Force 9 Energy

Glenouther Wind Farm
EIA Scoping Report

Prepared by LUC
August 2025

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EIA Scoping Report

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1. Introduction

1.1 Project Overview

1.1.1 Wind Power North Four Ltd (hereafter referred to as 'the Applicant') intends to apply to East Ayrshire Council (EAC) for planning permission under the Town and Country Planning (Scotland) Act 1997[1] ('the Act') (as amended) to construct and operate Glenouther Wind Farm (hereafter referred to as 'the Proposed Development'). The Proposed Development currently comprises five wind turbines of up to 200 metres (m) to blade tip with an output capacity of up to 36 megawatts (MW) and associated infrastructure. The Proposed Development is located on Glenouther Moor, to the immediate south of Corsehouse reservoir, and approximately 4.5 kilometres (km) north-east of Stewarton (hereafter referred to as 'the Site'). The Site itself is wholly within East Ayrshire (see **Figure 1.1: Site Location Plan**).

1.1.2 As the Proposed Development will exceed the thresholds for wind farms set out in Schedule 2 of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017[2] ('the EIA Regulations'), and as it is a scheme that could potentially result in significant environmental effects, an Environmental Impact Assessment (EIA) is proposed.

1.1.3 The EIA Regulations make provision for obtaining a Scoping Opinion from the local authority, within whose area a scheme is located, as to the environmental effects to be considered in the EIA (Regulation 17). This document accompanies the Applicant's written request to EAC for an EIA Scoping Opinion. It provides details of the Proposed Development; the environmental survey work undertaken to date and identifies the potential significant environmental effects to be investigated as part of the EIA and methodologies for doing so.

1.2 The Need for the Project

1.2.1 The UK has some of the most ambitious climate change and low carbon targets in the World and has most recently committed to the complete decarbonisation of UK electricity supply by 2030[3] to support its progress towards its legally binding net-zero target by 2050[4]. The Scottish Government has also set a target of achieving net-zero by 2045[5], and meeting 50% of total energy demand from renewables by 2030[6]. In response to this challenge, the Onshore Wind Policy Statement (OWPS)[7] has set an overall ambition to deploy 20 gigawatts (GW) of installed onshore wind capacity in Scotland by 2030. The 20 GW is not a cap, and it is currently expected that onshore wind will play an important part of the drive toward net zero past 2030. The Statement notes that the world is facing a climate emergency with the impacts of climate change and need for Scotland to accelerate its transition towards a net zero society. The latest statistics show that by the end of 2024, the installed onshore wind capacity in Scotland was 10.3 GW[8]. Therefore, there is a significant step change required to the pace of onshore wind deployment in the next five years.

1.2.2 To meet climate change and renewable energy targets, new renewable energy projects must be developed where resources are present, and environmental effects can be satisfactorily mitigated. Where appropriate, projects must also look for opportunities to create biodiversity net gain and make social and economic contributions to local communities and/or regional programmes. The Proposed Development will contribute to these targets by providing renewable electricity generation in Scotland and providing an opportunity to reduce CO_2 emissions from our electricity use. The Proposed Development will also provide biodiversity net gain and social and economic benefits to local communities as well as to the wider region.

[1] The Town and Country Planning (Scotland) Act 1997. Available [online] at: https://www.legislation.gov.uk/ukpga/1997/8/contents
[2] The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Available [online] at: https://www.legislation.gov.uk/ssi/2017/102/contents [Accessed: 22 April 2025]
[3] DESNZ (2024). Clean Power 2030 Action Plan. Available [online] at: https://www.gov.uk/government/publications/clean-power-2030-action-plan.] Accessed: 12.06.25]
[4] Climate Change Act 2008. Available [online] at: https://www.legislation.gov.uk/ukpga/2008/27/contents. [Accessed: 12.06.25]
[5] The Climate Change (Scotland) Act 2009. Available [online] at: https://www.legislation.gov.uk/asp/2009/12/section/A1. [Accessed: 10th June 202].
[6] Scottish Government (2017). The Future of Energy in Scotland: Scottish Energy Strategy. Available [online] at : https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/. [Accessed: 10th June 2025].
[7] The Scottish Government (2022). Onshore Wind Policy Statement. Available [online] at: https://www.gov.scot/publications/onshore-wind-policy-statement-2022/
[8] Department for Energy Security and Net Zero (DEZNZ) (2025). Renewable electricity capacity and generation (ET 6.1 – quarterly). Available [online] at: https://www.gov.uk/government/statistics/energy-trends-section-6-renewables. [Accessed: 10th June 2025].

1.3 Planning History

1.3.1 On 31st July 2015, a planning application (15/0584/PP) was submitted to EAC by Glenouther Renewable Energy Park Limited, a wholly owned subsidiary of Gamesa Energy UK Limited (a part of Gamesa Corporatión Technológica), for the construction and operation of 12 turbines at 126.5 metres (m) to blade tip, with associated infrastructure. This was accompanied by an Environmental Statement (ES) (hereafter referred to as the '2015 ES'). The application was refused by EAC on 25th May 2016 due to landscape and visual impacts (including cumulative considerations) and residential visual amenity impacts on surrounding properties. The project was also considered to exceed any landscape capacity for wind turbines in the area. Subsequently, an appeal was lodged against the decision to the (then) Department of Planning and Environmental Appeals (DPEA) division of the Scottish Government on 4th August 2016 (appeal reference PPA-190-2059-1). The refusal by EAC was upheld by the Reporter for the same reasons, and the appeal was dismissed and planning permission refused on 2nd October 2018. Since these decisions, the policy environment for on-shore wind has changed significantly as set out in Chapter 4 of this report.

1.4 The Applicant

1.4.1 The application will be submitted by Wind Power North Four Limited, a wholly owned subsidiary company of Vestas Development A/S which is in turn owned by Vestas Wind Systems A/S. The project is being developed under the terms of an agreement between Force 9 Energy Limited and Vestas Development A/S. Through the agreement, Force 9 leads on the development process of wind farm proposals up to consent. Force 9 is supported during this period by Vestas both financially and with staff resources requested by Force 9 on issues such as access, engineering design, turbine selection, wind flow and optimisation of energy capture.

1.4.2 Vestas is, by many measures, the leading global manufacturer and supplier of wind turbines. Vestas has installed over 91,000 turbines with a capacity of over 189,000 MW in 88 countries worldwide. In addition, Vestas has a broad range of experience of project development issues including turbine siting and optimisation, grid connection and construction management. They maintain and service over 56,000 turbines worldwide amounting to 156,000 MW. Force 9 Energy is a successful, independent UK wind farm developer based in Glasgow, Scotland. Wind farms developed by the Force 9 team and in operation already contribute more than 200 MW of clean, renewable, generating capacity in the UK. Force 9 also have a development pipeline of over 300 MW of consented potential installed capacity, 72 MW (installed wind capacity) of developments in planning and are bringing forward a portfolio of over 400 MW of potential generating capacity (including Glenouther).

1.5 The EIA Team

1.5.1 The EIA is being coordinated by LUC. LUC is accredited with the Institute of Sustainability and Environmental Professionals (formerly known as IEMA) EIA Quality Mark. This award is independently reviewed each year and recognises commitment to excellence in EIA activities and sharing good practice. The EIA Quality Mark demonstrates that LUC has sufficient expertise to ensure that all EIA related activities are undertaken to a high standard in accordance with Regulation 5(5)(a) of the EIA Regulations.

1.5.2 A team of independent specialist consultants has been appointed to provide input to the Proposed Development's design and undertake environmental assessments as part of the EIA Report (EIAR) to accompany the planning application. **Table 1.1** provides details of the EIA team.

Table 1.1 Proposed EIA Team

Topic	Team
Landscape and Visual Amenity	LUC
Ecology	MacArthur Green
Ornithology	Natural Research Projects Ltd
Cultural Heritage	LUC
Hydrology, Hydrogeology, Geology and Peat	Kaya Consulting Ltd & OWC Ltd

Topic	Team
Noise and Vibration	Hayes McKenzie Partnership Ltd
Access, Traffic and Transport and Civil Design	Pell Frischmann
Socio-Economics	BiGGAR Economics
Forestry	Scottish Woodlands
Other Issues (Socio-Economics, Tourism and Recreation, Aviation and Defence, Climate Change, Telecommunications, Shadow Flicker, Population and Human health including Dust, and Major Accidents and Disasters)	LUC, Aviatica, and Carbon Forecast

1.6 Consultation and Next Steps

1.6.1 This Scoping Report is being issued to EAC who will consult with statutory and non-statutory consultees before forming their Scoping Opinion.

1.6.2 Two rounds of in-person public consultation events will be held as the proposals progress. This consultation will provide an opportunity for the public to learn about the Proposed Development through viewing information boards, maps and visualisations, and meeting key team members. Feedback on the Proposed Development will be encouraged; and where received, this will be taken into account in the design of the Proposed Development as far as possible.

1.6.3 The Applicant will also actively engage in discussions with local community groups and councils regarding how the community might benefit financially from the Proposed Development. The intended consultation activity for the Proposed Development is set out in a separate Proposal of Application Notice (PoAN) issued to East Ayrshire Council.

1.7 Structure of this Document

1.7.1 The remainder of this report is structured as follows:

- **Chapter 2** provides information on the EIA process;
- **Chapter 3** provides a brief description of the Site and the nature of the Proposed Development;
- **Chapter 4** provides an overview of planning and energy policy and legislation relevant to the Proposed Development;
- **Chapters 5 to 12** outline the topic areas proposed to be considered in the EIA;
- **Chapter 13** provides a summary of topics proposed to be scoped in/out of the EIA;
- **Appendix 1** provides a consolidated list of all questions for consultees;
- **Appendix 2** provides a list of the Scoping turbine coordinates; and
- **Appendix 3 (confidential)** provides details of ornithology surveys completed to date and the findings. The circulation of this appendix has been limited and will not be uploaded to the EAC planning portal.

2. The Environment Impact Assessment

2.1 What is EIA?

2.1.1 EIA is the process of systematically compiling, evaluating and presenting all the likely significant environmental effects, both positive and negative, of a proposed development, to assist the determining authority (in this case EAC) in considering the application. It enables the significance of these effects, and the scope for reducing negative, or enhancing positive, effects to be clearly understood. The information compiled during the EIA is presented within an EIAR to accompany the application.

2.1.2 EIA is an iterative process and runs in tandem with project design. As potential effects are identified, the design of the Proposed Development will be adjusted to reduce or avoid adverse effects where possible, and mitigation measures will be proposed as appropriate.

2.1.3 The EIA will be conducted with regard to current Scottish Government regulations, policy and guidance, including:

- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017[9];
- The Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017[10];
- National Planning Framework 4 (NPF4)[11];
- NatureScot (formerly Scottish Natural Heritage (SNH) (2018) (5th Edition), Environmental Impact Assessment Handbook[12];
- Institute of Environmental Management and Assessment (IEMA) (2017), Delivering Proportionate EIA[13]; and
- PAN 1/2013 Environmental Impact Assessment (updated June 2017)[14].

2.1.4 The EIA process will include the following key stages as set out below.

2.2 Scoping

2.2.1 The purpose of Scoping is to focus the EIA on the likely and relevant significant environmental effects associated with a proposal. On the basis of the expert judgement of the assessment team, experience from similar projects, as well as relevant policy, guidance and standards, each of the topic chapters within this report outline both:

- Potential likely significant effects associated with construction, operation, and decommissioning of the Proposed Development, which will be assessed in detail in the EIAR.
- Effects which are considered unlikely to be significant and requiring no further assessment.

2.2.2 Additional objectives of the Scoping Report are:

- To establish the availability of baseline environmental data and its source;
- To define and agree a survey framework from which a comprehensive overall assessment can be produced;
- To invite comments on the proposed assessment methodologies;
- To invite consultees to identify any concerns that they might have in relation to the Proposed Development and respond to key questions asked throughout (see green text boxes);

[9] The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Available [online] at: https://www.legislation.gov.uk/ssi/2017/102/contents
[10] The Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017. Available [online] at: https://www.legislation.gov.uk/ssi/2017/113/contents
[11] National Planning Framework (NPF) 4. Available [online] at: https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf
[12] NatureScot (2018). Environmental Impact Assessment Handbook V5. Available [online] at: https://digital.nls.uk/pubs/e-monographs/2020/216527997.23.pdf
[13] Institute of Environmental Management and Assessment (2017). Delivering Proportionate EIA: A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice. Available [online] at: https://www.iema.net/media/lb0d3ten/delivering-proportionate-eia-july-2017.pdf
[14] Scottish Government (2017). Planning Circular 1/2017: Environmental Impact Assessment Regulations. Available [online] at: https://www.gov.scot/publications/planning-circular-1-2017-environmental-impact-assessment-regulations-2017/documents/

- To provide and receive information relevant to the Proposed Development; and
- To consider the way in which the findings are presented in the EIAR.

2.2.3 A number of statutory and non-statutory consultees will be consulted during the course of the EIA for information to inform assessments and to agree assessment methodologies etc. Additional suggestions of other stakeholders who may have an interest in the Proposed Development, and who may wish to be consulted for information to inform the EIA, are welcomed. Questions are included throughout the Scoping Report to help focus the feedback and ensure the maximum value of the Scoping process is realised for both the Applicant and consultees. A consolidated list of all questions included in the Scoping Report is provided at **Appendix 1**.

2.3 Baseline Conditions

2.3.1 Paragraph 3 of Schedule 4 of the EIA Regulations requires that the aspects of the environment, which are likely to be significantly affected by a proposal, are defined within the EIAR. To achieve this, it is necessary to gather information on the current state of the environment, i.e. 'baseline conditions' and then to confirm how these conditions are likely to evolve in the absence of the Proposed Development (the 'do-nothing scenario'). This work has been ongoing for a number of the topics which will be assessed in the EIA and will be further informed through a combination of consultation with stakeholders, field survey work and desk-based research. It is recognised that there is some data and information already available from the 2015 ES which can inform the EIA for the Proposed Development. Where relevant, this information will be re-used (as stated in the chapters), supplemented by new survey data as appropriate.

2.3.2 In accordance with IEMA guidance, and to inform the climate change assessment, each specialist topic (as relevant) will consider the way in which projected climate change conditions may alter the current baseline conditions of the Site during the construction, operation and decommissioning phases of the Proposed Development.

2.4 Assessment of Effects

2.4.1 The assessment of potential effects, using a range of appropriate methodologies, will consider the construction, operation, and decommissioning of the Proposed Development in relation to the Site and its environs. Whilst decommissioning effects are likely to be of a shorter duration and lesser magnitude of change compared to construction effects, there is still a need to consider decommissioning effects for potential significance.

2.4.2 Each chapter will consider the effects of the Proposed Development including a 50 m micro-siting allowance and where limitations to the allowance exist, this will be noted.

2.4.3 Study areas (including cumulative study areas) will be defined separately for each topic assessed in the EIA to reflect the likely extent of potential significant effects in accordance with professional judgement and guidance.

2.4.4 The technical assessments will each provide a detailed assessment of potential effects (direct and indirect, positive and negative, short term or long term), identify mitigation measures and determine the significance of the residual effects (those remaining after the mitigation measures have been implemented). It should be noted that it is not the intention for the EIAR to draw comparisons with the significance of effects reported in the 2015 ES given that this is a new EIA based on new assessment guidance for a new scheme which should be considered on its own merits.

2.4.5 EIAR chapters will be accompanied by technical appendices and figures where relevant. All technical guidance and data sources used will be fully referenced, as required by paragraph 10 of Schedule 4 of the EIA Regulations. Where sensitive ecological or ornithological data is provided to support these assessments, this will be treated as confidential and only shared with EAC, NatureScot and the RSPB.

2.4.6 A consolidated list of all significant effects before and after mitigation will be included in a final chapter of the EIAR for ease of reference.

2.4.7 A standalone Non-Technical Summary (NTS) of the findings of the EIAR will also be produced as required by paragraph 9 of Schedule 4 of the EIA Regulations.

2.5 Assessing Significance

2.5.1 The EIA Regulations do not define significance; therefore, it is necessary to define this for the Proposed Development EIA. The methods used vary according to the topic assessed and may be quantitative (e.g. comparing predicted values against published thresholds/criteria) or qualitative, based on experience and professional

judgement. The methodologies used for assessing each topic area will be fully described within the individual chapters of the EIAR.

2.6 Cumulative Assessment

2.6.1 An assessment will be made of the likely significant cumulative effects with other wind farms. These will include:

- Wind farm proposals which have been submitted to the relevant authorities but not yet determined;
- Wind farm proposals which are consented but not yet under construction.

2.6.2 Study areas will be defined separately for each topic assessed in the EIA, and this will determine which cumulative schemes are included. Operational wind farms, and those under construction, are included as part of the current baseline in accordance with established practice, noting that as a result, some of the effects recorded will be cumulative in nature.

2.6.3 Consideration will also be given as to whether there are any other large-scale developments which are the subject of a submitted application or consented and not constructed, which need to be taken into account.

2.6.4 The purpose of the cumulative assessment will be to determine the 'additional' effects of the Proposed Development should it be added to a future, albeit more speculative, baseline. The scope and methodology for the cumulative assessment will be agreed through this Scoping Report with the relevant statutory consultees, including EAC and NatureScot.

2.7 Approach to Mitigation

2.7.1 Paragraph 7 of Schedule 4 of the EIA Regulations notes that the EIAR should include *"A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases"*.

2.7.2 It is important to note that, given Industry-wide experience in implementing accepted good practice during the construction and operation of schemes such as this, and the current Scottish regulatory context, a number of measures are not considered 'mitigation' as such but rather an integral part of the design/construction process, and will be taken to be 'embedded mitigation' prior to assessing the likely significant effects of the Proposed Development. Where necessary, and where significant effects are likely, further tailored and location specific mitigation measures i.e. 'additional mitigation' will then be proposed prior to determining the likely significance of residual effects. The Project Developer will be committed to implementing all the mitigation measures identified in the EIAR. On the assumption that a number of good practice measures ('embedded mitigation') will be assumed to be in place which could help to avoid potentially significant effects, it may be appropriate to scope out a number of effects on this basis. This will be detailed in the relevant chapters of the EIAR as appropriate, and some proposals for scoping out certain effects on this basis are proposed in this Scoping Report.

2.7.3 Where appropriate, the mitigation measures implemented will be monitored for effectiveness. Where monitoring is proposed, this will be *"proportionate to the nature, location and size of the proposed development and the significance of its effects on the environment having regard in particular to the type of parameters to be monitored and the duration of the monitoring"*, as detailed in Regulation 30(2) of the EIA Regulations.

2.7.4 A Schedule of Mitigation, Good Practice, Enhancement and Monitoring will be included as an appendix to the EIAR and will provide a consolidated list of all proposed embedded and additional mitigation, enhancement and monitoring measures identified in the EIA.

2.8 Uncertainty

2.8.1 The EIA process is designed to enable good decision-making based on the best possible information about the environmental effects of a proposal. There will, however, sometimes be uncertainty as to the exact scale and nature of the effects. These may arise through shortcomings in available information i.e. environmental surveys, or due to the limitations of the professional judgement process. As required in paragraph 6 of Schedule 4 of the EIA Regulations, it is important that such uncertainty is explicitly recognised and that the EIA Report includes *"A*

description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved".

2.8.2 Each assessment chapter of the EIAR will include details of the assumptions made and limitations identified before assessing the significance of effects.

