Non-Technical Summary

Windburn Wind Farm

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Revision Record

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Table of Contents

Figures

Acronyms and Abbreviations

Abnormal Indivisible Load Vehicle	AILV
Automatic Traffic Counters	ATC
Battery Energy Storage System	BESS
Chartered Institute of Ecology and Environmental Management	CIEEM
Construction and Environmental Management Plan	CEMP
Construction Traffic Management Plan	CTMP
Energy Consents Unit	ECU
Environmental Clerk of Works	EnvCoW
Environmental Impact Assessment	EIA
Gross Value Added	GVA
Groundwater Dependent Terrestrial Ecosystem	GWDTE
Habitat Management Plan	HMP
Hectares	Ha
Heavy Goods Vehicles	HGV
Institute of Environmental Management and Assessment	IEMA
Landscape and Visual Impact Assessment	LVIA
Light Goods Vehicles	LGV
Local Area of Influence	LAI
Local Nature Conservation Site	LNCS
megawatts	MW
Megawatt hours	MWh
Metres	m
Ministry of Defence	MoD
National Grid Reference	NGR
Non-Technical Summary	NTS
Primary Surveillance Radar	PSR
Road Safety Risk Assessment	RSRA
Section 36	S36
Sustainable Drainage Systems	SuDS
Wider Study Area	WSA
Zone of Theoretical Visibility	ZTV

1.0 Introduction

This Non-technical Summary (NTS) summarises the Environmental Impact Assessment (EIA) Report for the proposed Windburn Wind Farm.

Windburn Wind Farm Limited (the applicant), proposes to construct and operate a wind farm comprising 13 wind turbines with associated infrastructure (the proposed development) on land (the site) approximately 2.9km north of the settlement of Alva. The nearest proposed turbine is 3.2km from Alva, 5.3km from the village of Blackford and 5.7km from Greenloaning. The site is located across the administrative boundaries of both Clackmannanshire and Perth & Kinross Councils, centred on National Grid Reference (NGR) NN 87737 02889. The area contained within the planning boundary is approximately 1,474 hectares (ha). The location of the proposed development and application boundary are shown in **Figure 1** and **Figure 2**.

The proposed development would consist of up to 13 three bladed horizontal wind turbines, 149.9 metres (m) to blade tip height, with associated infrastructure, and a battery energy storage system (BESS). The turbines would have an installed capacity of approximately 65 megawatts (MW), in addition to an energy storage system of up to 35MW,

Based on the wind resource across the site, the proposed development would produce an average of approximately 227,760 Megawatt hours (MWh) of electricity annually (which corresponds to a capacity factor of 40%). This equates to the power consumed by approximately 70,317 average UK households[1].

The generating capacity of the proposed development would exceed 50MW and as such an application is being submitted to the Energy Consents Unit (ECU) of the Scottish Government for consent under Section 36 of the Electricity Act 1989[2] , with the applicant also seeking a direction that deemed planning permission is granted.

Environmental effects of the proposed development have been considered via an EIA. The EIA Report presents the findings of the EIA process by describing the proposed development, the current conditions at the site and the likely effects and impacts (as well as their significance) which may result from the proposed development. Where appropriate, mitigation is proposed, and any residual impacts are reported. The results of the EIA are presented within the EIA Report and summarised in this NTS.

2.0 The Proposed Development

2.1 Design Evolution (EIA Report Chapter 2)

The design evolution of the proposed development involved an iterative process aimed at refining the layout of the proposed turbines and associated infrastructure to minimise environmental, technical, and visual impacts while optimising energy generation. The process included several key stages, each informed by constraints mapping, environmental assessments and stakeholder feedback.

A number of parameters and considerations informed the site selection and design of the proposed development, which are described in full in the separate **Design and Access**

[1] Calculated using the most recent statistics from Department of Energy Security and Net Zero (DESNZ) showing that annual GB average domestic household consumption is 3,239kWh (as of January 2024).

[2] UK Government (1989). The Electricity Act 1989

Statement and summarised in **Chapter 2: Site Description and Design Evolution** of the EIA Report. In terms of the site selection, the site was chosen as a good location for onshore wind development due to its regular windy conditions (as a result of its elevated position in the Ochils), its distance from residential receptors and properties, and the proximity to nearby operational wind farms, as well as other considerations including proximity to the national electricity network and major road infrastructure. The initial inputs to the design process for the proposed development were the topography and watercourse constraints. Landscape and visual impacts from key receptors and also peat depth information were then incorporated into the design process to further inform the position of turbines and other infrastructure. Subsequently, all other relevant environmental topics (covered in the EIA Report) were considered as part of the iterative design process. Appropriate spacing of turbines was also considered in order to ensure they operate efficiently.

Feedback from discussions with the Energy Consents Unit (ECU), Clackmannanshire Council, and Perth and Kinross Council, as well as other consultees, through direct engagement and also via the formal EIA Scoping process, was evaluated and fed into the design evolution of the site layout. Once wind turbine positions were selected, an access track layout, the proposed BESS, and all other infrastructure necessary to build the wind farm were added to the design, taking account of ground conditions and the natural screening provided by the topography.

The initial wind turbine layout considered, consisted of 10 turbines at a height of 180m to blade tip height. Subsequent key wind turbine layouts considered included 15 turbines at 149.9m, and 14 turbines at 149.9m.

The final design has optimised the wind turbine layout to 13 turbines at 149.9m.

Throughout the design evolution, the layout was continuously refined to balance energy generation with the need to minimise adverse effects on landscape and visual amenity as well as the onsite peat resource. The final design reflects a comprehensive consideration of environmental, technical, and stakeholder inputs.

2.2 Proposed Infrastructure / Works (EIA Report Chapter 3)

The proposed development is described in detail in **Chapter 3: Description of Development** of the EIA Report. An outline Construction and Environmental Management Plan (CEMP), which is intended to be a key document during the construction of the proposed development in order to minimise the risk of environmental incidents occurring, is contained in the EIA Report as **Technical Appendix 3.1**. A Forestry report, which sets out the amount and type of woodland to be removed in order to facilitate construction of the proposed development, is provided as **Technical Appendix 3.2** of the EIA Report. A BESS Fires Risk Statement, intended to set out how the design has reduced the risk of fire and how mitigation can reduce the risk further, is provided as **Technical Appendix 3.3** of the EIA Report.

The layout of the proposed development is shown in **Figure 3**. In summary the proposed development is comprised of the following main elements:

- **Wind Turbines**
  - 13 wind turbines including internal transformers, with blade tip heights of 149.9m.
- **Turbine Foundations and Crane Hardstandings**
  - 13 turbine foundations, each approximately 22.40m in diameter;

  - Associated crane hardstandings approximately 41.5m x 36m and 1m in depth, with additional areas for boom supports and blade storage trestles.

- **Access Tracks**
  - Approximately 3.76km of upgraded road (Sheriffmuir road widened from approximately 3.5m to 6m);
  - Approximately 14.54km of new access tracks with a typical running width of 6m, (wider at bends and junctions) and associated drainage;
  - Approximately 1.68km of the new track is anticipated to be floating track where consistent (30m distance or more) peat depths of over 0.5m or greater are identified along with shallow topography.
- **Underground Cabling**
  - Approximately 15.74km of underground cabling along access tracks to connect the turbine locations, and the onsite electrical substation.
- **Substation Compound**
  - One onsite substation which would accommodate 33kV Switchgear to collect electricity from different parts of the site. The substation compound would have an area of 100m x 75m and would include a control and metering building (approximately 16m x 30m and 8m high);
  - Up to 35MW of battery storage (battery units measuring approximately 12m (l) x 5m (w) x 4m (h) with ancillary equipment such as inverters).

In addition to the above operational components of the proposed development, construction of the proposed development will also require:

- **Temporary Construction Compounds**
  - Three temporary construction compounds covering approximately 1.78ha in total.
- **Borrow Pits**
  - Up to two borrow pits covering approximately 0.89ha in total.
- **Forest Felling**
  - Felling of approximately 1.08ha of, predominantly conifer trees, in order to facilitate new onsite access tracks.

Compensatory planting of up to 1.08ha is anticipated to be required as a result of the felling included as part of the proposed development. The exact location, scale and type of compensatory planting is not included in this application but is expected to be agreed (in consultation with Scottish Forestry and Perth and Kinross Council) post any consent granted for the proposed development.

The grid connection for the proposed development does not form part of this application and, as is standard, a separate application under Section 37 of the Electricity Act 1989 will be required in relation to the grid connection point and cabling route that will run from the onsite substation for the proposed development to the point of connection to the grid.

2.3 Habitat Management / Enhancements

Blanket bog was found throughout the upland part of the site, in degraded condition, in large part due to long term overgrazing from sheep and deer. The total area of bog habitat that

would be directly and indirectly affected by the proposed development, including blanket bog and degraded blanket bog is approximately 53.45ha.

As part of the proposed development, there is a commitment to carry out active blanket bog restoration across an area of approximately 251.31ha (across the site). Further to this, an additional area of approximately 360.59ha (across the site) is to be targeted for blanket bog restoration through grazing management.

