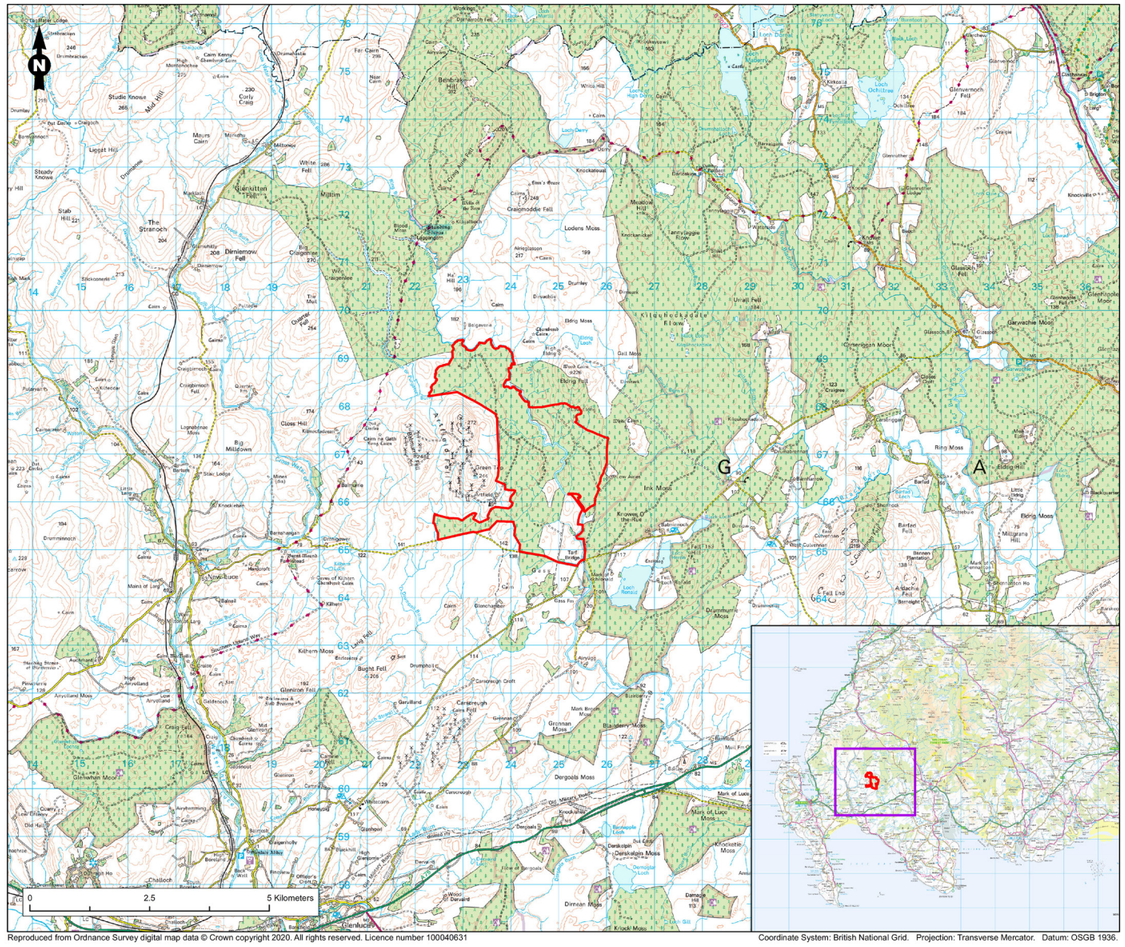