2.9 Competent Experts

2.9.1 As per Regulation 5(5), the EIAR must be prepared by 'competent experts' with a clear statement outlining the relevant competencies of those undertaking the EIA. This statement will be provided in the introductory sections of each technical chapter of the EIAR. Brief details of the qualifications and the professional expertise of the lead EIA coordinator will also be provided as an appendix to the EIAR.

2.10 EIA Report Structure

2.10.1 The EIAR will be structured as follows, subject to any changes to the scope identified through the consultation process:

- Introductory chapters including details of the EIA process, the Proposed Development and information on site design and alternatives considered. In the interest of proportionality, details of relevant national and local planning policy, climate change and renewable energy policy of relevance to the Proposed Development will be confined to the supporting Planning Statement and will not be discussed in detail in the EIAR. An initial review of relevant policies which will be discussed in detail in the Planning Statement, is included in **Chapter 4** of this Scoping Report.
- Individual environmental assessment topic chapters, including a description of the mitigation measures required to prevent, reduce and, where possible, offset any significant adverse effects on the environment. Enhancement measures will also be included where relevant.

2.10.2 Each chapter of the EIAR, where practicable, will adopt a consistent format. This will ensure compliance with the EIA Regulations regarding completeness and accuracy. Each chapter will comprise an opening introduction to the topic followed by:

- Methodology, Consultation and Legislation/Policy/Guidance;
- Baseline Conditions (derived from desk studies and surveys undertaken);
- Embedded Mitigation (detailing any regulatory good practice measures and design measures which are assumed to be in place, and which have informed the assessment)
- Assessment of Effects (identification of the effects and their significance);
- Additional Mitigation (detailing any additional mitigation required to address likely significant effects, and associated monitoring as appropriate);
- Residual Effects (assessment of effect significance once mitigation has been incorporated); and
- Summary of Significant Effects.

2.11 Supporting Application Documents

2.11.1 The planning application will also be accompanied by:

- A Pre-Application Consultation (PAC) Report which will detail the public consultation which has been undertaken in accordance with statutory requirements, and how feedback received has shaped the proposals; and
- A Design and Access Statement (DAS) which will discuss in detail the design rationale and process undertaken; and
- A Planning Statement which will include details of the planning and renewable energy policy context that is relevant to the Proposed Development, and an appraisal of the Proposed Development's compliance with these policies.

2.12 Questions

Questions for Consultees

Q2.1: Confirmation is requested on the proposed structure of EIAR topic chapters.

3. Project and Site Description

3.1 The Site and Surroundings

3.1.1 The Site is located on land at Glenouther Moor, south of Corsehouse reservoir and west of the M77 motorway. The closest settlement is Stewarton, approximately 4.5 km to the south-west.

3.1.2 The Site, illustrated in **Figure 1.1**, occupies an area of approximately 205 hectares (ha). The Site broadly slopes from north to south from approximately 230 m Above Ordnance Datum (AOD) to 210 AOD. The Site is within an area of privately owned commercial coniferous forest, with some small areas of open moorland and bog.

3.1.3 The northern part of the Site drains towards the Annick Water and Corsehouse Reservoir. The southern part of the Site drains towards the Swinzie Burn, a tributary of the Annick Water. The Site is surrounded by residential properties and farmsteads which flank the B769 to the north/north-west, Clunch Road (minor road) to the south/south-west and the A77 to the east/south-east; however, all are at least 1.1 km from the turbines. The operational Whitelee Wind Farm and its Extensions, and Middleton and Neilston Community Wind Farms all lie within 5 km of the Site.

3.2 The Proposed Development

3.2.1 The Applicant is investigating the potential for a wind farm development comprising five wind turbines and ancillary infrastructure. The principal elements of the Proposed Development are described in further detail below. Informed by early environmental surveys and design work, a provisional layout of the proposed turbines is shown on **Figure 3.1**: **Scoping Layout**.

3.2.2 The key elements of the Proposed Development include:

- Up to five wind turbines, each with a maximum height to blade tip of up to 200 m and a combined output capacity of up to 36 MW (see **Appendix 2** for Scoping turbine coordinates);
- Foundations supporting each turbine;
- Associated temporary and permanent crane hardstandings at each turbine location;
- A network of new onsite access tracks and associated watercourse crossings;
- A network of underground cables to connect the turbines to a substation;
- A control building and substation;
- A temporary construction compound including car parking;
- Forestry works; and
- A Biodiversity Enhancement Management Plan.

Aviation Lighting

3.2.3 Article 222 of the Air Navigation Order (ANO) 2016 requires that all structures of 150 m or more above ground level should have medium intensity steady red lights installed as close as possible to the top of obstacles in the interests of aviation safety in periods of darkness. There are, however, exceptions that can be made under Article 222(7) where it is demonstrated to the Civil Aviation Authority (CAA) that a reduced lighting design would still be sufficient for the purposes of managing air safety. In addition, CAA policy[15] also allows lights to be dimmed to no less than 10% of the required full intensity where meteorological visibility is beyond 5 km in all directions. This substantially reduces the operating time of full intensity lights at periods of darkness. Further consideration will be given as to the feasibility of a reduced lighting scheme for this five-turbine development, with the landscape and visual impact of the proposed aviation lighting design assessed in the Landscape and Visual Impact Assessment (LVIA) – see **Chapter 5.**

[15] CAA (2017). Policy Statement Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level.

Access and Construction Traffic

3.2.4 Access to the Site will be taken from the east. It is anticipated that general construction vehicles (Heavy Goods Vehicles (HGVs) and staff vehicles) will travel from the north and south (i.e. from Glasgow and Ayrshire) and will enter the Site via the existing junction off the A77 to the west of North Drumboy Quarry. These vehicles will then use the minor road (Floak Road) and existing bridge (Floak Farm Bridge) crossing the M77 which provides access to nearby farms (Floak, Mid Floak and Townhead of Floak), as well as Floak Quarry. From there, vehicles will use the existing M77 service road to travel south-west into the site.

3.2.5 For the transportation of abnormal indivisible loads (AIL), i.e. turbine components, there are currently two options being explored (as set out in **Chapter 11: Access, Traffic and Transport**):

- Option 1: AIL vehicles will exit Junction 6 of the M77 and travel back north via the A77. AIL vehicles will leave the A77 and travel into Site via Floak Road and Floak Farm Bridge. A blade lifter will be used from port to Site to enable safe passage over Floak Farm Bridge, if this option is taken forward; and
- Option 2: AIL vehicles will travel south via the M77 and A77 before making a U-turn at the Bellfield interchange at Kilmarnock. From there, AIL vehicles will travel back north via the A77 and M77 and exit the M77 via a new slip road off the M77 to the east of the Site. It is anticipated that AILs will be delivered using typical delivery vehicles such as a Superwing Carrier Trailer and a Tower Trailer for this option. The new slip road will be used for AIL vehicles only, if taken forward, and would be closed to all other traffic during construction and operation.

3.2.6 Construction materials will be sourced from local quarries and other facilities from the surrounding area.

3.2.7 The predicted number and type of vehicle movements will be assessed as part of the EIA process once the turbine and infrastructure layout is finalised. A Construction Traffic Management Plan (CTMP), Staff Travel Plan and Abnormal Loads Traffic Management Plan will be agreed and implemented in consultation with the local roads authority to manage traffic movements and minimise effects on local communities during construction.

3.2.8 An Abnormal Loads Route Survey Report will be prepared as part of the EIAR setting out the proposed route and the extent of works likely to be required along the public road network to accommodate abnormal loads.

Forestry and Biodiversity Enhancement Proposals

3.2.9 The Site comprises crops planted between 1974 and 1980 which are dominated by pure Sitka spruce and mixtures of Sitka spruce and Lodgepole pine. A significant proportion of the crops exhibit very poor growth rates, and over 60% of the trees are recorded as growing at below Yield Class 8, which is considered to be the result of planting on peatland. There are no ancient semi-natural woodland or native woodland designations within the Site.

3.2.10 Areas of woodland will need to be felled for the construction and operation of the Proposed Development, including areas for access tracks, turbine locations and other infrastructure. Further woodland may also need to be felled for wind yield and other forestry management purposes and the structure of the woodlands may therefore change, resulting in a potential loss of woodland area. The forestry assessment will consider the potential effects on forestry resource within the Site, and what mitigation will be implemented to minimise the impact of loss of woodland. Each topic chapter of the EIAR will consider the potential effects of proposed felling and replanting on the relevant receptors assessed. The forestry assessment will form a technical appendix to EIAR Chapter 4: Development Description and will be supported by figures. The assessment will be undertaken with reference to key legislation and guidance, including the UK Forestry Standard 2024, Scotland's Forestry Strategy 2019 and the Scottish Government's Control of Woodland Removal Policy (CoWRP) 2009. Existing forestry records for the study area will be analysed and augmented as required through further survey and assessment to document the full detail of the existing tree cover. Analysis will be presented documenting any requirement to remove tree crops to accommodate the infrastructure footprint of the Proposed Development.

3.2.11 There is a presumption against permanent woodland removal within the UK unless it addresses other environmental concerns or delivers additional and clearly defined public benefits. The CoWRP records the assessment requirements and compensatory measures which should be considered when removing woodland cover, and the requirements under this policy will be addressed within the EIA.

3.2.12 The redesign of the existing forest crops will be assessed so as to comply with the terms of the CoWRP, and final proposals may include a variety of measures including restoring afforested land to peatland habitat for biodiversity enhancement purposes (which may minimise the degree of compensatory planting required under the CoWRP),

replanting alternative woodland types or the provision of compensatory woodland planting on an alternative site. An assessment of residual effects on forestry resource will be provided on the basis of the mitigation proposed

3.2.13 The Applicant will investigate opportunities for habitat restoration and enhancements in accordance with Policy 3 of NPF4 to help compensate for habitat loss as a result of the Proposed Development. These may utilise areas of the Site which are not being developed. The aim will be to achieve a net gain for biodiversity within the Site which would not have otherwise been possible without the Proposed Development. It is proposed that an Outline Biodiversity Enhancement and Management Plan (OBEMP) will be included as a technical appendix to the EIAR setting out the details of the proposals. Proposed restoration and improvements will be agreed in consultation with EAC and NatureScot and implemented through the final BEMP. At this stage, one proposal could be to consider peatland restoration through returning forestry to bog habitat where current yield is poor (below Yield Class 8). The Forestry Plan prepared for the Site as a technical appendix to the EIAR will include details of all forestry proposals i.e. felling and restocking, compensatory planting and forest to bog restoration (if proposed).

Grid Connection

3.2.14 An initial grid study shows that there may be sufficient capacity available at the Kilmarnock Town Grid Supply Point (GSP) 33kV substation. However, fault levels at the substation may be exceeded by connection of a project of the scale and nature of the Proposed Development and therefore works may be required to be undertaken at the substation to enable connection. Alternatively, the study showed that there may be capacity at the Giffnock GSP to the north. A grid connection application for the project is likely to be made in November 2025 to establish the best connection option for the site. The grid connection will be subject to a separate application for consent and assessment.

Construction Works

3.2.15 It is estimated that it will take approximately 12 months to construct the Proposed Development. Where possible, construction activities will be carried out concurrently to reduce the overall length of the construction programme. Phasing of the construction process may result in civil engineering works progressing in some areas of the Site whilst turbines are being erected elsewhere. To minimise disruption to land use, site restoration will be undertaken as early as possible.

3.2.16 A detailed programme of works will be produced by the construction contractors prior to the commencement of works onsite, and a detailed Construction Environmental Management Plan (CEMP) will be prepared. The CEMP will establish the project management structure and clearly identify the roles and responsibilities in the management and reporting on the construction phase environmental aspects. The CEMP will be used to ensure that all relevant planning conditions, mitigation and good practice construction procedures identified within the EIAR to protect the environment are implemented through agreed procedures and working methods, and that there is a suitable process in place for monitoring the effectiveness of these measures. Adherence to the CEMP, as well as referenced legislation and guidance documents, will be a contractual requirement for the appointed contractor and their sub-contractors. It is expected that a planning condition will require submission and approval of the CEMP by the relevant authorities prior to any construction commencing, which will thereafter be implemented as approved.

3.2.17 Performance against the CEMP will be monitored by the Project Developer's Construction Project Manager and an Ecological Clerk of Works (ECoW) and/or Environmental Clerk of Works (EnvCoW) throughout the construction period. An outline CEMP will be prepared as an appendix to the EIAR.

Operational Life and Decommissioning

3.2.18 The expected operational life of the Proposed Development is 30 years from the date of commissioning. Towards the end of this period, a decision would be made as to whether to refurbish, remove, or replace the turbines.

3.2.19 The EIAR will include high level information on the likely process that will be undertaken to decommission the Proposed Development at the end of its operational life. A Decommissioning Environmental Management Plan (DEMP) will be prepared by the Project Developer prior to the end of the operational life of the Proposed Development. It is anticipated that the DEMP will be required through a planning condition and will have the following aims:

- To ensure that the site is restored to as good a condition as pre-construction, reflecting any changes which have occurred during the operational life of the Proposed Development e.g. through the implementation of the Biodiversity Enhancement Management Plan (BEMP);
- To ensure that appropriate methods are used in the decommissioning process, and that environmental protection measures are secured through adherence to detailed method statements and environmental control measures; and
- To reduce waste through a commitment to recycling the components and materials where facilities and technologies allow.

3.3 Design

3.3.1 The EIAR will provide full details of the final and alternative designs investigated as part of the EIA process, including the key design objectives and site-specific design principles which influenced the process. Importantly, the design process is taking cognisance of the reasons for which the original planning permission was refused in order to seek to address these issues as far as possible.

3.3.2 At this stage, the turbine layout has taken into consideration the constraints noted below which have been identified through baseline surveys undertaken to date (as detailed in subsequent chapters). The full infrastructure layout design will continue to respond positively to these constraints as far as possible.

- Deeper areas of peat and priority peatland habitats/blanket bog;
- Groundwater Dependent Terrestrial Ecosystems (GWDTE);
- Corsehouse Reservoir Drinking Water Protection Area (DWPA);
- Protected species;
- Watercourses, including required buffers;
- Telecommunications links;
- Residential properties, including minimum 1 km buffer; and
- Slopes > 12% for constructability purposes.

4. Planning and Legislative Background

4.1 Legislative Background

4.1.1 As the Proposed Development will have a generating capacity of up to 36 MW, the proposals constitute a 'major development' pursuant to The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009. The threshold for major developments within the electricity generation category of the Hierarchy of Developments Regulations is where *"the capacity of the generating station is or exceeds 20 megawatts"*.

4.1.2 The EIA Regulations are relevant in relation to the Proposed Development. The proposals constitute Schedule 2 development in line with category 3(j) of Schedule 2 of the EIA Regulations as the proposals involve the installation for the harnessing of wind power for energy production (wind farms) of more than 2 turbines and the hub heights of the proposed turbines exceeds 15 m. It is acknowledged that an EIA will be required to accompany the application for planning permission as the Proposed Development could have significant environmental effects. It should be noted that finding a significant environmental effect is not in itself reason to refuse planning permission for a development, but that any such findings will be considered in the balance of all material issues in the determination of the application.

4.1.3 The Proposed Development will be assessed in line with Sections 25 and 37(2) of the Town and Country Planning (Scotland) Act 1997 (as amended) where it is required that planning decisions be made in accordance with the development plan, unless material considerations indicate otherwise. The statutory development plan in this instance comprises National Planning Framework 4 (NPF4) and EAC's Local Development Plan 2 (LDP 2) 2024 including associated Supplementary Guidance.

4.1.4 It is proposed that the assessment of the Proposed Development's accordance with the relevant national and local planning policy and renewable energy context will be provided in a separate Planning Statement submitted with the planning application. The Planning Statement will appraise the compliance of the Proposed Development against national and local policy and other material considerations, having regard to the findings of the EIAR.

4.2 National Planning Policy

4.2.1 NPF4 is the national spatial strategy for Scotland. It sets out the spatial principles, regional priorities, national developments and national planning policy. NPF4 was laid before Scottish Parliament on 8th November 2022 and approved on 11th January 2023. NPF4 came into force on 13th February 2023 and was updated on 9th October 2024, forming part of the Development Plan of Local Authorities and superseding NPF3 and Scottish Planning Policy (SPP).

4.2.2 NPF4 sets out six overarching spatial principles that aim to provide an integrated strategy for the delivery of environmental, social and economic objectives. These are: Just transition, Conserving and recycling assets, Local living, Compact urban growth, Rebalanced development, and Rural revitalisation. These six principles are designed to support the planning and delivery of:

- "***Sustainable places**, where we reduce emissions, restore and better connect biodiversity;*
- ***Liveable places**, where we can all live better, healthier lives; and*
- ***Productive spaces**, where we can all have a greener, fairer and more inclusive wellbeing economy" (p.4).*

4.2.3 The strategy sets out that every decision made about future development must contribute to making Scotland a sustainable place. This includes the expansion of renewable energy generation. The spatial strategy is supported by 18 national developments. National developments are:

"Significant developments of national importance that will help to deliver our spatial strategy" (p.99).

4.2.4 Of particular relevance is National Development 3: Strategic Renewable Electricity Generation and Transmission Infrastructure. This national development recognises the need for a large and rapid increase in electricity generation from renewable sources for Scotland to meet its net zero ambitions. It provides intentionally high-level support for *"Renewable electricity generation, repowering, and expansion of the electricity grid" (p.103)*.

4.2.5 NPF4 contains a total of 33 policies. Policy 1 and Policy 11 are key policies of relevance to the Proposed Development.

4.2.6 Policy 1 entitled 'Tackling the climate and nature crises' states:

"…when considering all development proposals significant weight will be given to the global climate and nature crisis".

4.2.7 Policy 11 aims at expanding renewable, low carbon and zero emission technologies with the following stated 'policy intent':

"To encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies including hydrogen and carbon capture utilisation and storage" (p.53).

4.2.8 In addition, Policy 11 acknowledges "*that significant weight will be placed on the contribution of the proposal to renewable energy generation targets and on greenhouse gas emissions reduction targets*".

4.2.9 Of particular relevance is Policy 11(e)(ii) which notes "*significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/ or appropriate design mitigation has been applied, they will generally be considered to be acceptable*". It should be noted that, whilst the previous application was refused on landscape and visual grounds, including residential visual amenity, the impacts were considered by the Appeal Reporter to be 'localised'. A key design objective is to ensure that the extent and geographical spread of landscape and visual impacts are limited such they can be considered as localised.

4.2.10 The following policies within NPF4 are also relevant to the Proposed Development and will be explored further within the Planning Statement:

- Policy 3: Biodiversity;
- Policy 4: Natural Places;
- Policy 5: Soils;
- Policy 6: Forestry, Woodland and Trees; and
- Policy 7: Historic Assets and Places.

4.2.11 Local Development Plans (LDPs) are directed to seek to realise the full potential for electricity and heat from renewable, low carbon and zero emissions sources by identifying a range of opportunities for energy development.

4.3 Local Planning Policy

4.3.1 The statutory LDP for the Proposed Development comprises:

- EAC Local Development Plan 2 (LDP 2) 2024 (adopted April 2024); and
- EAC LDP 2 Supplementary Guidance (adopted 2024 and 2025).

4.3.2 The LDP policies, applicable to the Proposed Development, will be taken into account during the iterative EIA design process.