An outline Habitat Management Plan (HMP), which proposes habitat restoration and enhancement measures, and how these would be maintained, is provided as **Technical Appendix 8.4** of the EIA Report. Should the proposed development be granted consent it is anticipated that the document would be further developed, in discussion with Clackmannanshire Council, Perth and Kinross Council, Scottish Environment Protection Agency (SEPA) and NatureScot.

3.0 Benefits of the Development

3.1 Contribution Towards Government Targets

The proposed development would:

- Make a meaningful contribution of at least 65MW (with a further 35MW of battery storage) towards meeting the renewable energy generation targets set out by the Scottish Government, such as the goal for Scotland to have an overall installed onshore wind capacity of 20GW by 2030;
- Contribute towards the Scottish Government's goal for Scotland to have a fully decarbonised energy system by 2045;
- Make a valuable contribution towards UK generation targets and the reduction in emissions of greenhouse gases, principally carbon dioxide, in becoming carbon neutral in approximately 1.3 years as demonstrated by the carbon calculator (**Technical Appendix 14.1** of the EIA Report); and
- Make Scotland, and therefore the UK, less reliant on imported and price-volatile fossil fuels.

3.2 Community Shared Ownership

The applicant would look to explore potential models for part community share ownership of the proposed Windburn wind farm, whereby the local communities would have the opportunity to invest into the project.in line with the Scottish Government's Good Practice Principles.

3.3 Community Benefit Fund

Should the proposed development gain consent, a Community Benefit Fund would be made available to the community of interest. This is offered on the basis of a payment per MW of installed capacity at the Scottish Government recommended rate at the time of commissioning the proposed wind farm. At present, the recommended rate is £5,000 per MW. It is estimated that, depending on the type of investment selected, the community benefit fund alone would be approximately £325,000 per year or £13 million over the 40-year life of the wind farm.

4.0 Environmental Impact

4.1 Landscape and Visual (EIA Report Chapter 7)

EIA Report **Chapter 7: Landscape and Visual** contains an assessment of the potential impacts of the proposed development on Landscape and Visual receptors and designations.

4.1.1 Existing Environment

The proposed development is located in the Ochil Hills, an area characterised by rolling hills, steep escarpments, moorland, and scattered woodlands. The landscape features small watercourses and reservoirs, contributing to its natural appeal. The hills provide a prominent backdrop to the surrounding lowland areas, including the River Forth valley and Strathallan. The surrounding area includes several settlements and rural communities, with farmsteads and fields dotting the landscape. There are a number of operational wind farms nearby the site, within the Ochil Hills. The Ochil Hills are valued for their recreational opportunities, attracting walkers and nature enthusiasts.

4.1.2 Assessment Methodology Overview

The assessment methodology for the Landscape and Visual Impact Assessment (LVIA) follows established guidelines to ensure a thorough and accurate evaluation. The process begins with defining the study area, which extends up to 40km from the outermost turbines of the proposed development. This area is analysed using a Zone of Theoretical Visibility (ZTV) to determine where the turbines might be visible.

The landscape is then assessed to identify key receptors, such as specific viewpoints, settlements, and routes. Field surveys and desk-based research are conducted to gather data on the current landscape and visual conditions. The sensitivity of these receptors is evaluated based on their susceptibility to change and the value attached to the landscape or view.

The magnitude of change is assessed by considering the scale, duration, and reversibility of the effects. This involves examining how the proposed development will alter the landscape and visual character. The overall significance of the effects is determined by combining the sensitivity of the receptors with the magnitude of change, categorising the effects as negligible, minor, moderate, or major.

Visualisations, including photomontages and wirelines, are produced to illustrate the potential impacts from various viewpoints. These visual aids help in understanding the extent and nature of the changes. Mitigation measures are also considered, aiming to reduce adverse effects through design adjustments and other strategies.

4.1.3 Potential Effects

The potential landscape and visual impacts of the proposed development have been thoroughly assessed, considering both the construction and operational phases of the project.

4.1.3.1 Potential Effects During Construction

During the construction phase, several temporary and reversible effects on the landscape and visual environment are anticipated. These include physical changes such as excavations, track construction, borrow pits, crane operations, and the erection of wind turbines. These activities will cause noticeable alterations to the site’s terrain and land cover.

Additionally, the presence of construction equipment, vehicles, and temporary structures will introduce visual clutter into the landscape. The movement of construction machinery and the use of artificial lighting during periods of limited natural light will further impact the visual character of the area.

The physical changes will be concentrated within the site boundary, particularly in elevated areas where the turbines will be constructed. Indirect effects on the landscape character will extend to adjacent areas within the Ochil Hills. The construction phase is expected to last approximately 24 months. The effects are considered temporary and reversible, with the landscape expected to recover once construction is completed and disturbed areas are restored.

The visual effects during construction will impact the same receptors as those assessed during the operational phase. These include views from nearby settlements, roads, and recreational areas. Overall, the construction phase will result in significant but temporary changes to the landscape and visual environment, with efforts made to mitigate and manage these impacts effectively.

4.1.3.2 Potential Effects During Operation and Maintenance

During the operational phase, the primary effects on the landscape and visual environment will stem from the presence of the wind turbines. These turbines will become prominent features in the landscape, altering the visual character of the area. The movement of the turbine blades will introduce dynamic elements into the views, which may be visible from various vantage points, including nearby settlements, roads, and recreational areas. The operational effects will be continuous and long-term, Intensifying the presence of wind turbines in this part of the Ochils. The visibility of the turbines will vary depending on weather conditions, lighting, and the observer's location, but they will generally be noticeable across a wide area. Overall, the operational phase will result in significant landscape and visual effects, with the wind farm becoming a prominent feature in the western Ochils, intensifying the presence of existing wind turbines.

4.1.3.3 Potential Cumulative Effects

The cumulative effects, when considered alongside other existing, consented and ‘in planning’ developments in the area, include potential changes to the overall landscape character and visual amenity. These effects arise from the combined visibility of multiple wind farms and other infrastructure projects, which may lead to a more industrialised appearance of the landscape. The cumulative effects are particularly relevant in areas where views of multiple developments overlap, potentially affecting the perception of the Ochil Hills as a predominantly natural and rural environment.

4.1.4 Mitigation Measures

Mitigation measures are designed to minimise adverse effects on the landscape and visual environment. These measures include careful site selection and design to avoid sensitive areas, using appropriate materials and colours for turbines and infrastructure to blend with the surroundings, and restoring disturbed areas post-construction. Additionally, the implementation of a Construction Environmental Management Plan (CEMP) ensures that best practices are followed during construction to reduce visual and environmental impacts. These efforts aim to preserve the character and quality of the landscape while accommodating the development. Section 2.1 above, sets out some of the embedded mitigation (taken at the design stage) that is relevant to landscape and visual impacts.

4.1.5 Assessment Results

The assessment results indicate that the proposed development will have significant effects on landscape and visual amenity.

During construction, it is predicted that there would be Major Significant landscape and visual effects on the site itself.

In the operational phase, the wind turbines will become prominent features, leading to long-term changes in the visual character of the area. Major Significant Effects are predicted on the following:

- The site;
- Two Landscape Character Types ('Lowland Hill Ranges' and 'Lowland Hills – Central'); and
- Viewpoint 1: Ben Cleuch.

Medium / Moderate Significant Effects are predicted on the following:

- Two Landscape Character Types ('Broad Valley Lowlands' and 'Lowland Hills – Tayside');
- Viewpoint 2: The Nebit;
- Viewpoint 3: The Innerdownie;
- Viewpoint 4: Dumyat;
- Viewpoint 7: Braco;
- Viewpoint 10: B827;
- The settlement of Braco;
- The settlement of Greenloaning;
- The A822 (sections of);
- Core Paths and Rights of Way within 5km of the proposed development;
- The Dunblane to Perth Railway (sections of);
- The Ochil Hills Local Landscape Area designation (Perth and Kinross Council), the Ochils Special Landscape Area designation (Clackmannanshire Council) and the Western Ochils Local Landscape Area designation (Stirling Council).

Low / Minor and not significant effects are predicted on the following:

- Two Landscape Character Types ('Carselands' and 'Lowland Hill Fringes – Central');
- Viewpoint 5: B9140 near Collyland;
- Viewpoint 6: Gleneagles Hotel;
- Viewpoint 8: Alloa Tower;
- Viewpoint 9: Clackmannan Tower;
- Viewpoint 11: Cowie Road at Easter Greenyards;
- Viewpoint 12: A9/ B934;
- Viewpoint 13: Gask Ridge, St Davids;

- Viewpoint 14: Bannockburn Memorial;
- Viewpoint 15: Clackmannanshire Bridge;
- Viewpoint 16: Chartershall Road;
- Viewpoint 17: Blairdrummond Castle Safari Park;
- Viewpoint 18: Knock of Crieff;
- Viewpoint 19: A811 near Gargunnock;
- Viewpoint 20: Falkirk Wheel;
- The settlement of Alloa and Sauchie;
- The settlement of Clackmannan and Kennet;
- The settlement of Auchterarder / Gleneagles / Strathearn;
- The settlement of Stirling / Cambusbarron;
- The M9;
- The A9;
- The A905;
- NCN Route 76;
- The Falkirk Grahamston to Stirling railway;
- The Keir Local Landscape Area designation (Stirling Council); and
- The Forest Special Landscape Area designation (Clackmannanshire Council).