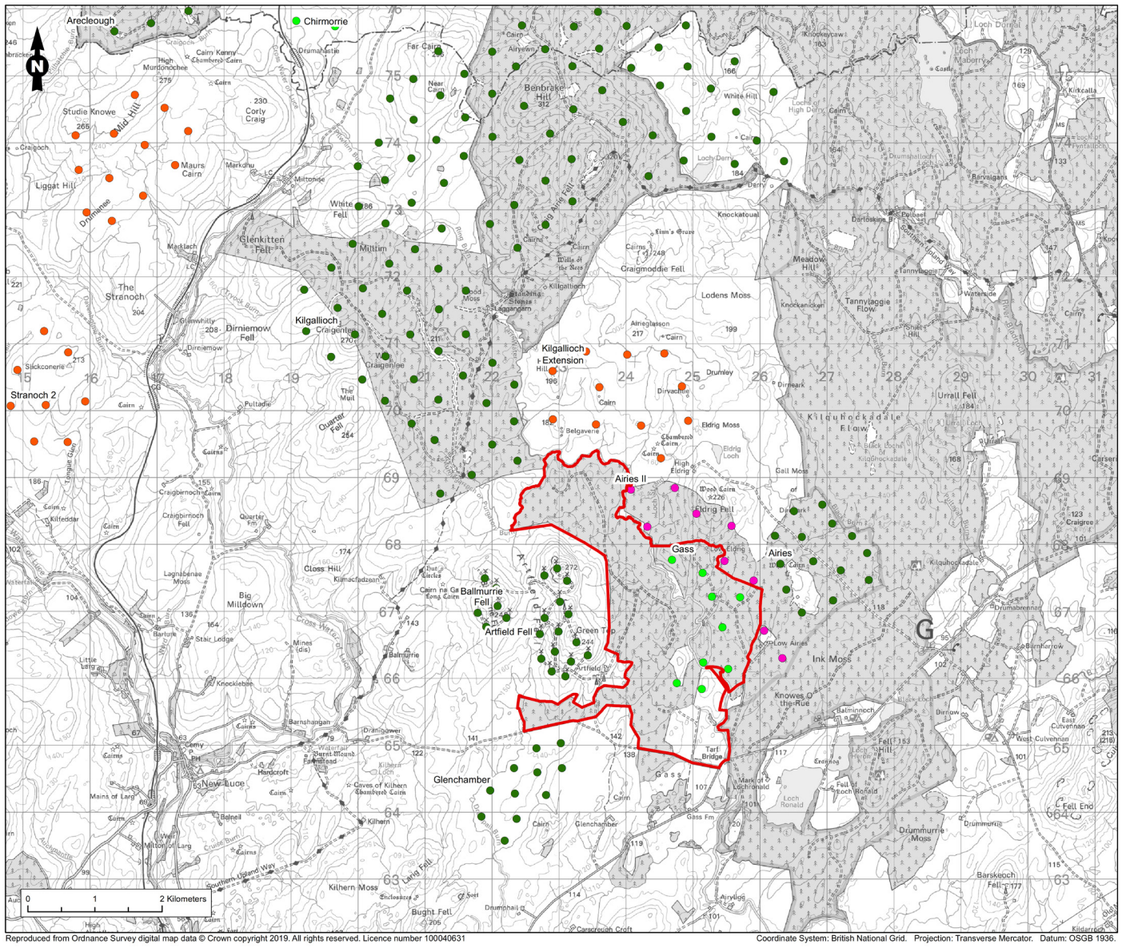