4.3.3 The key policy in the LDP for the Proposed Development is LDP 2 (08) 'Supporting Renewable Energy'. This states that EAC supports all forms of renewable energy and aims to ensure that EAC plays its part in tackling climate emergency and reducing greenhouse gas emissions. LDP 2 (08) also states that renewable energy developments will be assessed by balancing their contribution to energy targets and reducing carbon emissions, against any environmental, community and cumulative impacts. Development will be supported where any such impacts can be sufficiently minimised and mitigated.

4.4 National Renewable Energy and Climate Change Policy

4.4.1 The Planning Statement will describe, in summary, the renewable energy and climate change policy framework and associated need case for renewables, identified as a matter of both law and policy, at international, European and domestic levels.

4.4.2 The Proposed Development relates to the generation of electricity from renewable energy sources and comes as a direct response to national planning and energy policy objectives. The clear objectives of the UK and Scottish

Governments will be summarised, in relation to encouraging increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.

4.4.3 The description of the renewable energy policy framework in the Planning Statement will also make reference to the UK's Clean Power 2030 Action Plan, the Scottish Government's Climate Change Plan Update, the Scottish Energy Strategy and Just Transition Plan, Scotland's Energy Strategy Position Statement, the Onshore Wind Policy Statement (OWPS) and other relevant material considerations.

Questions for Consultees

Q4.1: Are there any other policies or material planning considerations of relevance to the Proposed Development which should be considered in the course of preparing the EIAR and Planning Statement?

5. Landscape and Visual Amenity

5.1 Introduction

5.1.1 This chapter sets out the proposed approach to the assessment of potential effects on the landscape and visual resource during construction, operation and decommissioning of the Proposed Development.

5.1.2 The Landscape and Visual Impact Assessment (LVIA) will be undertaken by Chartered Landscape Architects at LUC. The LVIA will consider direct and indirect effects on landscape resources, landscape character and designated landscapes. It will also examine effects on views and visual amenity. The effects of the proposed turbines, as well as the ancillary infrastructure and works (access tracks, transformers, lighting, forestry works) will all be assessed. The LVIA will also consider cumulative effects, i.e. the additional effects of the Proposed Development in combination with other as yet unbuilt wind farm developments.

5.1.3 The LVIA will be undertaken following the approach set out in the Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3)[16]. The assessment will also draw upon current good practice guidance issued by NatureScot and the Landscape Institute.

5.2 Study Area

5.2.1 A study area of 45 km radius from the outermost turbines in all directions is proposed for the LVIA, as recommended in current guidance for turbines greater than 150 m to blade tip[17]. At its furthest extents, this will include greater Glasgow to the north, Lanark to the east, Ayr to the south-west and the Firth of Clyde to the west.

5.2.2 A Zone of Theoretical Visibility (ZTV) plan will be used to identify which landscape and visual receptors require detailed assessment, and which can be scoped out because they are unlikely to be significantly affected due to a lack of theoretical intervisibility or based on professional judgement. Whilst the design of the Proposed Development is subject to change, **Figure 5.1** showing the ZTV to turbine tip height (200 m), is provided to illustrate the theoretical visibility of the Scoping layout.

5.3 Existing Conditions

5.3.1 The Site is located within the EAC administrative boundary, approximately 4.5 km to the north-east of Stewarton. The Site is located within an area of privately owned coniferous forest, the boundary of which is broadly contained by Corsehouse Reservoir to the north; the M77 to the east; the B769 to the west; and the Swinzie Burn to the south, beyond which there is open, gently undulating moorland.

5.3.2 The Site broadly slopes from north to south from approximately 230 m AOD to 210 m AOD. The Site has a simple landscape pattern, consisting mainly of semi mature coniferous forest plantation, with some small areas of open moorland and bog. The monoculture of coniferous forest, split into geometric coupes, presents a landscape clearly influenced by humans. Furthermore, the presence of the busy M77 and scattered farmsteads and properties to all sides further increases the human influence over the site. The operational Whitelee Wind Farm and its extensions to the east, and Middleton and Neilston Community Wind Farms, all lie within 5 km of the site.

5.3.3 The Site is largely contained within the Plateau Moorland with Windfarms – Ayrshire Landscape Character Type (LCT 79)[18]. The key characteristics are as follows:

- *"Comparatively level topography with extensive plateau rising to soft contoured ridges and flatter basins.*
- *Heather and grass moorland, with moss and lochs.*
- *Extensive areas of conifer forest.*
- *Sparse network of minor roads.*
- *Infrequent farms and houses in valleys and on lower hill slopes on outer fringes.*

[16] Landscape Institute and Institute of Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment. Third Edition (GLVIA3).
[17] SNH (2017). Visual Representation of Windfarms, Version 2.2.
[18] LCT 079 - Plateau Moorland with Windfarms - Ayrshire - Final pdf.pdf

- *Extensive operational wind farm development, with associated infrastructure, reducing wild character and sense of remoteness.*
- *Visible as largely horizontal backdrop skyline with wind turbines from the Ayrshire Basin, parts of the Irvine Valley and Glasgow."*

5.3.4 LCTs across the study area are mapped on **Figure 5.2a** (and listed on **Figure 5.2b**). There are no national or local level landscape designations within the Site. Landscape designations and Wild Land Areas (WLA) across the study area are mapped on **Figure 5.3**.

5.4 Proposed Surveys and Assessments Methodologies

Field Survey

5.4.1 Field survey work will be carried out during several visits, and records will be made in the form of field notes and photographs. Field survey work will include visits to the Site, viewpoints, and designated landscapes, and extensive travel around the Study Area to consider potential effects on landscape character and on experiences of views seen from designated landscapes, settlements and routes.

5.4.2 Predicted changes on both the physical landscape of the Site and landscape character within the 45 km Study Area will be identified. However, and based on assessor experience of similar scale developments, it is anticipated that potential significant direct and indirect effects will be limited to a more focused area, extending up to approximately 20 km from the Site. Landscape (and visual) receptors will be considered on a case-by-case basis with reference to the ZTV, and those with the potential for significant effects will be taken forward for detailed assessment.

Assessment Methodology

Landscape Effects

5.4.3 GLVIA3 states that the nature of landscape receptors, commonly referred to as their sensitivity, should be assessed in terms of the susceptibility of the receptor to change with reference to key characteristics and the value attached through landscape designations or other considerations. The magnitude of the effect should be assessed in terms of the scale, geographical extent, duration and reversibility of the effect. These aspects will all be considered together to inform a judgement regarding the overall significance of effect.

5.4.4 With regard to landscape designations, **Figure 5.3** shows that there are no local or nationally designated landscapes within a 15 km radius. When visible, in medium to longer distance outward views, any wind farm development at the site will be seen in the context of views which have already been altered by wind farms, due to the large scale Whitelee Wind Farm and other nearby schemes. As such, any wind farm development at the Site is unlikely to result in effects which would significantly alter the special qualities for which landscapes have been designated and their overall integrity.

5.4.5 As the site is not located in any WLA, and with reference to NPF4 Policy 4g, effects on wild land will not be a key consideration. It is therefore proposed that effects on WLA are scoped out of the assessment.

Visual Effects

5.4.6 Visual effects may be experienced by people at different locations throughout the study area, at static locations (for example settlements or viewpoints) and at transitional locations (such as sequential views from routes, including roads, footpaths and cycle routes). Visual receptors are the people who will be affected by changes in views at these places, and they are usually grouped by what they are doing at those places (for example residents, recreational users, motorists etc.).

5.4.7 GLVIA3 states that the nature of visual receptors should be assessed in terms of the susceptibility of the receptor to change in views/visual amenity and the value attached to particular views. The magnitude of the effect should be assessed in terms of the scale, geographical extent, duration and reversibility of the effect. These aspects will all be considered together to inform a judgement regarding the overall significance of effect.

5.4.8 Assessment of the visual effects of the Proposed Development will be based on analysis of the blade tip and hub ZTVs, field studies and assessment of representative viewpoints. **Figure 5.1** shows the ZTV for the Scoping layout, with a turbine blade tip height of 200 m, alongside the proposed assessment viewpoint locations listed in **Table 5.1**.

The assessment viewpoint locations have been refined from the list used for the previous Glenouther Renewable Energy Park LVIA, which were agreed through consultation at the time. For certain views, and given the nature of visibility, wireline only viewpoints are proposed for reasons set out below.

Table 5.1 LVIA Assessment Viewpoints

No.	Location (Grid Ref)	Direction and distance (to proposed turbines)	Commentary
1	A77 near South Drumboy Farm (249355, 648776)	East 1.1 km	Representative of views from residential properties to the east.
2	Glassock Bridge - A77/A719 (247764, 645497)	South 2.8 km	Representative of views of road users from the M77/A77 motorway and crossing the A719 bridge.
3	Harelaw Road (246483, 652086)	North-west 3.4 km	Representative of views from scattered residential properties to the north-west and minor road.
4	Kingsford B769 (243998, 647937)	West 3.7 km	Representative of views from residential properties in the small community of Kingsford.
5	Queenseat B764 (252531, 649120)	East 4.2 km	Representative of views from the B764 near the entrance to Whitelee Visitor Centre.
6	Neilston Pad (247549, 654934)	North 5.8 km	Representative of recreational views from a high point on a footpath on the escarpment looking south.
7	Dunlop Road (A735), Stewarton (241651, 646448)	South-west 6.3 km	Representative of views from residential properties on the north side of Stewarton.
8	Berryhill Moscow A719 (248565, 641002)	South 7.3 km	Representative of views of road users and residential properties on the A719 north of Moscow.
9	Builston A735 (241156, 643374)	South-west 8.2 km	Representative of views from road users and residents on the A735 south of Stewarton.
10	Foreside (245911, 657289)	North 8.5 km	Representative of views for road users and residential properties on higher ground to north of Neilston.
11	Standing Stones, north of Irvine (233977, 641486)	South-west 15.4 km	Representative of recreational views from footpath network to north-east of Irvine and views from Irvine.
12	B7038 Ditton south of Kilmarnock (241218, 634126)	South-west 15.6 km	Representative of views from elevated residential properties looking across Kilmarnock.
13	Loudon Hill A71 (260874, 637893)	South-east 16.4 km	Representative of views for recreational walkers on Loudon Hill. The Proposed Development will be contained behind Whitelee Wind Farm, at over 15 km distance. Unlikely to result in significant visual effects.

No.	Location (Grid Ref)	Direction and distance (to proposed turbines)	Commentary
			For information, a wireline only view will be presented, and this viewpoint will be scoped out of the detailed assessment.
14	Kilbirnie Connelston A760 (229608, 654212)	North-west 18.9 km	Representative of views for road users and residents around Kilbirnie. The Proposed Development will be seen in front (and contained within the horizontal field of view) of Whitelee Wind Farm, at over 18 km distance. Unlikely to result in significant visual effects. For information, a wireline only view will be presented, and this viewpoint will be scoped out of the detailed assessment.
15	Mauchline A76 (249262, 628599)	South 19.8 km	Representative of views for road users and a number of elevated residential properties in Mauchline.
16	Glasgow Necropolis (260400, 665536)	North-east 20.4 km	Representative of views from Glasgow city centre.
17	Clyde Muirshiel Regional Park Visitor Centre (231549, 663197)	North-west 21.6 km	Representative of views of recreational visitors to the regional park. The Proposed Development will be seen in front (and contained within the horizontal field of view) of Whitelee Wind Farm, at over 21 km distance. Unlikely to result in significant visual effects. For information, a wireline only view will be presented, and this viewpoint will be scoped out of the detailed assessment.
18	Wright's Well, Campsie Fells (261539, 680047)	North-east 33.6 km	Representative of distant views from the Campsie Fells to the north-east.

Cumulative Effects

5.4.9 The cumulative landscape and visual impact assessment (CLVIA) will be carried out in accordance with the principles contained in NatureScot's 'Assessing the Cumulative Impact of Onshore Wind Energy Developments' (2021).

5.4.10 A review of patterns of development will be provided for operational, consented and proposed wind farms which are the subject of a valid application, up to 45 km from the site.

5.4.11 The CLVIA will focus on wind energy developments considered to have potential to give rise to significant cumulative effects. This is likely to primarily be those wind farms in the more immediate landscape context, i.e. within 20 km. Turbines under 50 m to tip, single turbines beyond 5 km from the Site and schemes at scoping stage will not be included unless specifically requested. **Figures 5.4a-b** present the locations of operational, consented and proposed wind farms within the LVIA Study Area.

5.4.12 The 'primary' LVIA will consider the potential effects of the addition of the Proposed Development to the existing landscape against a baseline that includes existing wind farms and those under construction. The CLVIA will consider the potential 'additional' effects of the Proposed Development, against a baseline that includes wind farms

that may or may not be present in the landscape in the future (i.e. including wind farms that are consented but unbuilt (considered under Scenario 1) or undetermined applications (considered under Scenario 2)). Wind farm proposals that have been refused but that are subject to a live appeal will also be considered in the assessment (also considered under Scenario 2). As noted above, schemes at scoping stage will be included only where requested through consultation, and where sufficient design information is available.

5.4.13 Consideration will also be given to 'total' cumulative effects (assessment which considers all current and future proposals, including the Proposed Development) where these are judged to be significant.

Residential Visual Amenity

5.4.14 Given that the nearest residential properties are located within 2 km of the Site, a Residential Visual Amenity Assessment (RVAA) accompanying the LVIA will be carried out. This will be prepared in accordance with the Landscape Institute Residential Visual Amenity Assessment Technical Guidance Note 2/19 (2019).

5.4.15 A detailed assessment of potential visual effects on residential properties within a 2 km Study Area (measured from the nearest proposed turbines) will be undertaken as follows:

- Production of a ZTV for the 2 km Study Area including the location of all residential properties (with reference) indicated as having theoretical visibility of the Proposed Development;
- A detailed description of existing and proposed views from the residential property (or groups of properties) will be prepared, taking consideration of the distance and direction to the Proposed Development; the nature of the view (principal, secondary, outside curtilage or access to property); proportion of attainable view occupied; and the context/baseline situation at the residence (for example number of floors or the presence and nature of vegetation within the curtilage) to determine the nature of the predicted change to residential visual amenity and whether the predicted visibility could lead to a breach of the Residential Visual Amenity Threshold[19]; and
- The assessment will also be supported by baseline context photography (from the nearest publicly accessible location) and wireframes.

Aviation Lighting Assessment

5.4.16 In the interests of aviation safety, structures of ≥ 150 m, including wind turbines, require steady red visible aviation lighting, as set out in Article 222 of the Air Navigation Order[20] and Civil Aviation Authority (CAA) guidance[21]. As turbines over 150 m to tip are proposed, visible aviation lighting may be perceptible to receptors (people) from locations across the Study Area.

5.4.17 The introduction of visible aviation lighting in rural locations, where there are fewer sources of artificial lighting, may lead to potentially significant landscape and visual effects. An assessment of landscape and visual effects associated with visible aviation lighting will be carried out. The assessment will be supported by ZTV mapping and night time assessment viewpoints from a selection of LVIA viewpoints, to be agreed.

Visualisations

5.4.18 Wireframes and photomontages will be used to consider and illustrate changes to views. Photomontages will involve overlaying computer-generated perspectives of the Proposed Development over the photographs of the existing situation to illustrate how the views will change against the current baseline. Other (cumulative) wind farms visible from each of the viewpoints will be shown on the wireframes (and photomontages in relation to operational schemes where visible). Visualisations will be prepared in accordance with the relevant guidance[22].

5.4.19 Changes to forest cover across the Site and ancillary elements such as access tracks will be shown in photomontages, for viewpoints within 5 km where visible. Beyond 5 km, it is considered unlikely that these changes would form more than a minor element of the entire Proposed Development when compared to the turbines.

[19] Defined by Technical Guidance Note 2/19 (2019) as "*The threshold at which the visual amenity of a residential property is changed and adversely affected to the extent that it may become a matter of Residential Amenity and which, if such is the case, competent, appropriately experienced planners will weigh this effect in their planning balance*".
[20] Air Navigation Order (ANO) 2016
[21] Civil Aviation Authority (2016) CAA Policy and Guidelines on Wind Turbines – CAP 764
[22] SNH (2017). Visual Representation of Wind Farms Guidance – Version 2.2

5.5 Potential Significant Effects

Potential Effects Scoped Into the Assessment

5.5.1 The following potential effects are proposed for inclusion in the assessment:

- LCTs upon which there may be potential for significant landscape effects, likely focusing on those within a 20 km radius including LCT across and surrounding the Site;
- Settlements (as defined in the LDP) within 20 km and with the potential for notable views;
- Residential receptors living nearby (2 km RVAA Study Area proposed);
- Effects from representative viewpoints up to 45 km during operation (as proposed in **Table 5.1**);
- Recreational receptors e.g. those at recognised attractions; those at popular hill tops; and those on recognised walking routes/ the National Cycle Network within 20 km. The assessment of effects on Core Paths will focus on Core Paths within the more immediate Site context i.e. within 5 km;
- Users of key transport routes throughout the Study Area, including the M77 and A77 within 20 km; and
- Landscape and visual effects associated with aviation lighting during the hours of darkness.

Potential Effects Scoped Out of the Assessment

5.5.2 The following potential effects are proposed for exclusion from the assessment:

- Landscape character areas with limited theoretical visibility and/or beyond 20 km from the site, where the potential for significant effects on landscape character is limited;
- Indirect effects on landscape designations and WLA as the Proposed Development is unlikely to result in effects which would significantly alter the special qualities for which landscapes have been designated and their overall integrity.
- Settlements, major transport routes, long distance trails and national cycle routes with limited theoretical visibility and/or beyond 20 km from the site, where the potential for significant visual and sequential effects is limited;
- Landscape and visual receptors in the cumulative LVIA where the potential for significant cumulative landscape and visual effects is limited;
- Effects on viewpoints beyond 45 km where visual effects are unlikely to be significant; and
- Effects on residential receptors beyond 2 km where impacts are unlikely to result in a breach of the Residential Visual Amenity Threshold.

5.6 Approach to Mitigation

5.6.1 The primary form of mitigation for landscape and visual effects, including cumulative effects, is through iterative design of the layout of the turbines and associated infrastructure, as seen from key viewpoints.

5.6.2 As noted in **Chapter 1: Introduction**, the site was subject to a previous wind farm application (12 turbines at 126.5 m to tip), for which LUC prepared the Landscape and Visual Impact Assessment (LVIA) and provided expert witness services at the subsequent Appeal.

5.6.3 The Appeal was dismissed, for reasons including:

- Bringing turbines to the west of the M77 into a more ‘transitional’ landscape;
- Visual effects including cumulative sequential effects from the M77; and
- Effects on residential visual amenity, from the properties of Blair Farm, Corsehouse Farm, Glenouther Farm, Gree Law, Drumboy and Floak.

5.6.4 These considerations are key to the design evolution of the Proposed Development. Using a smaller number of larger turbines, located within the core of the Glenouther Moor site, provides the opportunity to mitigate against these potential issues. Effects associated with aviation lighting and cumulative effects (in light of the changing cumulative baseline) will also be key considerations in the design process.

5.7 Consultee List

5.7.1 It is proposed that the following stakeholders will be consulted in relation to the assessment and to agree the final set of viewpoints and cumulative list:

- NatureScot;
- East Ayrshire Council: and
- East Renfrewshire Council.