4.2 Ecology (EIA Report Chapter 8)

EIA Report **Chapter 8: Ecology** assesses the potential impacts of the proposed development on ecological receptors and designations.

4.2.1 Existing Environment

The area where the proposed development is located, and its surrounding area, encompasses a diverse range of habitats, including heathland, bog, and grassland, with some woodland areas. The site supports a variety of wildlife, such as invertebrates, reptiles, fish, and mammals like otters, bats, and deer. The watercourses within the site provide suitable habitats for fish species, including Atlantic salmon and brown trout. The site is also home to roe deer, which have been observed during surveys.

A large part of the site is covered by a candidate Local Nature Conservation Site (LNCS) called Alva Moss.

The area is characterised by its significant peatland habitats, which are of national importance due to their role in carbon absorption and biodiversity. However, much of the peatland and blanket bog across the site is degraded and as such presents a considerable opportunity for restoration.

4.2.2 Methodology Assessment Overview

The methodology for the ecological assessment of the proposed development involved a comprehensive and systematic approach to ensure accurate and reliable results. The study

area was carefully defined based on relevant good practice guidance, encompassing all areas within the site and an associated buffer zone to cover wetland habitats and other ecological features. The assessment began with an extensive desk study to gather existing ecological information from various sources, including the Wildlife Information Centre, MAGIC, NBN Atlas, and NatureScot's Carbon and Peatland 2016 Map. This was supplemented by ecological reports from nearby developments.

Field surveys were conducted to gather site-specific data, including UK Habitat Classification and National Vegetation Classification surveys, protected species walkover surveys, bat activity surveys, and a fish habitat assessment. These surveys were carried out during appropriate seasons to ensure the accuracy of the data collected. The impact assessment followed the guidelines set by the Chartered Institute of Ecology and Environmental Management (CIEEM). This involved identifying and characterising potential impacts on ecological features, incorporating measures to avoid and mitigate these impacts, assessing the significance of any residual effects after mitigation, and identifying appropriate compensation measures to offset significant residual effects. The assessment also highlighted opportunities for ecological enhancement.

4.2.3 Potential Effects

The potential effects of the proposed development on the ecological environment have been thoroughly assessed, considering both the construction and operational phases of the project.

4.2.3.1 Potential Effects During Construction (without further mitigation)

During the construction phase, several ecological effects are anticipated. The primary focus is the direct loss of habitats, including up to 45.05 hectares of nationally important Annex 1 blanket bog and 8.4 hectares of degraded blanket bog. Additionally, there will be a loss of 1.16 hectares of Annex 1 heathland habitat and 8.45 hectares of upland acid grassland. These habitat losses could affect local biodiversity, including plant species and the wildlife that depend on these habitats. Construction activities may also disturb local wildlife, such as otters, mountain hares, and various bird species, due to increased noise, human presence, and habitat disruption. Furthermore, there is the potential risk, during construction, of water pollution from sediment runoff and accidental spills, which could impact aquatic habitats and species in nearby watercourses.

4.2.3.2 Potential Effects During Operation and Maintenance (without further mitigation)

During the operational and maintenance phases, the primary ecological effects will stem from the presence and operation of the wind turbines and associated infrastructure. The rotating turbine blades pose a collision risk to bats and birds, potentially leading to fatalities. The operational activities, including maintenance traffic, could cause disturbance to local wildlife, although this is expected to be minimal compared to the construction phase. The presence of the turbines and infrastructure may also lead to habitat fragmentation, which can affect the movement and foraging patterns of species such as bats and birds (see Section 4.3 for Ornithology information). Additionally, there is a potential for minor pollution incidents from maintenance activities.

4.2.4 Mitigation Measures

Mitigation measures to address the ecological impacts identified include habitat restoration and enhancement efforts to compensate for habitat loss, such as the restoration of 251.31ha

of blanket bog and the creation of new habitats to support local wildlife. Good practice measures will be adopted to prevent pollution and manage water quality, ensuring the protection of aquatic habitats and species. Pre-construction surveys and ongoing monitoring will be conducted to ensure compliance with ecological protection measures and to assess the effectiveness of mitigation efforts. Additionally, specific measures will be implemented to minimise disturbance to wildlife during both construction and operational phases, such as timing construction activities to avoid sensitive periods for wildlife and implementing speed limits for construction traffic to reduce the risk of wildlife collisions.

4.2.5 Assessment Result

The ecological assessment concludes that the proposed development would have significant effects on local habitats and wildlife.

During construction, the proposed development is anticipated (without mitigation) to result in significant effects on the following:

- Alva Moss candidate LNCR (noting that this site is still only at candidate stage and so a highly precautionary approach has been taken in including it in the assessment);
- biodiversity at national level due to loss of Annex 1 habitat - However, this habitat loss would be compensated by a significant positive effect through the peatland restoration proposed, to be delivered via an HMP.
- badger at a local level due to temporary disturbance;
- red squirrels at a local level due to temporary disturbance;
- significant negative effect on red squirrels at a local level due to damage / destruction of dreys;
- roosting Natterer's bats at a regional level due to disturbance of bats within a roost;
- roosting common and soprano pipistrelles at a local level due to disturbance of bats within a roost;
- roosting Natterer's bats at a regional level due to damage/destruction of a bat roost;
- roosting common and soprano pipistrelle bats at a local level due to damage/destruction of a bat roost; and
- foraging and commuting bats due to disturbance and habitat loss.

Following the implementation of secondary mitigation measures (including pre-construction surveys), no significant residual effects on badger or red squirrel or commuting and foraging bats due to disturbance are predicted during the construction phase.

The residual significant negative effect on foraging and commuting bats due to habitat loss will be offset through habitat creation, to be delivered via an HMP. In addition to this a European Protected Species mitigation licence would be sought (if required) from NatureScot for any works which would disturb bats during construction phase.

During the operational phase, there is the potential for significant negative effects on Nyctlaus and Myotis sp. bats due to collision risk. Following secondary mitigation in the form of blade 'feathering[3]', no significant residual effects on bats are predicted during operation.

[3] Changing the angle of the turbine blades so as to slow or stop the blades from turning.

4.3 Ornithology (EIA Report Chapter 9)

EIA Report **Chapter 9: Ornithology** contains an assessment of the potential effects of the proposed development on birds.

4.3.1 Existing Environment

The site and surrounding area encompass a variety of habitats, including blanket bog, degraded bog, upland acid grassland, and other grassland types, which support diverse bird species. Baseline surveys conducted from April 2021 to July 2023 identified key species such as red kite, kestrel, snipe, and curlew. There are statutory designated sites (for ornithology) within 20km of the proposed development, such as Special Protection Areas (SPAs) and Sites of Special Scientific Interest (SSSIs), which are important for species like pink-footed goose and golden plover. There are several operational wind farms in close proximity to the proposed development, further east within the Ochils.

4.3.2 Methodology Assessment Overview

The methodology for the ornithological impact assessment involved a combination of desk studies and field surveys, adhering to NatureScot guidelines. The desk study included a review of existing ornithological data from sources such as the NatureScot SiteLink website, RSPB Scotland, and the Central Scotland Raptor Study Group. Field surveys were conducted from April 2021 to July 2023, covering vantage point surveys, breeding wader surveys, breeding raptor surveys, and black grouse lek surveys. These surveys aimed to gather comprehensive data on bird populations, their flight activities, and breeding behaviours within the study area.

Vantage point surveys were carried out from three locations, recording flight activity of target species such as red kite, kestrel, and golden plover. Breeding wader surveys focused on species like snipe and curlew, while breeding raptor surveys targeted species including red kite and kestrel. Black grouse lek surveys followed standard methodologies to identify lekking sites.

Collision risk modelling was performed using the Band Collision Risk Model, which estimates the likelihood of bird collisions with turbine blades based on recorded flight activity and species-specific biometrics. The assessment also considered potential impacts from habitat loss, disturbance, and displacement during the construction and operation phases.

4.3.3 Potential Effects

The potential effects of the proposed development on birds have been thoroughly assessed, considering both the construction and operational phases of the project.

4.3.3.1 Potential Effects During Construction (without further mitigation)

Potential effects on ornithological features during the construction phase include habitat loss, disturbance, and displacement. Habitat loss occurs due to the construction of turbine bases, access tracks, and other infrastructure, leading to both permanent and temporary loss of habitats such as blanket bog, upland grassland, and other grassland types. This loss can affect breeding and foraging habitats for species like the red kite, kestrel, snipe, and curlew. Disturbance and displacement impacts arise from noise and visual disturbances caused by construction activities, vehicular traffic, and the presence of construction workers. These disturbances can lead to temporary displacement of birds from their breeding and foraging areas, potentially affecting their breeding success and survival.

4.3.3.2 Potential Effects During Operation and Maintenance (without further mitigation)

During the operation and maintenance phase, the primary impacts on ornithological features include disturbance, displacement, and collision risks. Operating wind turbines and associated human activities for maintenance purposes can cause disturbance and displacement of birds from the site. While some species may become habituated to the presence of turbines, others may experience reduced habitat usage within certain distances from the turbines. Collision risks arise from birds flying into turbine blades, which can result in mortality. Species such as red kite, kestrel, and golden plover are particularly at risk due to their flight behaviours and site use. The assessment also considers the potential barrier effect, where wind turbines may restrict or alter the movement of birds, affecting their foraging efficiency and energy expenditure.