Figure 1: Site Location

Site Location

Operational wind farms are an existing feature of the surrounding landscape. As illustrated on Figure 2: Site Context, Kilgallioch wind farm is located to the north, Airies wind farm to the east, Glenchamber wind farm to the southwest and Artfield Fell and Balmurrie Fell wind farms are located directly west of the Site.



Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Figure 2: Site Context

Legend

- Site Boundary

Cumulative Schemes

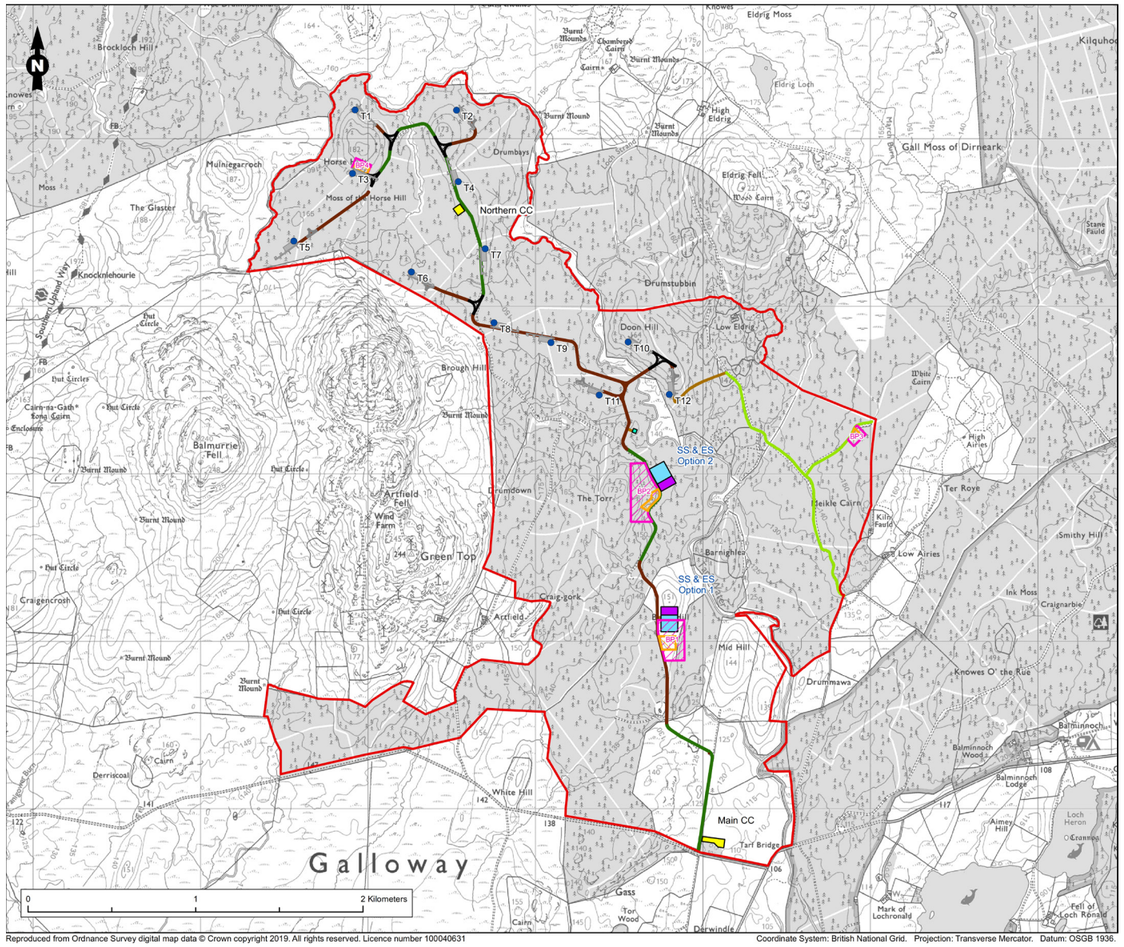
- Operational
- Consented
- In Planning
- Scoping

Note: Consent for Gass Wind Farm has lapsed

Note 2: Consent has been granted for Stranoch Wind Farm in 2016 but a new application, Stranoch 2 Wind Farm has been submitted in 2018 to replace the consented development

Proposed Development Description

The layout of the Proposed Development is shown in Figure 3 below and described in p.6.



Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Figure 3: Site Layout

Legend

- Site Boundary
- Proposed Turbine
- Proposed Turbine Hardstanding
- Existing Forestry Track No Upgrade
- Existing Forestry Track Upgrade
- New Track (Infrastructure only)
- New Track
- Proposed Turning Head (Loaded)
- Proposed Turning Head (Unloaded)
- Proposed Temporary Construction Compound (CC)
- Proposed Substation Option (SS)
- Proposed Energy Storage Option (ES)
- Proposed Met Mast and associated hardstanding
- Proposed Borrow Pit Search Area (BP)
- Potential Borrow Pit Excavation Area

Proposed Development Description

The locations of the proposed turbines and other infrastructure would be constructed in the locations shown in Figure 3 (p.5).

However, it is anticipated and common for a consent to allow for minor changes in turbine or infrastructure locations (micrositing) to respond to possible variations in ground conditions across the Site. Any micrositing required would only be understood following detailed site investigation work carried out immediately prior to construction and would be implemented under the supervision of an independent Ecological Clerk of Works (ECoW) and an appropriately experienced and qualified engineer.

The Proposed Development will be fitted with lighting to comply with relevant aviation regulations. This will comprise a medium intensity light fitted to the nacelle and low intensity lights fitted at half the nacelle height to provide 360 degree visibility To comply with the regulations, all of the turbines would be lit with the exception of T3 and T9 , providing all 'perimeter' turbines with lighting. However, it should be noted that a planning condition is proposed that would allow the Applicant to vary the lighting proposal, which could potentially reduce the current lighting scheme. The condition would allow the Applicant to consider a regional solution in collaboration with other wind farm developments and/or emerging regulations, guidance and technological solutions available nearer to the time of construction.

The Proposed Development would connect to the Newton Stewart Substation to the east of the Site (NX 40032 64907), approximately 15 km from the on-site substation, via a distribution voltage connection. The grid connection would be the responsibility of the Distribution Network Operator (DNO) (Scottish Power Energy Networks) and would be subject to a separate consenting process. As such the details of the grid connection route are unknown at this stage.