Questions for Consultees

Q5.1: Are there any comments on the overall methodology proposed to assess effects on landscape and visual receptors, including cumulative effects?

Q5.2: Are there any comments on the proposed list of assessment viewpoint locations?

Q5.3: Do consultees have any early advice on which viewpoints would be suitable for night time assessment locations? It is proposed to select night time assessment viewpoints from more accessible locations, more likely to be frequented during the hours of darkness.

Q5.4: Are there any further wind farm sites or changes to status, to those shown on **Figure 5.4**, to consider as part of the cumulative assessment?

Q5.5: Have consultees identified any further landscape or visual receptors to be considered within the assessment (i.e. where it is expected that significant effects may occur)?

Q5.6: Are there any other relevant consultees who should be consulted with respect to the LVIA?

Q5.7: Are there any comments on the scope of the RVAA with regard to the Study Area/ receptors for inclusion?

6. Ecology

6.1 Introduction

6.1.1 This chapter sets out the proposed approach to assessing the likely significant effects of the Proposed Development during construction, operation and decommissioning on non-avian ecology. It also details the methods that have and will be used to establish the baseline conditions within the Site and its surroundings, and the process to be used to determine the sensitivity of the habitats and species' populations present. The assessment will be undertaken in accordance with legislation and best practice guidance.

6.2 Study Area

6.2.1 The ecology assessment will use the following study areas:

- Designated sites: the Proposed Development Site and a 5 km study area;
- Protected species: the Proposed Development Site and any species-specific buffers as necessary and as defined in guidance;
- Potential bat roost features: the Proposed Development Site and a 200 m plus turbine blade length buffer (as per NatureScot *et al.* 2021) study area;
- Habitats and potential Groundwater Dependent Terrestrial Ecosystems (GWDTE): the Site;
- Bat collisions: static bat data from fixed locations will be processed through Ecobat[23]; and
- Cumulative assessment (if required); the Proposed Development Site and a 5 km study area.

6.2.2 A desk-based study will be completed to provide any historic ecological data within the Site and surrounding area, and this will be considered in the assessment.

6.3 Existing Conditions

6.3.1 Baseline ecological conditions have been / will be established from the following sources:

- Results of the ecological surveys undertaken for the Proposed Development between May and September 2024;
- A desk study to confirm the location and qualifying features of statutory designated sites[24], non-statutory designated sites[25,26] and ancient woodland[27] within potential zones of influence of the Proposed Development;
- Information from the National Biodiversity Network (NBN) Atlas[28] on ecological records within 5 km of the Site within the last 15 years (since 2010);
- Information from the Carbon and Peatland Map 2016[29];
- Results of the Phase 1 peat probing survey undertaken for the Proposed Development in May 2024 and additional forthcoming Phase 2 probing;
- Information from the Deer Distribution Survey by the British Deer Society[30];

[23] The Mammal Society (2017). Ecobat. Available at: https://mammal.org.uk/blog/2017/12/making-sense-of-clicks-and-squeaks-mammal-society-launches-ecobat. Accessed: April 2025.
[24] NatureScot Sitelink (2025). Available at: Available at: https://sitelink.nature.scot/home. Accessed: April 2025
[25] East Ayrshire Council (2024). Local Development Plan 2: Local Nature Conservation Sites. Non-statutory Planning Guidance
[26] East Renfrewshire Council (2025). Available at: https://eastrenfrewshire.maps.arcgis.com/apps/webappviewer/index.html?id=caee15bc978943fb88ab436a92fe6a92. Accessed: May 2025
[27] Ancient Woodland Inventory (Scotland). Available at: https://www.spatialdata.gov.scot/geonetwork/srv/api/records/A091F945-F744-4C8F-95B3-A09E6EF6AE33. Accessed: April 2025
[28] National Biodiversity Network Atlas Scotland (2025). Available at: https://scotland.nbnatlas.org/. Accessed: April 2025
[29] Scottish Government (2025). Scotland's Soils. Available at: https://map.environment.gov.scot/Soil_maps/?layer=10#. Accessed: April 2025
[30] British Deer Society (2023). Deer Distribution Survey. Available at: https://bds.org.uk/science-research/deer-surveys/deer-distribution-survey/. Accessed: April 2025

- Information from the Saving Scotland's Red Squirrels[31] website for red and grey squirrel sightings;
- Information from the 2015 ES covering the Site (see **Chapter 1**); and
- Any other EIARs or technical reports from other developments or proposed developments in the nearby local area.

Desk Study

6.3.2 There is one Site of Special Scientific Interest (SSSI) within 5 km of the Site with ecological qualifying features. There are no statutory designated sites within the Site (see **Figure 6.1**).

6.3.3 Brother and Little Lochs SSSI is 2.56 km from the Site. The SSSI is designated for oligotrophic loch (latest assessed condition 'favourable maintained' as of 20 March 2013) and varnished hook-moss (*Hamatocaulis vernicosus*) (latest assessed condition 'favourable maintained' as of 12 March 2014)[24].

6.3.4 There are 30 Local Nature Conservation Sites (LNCS) within 5 km of the Site that are designated (wholly or partially) for habitat related, botanical or protected species interests (**Figure 6.1**). These LNCS cover both East Ayrshire Council and East Renfrewshire Council (ERC) areas. The available summary details of these LNCS are presented in **Table 6.1**. Within ERC several of the LNCS are described as 'unconfirmed' and there is no further information available regarding respective site descriptions or interest features, with site surveys required to enable the sites to be assessed. It also appears these unconfirmed sites relate to historical Sites of Importance for Nature Conservation (SINCs).

Table 6.1 Local Nature Conservation Sites within 5 km of the Site

LNCS	Distance from Site (km)	Description
Corsehouse Reservoir	Inside Site	Primary habitat type: wetlands Interest: habitat This site comprises a reservoir with open agricultural grassland and residential dwellings to the north and forestry along the southern boundary. Corsehouse Burn runs into the reservoir and a minor road runs adjacent to the north.
Cairn Hill Moss (Unconfirmed)	1.27	No further information available. Associated with William's and James' Hills Local Biodiversity Site (LBS).
William's and James's Hills	1.36	Main habitats: acid grassland, blanket bog Notable habitats: blanket bog Reason for designation: large area of acid grassland with degraded blanket bog The site is a large area of degraded blanket bog between the B769 and Long Loch with some areas of agriculturally improved grassland.
Floak Bridge	1.37	Main habitats: acid grassland, marshy grassland Reason for designation: large area of typical upland acid grasslands The site is a large upland area east of the M77 with acid and marshy grassland and typical upland vegetation.
Fenwick Moor (Greenfield Burn)	1.39	Primary habitat type: mires and heaths Interest: habitat

[31] Scottish Squirrels (2025). Sightings of Red and Grey Squirrels across Scotland. Available at: https://scottishsquirrels.org.uk/squirrel-sightings/. Accessed: April 2025

LNCS	Distance from Site (km)	Description
		This site comprises predominantly commercial woodland based on aerial imagery with upland habitats to the south. A minor road runs through the site and there is a road bordering the north of the site. Data provided by South West Scotland Environmental Information Centre (SWSEIC) identified a record of pine marten within 1 km of the site in 2017.
Clonherb	1.95	Primary habitat type: woodland and scrub Interest: habitat The site comprises agricultural fields with conifer woodland to the south. Data provided by SWSEIC identified records of bats in 2017 and hedgehog in 2017 and 2019 within 500 m of the site.
Shieldhill Bog	1.57	Main habitats: blanket bog Notable habitats: blanket bog Notable species: round-leaved sundew (*Drosera rotundifolia*) Reason for designation: large area of blanket bog The site is largely undamaged and has a good range of associated plants and a local rarity.
Black Loch (Unconfirmed)	1.55	No further information available.
Robertland & Swinzie Burn	2.54	Primary habitat type: composite Interest: habitat – plant, bird and mammal interest The site is a mosaic of woodland, scrub and grassland habitat crossed by Annick Water and with Swinzie Burn flowing through the centre. The surrounding land use is primarily commercial forestry and agricultural land. SWSEIC identified a record of soprano pipistrelle within 500 m of the site in 2015.
White Loch (Unconfirmed)	2.25	No further information available.
Long Loch (Unconfirmed)	2.52	No further information available.
Moyne Moor	2.48	Main habitats: wet heath, acid grassland, degraded bog Notable habitats: wet heath Notable species: round-leaved sundew, water sedge (*Carex aquatalis*) Reason for designation: large area of upland bog and heath The site is a large area of upland degraded bog with a small range of associated habitats. There is a range of bog plants and two local rarities.
Totherick	2.86	Primary Habitat Type: grasslands Interest: habitat This site is predominantly improved or marshy grassland with much of it utilised as grazing grounds for livestock. The fields are generally separated by intact but species-poor hedgerows of hawthorn, beech and/or gorse. Small areas of broadleaf and mixed woodland are present within the south of the site and

LNCS	Distance from Site (km)	Description
		contain tree species such as beech, Scots pine and sycamore. Two small areas of scattered willow and hawthorn scrub woodland are present in the west of the site, and scattered lines of willow are present in the east of the site. Clerkland Burn flows through the western edge of the site and may provide limited suitable habitat for commuting otter; other small watercourses within the site are likely to be unsuitable for protected species as they are heavily poached.
Queenseat Hill to Drumduff Hill	2.55	Main habitats: blanket bog, acid grassland, marshy grassland, standing water, running water Notable habitats: blanket bog, marshy grassland Notable species: Round-leaved Sundew, Tall Bog-sedge (*Carex magellanica*), Haworth's Minor (*Celaena haworthii*), Veilwort (*Pallavicinia lyellii*) Reason for designation: a very large area of blanket bog (UKBAP Priority habitat) and associated habitats The site comprises a reservoir and an extensive area of grassland, marshy and boggy habitats and a large wind farm.
Bennan Loch (Unconfirmed)	2.65	No further information available.
Harelaw Dam (Unconfirmed)	3.47	No further information available.
Ballageich Bog	3.39	Main habitats: blanket bog Notable habitats: blanket bog Notable species: round-leaved sundew Reason for designation: an important area of blanket bog, a UK priority habitat The site is between Lochcraig Reservoir and Bennen Loch, with the bog modified in places through drainage and grazing. There are a number of associated plants and a local rarity.
Burnfoot Reservoir	3.74	Primary Habitat Type: wetlands Interest: habitat The site comprises one valuable freshwater reservoir with marginal vegetation, with open grassland and scrub surrounding the boundary. Balgray Mill Burn crosses the site and a minor road runs adjacent to the north of the site.
Dunlop House	4.15	Primary Habitat Type: woodland and scrub Interest: habitat The eastern section is predominantly a semi-mature semi-natural broadleaf woodland with tree species including beech, sycamore, horse chestnut and elder and a mix of grasses and herbs on the forest floor. The western section has a similar woodland, but the forest floor is improved grassland. A watercourse crosses the western section. Both sections have areas of improved and poor semi-improved grassland, and cattle have access to the woodland throughout the site. Data from SWSEIC identified a record of otter within 500 m of the site in 2020, in addition to palmate newt, common frog and small heath butterfly.

LNCS	Distance from Site (km)	Description
Carswell Hill (Unconfirmed)	3.84	No further information available.
Carsewell Mire (Unconfirmed)	3.85	No further information available.
Levern Water – Harelaw (Unconfirmed)	4.20	No further information available.
Lochcraig Reservoir (Unconfirmed)	3.88	No further information available.
Knockmade Moss	4.29	Primary Habitat Type: mires and heaths Interest: habitat The site comprises agricultural farmland in the north and east, bog or wetland in the centre, scrub to the east and commercial plantation to the west. Several roads border the site, and Glazert Burn watercourse crosses through the site. The surrounding land comprises similar habitats including scrub, agricultural fields, commercial plantation and a wind farm. Data from SWSEIC included a record of a small heath butterfly.
North Moorhouse Grasslands (Unconfirmed)	4.24	No further information available.
Craigendunton Reservoir	4.20	Primary Habitat Type: wetlands Interest: habitat The site comprises a reservoir with surrounding forestry, with Whitelee Wind Farm to the south. Dunton Water crosses the site, and the wind farm access tracks are located to the north and south.
Knockmade and Knockenae Mires	4.67	Main habitats: marshy grassland, acid grassland, standing water, running water Notable habitats: marshy grassland, swamp Notable species: red pondweed (*Potamogeton alpinus*), lesser tussock-sedge (*Carex diandra*), brown sedge (*Carex disticha*), tussock-sedge (*Carex paniculata*), fen bedstraw (*Galium uliginosum*), bitter-vetch (*Lathyrus linifolius*) The site is a large area of marshy grassland west of the Neilston to Dunlop road, with patches of acidic grassland, small ponds and boggy areas, with a wide range of associated plants.
Neilston Pad	4.94	Main habitats: acid grassland, neutral grassland, marshy grassland, wet heath, mixed woodland, deciduous woodland Notable habitats: acid grassland, neutral grassland Notable species: Moonwort (*Botrychium lunaria*) Frog Orchid (*Coeloglossum viride*), Parsley Fern (*Cryptogramma crispa*), Adder's-tongue (*Ophioglossum vulgatum*), Brown Hare (*Lepus euroaeus*) Reason for designation: a range of hilly grasslands (mainly acid and marshy) with a number of locally rare plants

LNCS	Distance from Site (km)	Description
		The site is a low hill comprising grassland with some scattered mixed woodland. There are a number of rocky outcrops and slopes adding variety to the habitat types.
Harelea Moss (Unconfirmed)	4.71	No further information available.
Pilmuir Reservoir (Unconfirmed)	4.85	No further information available.

6.3.5 There are no areas of ancient woodland within the Site[27]. There are few patches of ancient woodland within 5 km of the Site, to the west and north, with the closest area of ancient woodland 3.77 km from the Site (see **Figure 6.1**).

6.3.6 A search of the NBN Atlas Scotland[28] within 5 km of the Site in the last 15 years (i.e., from 2010 onwards) returned records of the following protected or notable species:

- Common lizard (*Zootoca vivipara*)[32,33];
- Red squirrel (*Sciurus vulgaris*)[32,34];
- Soprano pipistrelle (*Pipistrellus pygmaeus*)[35,36].

6.3.7 Records of the following invasive non-native species (INNS) were also returned from within 5 km of the Site:

- Japanese knotweed (*Fallopia japonica*)[32,37]; and
- Grey squirrel (*Sciurus carolinensis*)[32,34].

6.3.8 The above search was also extended out to 10 km for bat species, with the following species returned:

- Common pipistrelle (*Pipistrellus pipistrellus*)[35,38,39];
- Soprano pipistrelle[35,36,38,40,41,42];
- Leisler's bat (*Nyctalus leisleri*)[35,38,43];
- Daubenton's bat (*Myotis daubentonii*)[35,38];
- Natterer's bat (*Myotis nattereri*)[35,38]; and
- Brown long-eared bat (*Plecotus auritus*)[35,38].

6.3.9 Saving Scotland's Red Squirrels' sightings portal[31] has records of grey squirrels within 5 km of the Site most years since 2010. Single sightings of red squirrels were recorded within 5 km of the Site in 2013 and 2021. The Site does not fall within any red squirrel stronghold area[44] or within a priority area for grey squirrel control.

6.3.10 The Deer Distribution Survey[30] results suggested the likely presence of roe deer (*Capreolus capreolus*) in the general area of the Site.

[32] Licence: CC-BY. Creative Commons with Attribution 4.0 (CC-BY) https://creativecommons.org/licenses/by/4.0/. Accessed: April 2025
[33] Amphibian and Reptile Conservation and Biological Records Centre. (2025). Records verified via iRecord.
[34] Scottish Wildlife Trust (2025). The Scottish Squirrel Database. Occurrence dataset accessed through the NBNAtlas
[35] Licence: OGL. Open Government Licence (OGL) https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/. Accessed: April 2025
[36] NatureScot (2025). SNH Bat Casework Recording log 2015. Occurrence dataset on the NBN Atlas
[37] Botanical Society of Britain and Ireland. (2025) Vascular plant records verified via iRecord.
[38] Newson, S.E., Evans, H.E., Gillings, S., Jarrett, D. & Wilson, M.W. 2017. A survey of high risk bat species across southern Scotland. Scottish Natural Heritage Commissioned Report No. 1008
[39] National Bat Monitoring Programme (2025) Sunset/Sunrise Survey, Bat Conservation Trust.
[40] NatureScot (2025). SNH Bat Casework Recording log 2014. Occurrence dataset on the NBN Atlas
[41] NatureScot (2025). SNH Bat Casework Recording log 2016. Occurrence dataset on the NBN Atlas
[42] Wild Surveys (2025). Wild Surveys Soprano Pip Records. Occurrence dataset on the NBN Atlas.
[43] NatureScot (2017). Compilation of records of 12 Article 17 terrestrial mammal species in Scotland
[44] https://forestry.gov.scot/publications/21-map-of-red-squirrel-stronghold-areas Accessed: April 2025

6.3.11 As shown in **Figure 6.2**, the Carbon Peatland Map 2016[29] shows an area of Class 1[45] peatland in an unforested area in the north-west of the Site. The Map suggests the area around Swinzie Burn and its tributaries are likely Class 0 mineral soil[46]. With the exception of some areas in the north of the Site which are Class 4[47], the majority of the Site is mapped as Class 5[48]. Habitat and peat depth surveys undertaken for the Proposed Development take precedence over the Carbon Peatland Map information and provide further detailed site-specific information relating to site vegetation and soils (see **Field Surveys** section below and **Chapter 9: Hydrology, Hydrogeology, Geology and Peat**).

6.3.12 The previously submitted application for Glenouther Renewable Energy Park[49] included details of the ecological surveys carried out over an area concurrent with the Site for the Proposed Development. Bat detectors recorded common pipistrelle, soprano pipistrelle, *Myotis* sp., Daubenton's and Leisler's bats, with low levels of activity. Evidence of otter was recorded along Swinzie Burn and close to Corsehouse Reservoir. Evidence of water vole (*Arvicola amphibius*) was recorded along Swinzie Burn. No evidence of red squirrel was recorded, despite hair traps being deployed across the site. Several ponds within 500 m of the Site (none present within the Site) were surveyed for great crested newt (GCN) (*Triturus cristatus*), no evidence indicating the presence of GCN was recorded (palmate newt (*Lissotriton helveticus*) and smooth newt (*Lissotriton vulgaris*) were recorded during the surveys).

6.3.13 Ayrshire Rivers Trust (ART) also carried out electrofishing surveys in 2014 for Glenouther Renewable Energy Park, surveying three sites: two on the Swinzie Burn and one on the Annick Water (a control site). These historical survey sites on the Swinzie Burn are located approximately 300 m and 2,238 m downstream of the Proposed Development's Site boundary, respectively. Surveys on the Swinzie Burn survey location nearest the Site recorded brown trout (*Salmo trutta*), no other fish species were present. Surveys on the survey site further downstream on the Swinzie Burn also recorded trout, along with 'poor' numbers of salmon (*Salmo salar*) fry (no salmon parr recorded); other species present included minnows (*Phoxinus phoxinus*), stone loach (*Barbatula barbatula*) and European eel (*Anguilla anguilla*). The control site on the Annick Water contained fry and parr of both trout and salmon.