4.3.3.3 Potential Cumulative Effects

The Cumulative assessment considers the combined effects of the proposed development with other existing, consented, and planned wind farm projects within the region. These impacts are assessed for key species such as red kite, kestrel, snipe, curlew, and golden plover. The cumulative assessment evaluates the potential for increased habitat loss, disturbance, displacement, and collision risks across multiple wind farm sites. For example, the cumulative collision mortality for red kite and kestrel is assessed by combining predicted collision rates from the proposed development with those from other wind farms in the area. Similarly, cumulative disturbance and displacement effects are evaluated by considering the combined footprint of multiple wind farms on breeding and foraging habitats for species like snipe and curlew. The assessment aims to determine whether the combined impacts of multiple projects could lead to significant adverse effects on the conservation status of these species at a regional or national level.

4.3.4 Mitigation Measures

Mitigation measures proposed to minimise adverse effects on bird populations include timing of works, pre-commencement surveys, and implementation of disturbance-free buffer zones. An Environmental Clerk of Works has been recommended to oversee construction activities and ensure compliance with mitigation measures. Post-construction monitoring is suggested to evaluate the effectiveness of mitigation and assess any residual impacts on ornithological features.

4.3.5 Assessment Results

The assessment results indicate that the proposed development will have varying levels of impact on different bird species within the study area. Key species such as red kite, kestrel, snipe, and curlew are expected to experience some degree of habitat loss, disturbance, and displacement during both construction and operational phases.

Collision risk modelling predicts a low to moderate risk of bird collisions with turbine blades, with species like red kite and kestrel being more susceptible due to their flight behaviours.

There are no significant residual ornithological effects anticipated when considering the proposed development alone. However, there is a potential significant cumulative effect predicted for snipe.

4.4 Hydrology, Hydrogeology, and Geology (EIA Report Chapter 10)

EIA Report **Chapter 10: Hydrology, Hydrogeology and Geology** contains an assessment of the potential impacts of the proposed development on soils and the water environment.

4.4.1 Existing Environment

The site spans elevations from 142m to 677m Above Ordnance Datum (AOD). The principal surface water catchments draining the site include the Danny Burn, Burn of Ogilvie, River Devon, and Alva Burn. The site and surrounding area experiences annual rainfall ranging from 985mm to 1,639mm. The site is characterised by various soil types, predominantly peat and peaty podzols, with areas of brown soils and mineral podzols at lower elevations. The underlying geology mainly consists of igneous rocks from the Ochil Volcanic Formation, with sandstones of the Sheriffmuir Formation present in the northern extent. The study area includes no designated geological or water-dependent sites. Still, it encompasses areas of high sensitivity such as Class 1 and 2 peatlands, potential groundwater-dependent terrestrial ecosystems (GWDTE), and private water supplies.

4.4.2 Methodology Assessment Overview

The assessment methodology for the study area involved a combination of desk studies, field surveys, and consultations with stakeholders. The desk study reviewed available information on hydrology, hydrogeology, and geology, while field surveys included site visits to verify desk study data, assess surface water and groundwater conditions, and identify potential environmental constraints. The methodology also incorporated feedback from consultations with statutory and non-statutory consultees. The significance of potential effects was determined by evaluating the sensitivity of the receiving environment and the magnitude of the impact, using predefined criteria. This approach ensured a comprehensive understanding of the baseline conditions and informed the development of appropriate mitigation measures to manage and minimise adverse effects.

4.4.3 Potential Effects

The potential effects of the proposed development on soils and the water environment have been thoroughly assessed, considering both the construction and operational phases of the project.

4.4.3.1 Potential Effects during Construction (without further mitigation)

Effects identified to occur during construction include disturbance and loss of carbon-rich soils and peat deposits, which are significant carbon stores. Ground instability, including the risk of peat slides, is another concern. The quality of surface water and groundwater could be affected by pollution from fuel, oil, concrete, or other hazardous substances, as well as from sediment-laden runoff entering drainage systems and watercourses. There is also an increased flood risk to areas downstream due to higher surface runoff during construction. Changes in groundwater levels from dewatering excavations and potential alterations to groundwater flow paths could impact areas of peat, GWDTE, and water abstractions. Additionally, the construction of culverts could disturb watercourse beds and banks, and there is a risk of pollution to public and private water supplies. The formation and use of borrow pits could also lead to disturbance and pollution.

4.4.3.2 Potential Effects during Operation and Maintenance (without further mitigation)

During the operational and maintenance phases, increased runoff rates and flood risk may result from the expansion of tracks and hard-standing areas at turbines. Changes in natural surface water drainage patterns could affect water contributions to areas of peat, GWDTE, and water abstractions. Additionally, alterations to groundwater levels and groundwater movement could occur. There is also the potential for longer-term impacts on water supplies, particularly those dependent on groundwater. Furthermore, maintenance work could pose pollution risks to surface water quality.

4.4.3.3 Potential Cumulative Effects

The assessment also considers potential cumulative effects associated with other developments within 5km of the site and in the same surface water catchments. A cumulative effect is considered to be the impact on a hydrological, hydrogeological, or geological receptor arising from the site in combination with other developments likely to affect soils, geology, surface water, and groundwater. These developments will have been constructed and maintained following best practice, industry standards, and relevant legislation, planning policy, and guidance regulated by statutory consultees. These standards ensure that potential impacts are mitigated and controlled at the source.

4.4.4 Mitigation Measures

Mitigation measures to address the potential impacts identified during the assessment include the adoption of industry-standard good practice guidelines and the development of a detailed CEMP, which outlines procedures for pollution prevention, sediment control, and management of surface runoff rates and volumes. Specific measures will include maintaining a buffer zone around watercourses, careful handling and storage of fuels and hazardous materials, and the use of Sustainable Drainage Systems (SuDS) to manage and treat runoff. Additionally, regular monitoring of water quality will be conducted to ensure compliance with environmental standards. The appointment of an Environmental Clerk of Works (EnvCoW) will ensure that all mitigation measures are effectively implemented and maintained throughout the construction and operational phases. These measures aim to safeguard sensitive receptors such as peatlands, GWDTE, and private water supplies, thereby minimising adverse environmental effects.

4.4.5 Assessment Result

The assessment indicates that subject to the adoption of best practice construction techniques, no significant residual effects are predicted during the construction and operational phases of the proposed development. There is also no significant cumulative effect predicted.

4.5 Cultural Heritage and Archaeology (EIA Report Chapter 11)

EIA Report **Chapter 11: Cultural Heritage and Archaeology** contains the assessment of the potential impacts of the proposed development on Cultural Heritage and Archaeology assets.

4.5.1 Existing Environment

The area surrounding the site is rich in cultural heritage, featuring a variety of historic assets. These include archaeological sites, historic buildings, and designed landscapes. Notable

heritage assets within the vicinity of the site include Scheduled Monuments like East Biggs hut circles, numerous Category A and B Listed Buildings, Inventoried Gardens and Designed Landscapes, Conservation Areas, and Inventoried Battlefields. Further away from the site are important cultural heritage assets such as Stirling Castle. The landscape is characterized by upland moorland, peat bogs, and areas of agricultural activity, with historical evidence ranging from prehistoric settlements and artifacts to medieval and post-medieval farmsteads and enclosures. The setting of these assets contributes significantly to their cultural heritage value, offering insights into past human activities and historical events.

4.5.2 Methodology Assessment Overview

The assessment methodology for evaluating the potential effects of the proposed development on cultural heritage assets involves several key steps. First, a study area is defined, typically extending up to 10km from the proposed wind turbines, to identify all relevant heritage assets. Data sources such as Historic Environment Records, historic maps, and aerial photographs are used to establish baseline conditions. Field surveys, including walkover surveys and site assessments, are conducted to gather detailed information on the presence and condition of heritage assets. The assessment considers both direct and indirect impacts, including changes to the physical condition of assets and their settings. The significance of these impacts is evaluated using criteria that consider the heritage significance of the assets and the magnitude of the impact. Mitigation measures are proposed to minimise adverse effects, and residual effects are assessed to determine the overall significance of the impacts. Cumulative effects from other developments are also considered to provide a comprehensive evaluation.

4.5.3 Potential Effects

The potential impacts of the proposed development on the archaeological and cultural heritage assets have been thoroughly assessed, considering both the construction and operational phases of the project.

4.5.3.1 Potential Effects during Construction (without further mitigation)

During the construction phase, several heritage assets within the site may be directly affected. These effects include potential disturbance of archaeological remains due to ground-breaking activities such as widening or constructing access tracks. Specific assets that could be impacted include post-medieval agricultural systems, farmstead remains, and areas with prehistoric artefacts. The construction activities may lead to the partial or complete loss of these heritage features, affecting their integrity and the information they provide about past human activities.

4.5.3.2 Potential Effects During Operation and Maintenance (without further mitigation)

The operation and maintenance of the wind farm may indirectly affect the setting of heritage assets within the vicinity. The presence of wind turbines could alter the visual landscape, affecting how these assets are experienced and appreciated. For example, turbines visible from historic sites like Ardoch Roman Military Camp and Braco Garden and Designed Landscape may intrude upon important views and the overall aesthetic value of these sites. The changes in the landscape could influence the cultural significance of these heritage assets by altering their historical context and the way they are perceived.