The Proposed Development would include the following key components:

- 12 three-bladed horizontal axis wind turbines with a maximum tip height of 180 m;
- Internal/ external transformers and related switchgear at each turbine;
- Permanent foundation and associated crane hardstanding at each turbine location;
- A network of on-site access tracks, with associated watercourse crossings, intervisible passing place and turning heads, connecting between turbines using both new and upgraded existing tracks;
- A control building and substation compound (selecting one of two options);
- An energy storage facility (selecting one of two options);
- Two temporary construction compounds and laydown area (including concrete batching plant);
- Search areas of up to four borrow pits;
- A permanent anemometer mast or LiDAR compound including associated foundations and hardstanding;
- A main site entrance on C3w (existing Gass Farm entrance), for use during construction and operation, designed to accommodate abnormal indivisible loads required for turbine component;
- A secondary site access for use during construction only;
- A network of underground cable arrays within the Site connecting the turbines to the onsite substation;
- Forestry felling and restocking and associated ancillary work; and
- Engineering operations which includes for example turbine foundations, access tracks, and peat excavation and restoration work.

Proposed Development Description

The construction of the Proposed Development would take approximately 18 months.

Construction Activities

The typical construction hours of work would be Monday to Friday 0700 to 1900 and Saturday 0700 to 1300. No works, with the exception of turbine delivery, the completion of turbine erection or emergency work, will take place outside these hours, and any such out-of-hours works will be subject to prior agreement with Dumfries and Galloway Council (DGC).

A Traffic Management Plan would be agreed in consultation with DGC and Transport Scotland prior to construction commencing to avoid and reduce potential effects associated with construction traffic during working hours.

A Construction Environmental Management Plan (CEMP) would be implemented during construction to avoid, reduce or control associated adverse environmental effects. The CEMP would, as a minimum, include details of:

- construction methodologies;
- pollution prevention measures;
- public liaison provision;
- peat slide, erosion and compaction management;
- ecological management;
- archaeological mitigation measures;
- control of contamination/pollution prevention;
- drainage management and Sustainable Drainage Systems (SuDS);
- water quality monitoring;
- management of construction traffic;
- control of noise and vibration; and
- control of dust and other emissions to air.

Operation Management and Maintenance

The expected operational life of the turbines would be 30 years from the date of final commissioning.

Despite being designed to operate largely unattended, staff would be employed to monitor the turbines and to manage the Proposed Development.

Routine maintenance of the turbines would be undertaken approximately twice yearly. This would not involve any large vehicles or machinery.

Residue and Emissions

The EIAR has considered the potential for residues and emission associated with the construction and operation of the Proposed Development. As required by the EIA Regulations, this includes consideration of: water; air; soil and subsoil; noise and vibration; light; heat and radiation; and waste. With the implementation of the CEMP, no significant residues or emissions have been identified during the construction phase. No significant residues or emissions would result from the operation of the Proposed Development.

Design Evolution and Alternatives

Figure 4 (p.9) summarises the design evolution of the proposed turbine layouts for the Proposed Development from layout 1 (known as 'Pre-Scoping' Layout) to layout 4 (Design Freeze Layout).

Site Selection Considerations

Statkraft UK are committed to delivering onshore wind within Scotland to help contribute to reaching the net zero goals. As part of delivering on this objective, Statkraft are actively pursuing potential wind farm developments throughout Scotland.