Field Surveys

Habitat Surveys

6.3.14 National Vegetation Classification (NVC) surveys were undertaken across the Site (including a larger area, reflecting previous areas of interest) in May 2024 and showed that outside of the planted conifer coupes which dominate in terms of area, some instances of blanket bog and wet modified bog were present. These bog habitats overlap in some areas with the deepest peat on the Site. The main area of blanket bog within the Site is present in the north-west where there has been no conifer planting, the vegetation is of the M18 *Erica tetralix - Sphagnum papillosum* raised and blanket mire NVC type; this area coincides with the area of Class 1[45] priority peatland habitat identified in the desk study and shown in **Figure 6.2**. M18 is also a priority peatland community, as per NatureScot guidance[50]. The core area of M18 here is relatively near-natural and contains abundant Sphagna and includes bog rosemary (*Andromeda polifolia*); however, there are no bog pools present, and away from the central core and towards the outer edge of the bog, the vegetation becomes more modified due to the effects of the conifer forestry, including invasion and encroachment of self-seeding non-native conifer species.

6.3.15 Areas of bog with the forestry rides and other smaller woodland openings are modified/degraded bog of M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire and M20 *Eriophorum vaginatum* blanket mire NVC types. These areas have been modified/degraded primarily due to conifer forestry effects such as drainage, shading, increased evapotranspiration, and invasion and encroachment of self-seeding non-native conifer species. M19 and M20 are also priority peatland communities, however M20 is noted as a community unlikely to raise issues of national interest, as per NatureScot guidance[50].

[45] Class 1 – Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value.
[46] Class 0 - Mineral soil - Peatland habitats are not typically found on such soils.
[47] Class 4 - Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils.
[48] Class 5 - Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat.
[49] TNEI Services Ltd. (2015). Glenouther Renewable Energy Park Environmental Statement. Chapter 8: Ecology (and associated Technical Appendices).
[50] NatureScot (2023). Advising on peatland, carbon-rich soils and priority peatland habitats in development management https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management

6.3.16 In addition to the predominant conifer plantation and bog habitats described above, there are also patches of other common habitat types present within the Site, although their extents are much smaller and distribution more scattered. These other habitats tend to be found along the narrow riparian zones of watercourses, or on the fringes of the Site, and include areas of marshy grassland and acid/neutral flush.

6.3.17 Areas of potential GWDTE were found in some areas based on the NVC survey results. These areas were surveyed by the project hydrologists in March 2025 to determine actual groundwater dependency. Only one area is a moderately dependent GWDTE but is of low ecological importance, see **Chapter 9** for more details.

Protected Species and Fisheries Surveys

6.3.18 The protected species surveys undertaken in May 2024 recorded evidence and the presence of otter (*Lutra lutra*), common lizard, and badger (*Meles meles*). The only protected feature recorded was a potential otter holt, located 804 m west of the Site boundary. No other protected species (e.g. red squirrel, pine marten (*Martes martes*), or water vole) were recorded within the Site during surveys. No potential roost features (PRFs) for bats were recorded within the Site.

6.3.19 Static (anabat) bat surveys were undertaken seasonally (spring/summer/autumn) at the Site from April to September 2024 in line with NatureScot *et al.* (2021)[51] guidance. Anabat detectors were deployed at six locations within the Site over a minimum period of 42 days and collected 252 complete recording nights of data. Eight bat species were recorded, i.e., common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle (*Pipistrellus nathusii*), Daubenton's, Natterer's, Noctule (*Nyctalus noctule*), Leisler and brown long-eared. A total of 6,586 bat registrations were recorded, with soprano pipistrelle accounting for 77.9% of all bat registrations.

6.3.20 Electrofishing surveys were undertaken by ART in 2024 which covered five electrofishing sites on the Swinzie Burn (three within the Site and two further downstream of the Site). The surveys recorded that the Swinzie Burn supports Atlantic salmon and brown trout. Trout were present at four of the five survey sites, being absent from the most upstream location. Poor numbers of salmon fry (no parr recorded) were present at the two most downstream sites, both outwith the Site boundary. No evidence of European eels or lamprey species (*Lampetra* spp.) was found during the 2024 surveys, with other species recorded comprising minnow, stone loach and three-spined stickleback (*Gasterosteus aculeatus*).

Phase 1 Peat Depth Surveys

6.3.21 A Phase 1 peat depth survey based on a 100 m grid of the Site as well as the wider landholding of the landowner was undertaken in May 2024. A total of 379 peat depth probes were collected and show that the majority of the Site is covered in deep peat (>0.5 m), with most of it greater than 1 m in depth – see **Figure 9.2.**

6.4 Proposed Surveys and Assessments Methodologies

Legislation and Guidance

6.4.1 The ecological assessment will be undertaken in line with the following European and National Legislation:

- European Union Council Directive 92/43/EEC on Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (Habitats Directive);
- European Union Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy ("Water Framework Directive");
- The Environmental Impact Assessment Directive 85/337/EEC, as amended ("EIA Directive"), (as subsequently codified by Directive 2011/92/EU, and as amended by Directive 2014/52/EU);
- The Town and Country Planning (Environmental Impact Assessment (Scotland) Regulations 2017 ('the EIA Regulations');
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003;

[51] NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019, with minor updates 2021). Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation.

- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) 'The Habitats Regulations');
- The Protection of Badgers Act 1992;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011;
- The Wildlife and Countryside Act 1981 (as amended); and
- The Wildlife and Natural Environment (Scotland) Act 2011 (WANE).

6.4.2 The assessment will be carried out in accordance with the principles contained within the following guidance and policy documents:

- Ayrshire Biodiversity Action Plan (2008) The Conservation and Enhancement of Ayrshire's Biodiversity 2007 – 2010.
- Chartered Institute of Ecology and Environmental Management (CIEEM) (2024) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (version 1.3). Chartered Institute of Ecology and Environmental Management, Winchester;
- Collins, J. (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). Bat Conservation Trust;
- East Ayrshire Council (2024) The East Ayrshire Local Development Plan 2 (LDP 2);
- European Commission (2020) Guidance document on wind energy developments and EU nature legislation;
- Joint Nature Conservation Committee (JNCC) and Defra (on behalf of the Four Countries' Biodiversity Group) (2012) UK Post-2010 Biodiversity Framework;
- JNCC (2013) Guidelines for selection of biological Sites of Special Scientific Interest (SSSI);
- NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019, with minor updates 2021). Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation;
- NatureScot (2023) Advising on carbon-rich soils, deep peat and priority peatland habitat in development management;
- NatureScot (2024) General Pre-application and Scoping Advice to Developers of Onshore Wind Farms;
- Scottish Badgers (2018) Surveying for Badgers: Good Practice Guidelines. Version 1;
- Scottish Executive (2000) Nature conservation: implementation in Scotland of EC Directives on the conservation of natural habitats and of wild flora and fauna and the conservation of wild birds ('The Habitats and Birds Directives'). Revised guidance updating Scottish Office Circular no. 6/1995;
- SEPA (2024) Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems;
- Scottish Government (2001) European Protected Species, Development Sites and the Planning Systems: Interim guidance for local authorities on licensing arrangements;
- Scottish Government (2006) European Protected Species – terms of guidance: Chief Planner letter;
- Scottish Government (2013) Scottish Biodiversity Strategy: It's in Your Hands (2004)/2020 Challenge for Scotland's Biodiversity (2013);
- Scottish Government (2016) Draft Peatland and Energy Policy Statement;
- Scottish Government (2017a) Planning Advice Note 1/2013 - Environmental Impact Assessment, Revision 1.0;
- Scottish Government (2017b) Planning Circular 1/2017: Guidance on The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Scottish Government (2018) Climate Change Plan: Third Report on Policies and Proposals 2018-2032;
- Scottish Government (2019) The Scottish Forestry Strategy (SFS);
- Scottish Government (2020a) Scottish Biodiversity Strategy post-2020: statement of intent;

- Scottish Government (2020b) EU Exit: The Habitat Regulations in Scotland;
- Scottish Government (2020c) Securing a green recovery on a path to net zero: climate change plan 2018–2032 – update;
- Scottish Government (2021) Freshwater and diadromous fish and fisheries associated with onshore wind farm and transmission line developments: generic scoping guidelines;
- Scottish Government (2022a) Onshore Wind Policy Statement 2022;
- Scottish Government (2022b) Scottish Biodiversity Strategy to 2045. Tackling the Nature Emergency in Scotland;
- Scottish Government (2023) Draft Planning Guidance: Biodiversity;
- Scottish Government (2024) National Planning Framework (NPF) 4, Policy 3;
- Scottish Government, SNH & SEPA (2017) Peatland Survey – Guidance on Developments on Peatland;
- SNH (2015) Scotland's National Peatland Plan;
- SNH (2016a) Planning for Development: What to consider and include in deer assessments and management at development sites (Version 2);
- SNH (2016b) Planning for Development: What to consider and include in Habitat Management Plans. Version 2;
- SNH (2018) Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland; and
- Scottish Renewables, SNH, SEPA, Forestry Commission (Scotland), HES, AEECoW (2024) Good Practice During Windfarm Construction (4th Edition).

Proposed Surveys

6.4.3 It is proposed that the surveys undertaken to date, as detailed in the **Field Surveys** section above, along with the desk-based information, are sufficient to inform a robust ecological assessment.

Assessment Methodologies

6.4.4 The Ecological Impact Assessment (EcIA) will consider the potential direct, indirect and cumulative impacts that the construction, operation and decommissioning of the Proposed Development could have on Important Ecological Features (IEFs) as per CIEEM[52] guidance. The assessment will be supported by appendices that will include details of survey methodologies and all survey data.

6.4.5 An assessment of relevant cumulative effects will be undertaken following published guidance. Where determined that a cumulative assessment is necessary, impacts will be assessed with other relevant projects subject to the EIA process within a relevant search area, and their effects on a relevant reference population; for example, at a watercourse, watershed or Natural Heritage Zone (NHZ) level.

6.4.6 The EcIA will include the following elements:

- Baseline conditions;
- Scoping in / out of ecological features and impacts;
- Assessment of potential impacts and effects on Important Ecological Features (IEFs) during construction, operation and decommissioning;
- Cumulative effects;
- Mitigation; and
- Summary of significant residual effects.

[52] CIEEM (2024). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester.

6.4.7 Effects on IEFs will be assessed in relation to the species' reference population or habitat extent, conservation status, range and distribution. The assessment of potential effects will be informed by guidelines published by CIEEM[52] and NatureScot.

6.4.8 The assessment will involve the following process:

- Identifying potential impacts of the Proposed Development;
- Considering the likelihood of occurrence of potential impacts;
- Defining the nature conservation value (NCV) and conservation status of relevant populations for each IEF to determine overall sensitivity;
- Establishing the magnitude of the likely impact (both spatial and temporal) on each IEF;
- Based on the above information, making a judgement as to whether or not the consequent potential effect would be significant with respect to the EIA Regulations;
- If a potential effect is determined to be significant, considering measures to avoid or reduce the significance of effects;
- Considering opportunities for enhancement where appropriate; and
- Concluding residual potential effects after considering mitigation, compensation and enhancement.

6.5 Potential Significant Effects

6.5.1 The assessment will consider the potential effects associated with construction, operation and decommissioning of the Proposed Development, with a focus on those which could be significant.

6.5.2 Construction effects that will be considered include:

- Temporary and permanent habitat loss/alteration/fragmentation/drainage associated with the Proposed Development infrastructure;
- Pollution impacts on watercourses and aquatic fauna within the Site;
- Loss of shelter, breeding or foraging habitat for identified protected species;
- Displacement of deer;
- Risk of injury or death to protected species from collisions with increased construction traffic; and
- Visual and noise disturbance to protected species associated with construction activities.

6.5.3 Operational impacts that will be considered include:

- Displacement of protected species from shelter, breeding or foraging habitats around operational turbines and other permanent infrastructure, including barrier effects;
- Risks of bats colliding with or suffering barotrauma from proximity to operational wind turbine blades; and
- Peatland restoration/enhancement to be delivered as part of the Proposed Development's Biodiversity Enhancement Management Plan (BEMP).

6.5.4 Where appropriate, these construction and operational effects will also be considered in a cumulative assessment.

6.5.5 Decommissioning phase impacts are assumed to be similar to construction impacts, albeit with a shorter duration and will be considered accordingly in the EIAR.

Potential Effects Scoped Into the Assessment

6.5.6 There is potential connectivity between the Proposed Development and Corsehouse Reservoir LNCS; this LNCS will be considered further as the Site layout develops and will potentially be scoped in.

6.5.7 Priority peatland and habitats on Annex I to the Habitats Directive cannot be scoped out until the presence and distribution of such habitats in relation to the planned infrastructure and activities associated with the Proposed Development are fully understood. However, given the known presence and extent of blanket bog within the Site from surveys undertaken to date, blanket bog will be scoped in as an IEF.

6.5.8 Effects on otter, bats, fish populations (migratory salmonids and resident fish) and deer cannot be scoped out until the presence and distribution of ecological features, species, suitable habitats and respective levels of activity in relation to the planned infrastructure and activities associated with the Proposed Development are fully understood.

Potential Effects Scoped Out of the Assessment

6.5.9 In line with CIEEM guidance[52], it is not necessary to carry out detailed assessment on features that are sufficiently widespread, unthreatened, and resilient to effects of the Proposed Development. Therefore, adverse effects on common and widely distributed habitats or species will be scoped out.

6.5.10 On the basis of the results of the desk-based work and fieldwork undertaken to date, the professional judgement of the EIA team, experience from other relevant projects and policy guidance or standards, generally common and widely distributed habitats or species which do not fall within the categories listed below will be scoped out of the assessment, i.e., habitats not on Annex I to the Habitats Directive and species not on Annex II to the Habitats Directive and habitats or species not protected by other legislation (e.g., The Wildlife and Countryside Act 1981 (as amended), the Nature Conservation (Scotland) Act 2004 or The Protection of Badgers Act).

6.5.11 Adverse effects on statutory designated sites can be scoped out of the assessment. There is one statutory designated site within 5 km of the Proposed Development, i.e., Brother and Little Lochs SSSI (see **Figure 6.1**). There is no hydrological connectivity between the Site and this SSSI. Furthermore, due to prevailing topography, distance from the Site, and the respective qualifying features (see **paragraph 6.3.3**), it is considered there is no connectivity between the Proposed Development and Brother and Little Lochs SSSI.

6.5.12 Adverse effects on all LNCS, with the exception of Corsehouse Reservoir LNCS (**Figure 6.1**), can be scoped out of the assessment due to hydrological, topographical, and ecological separation, lack of connectivity, distance from the Site, and the interest features of the respective LNCS (see **Table 6.1**).

6.5.13 Adverse effects on ancient woodland can be scoped out of the assessment due to the absence of ancient woodland within or adjacent to the Site, the closest stand to the Proposed Development being located more than 3 km to the west of the Site (**Figure 6.1**).

6.5.14 Adverse effects on badger, red squirrel, pine marten, water vole and reptiles can be scoped out of the detailed assessment due the absence or lack of field survey signs, absence of relevant protected features for these species, low habitat suitability, and in cognisance of standard good practice and embedded mitigation (see **Approach to Mitigation** section below).

6.5.15 Adverse effects on GCN and beaver will be scoped out. Effects on these species are scoped out due to the absence of suitable habitat at the Site or the Site's geographical location being outwith the known range of the respective species and/or the lack of evidence of their presence locally from desk-based research and recent and historical surveys at the Site.

6.6 Approach to Mitigation

Design Considerations

6.6.1 Significant impacts on ecological features will be avoided or minimised where possible through the design process. Such considerations will include but are not limited to:

- Avoidance of Corsehouse Reservoir LNCS for the location of turbines and other infrastructure;
- Avoidance of Class 1 peatland for the location of turbines and other infrastructure;
- Avoidance of active blanket bog habitat and GWDTEs for the location of turbines and other infrastructure as far as practicable;
- Maintenance of a buffer from turbines to forest edge habitats to maintain a minimum 50 m buffer from turbine blade tip to feature height for all turbines, as recommended by NatureScot *et al.* (2021)[51] in relation to bats;
- Maintaining buffers between infrastructure and any protected features in line with appropriate guidance (e.g., a minimum 30 m buffer for any infrastructure or construction activity (200 m if the feature is occupied for breeding) around the entrance to any otter holt);

- Maintaining a 50 m buffer between infrastructure and any watercourses, except where a minimum number of watercourse crossings are required;
- Design of the track length and alignment to reduce the extent of track where practicable; and
- Maintaining a 50 m micrositing allowance, where practicable.

6.6.2 The scoping layout takes into account the above considerations, where appropriate.

Good Practice

6.6.3 The following good practice mitigation measures are assumed to be in place for the purposes of the assessment:

- A Species Protection Plan (SPP) implemented as part of a Construction Environmental Management Plan (CEMP) or similar during the construction phase to ensure that all reasonable precautions are taken to adhere to the relevant wildlife legislation;
- Pre- and during-construction surveys carried out by an Ecological Clerk of Works (ECoW) or suitably qualified ecologist as part of the SPP, with an ECoW present during the construction period; and
- A comprehensive Site-specific and robust CEMP. This document will detail how the successful Principal Contractor will manage the works in accordance with all commitments and mitigation detailed in the EIAR, the SPP, statutory consents and authorisations, and good industry practice and guidance for environmental management, including implementation of appropriate pollution prevention (particularly in relation to watercourses).

6.7 Biodiversity Enhancement

6.7.1 Enhancement, restoration and creation of habitats of conservation value through the delivery of a BEMP for the operational phase would reduce potential effects on habitats further, with the Proposed Development providing an opportunity to deliver significant biodiversity enhancement at the Site, in line with objectives outlined in NPF4 Policy 3, the Onshore Wind Policy Statement, and the Scottish Biodiversity Strategy to 2045. An outline BEMP will be provided with the EIAR.

6.7.2 Specific biodiversity enhancement proposals and their locations will be developed through discussions with the Applicant, landowner, and relevant technical specialists in order to enhance, create and connect habitats of biodiversity value, and will include forestry work proposals (see Chapter 3 of the Scoping Report). Based on the existing knowledge of the Site, biodiversity enhancement measures for the Proposed Development may include, but not be limited to, options such as forest-to-bog peatland restoration for priority peatlands, and native riparian planting. The full suite of proposals will be presented within the outline BEMP in the EIAR.

6.8 Consultee List

6.8.1 It is proposed that the following stakeholders will be consulted in relation to the assessment:

- NatureScot;
- East Ayrshire Council;
- East Renfrewshire Council; and
- Ayrshire Rivers Trust.

Questions for Consultees

Q6.1: Do consultees agree that, subject to further information coming to light from any further field surveys and the desk study, the scope of IEFs to be included in the assessment is appropriate?

Q6.2: Do consultees agree that the suite of field surveys undertaken in 2024 in addition to a desk study and review of the data associated with the 2015 ES are sufficient to inform a robust impact assessment?

Q6.3: Do consultees agree that the methodology and scope of assessment is appropriate?

Q6.4: Do consultees agree with the potential effects to be scoped out of the assessment?

7. Ornithology

7.1 Introduction

7.1.1 This chapter sets out the proposed approach to the evaluation of the ornithological interest of the Site, and to the assessment of potential effects on birds during construction, operation and decommissioning of the Proposed Development.

7.1.2 The ornithological assessment will be carried out in line with relevant legislation and standards, as well as having due regard to relevant guidance.