4.5.3.3 Potential Cumulative Effects

The cumulative assessment considers the combined effects of the proposed development and other existing or planned developments in the area, such as the Strathallan Wind Farm. The presence of multiple wind farms could collectively alter the visual landscape and the setting of heritage assets, potentially amplifying the overall impact on their cultural significance. This assessment ensures that the broader implications of these combined developments on the historic environment are thoroughly evaluated.

4.5.4 Mitigation Measures

To minimise the adverse effects on cultural heritage assets, several mitigation measures are proposed. These include conducting archaeological evaluations and watching briefs during construction to record and preserve any significant remains. These measures aim to balance the development needs with the preservation of cultural heritage, ensuring that the historical and archaeological value of the area is maintained as much as possible.

4.5.5 Assessment Result

Whilst the assessment identifies that the proposed development would have effects on several cultural heritage assets during both the construction and operational phases, none of these assets are predicted to experience more than Minor significant effects. When mitigation measures such as watching briefs are considered, there are no significant effects predicted for cultural heritage assets.

4.6 Traffic and Transport (EIA Report Chapter 12)

EIA Report **Chapter 12: Traffic and Transport** contains an assessment of the potential impact of the proposed development on the road network surrounding the site.

4.6.1 Existing Environment

The study area for the traffic and transport assessment encompasses the A9 extending westbound from Blackford to its junction with the C468 (Sheriffmuir Road), and the C468 (Sheriffmuir Road) southbound to the site area. The C468 (Sheriffmuir Road) is a single-track road with passing places and a 60mph speed limit, passing through mainly open farmland with occasional dwellings. The A9, a dual carriageway trunk road managed by Transport Scotland, also traverses open farmland and has a 70mph speed limit. Both roads lack footways. Vehicle movement data was collected using Automatic Traffic Counters (ATCs) installed at key locations, supplemented by a Road Safety Risk Assessment (RSRA) using collision data from 2019 to 2022. The baseline traffic flows and safety performance indicate no existing road safety problems. The assessment considers the potential impacts of construction-related traffic, including staff travel and delivery of materials, with a focus on managing increased vehicle movements and ensuring road safety.

The port of delivery (for abnormal loads such as wind turbine blades) for the proposed development is expected to be the Port of Rosyth. The abnormal load delivery route would be from the Port of Rosyth, northwards via the M90 to the edge of Perth, then southbound on the A9 until turning off onto the C468 (Sheriffmuir Road) near Blackford.

4.6.2 Methodology Assessment Overview

The methodology for assessing the traffic and transport impacts of the proposed development involves several key steps to ensure a comprehensive evaluation. The study area was defined using professional judgment to identify the sections of the road network

likely to be used by vehicles travelling to and from the development site. Vehicle movement data was collected through surveys using Automatic Traffic Counters (ATCs) at strategic locations. Additionally, a Road Safety Risk Assessment (RSRA) was conducted using collision data from recent years to understand the safety performance of the roads in the study area.

Estimates were made of the materials and aggregate needed to be brought to site during construction, as well as estimates of workforce numbers. These estimates were considered alongside the anticipated construction period (24 months) in order to help predict monthly vehicle movement numbers during construction.

The assessment followed guidelines from the Institute of Environmental Management and Assessment (IEMA), which included estimating the number of daily construction-related vehicle movements and comparing these to baseline traffic flows. The potential effects on traffic were evaluated based on criteria such as severance, road vehicle delay, non-motorised user delay, amenity, fear and intimidation, and road safety. The significance of these effects was determined by considering both the sensitivity of the receptors and the magnitude of the impact. Mitigation measures, such as good construction practices and a detailed Construction Traffic Management Plan (CTMP), were proposed to address any significant effects. The assessment also considered cumulative effects with other developments in the area.

4.6.3 Potential Effects

The potential effects of the proposed development on traffic and transport have been thoroughly assessed, considering both the construction and operational phases of the project.

4.6.3.1 Potential Effects during Construction (without further mitigation)

During the construction phase of the proposed development, there will be significant effects on the local traffic and transport network. The construction activities will generate a substantial increase in vehicle movements, including cars, vans, Light Goods Vehicles (LGVs), and Heavy Goods Vehicles (HGVs). This increase is primarily due to staff travelling to and from the site, as well as the delivery and removal of plant, components, materials, and supplies. The busiest month of construction (month 9) is expected to see an average of 240 vehicle movements per day, with a significant proportion being HGVs. This surge in traffic will affect the C468 (Sheriffmuir Road) and the A9, particularly the sections closest to the site. The delivery of turbine components will require Abnormal Indivisible Load Vehicle (AILV) movements, which involve vehicles exceeding standard dimensions. These movements will occur in convoys (including escort vehicles from Police Scotland) and may necessitate temporary short term road closures and adjustments to street furniture. The increased traffic flow will lead to potential delays for road users, both motorized and non-motorized, and may impact the amenity and safety of the transport network. The assessment has identified that the C468 (Sheriffmuir Road) will experience the most significant increase in traffic, warranting further detailed evaluation of the effects on severance, road vehicle delay, non-motorized user delay, amenity, fear and intimidation, and road safety.

4.6.3.2 Potential Effects during Operation and Maintenance (without further mitigation)

During the operation and maintenance phase of the proposed development, the effects on the local traffic and transport network will be considerably less than during construction. However, there will still be some ongoing effects. Regular maintenance activities will require

periodic vehicle movements, including LGVs and occasional HGVs for transporting equipment and personnel to the site. These movements are expected to be infrequent and will not significantly alter the baseline traffic flows. Additionally, the operational phase will involve routine inspections and minor repairs, which may necessitate short-term road usage but will generally be limited in scope and duration. The presence of maintenance vehicles may cause minor delays for road users, but these impacts are anticipated to be minimal compared to the construction phase. Overall, the traffic and transport impacts during the operation and maintenance phase are expected to be manageable and significantly lower in intensity.

4.6.3.3 Potential Cumulative Effects

The cumulative effects of the proposed development, when considered alongside other existing and planned developments in the area, could lead to a more pronounced effect on the local traffic and transport network. The combined increase in vehicle movements from multiple projects may result in higher traffic volumes on key routes such as the A9 and the C468 (Sheriffmuir Road). This could exacerbate road vehicle delays, increase the risk of accidents, and heighten the overall strain on the transport infrastructure. Additionally, the cumulative effect of construction and operational traffic from various developments could impact the amenity and safety of the road network, leading to potential issues such as increased noise, air pollution, and reduced road user comfort. The assessment of cumulative impacts requires careful consideration of the timing, scale, and nature of all relevant projects to fully understand the broader implications for traffic and transport in the region.

4.6.4 Mitigation Measures

To address the potential effects identified in the traffic and transport assessment, several mitigation measures have been proposed. These include implementing a detailed Construction Traffic Management Plan (CTMP) to manage and coordinate vehicle movements (including a left in, left out policy for construction vehicles at the junction between the A9 and the C468 (Sheriffmuir Road), no construction vehicles using the C468 (Sheriffmuir Road) between Carim Lodge and Dunblane, and ensuring that construction traffic avoids peak hours to minimise disruption.

The use of designated routes for construction vehicles will help to reduce the impact on local roads. Additionally, measures such as the provision of temporary traffic signals, and the use of banksmen to guide large vehicles will enhance safety and traffic flow.

Regular communication with local residents and stakeholders will be maintained to keep them informed about construction activities and any temporary road closures or diversions. These measures aim to mitigate the adverse effects on traffic, road safety, and the overall amenity of the area during the construction phase.

4.6.5 Assessment Result

The assessment results indicate that, with mitigation measures applied, no significant effects are expected on transport during the construction, operation and decommissioning of the proposed development, both individually and in combination with other proposed developments.

4.7 Socio-Economics, Tourism, Recreation and Land Use (EIA Report Chapter 13)

EIA Report **Chapter 13: Socio-Economics, Tourism, Recreation and Land Use** assesses the potential impacts of the proposed development on socio-economic factors, tourism, recreation, and land use.

4.7.1 Existing Environment

The study area for the socio-economic assessment of the proposed development is divided into two tiers: the Wider Study Area (WSA) and the Local Area of Influence (LAI). The WSA includes the Local WSA (Perth and Kinross, Clackmannanshire, and Stirling Councils) administrative areas), the National WSA (Scotland), and the UK-wide WSA (UK), focusing on economic and employment effects. The LAI, extending 10km from the site, encompasses Blackford, Gleneagles, Auchterarder, Dunblane, and Bridge of Allan, covering both direct and indirect effects on local recreation and tourism receptors. The baseline conditions within the WSA include population, labour market, and tourism economy, while the LAI baseline covers formal and informal recreational receptors, tourism attractions, long-distance routes, core paths, rights of way, heritage paths, Scottish hill tracks, access land, cycling, and horse riding. The area is characterised by a mix of rural and urban settings, with significant recreational and tourism activities, particularly in the Ochil Hills and surrounding area.