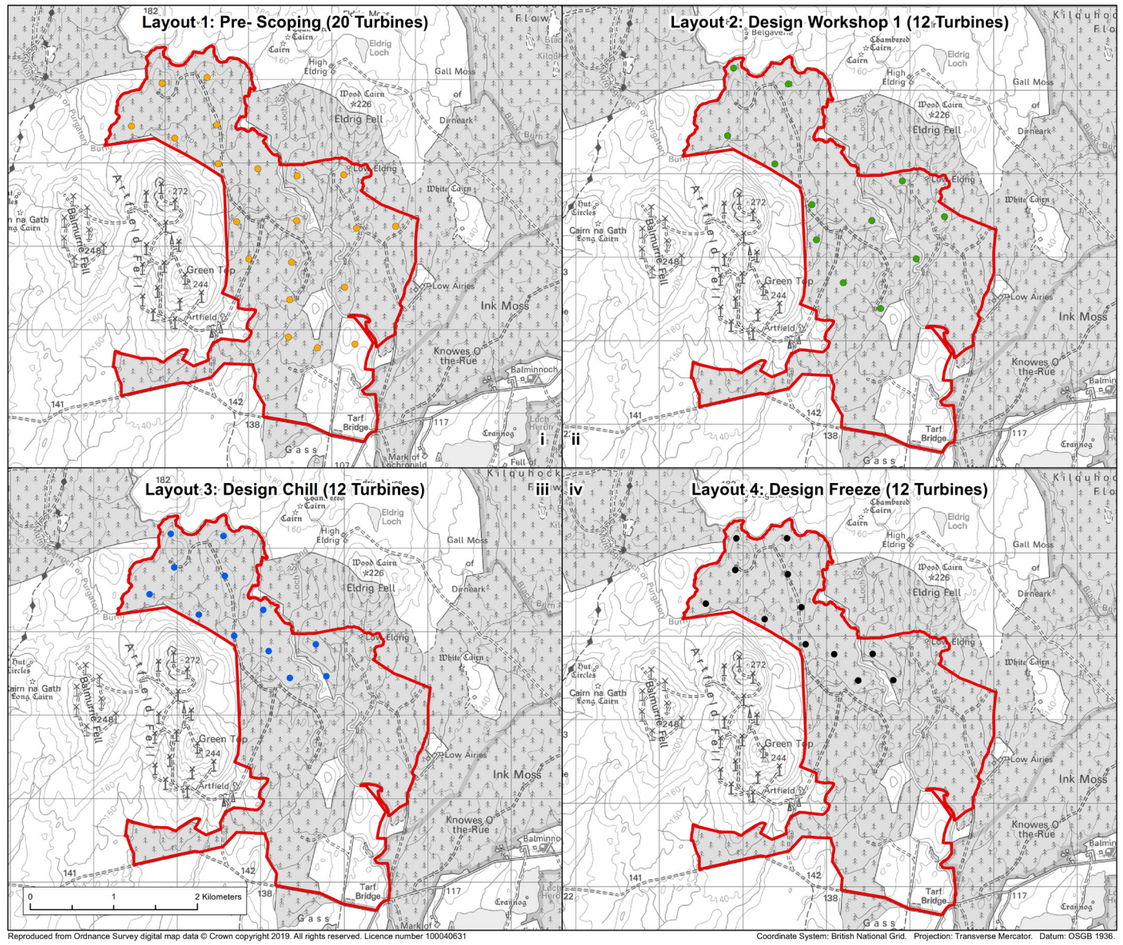
The Site covers an area of approximately 800 hectares and has been chosen for wind farm development for a number of reasons:

- The eastern section of the Site was previously the subject of a planning consent for Gass Wind Farm, a project developed by Willowind Energy Limited – while a review of the consented (now lapsed) Gass Wind Farm by the previous developer concluded that there would be no economically viable route to market for the Gass Wind Farm project; an assessment by the Applicant identified the feasibility of developing an entirely new application for consent for a larger scheme across a wider landholding;
- The Site is located in an area primarily consisting of productive coniferous woodland plantation, which would continue to be subject to periodic felling and replanting either with or without the Proposed Development, meaning the Site is of limited nature conservation value;
- With the exception of the River Bladnoch Special Area of Conservation (SAC), the Site has no potential direct effects on areas protected by law for nature conservation;
- Wind farms are a key characteristic of the existing landscape character and the Proposed Development can be argued to represent 'infill' within the existing and emerging pattern of wind farm development;
- The Site is not within any formal landscape designations; and
- The Site is relatively distant from settlements and well used roads.

Design Evolution and Alternative Layouts

A range of site layouts were assessed, with layout 4 selected as best balance of addressing environmental impacts whilst being commercially ensuring significant renewable energy generation. The main environmental reasons for selecting layout 4 include:

- Turbines located to the north and west of the Site, 'infilling' between Kilgallioch (and Extension), Airies (and Airies II), increasing the separation from the edge of the upland plateau to the south, further from settled farmland, residential properties and transport corridors.
- Turbines are at least 1 km from residential properties (with only two properties within 2 km), protecting residential amenity in terms of both views and noise.
- The layout avoids, or where this is not possible, minimises impacts on all known cultural heritage assets within the Site.
- Turbines would not appear in the backdrop of view to Wood Cairn (SM1953) when viewed from the non designated cultural heritage assets located to the north. With turbines clearly positioned on lower ground to the west and with visual separation, fundamentally altering the 'dominance' of Wood Cairn (on Eldrig Fell) over the surroundings is avoided.
- The layout incorporates suitable watercourses buffers, sufficient to protect the SAC and relevant protected species including bats, water vole and otter.
- The design avoids effects on telecommunications links and radar.
- The layout maximises the use of existing access tracks, reducing the 'new' infrastructure footprint and optimising, in this case limiting, woodland removal.
- The layout minimises the number of watercourse crossings required, avoiding likely significant effects on the water environment as far as possible.
- The layout avoids development on areas of deeper peat where possible and avoids all 'priority peatland habitat'.