7.2 Study Area

7.2.1 The Study Area is defined with reference to the Ornithology Study Area (OSA) and encompasses a series of buffers of up to 2 km radius from the OSA, with buffer size dependent on the sensitivity of key species to potential effects associated with the Proposed Development. Accordingly, surveys within the OSA plus buffers of 500 m, 1.5 km and 2 km around this, are being carried out during the period September 2023 to August 2025 (**Figure 7.1: Ornithology Study Area**).

7.3 Existing Conditions

Desk Study

7.3.1 A desk-based study has been undertaken to collate existing bird records/data and information on designated sites for ornithology interests. Results from the desk-based study have informed the field survey design. Distribution and abundance data were collected from the following published sources:

- NatureScot Sitelink (online information about designated sites).
- Publicly available EIA documentation for the previous Glenouther Renewable Energy Park application (East Ayrshire Council ref 15/0584/PP) has been reviewed for existing information on target species within proximity to the Proposed Development.
- UK Biodiversity Action Plan (BAP).
- The Birds of Conservation Concern (BoCC) (Stanbury *et al*., 2021)[53] .
- International Union for the Conservation of Nature (IUCN, 2023)[54] Red list of threatened species.
- Scottish Biodiversity List (Scottish Biodiversity Forum, 2013), and
- National Biodiversity Network (NBN) Gateway website (https://data.nbn.org.uk/).

7.3.2 **Table 7.1** lists the sites designated for their ornithological features within 20 km of the Site; these are also shown in **Figure 7.2**.

Table 7.1 Designated sites within 20 km of the Proposed Development

Designation	Site	Qualifying feature	Approximate distance
Ramsar	Inner Clyde	Redshank	19.5 km north
Special Protection Area	Muirkirk & North Lowther Uplands	Hen harrier Merlin Peregrine Short-eared owl	15.4 km south east

[53] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., & Win I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747.
[54] IUCN. (2023). IUCN Red List of Threatened Species (ver. 2022-2). Available at: http://www.iucnredlist.org. (Accessed: September 2023).

Designation	Site	Qualifying feature	Approximate distance
		Golden plover	
	Black Cart	Whooper swan	17.0 km north
	Renfrewshire Heights	Hen harrier	17.7 km north west
	Inner Clyde	Redshank	19.5 km north
Site of Special Scientific Interest	Castle Semple and Barr Lochs	Breeding bird assemblage	13.9 km north west
	Muirkirk Uplands	Breeding bird assemblage Hen harrier, breeding Hen harrier, non-breeding Short-eared owl, breeding	15.4 km south east
	Black Cart	Whooper swan, non-breeding	17.0 km north
	Renfrewshire Heights	Hen harrier, breeding	17.7 km north west
	Inner Clyde	Cormorant, non-breeding Eider, non-breeding Goldeneye, non-breeding Oystercatcher, non-breeding Red-breasted merganser, non-breeding Red-throated diver, non-breeding Redshank, non-breeding	19.5 km north

7.3.4 The Inner Clyde Ramsar site, Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI) is located approximately 19.5 km north of the Site boundary (**Figure 7.2**). Due to the separation distance between the Inner Clyde and the Proposed Development, there is considered to be no prospect of any effect on the qualifying species as a result of the Proposed Development, and effects on the Inner Clyde Ramsar site, SPA and SSSI are scoped out of further consideration.

7.3.5 The Muirkirk & North Lowther Uplands SPA is located approximately 15.4 km south east of the Site boundary (**Figure 7.2**). The Proposed Development is outside of the core foraging ranges of all the qualifying species (SNH, 2016), and therefore there is considered to be no prospect of any effect on the qualifying interests of the SPA as a result of the Proposed Development, and effects on this SPA are scoped out of further consideration. It follows, therefore, that there will be no detrimental effects on the respective SSSI designation which spatially overlaps that of the SPA and is also scoped out of further consideration.

7.3.6 Similarly, the Black Cart SPA and the Renfrewshire Heights SPA are located approximately 17.0 km and 17.7 km from the Site boundary respectively (**Figure 7.2**). The Proposed Development is outside of the core foraging ranges of all the qualifying species (SNH, 2016), and therefore there is considered to be no prospect of any effect on the qualifying interests of the SPAs as a result of the Proposed Development, and effects on these SPAs are scoped out of further consideration. It follows, therefore, that there will be no detrimental effects on the respective SSSI designations which spatially overlap that of the SPAs and are also scoped out of further consideration.

7.3.7 The Castle Semple and Barr Lochs SSSI is located approximately 13.9 km from the Site boundary (**Figure 7.2**). Due to the separation distance between the SSSI and the Proposed Development there is considered to be no prospect of any effect on the qualifying species as a result of the Proposed Development, and effects on the Castle Semple and Barr Lochs SSSI are scoped out of further consideration.

Field Surveys

7.3.8 NatureScot guidance (SNH, 2017) was used for initial survey design. A range of baseline ornithological surveys commenced within the OSA and surrounding area in September 2023 and will be completed in August 2025.

7.3.9 Baseline data from the following surveys will be used to inform the assessment:

- Flight activity surveys (September 2023 to August 2025; within OSA and 500 m buffer).
- Moorland breeding bird surveys (April to July 2024 and April to July 2025; within the OSA and 500 m buffer).
- Scarce breeding bird surveys (April to August 2024 and April to August 2025; within the OSA and buffer extending up to 2 km).
- Black grouse surveys (April & May 2024 and April & May 2025: within the OSA and buffer extending up to 1.5 km)
- Winter walkover surveys (September 2023 to March 2024 and September 2024 to March 2025; within the OSA and 500 m buffer)
- Winter wildfowl counts (September 2023 to March 2024 and September 2024 to March 2025; Corsehouse Reservoir)

7.3.10 Survey methods follow contemporary best practice guidance; further details of the survey methods are provided below.

Flight Activity Surveys

7.3.11 Information on bird flight activity has been collected during timed watches from strategic Vantage Points using the methods described by Band *et al*. (2007)[55]. The Flight Activity Survey Area is defined by the OSA boundary plus an additional 500 m buffer around the OSA. Two Vantage Points have been selected, through a mix of GIS analysis and field trials, with the aim of maximising ground visibility within the OSA using the minimum number of points. The viewsheds have been derived using a 20 m vertical cut-off and are truncated horizontally to 2 km (**Figure 7.3: Vantage Points and Viewsheds**).

7.3.12 Watches from these Vantage Points have not exceeded three hours in length and have been timed to ensure observations are spread throughout daylight hours each month. To date, a total of at least 36 hours of observation per Vantage Point has been completed during each of the past two non-breeding seasons (September 2023 to March 2024 and September 2024 to March 2025) and will be completed during each of the two breeding seasons (April to August 2024 and April to August 2025).

Moorland Breeding Bird Surveys

7.3.13 Moorland bird surveys are being undertaken to gain a preliminary insight into the bird assemblage and possible sensitivities. The survey area for these includes the OSA and a 500 m buffer (**Figure 7.1**).

7.3.14 The Brown & Shepherd (1993)[56] method for surveying upland waders has been employed. The method has been modified to provide reliable estimates for some breeding moorland passerines by undertaking some surveys during the first few hours of daylight. Survey visits have been conducted four times and spread across each month to allow for differences in detection rates between early and late breeding species. All suitable ground within the 500 m survey boundary has been approached closely, typically to within 100 m.

Scarce Breeding Bird Surveys

7.3.15 Priority has been given to detecting the species considered most likely to occur; hen harrier (*Circus cyaneus*), osprey (*Pandion haliaetus*), goshawk (*Accipiter gentilis*), merlin (*Falco columbarius*) and peregrine (*F. peregrinus*). Surveys focused on areas or sites suitable for nesting and foraging within a buffer of up to 2 km from the OSA (**Figure 7.1**). The survey methods used for each species are described below.

[55] Band, W., Madders, M. & Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. In de Lucas, M, Janss, G.F.E. and Ferrer, M. (Eds.) Birds and Wind Farms: Risk assessment and Mitigation, pp. 259 - 275. Quercus, Madrid.
[56] Brown, A.F. & Shepherd, K.B. (1993). A method for censusing upland breeding waders. Bird Study 40: 3 pp189 -195.

Hen harrier

7.3.16 Survey methods given in Hardey *et al*. (2013)[57] have been followed. Emphasis has been given to searching habitats within 2 km of the Site considered potentially suitable for nesting: in this case including areas of heath/bog with stands of heather >0.4 m tall, and suitable habitats within plantation forest.

Osprey

7.3.17 Survey methods based on Hardey *et al*. (2013) have been followed. Checks have been made in areas where mature trees are present (particularly where artificial nest platforms had been provided) for nests and watches made for birds carrying fish or exhibiting territorial behaviour.

Goshawk

7.3.18 Survey methods based on Hardey *et al*. (2013) have been followed. Checks have been made for displaying and calling birds early in the spring with searches of mature forestry to locate nests and calling juveniles later in the breeding season.

Merlin

7.3.19 Survey methods given in Hardey *et al*. (2013) have been followed. Suitable habitats within 2 km of the Site, including old crow nests (which could be re-used by merlin), fenceposts, hummocks, bushes and trees have been checked for signs of occupation (e.g., plucked prey, moulted feathers, pellets and faeces). Emphasis has been given to heath/bog habitats with stands of heather >0.4 m tall.

Peregrine

7.3.20 Survey methods given in Hardey *et al*. (2013) have been followed. Suitable habitats within 2 km of the Site, including crags and cliffs with suitable ledges and any suitable man-made structures, were searched for signs of occupancy.

Black Grouse Surveys

7.3.21 Searches for black grouse (*Lyrurus tetrix*) have been undertaken in suitable habitat within a buffer of 1.5 km from the OSA (**Figure 7.1**) during the peak period for display activity (lekking) by males between April and May. The methods employed were based on those described in Gilbert *et al*. (1998)[58]. Surveys were undertaken during the early morning in calm, dry weather with good visibility. Observers listened and scanned the areas considered suitable for lekking.

Winter Walkover Surveys

7.3.22 Walkover surveys have been undertaken between September 2023 and March 2024 and between September 2024 and March 2025. Surveys were designed to record any important assemblages of migrant and wintering birds on the OSA and within a 500 m Study Area (**Figure 7.1**).

7.3.23 Survey routes meandered to encompass as much ground as practical. Where practicable, surveyors used a different route to maximise the eventual spatial coverage of the OSA and paused to scan for birds.

Winter Wildfowl Counts

7.3.24 Counts of wintering wildfowl on Corsehouse Reservoir were undertaken between September 2023 and March 2024 and between September 2024 and March 2025.

Summary of Ornithological Activity

7.3.25 This section summarises the baseline bird populations and flight activity within and surrounding the Proposed Development based on surveys undertaken during the period September 2023 to August 2024. Details of methods and full results are presented in the **Confidential Ornithological Technical Report** (**Appendix 3**)[59]. The second

[57] Hardey, J., Crick, H.Q.P., Wernham, C., Riley, H. & Thompson, D. (2013). Raptors: A Field Guide to Survey and Monitoring, 2nd ed. Edinburgh: The Stationary Office.
[58] Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird monitoring methods. RSPB Sandy, Bedfordshire.
[59] Appendix 3 has only been made available to East Ayrshire Council, NatureScot and the RSPB.

year of surveys, between September 2024 and August 2025, are still underway and no analysis of these data has taken place at this stage. Details and analysis of the full survey effort will be presented in the EIAR. No assessment of collision risk has taken place for either year.

7.3.26 Summary of baseline surveys:

- **Geese and swans** – no regular local or passage movements of geese or swans over the OSA. During flight activity surveys one flight by whooper swan, two flights by pink-footed geese and nine flights by British greylag geese were recorded within 500m of the OSA.
- **Scarce raptors** – one active goshawk nest was recorded within 2 km of the OSA. No other scarce raptor species was found breeding within 2 km of the OSA, despite extensive searches in suitable habitat. Low levels of flight activity, gathered from 144 hours of observation, were recorded for goshawk, hen harrier, peregrine and osprey within 500 m of the OSA.
- **Waders** – breeding wader species, typical of the habitats present within the Study Area, were present in very low numbers. No wader species of conservation concern was confirmed to have bred within 500 m of the OSA.
- **Black grouse** – there was no evidence of black grouse within the OSA or Study Area.
- **Other species** – the Study Area supports a suite of breeding songbirds typically associated with lowland moorland habitats and commercial conifer plantation in south-west Scotland.

7.4 Proposed Assessments Methodologies

Legislation and Guidance

7.4.1 The following national legislation, which has been amended as a consequence of the UK's exit from the European Union, will be considered as part of the ornithology assessment:

- Scottish Government (2019). The Town and Country Planning and Electricity Works (EU Exit) (Scotland) Regulations 2019.
- Scottish Government (2020). EU Exit: The Habitats Regulations in Scotland.
- The Conservation (Natural Habitats &c.) Regulations 1994 (The Habitats Regulations).
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations).
- The Nature Conservation (Scotland) Act 2004.
- The Wildlife and Natural Environment (Scotland) Act 2011, and
- The Wildlife and Countryside Act 1981.

7.4.2 The ornithological assessment will also have due regard to the following guidance:

- NatureScot (SNH, 2000) Natural Heritage Zones.
- European Commission (2011) Wind energy developments and Natura 2000.
- Natural Heritage Zone bird population estimates (Wilson *et al.*, 2015)[60]
- NatureScot (SNH, 2016) Assessing connectivity with Special Protection Areas.
- NatureScot (SNH, 2017) Recommended bird survey methods to inform impact assessment of onshore wind farms.
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine' (CIEEM, 2018; updated 2022)[61].

[60] Wilson, M. W., Austin, G. E., Gillings, S. & Wernham, C. V. (2015). Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report number SWBSG_1504, 72pp.
[61] Chartered Institute of Ecology and Environmental Management (CIEEM). (2018; updated 2022). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (version 1.2). CIEEM, Winchester. Available at https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf

- Disturbance distances review: An updated literature review of disturbance distances of selected bird species (Goodship & Furness, 2022)
- NatureScot (2023) NatureScot pre-application guidance for onshore windfarms.
- NatureScot (2024a) Standing advice for planning consultations – Birds.
- NatureScot (2024b) NatureScot pre-application guidance for onshore wind farms.
- NatureScot (2024c) Good Practice During Wind Farm Construction. 4th Edition.
- NatureScot (2025a) Assessing significance of impacts from onshore windfarms outwith designated areas, and
- NatureScot (2025b) Assessing the cumulative impacts of onshore windfarms on birds.

Proposed Surveys

7.4.3 It is proposed that the surveys undertaken to date and currently in progress, as detailed in the **Field Surveys** section above, along with the desk-based information, are sufficient to inform a robust ornithology assessment.

Assessment Methodologies

7.4.4 Particular consideration will be given in the assessment to potential effects on bird species whose populations are of moderate to high Nature Conservation Importance and that belong to taxonomic groups that are considered to be particularly susceptible to impacts from the Proposed Development. These include:

- Species listed on Annex 1 of European Council Directive 2009/147/EC on the conservation of wild birds (i.e. 'Annex 1' species), in particular those that may be associated with populations of species that are qualifying interests of SPAs in the wider area.
- Species listed in Schedule 1 to the Wildlife and Countryside Act 1981, as amended (i.e. 'Schedule 1' species), and
- Species of national conservation concern, not included within the above categories, but that are present within the Study Area in nationally or regionally important numbers (e.g. species on the UK Red List of Birds of Conservation Concern (Stanbury *et al*., 2021)).

7.4.5 Effects, including a 50 m micro-siting allowance, will be assessed against the existing baseline conditions, i.e., without the Proposed Development present. This assessment will be carried out assuming that there are no existing significant adverse effects on the population, range or distribution of a species (i.e., no significant effect on the species' conservation status) and no significant interference with the flight paths of migratory birds.

7.4.6 The assessment will therefore first identify the possible effects of the Proposed Development and will then consider the likelihood of their occurrence. A judgement will then be made as to whether or not these effects are significant in the context of the EIA Regulations. In judging whether a possible effect is significant or not, the assessment will:

- Evaluate the Nature Conservation Importance of the bird interest in a systematic manner; and
- Estimate the magnitude of likely effects on each species as a result of the Proposed Development.

7.4.7 Effects will be assessed taking into account the national and regional populations of the species.

7.4.8 Impacts will be assessed in relation to species' population, range and distribution. Key considerations will include territory occupancy, breeding success, foraging success and ranging behaviour. The significance of each potential effect will be judged by integrating scales relating to ecological value, behavioural sensitivity and effects magnitude in a reasoned way, in the context of the status of, and trends within, species' regional populations (as defined by NatureScot Natural Heritage Zones [NHZ] (SNH, 2000)). If required, measures will be presented to mitigate any effects deemed to be significant.

7.4.9 The effects of the Proposed Development will be assessed in isolation and in combination with predicted effects of other cumulative developments in the same NHZ. The assessment of cumulative effects will be undertaken following published guidance (NatureScot, 2025b).

7.5 Potential Significant Effects

Potential Effects Scoped into Assessment

7.5.1 Taking account of the findings of the work undertaken to date, whilst still adopting a precautionary approach, potential ornithological effects associated with construction, operation and/or decommissioning of the Proposed Development include:

- Disturbance and/or displacement from supporting habitats during construction and decommissioning works.
- Loss/degradation of habitats through construction and decommissioning works, permanent structures and access tracks.
- Displacement from and disturbance to foraging, nesting, roosting habitat during the operational period.
- Mortality from collision with wind turbine blades, and
- The potential for cumulative effects arising from the combined effects of other existing and proposed developments within the wider area affecting the same bird populations.

Potential Effects Scoped Out of Assessment

7.5.2 On the basis of the desk-based work undertaken, the professional judgement of the EIA team, experience from other relevant projects and policy, guidance or standards, the effects proposed to be scoped out of this assessment are:

- Due to distance and the species for which protected sites have been designated (Table 7.1), significant effects can be scoped out for all qualifying species.
- Species of low conservation concern (e.g., green-listed Birds of Conservation Concern), or those not considered sensitive to wind farm developments are proposed to be scoped out of the assessment, as per best practice guidance (NatureScot, 2025a).

7.5.3 Until all baseline surveys are completed, and the results examined in detail, all other species will be scoped into the assessment.

7.6 Approach to Mitigation

7.6.1 The approach to mitigation would follow the principles of the mitigation hierarchy. Baseline results will be taken into consideration in the process of finalising the design of the Proposed Development.

7.6.2 Significant effects on birds will be avoided/minimised where possible during the design process, by considering locations of known nest, roost and lek sites, key foraging areas, and likely sensitivities of species of Nature Conservation Importance. Good practice (NatureScot, 2024a) during construction, operation and decommissioning of the Proposed Development will also be implemented, and the assessment will be undertaken on this basis. This would include the following:

- A Bird Disturbance Management Plan (BDMP) would be implemented as part of a Construction Environmental Management Plan (CEMP) or similar during the construction phase, to ensure that all reasonable precautions are taken to adhere to the relevant wildlife legislation.
- Pre- and during- construction surveys carried out by an Ecological Clerk of Works (ECoW) or suitably qualified ornithologist would take place as part of the BDMP, and
- A Biodiversity Enhancement Management Plan (BEMP) would be developed for the operational phase and agreed with consultees, to mitigate for identified impacts and enhance habitat for species of Nature Conservation Importance and to provide wider biodiversity improvements.

7.6.3 The need for, and scope of, further monitoring of bird activity in relation to the Proposed Development will also be defined as part of the assessment process.