4.7.2 Methodology Assessment Overview

The assessment methodology for the socio-economic impact of the proposed development involves a comprehensive approach to evaluating potential effects. This includes describing baseline conditions, identifying likely effects from construction and operation, assessing receptor sensitivity, and determining the significance of any effects. The methodology distinguishes between direct effects, such as employment and Gross Value Added (GVA) from initial capital expenditure, and indirect effects from the supply of goods and services to main contractors.

For tourism and recreational receptors, direct effects are those physically impacted by the development, while indirect effects include visual or noise impacts. The assessment uses economic models to estimate gross and net effects, considering factors like leakage, displacement, and multipliers. Sensitivity criteria are based on the importance, availability of alternatives, and capacity to absorb impacts, while magnitude criteria define the extent of change. The significance of effects is determined using a matrix combining sensitivity and magnitude, with professional judgement applied to borderline cases. Mitigation measures are proposed to reduce significant adverse effects, and residual effects are assessed following mitigation. Cumulative effects are also considered, particularly in relation to competition for resources and impacts on tourism and recreation.

A survey of recreational usage of the Ochils (the area covering and surrounding the site of the proposed development) was carried out in Summer 2023, in order to understand whether wind farm development in the Ochils has deterred the public from using the hills recreationally.

4.7.3 Potential Effects

The potential effects of the proposed development on the Socio-Economic, Tourism, Recreation and Land Use have been thoroughly assessed, considering both the construction and operational phases of the project.

4.7.3.1 Potential Effects During Construction (without further mitigation)

During the construction phase, the proposed development is expected to generate significant socio-economic effects on both the WSA and the LAI. The WSA will experience substantial economic activity, including temporary employment opportunities and increased business for local suppliers and accommodation providers. Although the overall increase in employment and economic output will be relatively small in percentage terms, the positive impact on the local economy is notable. In the LAI, tourism and recreational activities may face temporary disruptions due to increased traffic and construction activities, affecting access routes and visitor experiences. Formal recreational facilities and informal activities like walking, hiking, and cycling may see temporary declines in usage due to closures or diversions of paths and trails. Overall, while the construction phase brings economic benefits, it may also cause manageable and short-term disruptions to tourism and recreation in the local area.

4.7.3.2 Potential Effects During Operation and Maintenance (without further mitigation)

During the operational phase, the proposed development is expected to have various socio-economic effects on both the WSA and the LAI. The WSA will benefit from the creation of permanent jobs related to the operation and maintenance of the development, with additional indirect employment generated through supply chain activities. Local businesses, such as shops, cafes, and accommodation providers, may experience increased patronage from visitors and technicians involved in the ongoing maintenance of the site. Although the overall increase in employment and economic output will be relatively small, the positive impact on the local economy is beneficial. In the LAI, recreational activities may be affected by visual impacts from the development, particularly on popular hill summits and paths. However, studies have shown that the presence of wind farms generally has little or no adverse effect on tourism and recreational usage. The development may also contribute to long-term community benefits through potential community benefit fund payments, enhancing the local area and supporting further socio-economic growth.

4.7.3.3 Cumulative Effects

The cumulative effects of the proposed development have been considered in relation to socio-economics and land use. These effects could arise from competition for materials, workers, accommodation, and supply chain products due to the construction of other nearby projects. If construction phases overlap, it is expected that the availability of resources and workforce will be sufficient, given the proximity to major population centres and cities. The cumulative effect on tourism and recreational activities is anticipated to be negligible, as studies show that wind farms generally have little or no adverse effect on tourism. Additionally, the presence of multiple wind farms could enhance local community benefits through increased investment and employment opportunities, maximising the positive effects of the developments.

4.7.4 Mitigation Measures

The proposed development incorporates several mitigation measures to address potential adverse effects on socio-economics, tourism, recreation, and land use. These measures include good practice principles for traffic management, noise and dust control, and maintaining access for walkers, cyclists, and horse-riders. An Outline Construction and Environmental Management Plan (CEMP) details these measures, which will be further developed in a final detailed CEMP prior to construction.

During construction, measures will be implemented to minimise disruptions to local businesses and tourism assets, such as clear communication about construction schedules and temporary diversions for affected paths and trails. The development of an Access Management Plan (AMP) will ensure the continuity of recreational routes and enhance safety for users.

In the operational phase, ongoing maintenance activities will be managed to minimise impacts on local communities and recreational users. The applicant is also committed to providing community benefits, including potential community benefit fund payments and exploring shared ownership opportunities, which can support local socio-economic growth and enhance the overall positive impact of the development.

A potential walking route / path is proposed in order to link the onsite wind farm access tracks to an existing walking path in the Ochils. This would provide a continuous walking path from Alva in Clackmannanshire to the C468 (Sheriffmuir Road) in Perth and Kinross.

4.7.5 Assessment Results

The assessment of the proposed development concludes that there would be no Major Significant effects on Socio-Economics, Tourism receptors, Recreation receptors or Land Use. Minor beneficial effects are predicted for tourism businesses, and Minor adverse effects predicted for core paths, rights of way, and heritage paths near the site.

If consented, the proposed development is predicted, during the construction phase, to generate approximately £4.7 million of Gross Value Added (GVA) for the local area, and a further £11.8 million GVA to the wider Scottish economy. The construction phase of the proposed development is predicted to support (directly and indirectly) approximately 64 full time equivalent jobs locally (across the local area), and a further 202 full time equivalent jobs across Scotland. The operational phase of the proposed development is predicted to support (directly and indirectly) up to 17 full time equivalent jobs locally (across the local area).

During the operational phase there are no significant effects (beneficial or adverse) predicted as a result of the proposed development.

4.8 Other Issues (EIA Report Chapter 14)

EIA Report **Chapter 14: Other Issues** covers various other topics that are relevant to the proposed development but do not require to be assessed in their own stand alone chapter. The chapter aims to provide a comprehensive overview of these issues and their potential impacts, ensuring that all relevant environmental considerations are addressed.

4.8.1 Shadow Flicker

Shadow flicker is a phenomenon that occurs when the sun passes behind the rotors of a wind turbine, casting a flickering shadow on nearby properties. This effect is only noticeable inside buildings and depends on factors such as the direction of the property relative to the turbine, distance from the turbine, turbine height, time of year and day, and weather conditions.

The wind turbines for the proposed development have a rotor diameter of 138m, which results in a study area of 1,380m from the turbines (10 x rotor diameter). In addition to this a further 50m area was added to the 10 times rotor diameter distance, in order to account for potential micrositing should the proposed development receive consent (total study area = 1,430m).

The distance from the proposed wind turbines, within which shadow flicker could be a significant issue, is defined as 1,430m (1.43km). The nearest inhabited residential property to any of the proposed Windburn wind turbines is approximately 2.7km. The assessment concluded that no residential properties are within the zone where shadow flicker could be considered a significant problem or result in significant effects, so no further assessment was undertaken.

4.8.2 Climate and Carbon Balance

The assessment estimates the CO_2 emissions associated with the manufacture and construction of the wind turbines and infrastructure, as well as the CO_2 savings from the electricity generated by the wind farm. Each unit of wind-generated electricity displaces a unit of conventionally generated electricity, thereby saving emissions from power stations. The results indicate that the proposed development would have a positive impact on reducing CO_2 emissions, supporting national and international climate change targets, over its 40 year lifespan. Overall, the proposed development has a carbon payback period of approximately 1.3 years when compared to the fossil fuel mix of electricity generation. This means that the wind farm would offset its carbon footprint within this period and continue to provide net CO_2 savings for the remainder of its operational life, estimated at 40 years.

The potential savings in CO_2 emissions due to the proposed development replacing other electricity sources over the lifetime of the wind turbines (assumed to be 40 years) are approximately 99,500 tonnes of CO_2 per year over a fossil fuel mix of electricity (3.9 million tonnes assuming a 40 year lifetime).

The proposed development is assessed to have Minor, beneficial environmental effects, which are not significant.

4.8.3 Noise

Wind turbines produce two types of noise: aerodynamic noise from the blades and mechanical noise from components within the nacelle. Aerodynamic noise, often described as a "swish" sound, occurs as the blades pass through the air, while mechanical noise, which has a more tonal quality, comes from the turbine's internal machinery. Over the years, advancements in turbine technology have significantly reduced mechanical noise. The assessment of noise impact considers the relative difference between background noise and wind turbine noise at nearby dwellings. This difference forms the basis of the noise assessment, ensuring that noise levels remain within acceptable limits. The assessment follows guidelines such as ETSU-R-97 and the Institute of Acoustics' Good Practice Guide, which provide a framework for evaluating and mitigating noise impacts.

The nearest inhabited residential property is approximately 2.7km from the nearest proposed wind turbine. The nearest inhabited residential property is in excess of 500m from the proposed substation compound (including BESS).

The predicted noise levels, at nearby residential receptors, from the proposed development, are significantly below the established limits. There is no significant residual impact from noise on the surrounding receptors.