Legend

- Site Boundary
- Proposed Turbine (Pre-Scoping)
- Proposed Turbine (Design Workshop 1)
- Proposed Turbines (Design Chill)
- Proposed Turbines (Design Freeze)

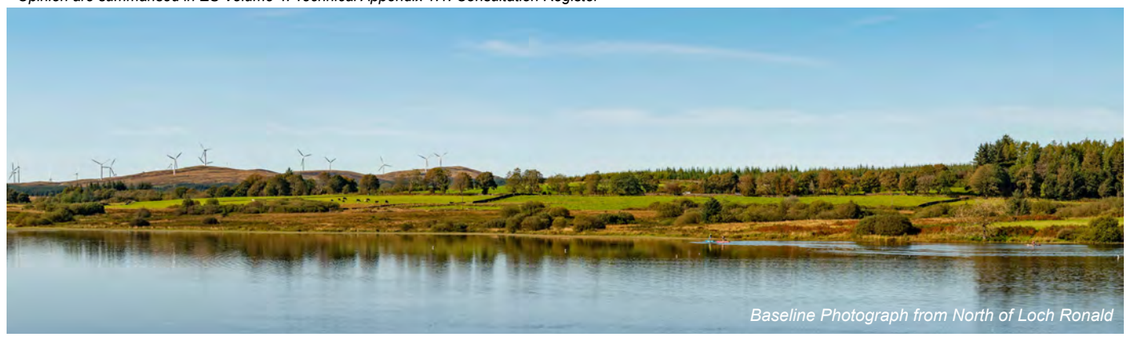
Figure 4: Design Evolution

Potential Environmental Effects

The EIA process is designed to identify the likely significant effects that the Proposed Development could have on the environment and where it has been possible, set out how they have been reduced or mitigated. The EIA considered the environmental impacts across a range of factors, in accordance with the EIA Scoping Opinion issued by Scottish Ministers[2]. The conclusions of the EIA are that potential likely significant effects were identified for a number of topics (see bullet list below) however these would be reduced to a non-significant level through the application of mitigation. The only exception to this is for landscape and visual; and archaeology and cultural heritage impacts where some significant residual effects would remain.

- Landscape and Visual;
- Archaeology and Cultural Heritage;
- Ecology and Ornithology;
- Hydrology, Hydrogeology and Geology;
- Traffic and Transport; and
- Forestry.

[2] A Scoping Opinion was received from Scottish Ministers on 20 August 2020. Contents of the Scoping Opinion are summarised in ES Volume 4: Technical Appendix 1.1: Consultation Register



Baseline Photograph from North of Loch Ronald

Landscape and Visual

Careful siting and design of the Proposed Development has successfully minimised potential effects on landscape and visual receptors.

Of the 36 Landscape Character Types (LCT) within the study area, likely significant effects have been limited to localised areas within the Plateau Moorland with Forest LCT when considering the Proposed Development on its own. When considering the Proposed Development in combination with other wind farm developments, likely significant cumulative effects are predicted for 13 of the 36 LCT in the study area; although it is noted that the Proposed Development makes a relatively minor contribution within the context of existing and proposed wind farm development which is already a defining characteristic of the moorland plateau landscape.

Similarly, in terms of visual receptors when considering the Proposed Development on its own, likely significant effects have been successfully limited to:

- localised parts of the Southern Upland Way (SUW) within approximately 6 km of the proposed turbines (there would be no significant effects on the remainder of the SUW within the study area);
- localised parts of the Moors of Wigtownshire Walk Core Path within the Tarf Bridge section of the path (no significant effects are predicted on the western sections of this footpath); and
- the Three Lochs Kirkcowan Core Path.

A detailed viewpoint assessment was undertaken using representative locations and receptors. This identified predicted significant effects at four of the 21 selected viewpoints. An assessment of settlements and transportation routes concluded that the Proposed Development would not result in any likely significant effects on its own or in addition to cumulative wind farm developments.

When considering the cumulative effects of the Proposed Development in combination with other wind farm developments, the significant effects are relatively more widespread (identified at 16 of the 21 selected viewpoints), and for localised parts of the settlements and sections of both transportation and recreational routes. This again reflects the context of existing and proposed wind farm development, with the Proposed Development playing a negligible to minor role in adding to significant cumulative effects, except within very close proximity (6km) of the Site.

Baseline Photograph from Wood Cairn, Eldrig Fell

Cultural Heritage and Archaeology

Fifteen known heritage assets are within the Site. No significant impacts are expected upon these as the design process has largely achieved mitigation through avoidance. Possible significant effects upon hitherto unknown archaeological remains has been considered and mitigation measures have been suggested to ensure identification, assessment and recording of any such assets as required.