7.6.4 Reasonable opportunities for enhancement measures to meet the policy aims of NPF4 and deliver biodiversity enhancement will be explored.

7.7 Consultee List

7.7.1 It is proposed that the following stakeholders will be consulted in relation to the assessment:

- NatureScot; and
- The Royal Society for the Protection of Birds (RSPB).

Questions for Consultees

Q7.1: Do the consultees agree that all international, European and national designated sites for ornithology can be scoped out of the EIA given the lack of connectivity?

Q7.2: Are the consultees content with and / or have any comments on the baseline survey methods and level and timing of survey effort?

Q7.3: Are the consultees content with and / or have any comments on the list of potential effects and impact assessment methods?

8. Cultural Heritage

8.1 Introduction

8.1.1 This chapter sets out the proposed approach to the assessment of potential effects on Cultural Heritage during construction, operation and decommissioning of the Proposed Development, including physical effects, setting change and cumulative effects.

8.1.2 In this context, cultural heritage is held to be "*the physical evidence for past human activity. It connects people with place, and with the traditions, stories, and memories associated with places and landscapes*".[62] It comprises tangible, physical assets, including: historic buildings and structures; archaeological assets; the remains of past environments shaped by human action; gardens and designed landscapes; historic landscapes and townscapes; and other sites, features or places in the landscape that have the potential to provide information on past human activity. It also incorporates non-tangible associations of place with events, such as historical battlefields, or with historical figures and folklore.

8.2 Study Area

8.2.1 The following study areas are proposed for the Historic Environment Assessment (HEA) which will support the EIAR chapter:

- **The Site/Core Study Area:** comprising the Site (i.e. land within the red line boundary), identifying all previously recorded, designated and non-designated heritage assets, and previous archaeological investigations ('events'). This will allow for assessment of the potential for direct effects on known heritage assets and of the potential for hitherto unknown buried assets to survive in situ, and thus potentially experience physical effects. Effects arising from setting change will also be assessed for those assets within the Proposed Development Site (see **Figure 8.1**).
- **5 km Inner Study Area**: up to 5 km from the Site, comprising World Heritage Sites, Scheduled Monuments, Listed Buildings, Inventory-listed Gardens and Designed Landscapes, Inventory-listed Battlefields, and Conservation Areas to allow for the assessment of potential changes to their settings (**See Figure 8.2a-b**). Non-designated assets of more than local importance will be reviewed and scoped in where significant effects as a consequence of setting change are anticipated (see **Figure 8.3**).
- **10 km Outer Study Area:** between 5-10 km from the Site, identifying any designated assets, and non-designated assets of demonstrable national significance, at greater distances likely to be susceptible to setting change (see **Figure 8.4**).

8.3 Existing Conditions

8.3.1 A preliminary desk-based assessment has been undertaken to determine, as far as is reasonably possible, the existing historic environment conditions within the Site and the study areas. The following data sources were consulted for this preliminary assessment:

- Historic Environment Scotland (HES) spatial datasets and database for designated heritage assets comprising:
  - Scheduled Monuments;
  - Listed Buildings;
  - Conservation Areas;
  - Inventory-listed Garden and Designed Landscapes; and
  - Inventory-listed Historic Battlefields.
- HES National Record of the Historic Environment (NRHE) database;
- West of Scotland Archaeology Service (WoSAS) Historic Environment Record (HER) data;

[62] Historic Environment Scotland (2023) Our Past, Our Future. Available [online] at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=79204155-9eb2-4d29-ab14-aff200ec2801 (Accessed April 2025)

- Historic Ordnance Survey mapping (principally First and Second Edition 25-inch and 6-inch to the mile mapping where available for the Site and Inner Study Areas) as well as other published historic mapping held in the National Library of Scotland (NLS) and available online;
- Scottish Archaeological Research Framework (ScARF 2012).

The Site

8.3.2 The bedrock geology across the Site is largely characterised by igneous formations with Harelaw Lava Member (trachyte) covering much of the of the Site, with Flow Moss Lava Member (basalt and olivine-macrophyric) present in extending across the north-east of the Site. Such bedrock forms part of the Clyde Plateau Volcanic Formation which covers much of northern East Ayrshire and its surrounds. In the far south-west of the Site, there are comparatively small areas of Kirkwood volcaniclastic sedimentary rock as well as Lower Limestone sedimentary rock. All of these bedrock types formed during the Carboniferous period between 347.6 and 328 million years ago.[63]

8.3.3 Superficial deposits of peat cover nearly the entire Site.[64] This peat formed during the last 10,000 years but is likely to have gained pace following climatic deterioration evident around 6,000 years ago. Deposits can provide important information about climate and environmental change since the early Holocene, which can include evidence of human activities that interacted with the upland landscape. Therefore, paleoenvironmental evidence (i.e. evidence of past environments and climate such as seeds, pollen, etc.) from peat deposits can help to reconstruct the environment in which human activities took place.

8.3.4 Also present are small areas of superficial deposits of Quaternary diamicton sedimentary Devensian till in the south-west near the Swinzie Burn and the north-east towards the Corsehouse Reservoir.[65] Owing to its poorly sorted nature, archaeological preservation within such deposits can vary due to its inconsistent drainage characteristics which can, in places, be waterlogged (generally good for archaeological preservation) or permeable with little water inundation.

Designated Heritage Assets

8.3.5 Designation is the legal and or/policy recognition of some of Scotland's most important historic sites and places. It aims to ensure that the cultural, social, environmental, and economic value of sites and places are recognised through the planning system and other regulatory processes.

8.3.6 There are no designated heritage assets within the Site/Core Study Area (see **Figure 8.1**).

8.3.7 The following heritage assets have been identified within the 5 km Inner Study Area and are shown in **Figures 8.2a-b**:

- Four Scheduled Monuments;
  - The Moyne prehistoric funerary cairn (SM12856)
  - The Middleton and Bannerbank prehistoric settlements (SM12815; SM12816)
  - The medieval Robertland Castle (SM3380)
- 30 Listed Buildings (two category A, nine category B, and 19 category C)[66]; and
- High Fenwick (CA52) Conservation Area.

The following designated heritage assets lie within the 5-10 km Outer Study Area and are shown in **Figure 8.4**:

- Eight Scheduled Monuments;
- 268 Listed Buildings (15 category A, 119 category B, and 134 category C);
- Four Gardens and Designed Landscapes; and

[63] British Geological Survey. Available online: https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/ [Accessed May 2025]
[64] British Geological Survey. Available online: https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/ [Accessed May 2025]
[65] British Geological Survey. Available online: https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/ [Accessed May 2025]
[66] Listed buildings may contain multiple elements under a single list entry. For the purposes of the asset count presented here these are treated as one entry, however, multiple geospatial entries may be shown on relevant figures accompanying this report.

- Six Conservation Areas.

Non-designated Heritage Assets

8.3.8 Within the Site, the WoSAS historic environment record (HER) has identified two assets located in its south-west along/near the Swinzie Burn, both of which are which noted as destroyed by forestry ploughing in 1982 by the Ordnance Survey (see **Figure 8.1**). These non-designated heritage assets comprise a prehistoric settlement containing three round houses (WoSAS Pin: 7439), as well as a dam and water mill of, probable, post-medieval date (WoSAS Pin: 7435). Within the Inner Study Area, there are 714 entries in the WoSAS HER database, excluding those directly related to designated heritage assets (see **Figure 8.3**) and including the Dunlop Designed landscape (WoSAS Pin: 53566). Of these, WoSAS deem four non-designated assets to be 'almost certainly of national importance' or 'probably of national importance'. These comprise:

- The prehistoric Moyne Moor / Covenanters' Stones stone circle (WoSAS Pin: 7593);
- The prehistoric Picketlaw hut-circle (WoSAS Pin: 12787);
- The Iron Age Black Law hill fort (WoSAS Pin: 7572); and
- The undated Ballagioch / Ballageich Hill cairn (WoSAS Pin: 8471).

8.3.9 The majority of HER entries within 5 km of the Site are unlikely to be nationally important and relate to post-medieval rural settlement and agricultural practices, with a large number also relating to prehistoric occupation of the landscape. These are typically located along watercourses and near bodies of water owing to their utility in both supporting life as sources of fresh water, but also due to the fertility of the land likely being slightly higher than surrounding land owing to the natural irrigation. The highest concentration of non-designated assets, however, is located within areas that have previously been subject to archaeological investigation. As such, the distribution of known heritage assets within the Inner Study Area is not representative of the distribution of past populations, but a bias created by the location of modern development.

8.3.10 Post-medieval rural agricultural practices are demonstrated in the First and Second Edition of the Ordnance Survey six-inch map[67] which shows that in the 19th century, the Glenouther Moor was surrounded by regular field enclosures of various sizes with the Moor itself featuring large regular enclosures in its north-west. By the late 20th century, the Corsehouse Reservoir had been established, consuming part of the Moor's northern extent while much of what remains became used for commercial forestry. Some of the 19th century boundaries within the Moor are still used to divide the parcels of modern forestry.

8.4 Proposed Surveys and Assessments Methodologies

Legislation, Guidance and Policy

Legislation and Policy

8.4.1 There is a range of legislation and national and local policy that is relevant to examining the potential effects of the Proposed Development on cultural heritage assets. These include:

- The Town and Country Planning (Scotland) Act 1997;
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Legislation pertaining to the designation of heritage assets and the protections afforded to them, including:
  - The Ancient Monuments and Archaeological Areas Act 1979;
  - The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997;
- National Planning Framework 4 (2023) Policy 7: Historic assets and places;
- Historic Environment Policy for Scotland (HEPS) (2019); and

[67] OS Six inch to a mile Ayrshire Sheet XIII (survey date: 1856, Publication date: 1856); OS Six inch to a mile Ayrshire Sheet XIII.NE (date revised: 1895, Publication date: 1897);

- East Ayrshire Council Local Development Plan (2024) Section 04: Place and Environment – Historic Environment.

Guidance

8.4.2 The following guidance documents will be consulted during the assessment to inform the methodology for and assist in the determination of potential effects on cultural heritage assets:

- Planning Advice Note (PAN) 2/2011: Planning and Archaeology (PAN2/2011);
- HES Designation Policy and Selection Guidance (2019);
- HES (2016) 'Managing Change in the Historic Environment Guidance Notes – Setting';
- HES (2016) 'Managing Change in the Historic Environment Guidance Notes - Historic Battlefields';
- HES and Scottish Natural Heritage (2018) 'Environmental Impact Assessment Handbook' (particularly the framework for Cultural Heritage Impact Assessment provided in Appendix 1)';
- CIfA (2014) 'Code of Conduct';
- CIfA (2017) 'Standard and guidance for historic environment desk-based assessment'; and
- CIfA, Institute of Historic Building Conservation and Institute of Environmental Management and Assessment 'Principles of Cultural Heritage Impact Assessment (PCHIA) in the UK' (2021).

Desk and Field Surveys

Desk Study

8.4.3 A detailed desk-based assessment will be undertaken in line with the CIfA guidance, to determine, as far as is reasonably possible from existing records, the nature, extent and significance of the historic environment within the Site and the study areas and to establish the impact of the Proposed Development on their cultural significance.

8.4.4 The following data sources will be consulted to inform the desk-based assessment:

- HES spatial datasets and database for designated heritage assets comprising:
  - Scheduled Monuments;
  - Listed Buildings;
  - Conservation Areas;
  - Inventory-listed Garden and Designed Landscapes;
  - Inventory-listed Historic Battlefields;
- HES National Record of the Historic Environment (NRHE) 'Canmore';
- Historic Land-use Assessment (HLA) data;
- West of Scotland Archaeology Service (WoSAS) HER data (held on behalf of EAC);
- Historic Ordnance Survey mapping (principally First and Second Edition 25-inch and 6-inch to the mile mapping where available for the Site and Inner Study Areas) as well as other published historic mapping held in the National Library of Scotland (NLS) and available online;
- Aerial photographs (oblique and vertical) held by the National Collection of Aerial Photography (NCAP), Cambridge Aerial Photos and Britain From Above, available online;
- Available grey literature reports from recent archaeological work undertaken in the area, the Excavation Index for Scotland, and archaeological journals and monographs;
- The national Scottish Archaeological Research Framework (ScARF 2012);
- Relevant archive material held by EAC/WoSAS, HES, NLS, Registers of Scotland available online;
- Publicly available LiDAR data;

- Visualisations and 3-D turbines modelled and viewed in relevant software; and
- Findings of other relevant topics, including Landscape and Visual Amenity, Geology, Hydrology, Hydrogeology, and Peat.

Field Survey

8.4.5 A walkover field survey targeting the construction footprint and proposed micro-siting allowance, where ground conditions allow (e.g. forestry access restrictions), will be conducted within the Site boundary. This will confirm the location, interpretation and likely sensitivity to change of the identified cultural heritage assets, as well as the potential effects on those assets to inform consideration of the mitigation measures likely to be required.

8.4.6 Selected assets in the vicinity of the Site will also be visited to gather baseline data regarding their setting. Selection will be informed by the Zone of Theoretical Visibility (ZTV) and judgements on the likely sensitivity to setting change of assets with theoretical visibility.

8.4.7 The proposed field survey, as well as a review of the final design layout and supporting ZTV, will seek to determine which designated assets are sensitive to setting change and, through the operation of the Proposed Development, have the potential to experience significant effects. In addition, the field survey will also aid the understanding of which non-designated heritage assets are sensitive to setting change, through the operation of the Proposed Development. The assessment of non-designated heritage assets will focus on all such assets located within the site, as well as those of regional, or possible national, significance within the 5 km Inner Study Area. The findings of the sensitivity assessment will be presented in HEA.

Types of Effects

Assessment Methodology

8.4.8 The assessment will consider both direct and indirect physical impacts and impacts as a consequence of setting change.

8.4.9 Direct physical effects to assets occur when the fabric of assets are removed or damaged as a result of development. This will be permanent and generally occurs during the construction phase.

8.4.10 Indirect physical effects occur as an indirect consequence of the development such as increased/decreased erosion or damage from vibration of piling or haulage movements. Again, such impacts are likely to be permanent.

8.4.11 Effects arising from setting change are usually direct and result from the development causing change within the setting of a heritage asset which affects its significance, for example, through the ability for an asset to be understood, appreciated and experienced within the context of the surrounding landscape. This is often related to visual effects resulting from the appearance of the development in the surroundings of the asset, but can also relate to disruptions of historical, functional or symbolic relationships (including intervisibility between assets or historic patterns of land use) or sensory factors such as noise, odour or emissions. All assets have a setting, but the contribution that this makes to their cultural significance varies in line with the location, form, function and preservation of the asset's surroundings. Setting can be integral to the cultural significance of an asset, therefore a change in an important element of an asset's setting represents a direct impact to its significance. Equally, depending on the type of asset, setting may make little or no contribution to cultural significance.

8.4.12 Once baseline data has been compiled, all heritage assets within the study area will be identified and the scoping baseline analysis detailed above will be revisited and updated in the HEA. Using professional judgement and data gathered from the Proposed Development ZTV and walkover surveys, assets identified as being likely to experience significant effects, either through physical change or changes within their setting, will be scoped into the assessment, and a full description of their cultural significance will be outlined with reference to:

- HES's Designation Policy and Selection Guidance (2019), which sets out cultural values that vary according to asset type; and
- The Burra Charter (Australia ICOMOS 2013) values (e.g. aesthetic, historic, scientific or social) which are referenced by the Historic Environment Policy for Scotland (2019).

8.4.13 The contribution made by setting to that significance will be set out narratively with reference to HES's setting guidance. Sensitivity ratings to setting change (i.e. high, medium and low) will also be ascribed to each asset based

on the contribution that setting makes to the significance of the asset and its potential for change, given the nature of and likely interaction with the Proposed Development. All heritage assets within the Site will be assumed to be of high sensitivity to direct physical change, unless otherwise stated.

8.4.14 The importance of assets' cultural heritage significance will be ascribed under the following criteria:

- High: assets of national importance, comprising designated heritage assets and non-designated assets of demonstrably equal value.
- Medium: assets of regional importance, for example those identified by regional research priorities, via engagement with relevant consultees or through the assessment of their significance.
- Low: assets of local importance.
- Uncertain: assets of uncertain importance.

8.4.15 A full assessment of the significance of effects will then be undertaken. All such effects will be assessed to reflect the way in which the Proposed Development has the potential to affect the cultural significance of an asset either through direct physical effects, setting change, or, if relevant, indirect physical (or secondary) effects.

8.4.16 In articulating effects, a judgement will be made on the level of harm or benefit that a heritage asset will experience as a result of the Proposed Development, supported by an appropriate narrative explaining how the cultural significance of the asset will be changed. The level of harm or benefit will be considered alongside the importance of the asset to determine the magnitude of change, The criteria for the assessment for determining the significance of effect will be informed by guidance published in Appendix 1 of SNH and HES' 'EIA Handbook' and HES' 'Managing Change in the Historic Environment: Setting' guidance note.

8.4.17 NPF4 Policy 7(h) states that proposals will only be supported where *"significant adverse impacts on the integrity of the setting of a scheduled monument are avoided"*. The integrity of a Scheduled Monument's setting will be held to comprise the factors of setting that contribute to how the cultural significance of the asset is understood, appreciated and experienced.[68] A qualitive judgement on the level of impact [69] will be made within the relevant detailed assessment of direct effects, and a clear judgement presented as to whether this is held to constitute a 'significant adverse impact' on integrity of setting.[70]

8.4.18 The cumulative assessment will consider the potential effects to heritage assets against a baseline that includes operational and under construction wind farms. Consented and proposed (excluding those at Scoping) wind farms within 10 km of the Proposed Development will be included in the cumulative assessment.[71] Only assets identified as likely to experience significant effects will be assessed within the EIAR chapter. Effects to assets that are not significant in EIA terms will still be fully considered and reported upon in the HEA.

8.4.19 The assessment of potential effects related to a change in setting will be informed by review of the ZTV for the Proposed Development, site visits, and visualisations such as wirelines and photomontages.

8.4.20 Following receipt of the Scoping Opinion, detailed follow-up consultation will be undertaken with relevant consultees to further agree the scope of the assessment, as required. It is anticipated that this will include the identification of viewpoints for wireframe and, where necessary, photomontage visualisations. Suggested viewpoints are provided in **Table 8.1** below and shown in **Figure 8.5.** These have been chosen through professional judgement based on advice on previous applications, understanding of the Site and the extent of the ZTV.

[68] This definition derives from that which was agreed upon between HES and the Appellant during the Righill Wind Farm appeal (PPA-310-2034) owing to the lack of definition provided by NPF4 or any relevant guidance documents.
[69] This qualitative judgement will be based on a professional understanding of the asset, its current setting, and how elements of this setting contribute to the ways in which it is understood, appreciated and experienced.
[70] In order for there to be a significant adverse impact on the integrity of a scheduled monument's setting, the contribution that setting makes to the cultural significance of an asset must be significantly impacted in its own right. As such, it is considered that non-significant effects arising from setting change are incapable of resulting in a significant impact to the integrity of said setting. However, a significant effect arising from setting change will not always result in a significant effect to the integrity of setting.
[71] The possibility that significant effects on heritage assets may arise due to the presence of cumulative developments located beyond 10 km is restricted and considered to be unlikely.