4.8.4 Risk of Accidents and Other Disasters

The proposed development is considered to have a low risk of major accidents and natural disasters due to its geographical location and design. The site is remote with a low population density in its immediate vicinity. Potential construction risks, are addressed through measures set out in the outline CEMP. The risk of turbine failure during high winds

is mitigated by the turbines' automatic shutdown feature in wind speeds over 50 m/s. Lightning strikes are managed through the design of turbines to conduct lightning safely to the ground, and modern turbine blades are designed to remain attached even if damaged. Ice build-up on blades is rare and managed by automatic shutdowns when necessary. The risk of seismic activity affecting the development is negligible due to the minor nature of earthquakes in Scotland. Overall, the assessment concludes that the risk of accidents and other disasters is not significant, and appropriate mitigation measures are in place to manage any potential risks.

4.8.5 Population and Human Health

The assessment of population and human health considers various factors that could affect the well-being of the local community. This includes potential effects on landscape and visual amenity, hydrology, hydrogeology, geology, site access, traffic, transport, noise, and socio-economics. Each of these aspects is thoroughly evaluated in its respective chapters, with an analysis of both positive and negative impacts. Mitigation measures are proposed to minimise any adverse effects, ensuring that the development does not significantly harm the health and well-being of the local population. The overall conclusion is that, with the implementation of these mitigation measures, the proposed wind farm will not have significant negative effects on population and human health. The assessment also highlights the importance of ongoing monitoring and management to address any unforeseen issues that may arise during the construction and operational phases of the project.

4.8.6 Air Quality

Construction activities associated with the proposed development can result in temporary effects from dust if unmanaged. This can lead to nuisance effects such as soiling of buildings and, if present over a long period, can affect human health. However, the nearest non-financially involved property is over 400 meters away from any substantial construction works, such as the substation compound, borrow pits, and new tracks. Given this distance, the effects associated with dust or vehicle emissions are considered unlikely. Therefore, the assessment concludes that the effects of dust and vehicle emissions from the construction and operation of the proposed development are not significant.

4.8.7 Aviation

The development of wind turbines has the potential to cause a variety of adverse effects on aviation during turbine operation, including physical obstructions, and adverse effects on the overall performance of Communications, Navigation, and Surveillance (CNS) equipment including the generation of unwanted returns on Primary Surveillance Radar (PSR) which would have a demonstrated detrimental impact on the provision of a safe and efficient air traffic service. Consultation has been carried out with aviation stakeholders, including Edinburgh Airport, Glasgow Airport, the Ministry of Defence (MOD), and NATS Safeguarding.

Instrument Flight Procedure (IFP) Assessments were carried out for both Edinburgh Airport (**Technical Appendix 14.3** of the EIA Report) and Glasgow Airport (**Technical Appendix 14.4** of the EIA Report), concluding that there were no IFP related risks from the proposed development.

Following the receipt of advice from aviation consultants Straten CSL, and direct consultation with the Defence Infrastructure Organisation (DIO, part of the MOD), no visible lighting is proposed to be fitted to the turbines. Infrared aviation lighting beacons (not visible

to the naked eye) would be installed on all proposed wind turbines, and charted. This is to mitigate risks to low flying aircraft (particularly military aircraft).

Additionally, an Aviation Report (**Technical Appendix 14.5** of the EIA Report) was carried out by Staten CSL, which focused on concerns raised by NATS at the Scoping stage, regarding their aviation radar infrastructure. The report concludes that the proposed development would not cause an unacceptable impact with regards to NATS infrastructure. However, should further information be brought forward by NATS to suggest that there may be impacts on their infrastructure from the proposed development, which require mitigation, options for appropriate mitigation are available, the implementation of which would be considered in line with the precedent established in other recent wind farm determinations.

4.8.8 Telecommunications and Other Infrastructure

Wind turbines can potentially interfere with telecommunication links through reflection and shadowing of electro-magnetically propagated signals, including terrestrial fixed microwave links. Early constraints mapping identified no fixed links running through or near the site. Consultation with telecommunications organizations such as Ofcom, Vodafone, BT, Virgin Media/O2, and MBNL confirmed that there are no communications links in or near the site that may be affected by the proposed development. Additionally, wind turbines can affect analogue television reception, but the area is now served by a digital transmitter, making such interference unlikely. In the rare event that television signals are affected, reasonable mitigation measures will be considered. The assessment concludes that impacts on telecommunications and TV reception are not significant.

4.8.9 Waste and Environmental Management

The proposed development includes measures to manage waste and environmental issues during construction. **Chapters 7** to **14** of the EIA Report provide suggestions on mitigating negative impacts, and commitments are summarised in **Chapter 15: Schedule of Commitments**. The outline Construction Environmental Management Plan (CEMP) provides a general overview of how waste and other environmental issues will be managed during the construction phase. Additionally, the Peat Management Plan (**Technical Appendix 10.2** of the EIA Report) details how excavated peat will be controlled, stored, reused, and disposed of. A site-specific waste management plan for the control and disposal of waste generated onsite will be required by condition if the proposed development receives consent. Therefore, waste management impacts are not considered significant and have been scoped out of further assessment.

5.0 Summary of Significant Effects

The following table (**Table 1**) summarises the significant effects predicted as a result of the proposed development.

Table 1: Summary of Effects from Proposed Development

Topic	Mitigation	Residual Significant Effects

Landscape and Visual Amenity	• Careful site selection and design
	• Use appropriate materials and colours
	• Restore disturbed areas post-construction
	• CEMP implementation
		• Significant Effects predicted during both construction and operational phase.
		• Major Significant Effects are predicted on the following:
		  ○ The site (during construction and operation);
		  ○ Two Landscape Character Types ('Lowland Hill Ranges' and 'Lowland Hills – Central'); and
		  ○ Viewpoint 1: Ben Cleuch.
		• Medium / Moderate Significant Effects are predicted on the following:
		• Two Landscape Character Types ('Broad Valley Lowlands' and 'Lowland Hills –Tayside');
		• Five Viewpoint;
		• Two settlements;
		• Sections of one road;
		• Core Paths and Rights of Way within 5km of the proposed development;
		• Sections of one railway line;
		• The Ochil Hills Local Landscape Area designation (Perth and Kinross Council), the Ochils Special Landscape Area designation (Clackmannanshire Council) and the Western Ochils Local Landscape Area designation (Stirling Council).

Ecology	• Habitat restoration and enhancement • Pollution prevention • Pre-construction surveys • Ongoing monitoring • Environmental Clerk of Works • CEMP implementation	• Significant negative effect on the Alva Moss candidate LNCS and biodiversity at national level due to loss of Annex 1 habitat. However, this habitat loss would be compensated by a significant positive effect through the peatland restoration proposed, to be delivered via a HMP. • Significant negative effect for the loss of blanket bog and wet heath at the national level, and for the loss of

Topic	Mitigation	Residual Significant Effects
		degraded blanket bog and dry heath at the local level. However, this habitat loss would be compensated through the peatland restoration proposed, to be delivered via a HMP, which would result in an overall positive effect.
Ornithology	• Timing of works • Pre-commencement surveys • Disturbance-free buffer zones • Environmental Clerk of Works • Post-construction monitoring • CEMP implementation	• Potential significant cumulative effect predicted for snipe.
Hydrology, Hydrogeology, and Geology	• Good practice guidelines • CEMP implementation • SuDS for runoff management • Regular water quality monitoring	• None.
Cultural Heritage and Archaeology	• Archaeological evaluations • Watching briefs during construction • Adjustments to turbine layout • Reduce visual impacts on heritage sites	• None.
Traffic and Transport	• Detailed CTMP • Avoid peak hours • Designated routes for construction vehicles • temporary traffic signals • Regular communication with residents • CEMP implementation	• None.
Socio-economics, Tourism, Recreation and Land Use	• CEMP implementation • Good practice principles for traffic, noise, and dust control • Maintain access for recreational users • Clear communication about construction • Access Management Plan • Community benefits and shared ownership opportunities	• None.
Other Issues	• Good practice principles for traffic, noise, and dust control • Maintain access for recreational users	• None.

Topic	Mitigation	Residual Significant Effects
	• Clear communication about construction • Access Management Plan • Community benefits and shared ownership opportunities	

6.0 Next Steps and Further Information

The ECU will consider the Section 36 application and the findings of the EIA. Before making a decision on the application, the ECU will consult a number of consultees including Clackmannanshire Council, Perth and Kinross Council, , NatureScot and SEPA, and will consider all representations received from other parties including members of the public.

A copy of the NTS will be made available for download from the applicant website at:

https://windburnwindfarm.co.uk/

Hard copies of this NTS are available free of charge from:

SLR Consulting Limited,

24 St. Vincent Place,

Glasgow,

United Kingdom,

G1 2EU

Tel: 07718 482283

Paper copies of the EIA Report may be purchased by arrangement from the above address for £1,800 per copy, or £20 per USB memory stick copy. The price of the paper copy reflects the cost of producing all of the Landscape and Visual photographs at the recommended size. As such, a USB memory stick is recommended.