This assessment has identified a large number of Scheduled Monuments (93), one non-statutory heritage asset and the eastern boundary of New Luce Conservation Area within 5 km of the Site. A further 157 Scheduled Monuments and 84 non-statutory heritage assets are situated between 5 km and 10 km of the Site. The design of the Proposed Development limits likely significant effects to two Moderate and Significant effects upon heritage assets during the Operational Phase of the Proposed Development. These would result from impacts upon the settings of the Scheduled Wood Cairn (Site 242) and the non-designated High Eldrig Cairn (Site 328), which are both within 1 km of the Site.

Significant cumulative effects are also expected upon Wood Cairn (Site 242) and High Eldrig Cairn (Site 328). In the cumulative scenario, which includes the Proposed Development along with the proposed Kilgallioch Extension and proposed Airies II, it is noted that most of the likely significant effect during the opertional phase would be attributed to the Kilgallioch Extension and Airies II developments.

Traffic, Transport and Access

The assessment considered likely significant effects on traffic, transport and access associated with the construction, operation and decommissioning of the Proposed Development.

During the construction phase of the Proposed Development there would be a temporary increase in traffic flows. General construction traffic movements would be managed through the provision of a Construction Traffic Management Plan (CTMP) to reduce the traffic impacts and effects associated with the Proposed Development. Where applicable the CTMP would include management of construction vehicle routing, delivery control, use of warning and information signs.

The CTMP would include a Transport Management Plan for Abnormal Indivisible Load traffic.

The Proposed Development would not result in any significant effects either on its own, or in combination with other projects in relation construction traffic.

Once the Proposed Development is operational, the volume of traffic associated with the operations would be minimal, relating to maintenance of wind turbines only. There would be no significant residual effects from the operational phase of the Proposed Development.

Ecology and Ornithology

An ecological assessment focussed on the effects of construction, operation and decommissioning of the Proposed Development upon ecological features.

Detailed desk-based studies and field surveys were completed, including habitat surveys, protected species surveys, bat activity surveys, breeding bird surveys and bird flight activity surveys. Effects of the following impacts were considered: habitat loss/ deterioration, mortality/ loss of life and disturbance/ displacement of species.

The impact assessment included consideration of mitigation proposed, which includes a Construction Environmental Management Plan (CEMP), Species Protection Plans, a construction phase breeding bird protection plan, presence of an ECoW and 50 m buffers to watercourses.

The conclusions of the impact assessment are that there would be no likely significant effects on either ecological or ornithological receptors. This is because of their absence from the Site, they are considered of low conservation value, the type and frequency of field signs present, the small extent of the sensitive habitat, or the negligible scale of potential effects.

Otter

Hydrology, Hydrogeology and Geology

The assessment considered likely significant effects on the water environment, taking account of the hydrological, hydrogeological and geological characteristics of the Site. The assessment considered effects on water quality, flood risk, water resources, private water supplies (PWS) and ground water dependent ecosystems (GWTDE).

The topography of the Site is such that the Proposed Development is entirely within the catchment of the Tarf Water. The Tarf Water is included as part of the River Bladnoch Special Area of Conservation (SAC). While there is peat present, the majority of the peat has been degraded by the extensive forestry plantation within the Site. The Proposed Development avoids all priority peatland habitat areas.

All construction phases would be carried out in accordance with a site-specific CEMP which would include: pollution prevention control measures; adoption of 50 m buffer from surface water features; use of sustainable urban drainage systems; applications for the relevant licences/ authorisations for abstractions, discharges and watercourse crossings; and management and reinstatement of peat in line with the peat management plan.

During the operational phase there would be ongoing maintenance of all on-site drains and culverts to ensure the effective operation of drainage measures, preventing flow disruptions and associated increased flood risk, sediment transport etc. This would ensure that silt management measures remain effective for the lifetime of the Proposed Development.

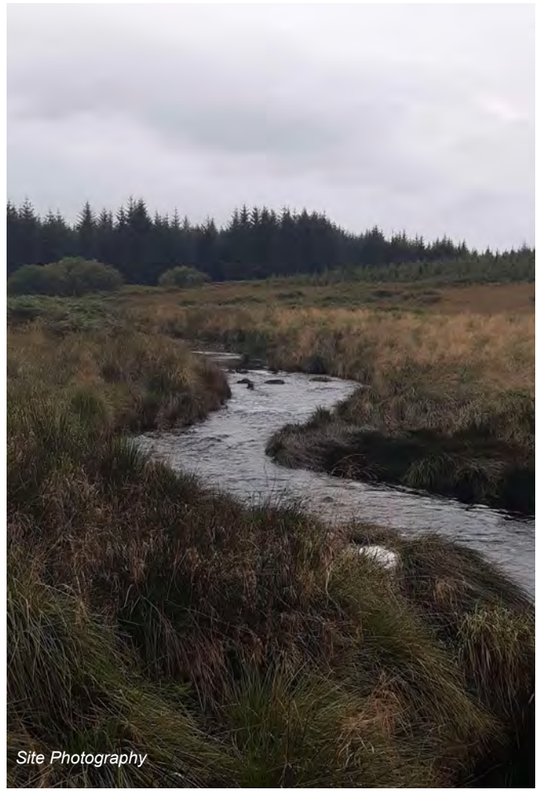
The assessment notes that, with the implementation of the proposed mitigation, there would be no likely significant effects.

Aviation and Telecommunications

An aviation and telecommunications assessment considered the potential for conflict with:

- Air traffic control and air defence primary surveillance radars;
- Meteorological Office rainfall radars;
- Secondary surveillance radars and aeronautical radio navigation aids;
- Eskdalemuir seismic monitoring station;
- Licensed, certificated and Government aerodromes;
- Unlicensed aerodromes, airstrips and gliding sites; and
- Fixed telecommunications links within 5km.

The assessment has identified no significant effects on aviation or telecommunications as a result of the construction, operation or decommissioning of the Proposed Development.



Site Photography

Noise

The assessment considers the likely significant effects with respect to the noise associated with the construction, operation and decommissioning of the Proposed Development. The assessment considered effects on the potential noise impacts at the nearby dwellings during the construction (which includes consideration of decommissioning) and operational phases.

Best practice guidance was used to derive appropriate noise limits for both the construction and operational phases of the Proposed Development, taking account of the Proposed Development alone and taken in combination with other cumulative developments. Modelling provided in the EIAR demonstrates that the Proposed Development could operate within both construction and operational stage noise limits, and therefore no likely significant effects are identified.

Socioeconomics

A desk-based assessment considered the potential for effects on socioeconomic indicators, tourism routes and recreation associated with the construction and operation of the Proposed Development.

The assessment has identified that the Proposed Development would support between 227 and 327 job years during construction across the UK economy. Overall the socioeconomic effects of the capital investment, employment and GVA to the economy are considered to be beneficial (short term during construction, long term during operation). In combination with other similar renewable energy developments, the economic benefits are considered to contribute to significant cumulative beneficial effect for the Scottish economy.

It is noted that the Proposed Development would also generate a beneficial effect on the local economy as a result of community funding provided by the developer with an estimated contribution of approximately £10 million during the operational life of the Proposed Development.

No significant adverse effects as a result of the construction or operation of the Proposed Development have been identified and therefore no mitigation is required.

Forestry

A desk-based assessment considered the likely significant effects on the forests and woodland associated with the construction, operation and decommissioning of the Proposed Development.

The forestry study area within the Proposed Development consists of three privately owned productive conifer forests. Artfield Forest, Gass Forest and Meikle Cairn Forest covering a combined area of 785.24 ha.

The Proposed Development would require 54.37 ha of woodland to be permanently felled for the infrastructure including tracks and stand-off distances between trees and turbines. Temporary felled areas would be replanted to a key-hole design. In the absence of mitigation, this would be a significant effect when considering the Scottish Government policy on the Control of Woodland Removal.

The Applicant is committed to providing appropriate compensatory planting. Following completion of the compensatory planting, the residual effect of the Proposed Development would be not significant.

Shadow Flicker

The assessment considers the potential impacts on residential amenity resulting from shadow flicker from the Proposed Development. The assessment indicates that there would be zero shadow flicker hours experienced at the one property identified within the shadow flicker study area.

Climate

The results of the carbon calculator show the estimated carbon payback period of the Proposed Development would be between 0.7 and 4.4 year, with an expected value of 1.9 years when considered against a fossil fuel mix of electricity generation[3]. The carbon payback period therefore confirms a net beneficial environmental effect from the Proposed Development.

[3] When considered in comparison to the equivalent CO_2 emissions that would be generated from the same electricity generation using fossil fuels.

Site Photography

Photomontage from Bruce's Stone, Merrick Car Park

Summary

As a result of a combination of design-led mitigation and additional proven construction phase mitigation measures, the EIAR concludes that likely significant effects associated with the proposed development, alone and in addition to other wind farm developments, are limited to landscape and visual effects (in localised areas within 6 km of the Site) and on two heritage assets (within 1 km of the Site), during the operational phase of the Site.

No residual significant effects are identified for considering ecology, ornithology, hydrology, hydrogeology, geology (including peat), noise, traffic and transport, aviation, telecommunications, shadow flicker, socioeconomics, forestry and climate.

Statkraft

RAMBØLL