Hard copies of the EIA Report can be viewed at the following locations during their normal opening hours:

- Library Services, Clackmannanshire Council, Speirs Centre, Primrose Place, Alloa, FK10 1AD
- Perth and Kinross Council HQ, Pullar House, 35 Kinnoull St, Perth, PH15GD
- Auchterarder Library, Chapel Wynd, Auchterarder, PH3 1BL

Figures

Non Technical Summary

Windburn Wind Farm

Wind 2 Limited

SLR Project No.: 428.V12959.00001

2 June 2025

270000 280000 290000 300000 310000

720000 710000 700000

LEGEND

Application Boundary

N

WINDBURN WIND FARM LTD

SLR

WINDBURN WIND FARM

NON-TECHNICAL SUMMARY

SITE LOCATION

FIGURE 1

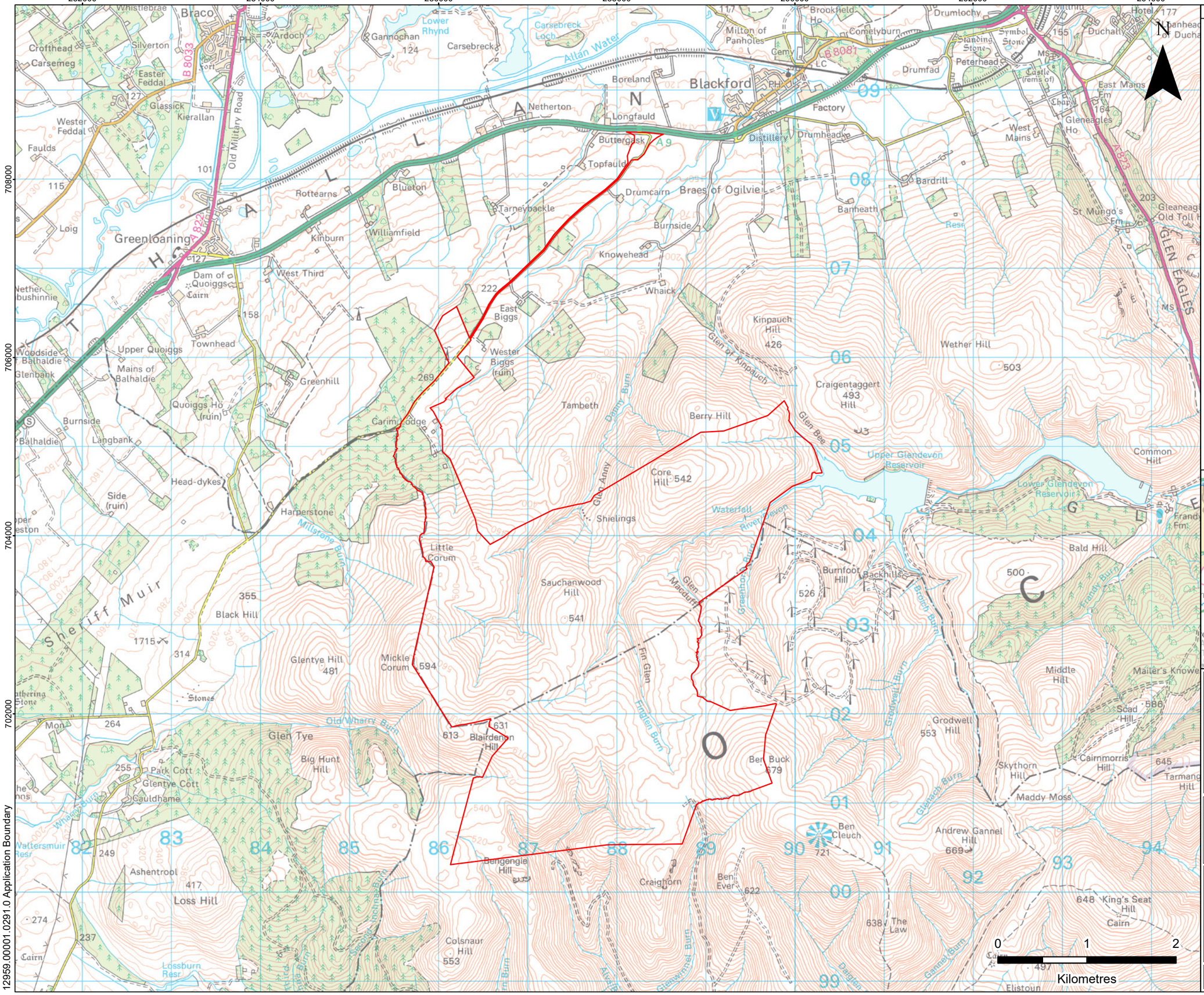
Scale 1:150,000 @ A3

Date APRIL 2025

0 5 10

Kilometres

12959.00001.0290.0 Site Location



WINDBURN WIND FARM LTD

SLR

WINDBURN WIND FARM

NON-TECHNICAL SUMMARY

APPLICATION BOUNDARY

FIGURE 2

Scale	Date
1:40,000 @ A3	MAY 2025

12959.00001.0291.0 Application Boundary

282000 284000 286000 288000 290000 292000 294000

708000 706000 704000 702000

12959.00001.0289.0 Site Layout

LEGEND

- Application Boundary
- Proposed Turbine Location
- Proposed Crane Pad
- Proposed Substation Compound
- Proposed Temporary Construction Compound (TCC)
- Proposed Borrow Pit
- Proposed Access Track
- Proposed Turning Head
- Existing Road (To Be Upgraded)

TCC1 TCC2 TCC3 BP1 BP2 T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13

0 1 2 Kilometres

WINDBURN WIND FARM LTD

SLR

WINDBURN WIND FARM

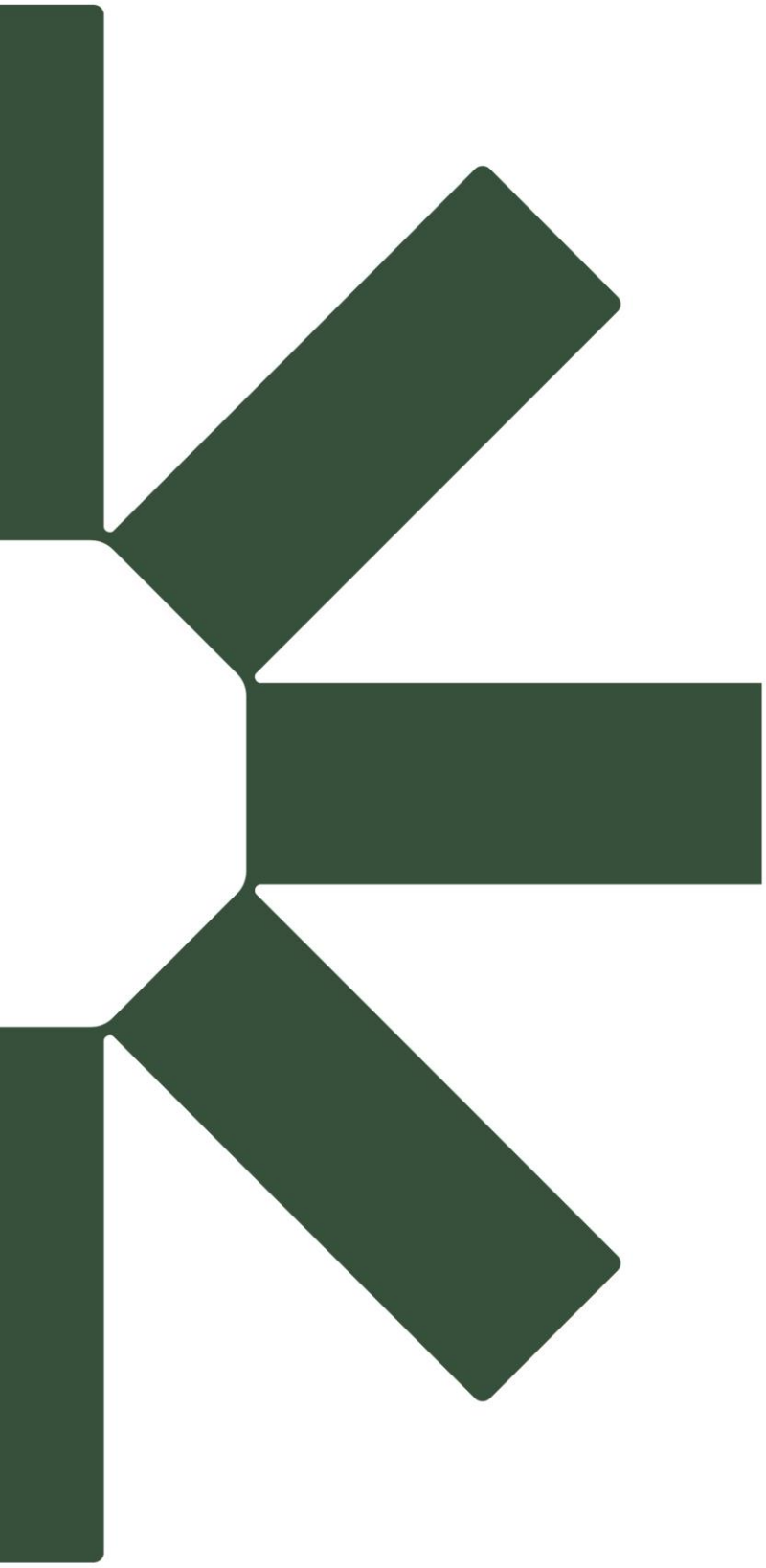
NON-TECHNICAL SUMMARY

SITE LAYOUT

FIGURE 3

Scale 1:40,000 @ A3

Date MAY 2025



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