Table 8.1 Initial Cultural Heritage viewpoints for consideration

VP ID	Name	Reference ID	Visualisation method	Easting	Northing
CHVP1	Moyne, cairn	SM12856	Wireline/Photomontage	247982	653242
CHVP2	Dunwan Hill, fort	SM12882	Wireline	254689	648952
CHVP3	Harelaw	LB13823 (Category C)	Wireline	248912	647048
CHVP4	King's well	LB12508 (Category B)	Wireline	250011	647745
CHVP5	Lockgoyn Monument	LB12509 (Category C)	Wireline	252824	646950
CHVP6	Rowallan Castle / Rowallan GDL	LB12524 (Category A) / GDL00333	Wireline	243486	642423
CHVP7	Rowallan House / Rowallan GDL	LB12524 (Category A) / GDL00333	Wireline	243277	642725
CHVP8	Black Law	WoSAS ID: 7572	Wireline	246420	650150

8.4.21 At present, proposed visualisations are located from within the relevant asset. The need for, and exact location of, additional visualisations to support the assessment of in-combination views[72] will be under continual review.

8.4.22 In addition to those listed in **Table 8.1**, Landscape and Visual Impact Assessment (LVIA) (see **Chapter 5**) viewpoints, where relevant to the historic environment, will be utilised to aid assessment.

8.5 Potential Significant Effects

Potential Effects Scoped Into the Assessment

8.5.1 Based on baseline conditions and review work undertaken to date, it is proposed that the following are scoped into the assessment:

- Physical impacts to both designated and non-designated assets within the proposed Site boundary (core study area).
- Setting change to susceptible designated heritage assets with theoretical visibility within the core, inner (5 km) and outer (10 km) study areas.
- Susceptible non-designated assets with theoretical visibility within the 5 km study area identified as being of high sensitivity to setting change.
- Indirect physical effects; and
- Cumulative effects.

Potential Effects Scoped Out of the Assessment

8.5.2 Based on baseline conditions and review work undertaken to date, including theoretical visibility and distance from the Site, it is proposed that the following are scoped out:

- Direct physical effects on cultural heritage assets outside of the Site boundary where no physical interaction with infrastructure will occur;

[72] Where the asset is in the foreground in the photography

- Impacts as a consequence of setting change to non-designated heritage assets beyond 5 km. Non-designated assets identified as being of regional or national importance, and highly susceptible to setting change may be scoped in based on the review process noted above; and
- Impacts on the setting of all heritage assets located outside the ZTV. These assets will not be adversely affected if there is no theoretical intervisibility with the Proposed Development.

8.6 Approach to Mitigation

8.6.1 Design considerations relevant to cultural heritage are likely to include suitable buffers from heritage assets to avoid direct physical effects during construction and decommissioning, and measures to minimise the intrusion of wind turbines and associated infrastructure within the setting of heritage assets. Similarly, design principles to minimise intervisibility, changes in views to, from and of assets will be implemented in parallel with wider parameters intended to conserve landscape and visual amenity. These measures will be considered as embedded mitigation.

8.6.2 Where adverse effects to assets within the Site are identified, additional mitigation measures to avoid, reduce and/or offset these effects will be proposed. Where necessary, to prevent accidental damage or potential destruction of assets, appropriate good practice measures will be put in place through a Construction Environmental Management Plan (CEMP) and a Decommissioning Environmental Management Plan (DEMP). This may include the fencing off or marking of assets to be avoided during construction, and the appointment of an Archaeological Clerk of Works (ACoW), or Historic Environment Clerk of Works (HECoW) to supervise targeted ground-breaking works.

8.6.3 Where possible the design iteration process will aim to avoid or minimise impacts upon the setting of designated heritage assets.

8.7 Consultee List

8.7.1 It is proposed that the following stakeholders will be consulted in relation to the assessment:

- HES;
- WoSAS on behalf of EAC; and
- The conservation advisor for EAC.

Questions for Consultees

Q8.1: Are there any additional sources of baseline information which should be referred to, to inform the appraisal of effects on cultural heritage?

Q8.2: Are the proposals to scope out certain elements of cultural heritage from detailed assessment appropriate?

Q8.3: Is the proposed methodology clear and appropriate?

Q8.4: Are there further specific heritage assets that should be considered in the impact assessment?

Q8.5: Are there further assets or locations which you wish to see visualisations for in addition to those included in Table 8.1?

9. Hydrology, Hydrogeology, Geology and Peat

9.1 Introduction

9.1.1 This chapter sets out the proposed approach to the assessment of potential effects on hydrology, hydrogeology, geology and peat during construction, operation and decommissioning of the Proposed Development. The assessment will be carried out in line with relevant legislation and standards.

9.2 Study Area

9.2.1 The study area for the hydrology, hydrogeology, geology and peat assessment comprises the Site and watercourses and catchments within or hydrologically connected to the Site. **Figure 9.1: Hydrology Overview** shows the main watercourses and water features within and close to the Site. **Figure 6.2: Carbon and Peatland Map 2016** shows the NatureScot (2016) Carbon and Peatland classification and **Figure 9.2: Peat Depths** shows the results of the Phase 1 peat depth survey within the Site boundary.

9.2.2 The study area for detailed assessment of groundwater abstractions, including Private Water Supplies (PWS), and ground water dependent terrestrial ecosystems (GWDTE) will be within a 250 m buffer from the proposed infrastructure, as per SEPA guidance[73] [74]. However, a wider search area (1 km buffer) from the Site boundary for PWS was undertaken for the assessment.

9.3 Existing Conditions

9.3.1 A desk-based review of 1:25,000 scale Ordnance Survey maps, 1:50,000 scale British Geological Survey (BGS) Geology maps, 1:250,000 scale Soils Maps of Scotland and the 1:250,000 NatureScot Carbon and Peatland 2016 Map was undertaken. In addition, a Phase 1 peat survey was completed in September 2024, and an initial hydrology and Groundwater Dependent Terrestrial Ecosystem (GWDTE) survey was completed in March 2025 to identify watercourses, peat depths, GWDTE and ground conditions within the Site.

9.3.2 The Site is located on a large area of commercial forestry with some open areas of blanket bog habitat. The topography across much of the area to the west and south is generally flat, owing to its position on the Glenouther Moor raised bog. The terrain is incised by the Swinzie Burn and other small watercourses. The northern area of the Site sits higher with a maximum elevation of 237 m AOD (Above Ordnance Datum).

9.3.3 The Site is located almost entirely in the River Irvine catchment, with the exception of a small area to the north-east which drains into the White Cart Water catchment. Most of the Site drains into the Swinzie Burn which flows along the southern Site boundary in a westerly direction to meet the Annick Water, a tributary of the River irvine. Part of the northern area of the Site drain directly into the Corsehouse Reservoir or into the Annick Water via an unnamed tributary near the north-western site boundary (**Figure 9.1**).

9.3.4 A review of the SEPA Future Flood Map indicates that there are some areas at risk of flooding in a 1 in 200-year event within the Site (**Figure 9.1**). This is largely restricted to the Swinzie Burn which has a ~100m wide floodplain in some areas and is most extensive along the southern boundary of the Site. Flooding from surface water and small watercourses is restricted to the tributaries and upper reaches of the Swinzie Burn.

9.3.5 SEPA has characterised surface water quality status under the terms of the Water Framework Directive. Classification by SEPA considers water quality, hydromorphology, biological elements including fish, plant life and invertebrates, and specific pollutants known to be problematic. The classification grades through High, Good, Moderate, Poor, and Bad status. This provides a holistic assessment of ecological health. The Swinzie Burn which flows through the Site is not big enough to be classified by SEPA; however, it flows into the Annick Water (Waterbody ID: 10394) ~4 km south-west of the Site which has been designated an overall status of 'Moderate ecological potential' in 2023. It is classed as having 'Bad' overall morphology on account of being heavily modified for agricultural drainage.

[73] SEPA (2024) Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems
[74] SEPA (2024) Guidance on Assessing the Impacts of Development on Groundwater Abstractions

9.3.6 Part of the northern area of the Site falls within the surface water drinking protected area (DWPA) of the Corsehouse Reservoir, as shown in **Figure 9.1**. The proposed turbine locations are all within the Swinzie Burn catchment and therefore avoid the DWPA.

9.3.7 The underlying bedrock geology comprises the Flow Moss Lava Member and the Harelaw Lava Member, both of igneous origins. The Flow Moss Lava Member is an alkali basalt and subordinate basanites. The Harelaw Lava Member is composed of trachyte, trachyandesites and trachybasalt lavas. There are two sedimentary bedrock features (Kirkwood Formation and Lower Limestone Formation) in the south-western corner of the Site.

9.3.8 The superficial geology is dominated by peat deposits, with only a small area of alluvium deposits along the Swinzie Burn and Devensian Till in the north and south-east of the Site.

9.3.9 The NatureScot Carbon and Peatland (2016) Map indicates that the Site is largely underlain by Class 5 peat, with some Class 4 present in the northern part of the Site (**Figure 6.2**). The area of non-forested peatland in the north-west of the Site is categorised as Class 1. There is some mineral soil present along the Swinzie Burn. The descriptions for the carbon and peatland classes within the Site are listed below:

- Class 1 – Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value.
- Class 4 – Area unlikely to be associated with peatland habitat or wet and acidic type. Are unlikely to include carbon-rich soils.
- Class 5 – Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soils. Soils are carbon-rich and deep peat.

9.3.10 A Phase 1 peat survey on a 100 m x 100 m grid across the whole Site was completed in 2024 by MacArthur Green to determine peat depths across the Site. The survey indicates the presence of peat across the majority of the Site. The deepest peat extends roughly around the area of Class 1 peat in the north-west of the Site, reaching up to 8.18m at the deepest measured point. The spatial distribution of peat depths is shown in **Figure 9.2**. The shallowest probe depths were found along the Swinzie Burn.

9.3.11 The Site is mostly underlain by the Whitelee groundwater body (ID: 150599) which was assessed by SEPA to be in 'Good' condition in 2023. The small area which falls within the White Cart Water catchment is underlain by the Newton Mearns groundwater body (ID:150622) and classified by SEPA as being in 'Good' condition in 2023.

9.3.12 The aquifer underlying the Site is a Class 2c aquifer of low productivity in which flow is virtually through all cracks and discontinuities. There are small amounts of groundwater in the near surface weathered zone and secondary fractures and can yield up to 2L/s from rare springs.

9.3.13 Private Water Supply (PWS) and abstraction data from East Ayrshire Council, East Renfrewshire Council and SEPA has been obtained, along with a review of PWS data from the previous 2015 EIA. Based on the PWS data available, there are no known PWS or SEPA licenced abstractions within the Site boundary (**Figure 9.1**). This will be confirmed during the EIA process.

9.3.14 A GWDTE survey was carried out in March 2025 by hydrologists to groundtruth the areas of the Site that were identified to be *potentially* groundwater dependent based on the NVC habitat surveys carried out by the ecologists (see **Chapter 6: Ecology**). Most of the areas identified by ecology surveys were considered to be mainly fed by surface water, based on the surrounding topography, proximity to watercourses and the low productivity aquifer and had at most a low dependency on groundwater. One moderately dependent GWDTE was identified near the centre of the Site; this was a groundwater seep arising in an area of bare peat in commercial forestry. This was classed as a moderately dependent GWDTE, although it was assessed to have low ecological importance (see **Chapter 6**). The location of the GWDTE is shown in **Figure 9.1.**

9.4 Proposed Surveys and Assessments Methodologies

Proposed Surveys

9.4.1 A Phase 2 peat survey and detailed hydrology survey of the Site will be carried out to supplement the desk-based work and data collection to identify the existing baseline conditions. The hydrology survey will include identifying and documenting all watercourse crossings (proposed and existing) and undertaking an overview assessment of areas identified as floodplain within the SEPA Flood Maps. Private water supply questionnaires will be sent to remote

properties within 1 km of the Site to identify any PWS not present in the council dataset and to verify the source locations. This will be followed up with property visits to PWS with potential hydrological connectivity to the Proposed Development if further information is required.

9.4.2 The proposed frequency for Phase 2 peat probing and coring will follow relevant guidance[75], as follows:

- Targeted high frequency probing will be undertaken along tracks, at turbines/hardstandings, turning points and passing places, site compounds, substation, and met mast location.
- Probes will be taken at 50 m spacing both along the centre line of any access tracks and at 10 m offsets.
- Detailed probing survey on a 10 m x 10 m grid basis will be undertaken around the centre of each proposed turbine base and additional proposed infrastructure.
- Cores will be undertaken at representative locations, including each turbine, to verify the actual peat depth, the thickness of the acrotelm and catotelm, determine the mineral soil characteristics and allow for Von Post-tests to be undertaken.

9.4.3 The data obtained from the site investigations will be used to produce maps of peat depths within the Site and around proposed infrastructure. A shaded contour interval of 0 – 0.5 m, 0.5 – 1 m, 1 – 2 m, 2 – 3 m, etc. will be used to demonstrate the occurrence of peat and show peat depths across the Site.

9.4.4 The findings of the survey work and baseline assessment will contribute to environmental constraints mapping and will inform design iterations and subsequent environmental assessment.

9.4.5 The peat survey results will also be used to inform the preparation of a peat management plan (PMP) and peat landslide hazard and risk assessment (PLHRA).

9.4.6 The PMP will follow relevant guidance and identify potential excavation volumes of peat (both acrotelm and catotelm). Early calculations will be used to optimise infrastructure locations with respect to peat depth (in balance with other constraints). Detailed calculations of excavation and reuse of acrotelmic and catotelmic peat will be undertaken using the design-freeze layout and opportunities to reuse peat will be explored based on infrastructure and site conditions. This may include integration of peat reuse measures with habitat management proposals to improve site conditions where there is benefit in so doing.

9.4.7 The PLHRA will be undertaken according to Scottish Government guidance and will assess the likelihood of peat instability in association with wind farm construction. Early calculations will be used to minimise overlap with areas of higher natural likelihood. Assessment of the design-freeze layout will consider all relevant receptors and provide mitigation measures and good practice recommendations to minimise risks associated with peat landslides. If necessary, the assessment will consider the impacts of forestry on peat physical properties and stability.

Assessment Methodology

9.4.8 The assessment will be undertaken in accordance with key legislation, policy and guidance (including SEPA's Guidance for Pollution Prevention (GPP) and Pollution Prevention Guidelines (PPG)).

9.4.9 The sensitivity of the hydrological, geological and hydrogeological receptors will be defined separately in the assessment on a scale of high, medium and low. The magnitude of effect on each receptor will be defined taking into account factors such as timing, scale, size and duration of the effect and will use a scale of major, moderate, minor and negligible. Significance of effect will be determined through a combination of the above two factors, using professional judgement. Major and moderate effects will represent significant effects in the context of the EIA Regulations.

9.5 Potential Significant Effects

9.5.1 Potentially significant effects are considered most likely to occur during the construction, and to a lesser extent, the decommissioning, phase. The Project Developer is committed to implementing good practice construction methods and pollution prevention measures and has extensive knowledge of wind farm construction methods.

[75] Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland

Potential Effects Scoped Into the Assessment

9.5.2 Potential effects on hydrology, hydrogeology, geology and peat will be assessed as part of the EIA process. This will include the identification of both generic effects of construction, including forestry works, and decommissioning (e.g. sediment release, pollution, fuel spills etc.) on the downstream receiving environment and effects on specific locations, such as sensitive habitats (i.e. GWDTEs, PWS, peatland habitats or watercourse crossings, which are sensitive to pollution risk and / or disturbance from required engineering works). Forestry works will involve felling to clear areas around the proposed infrastructure which can introduce high sediment loads into the water environment without mitigation.

9.5.3 Taking account of the findings of the work undertaken to date, and professional experience, whilst still adopting a precautionary approach at this preliminary stage, potential effects associated with the construction, operation and decommissioning of the Proposed Development include:

- Pollution of surface water caused by releases of sediment to watercourses from any excavated/stockpiled material, forestry felling prior to construction and decommissioning because of stream crossings or works near watercourses.
- Pollution of surface water and groundwater through operation of machinery (e.g., spillage of fuels, oils etc.) during site preparation, construction and decommissioning.
- Effects on PWS and GWDTE quality and quantity during construction, operation and decommissioning (if relevant buffers cannot be achieved).
- Modifications to natural drainage patterns, changes to runoff rates and volumes and consequent increase in flood risk during construction, operation and decommissioning.
- Effects on peat (including potential peat instability).
- Cumulative effects during construction, operation and decommissioning on surface and ground water quality, hydrology and peat. Potential impacts of the Proposed Development will be assessed in combination with relevant developments (submitted and consented applications) to determine any significant effects. It will be assumed that any future nearby wind farm schemes are designed and constructed in line with NPF4 and national guidelines with respect to SuDS and GPPs.

9.5.4 Based on the scoping layout, all the turbines and supporting infrastructure are likely to be within the Swinzie Burn catchment. If this remains the case, the assessment of hydrological effects will focus on the Swinzie Burn and its tributaries.

Potential Effects Scoped Out of the Assessment

9.5.5 Potential effects on geology are scoped out of the assessment.

9.5.6 It is likely that the DWPA catchment to the reservoir can be avoided entirely during early design; if this remains the case, potential effects on the DWPA will be scoped out of the assessment.

9.6 Approach to Mitigation

9.6.1 The following design measures will be implemented as embedded mitigation, where this is possible:

- A 50 m buffer will be applied to watercourses to minimise the risk of potential impacts due to changes in runoff, sedimentation, or water quality.
- Components of the Proposed Development will be kept outwith the 1 in 200-year plus climate change flood extent based on SEPA Future Flood maps.
- Components of the Proposed Development will be kept outwith the DWPA catchment.
- Existing tracks will be used for the Proposed Development to minimise both the land take and new watercourse crossings. Any new permanent watercourse crossings will be sensibly designed to account for local fluvial geomorphology and will be designed for the 200-year + climate change flow.
- Infrastructure will avoid areas of deeper (> 1 m) peat. This reduces the volume of peat required to be excavated (reducing displaced carbon) and limits effects on peatland hydrology.

- Excavations <1 m will be over 100 m away from any groundwater abstractions, PWS or GWDTEs as per SEPA guidance[76,77]. Excavations >1 m (e.g., turbine bases) will be over 250 m away from these receptors.

9.6.2 In addition to the careful siting of infrastructure components, and given the Project Developer's commitment to, and prior experience of, implementing accepted good practice during construction and operation, together with the current regulatory context, many potential effects on the water environment can be avoided or reduced. With respect to the current regulatory context, since the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR) came into force, CAR authorisation is required in relation to a number of activities e.g., engineering works in inland waters and wetlands. A Construction Site Licence (CSL) for surface water run-off management and pollution control during construction will be required for the works under the CAR Regulations. Consultation with SEPA throughout the EIA process will be undertaken in relation to those activities for which a licence or registration is required.

9.6.3 Good practice pollution prevention and control measures will be put in place during construction. These will reflect best practice guidance and recognised Industry standards (e.g., SEPA guidance, including their Guidance for Pollution Prevention (GPPs), CIRIA SUDS Manual[78] and Control of Water Pollution from Construction Sites Guidance[79] and the joint publication: Good Practice during Windfarm Construction[80] amongst others).

9.6.4 Therefore, a number of measures are not considered to be mitigation as such, but rather an integral part of the design/construction process as part of good practice; and it is proposed that these will be taken into account prior to assessing the likely effects of the Proposed Development. However, where appropriate, more tailored 'additional' mitigation measures will be identified prior to determining the likely significance of residual effects.

9.7 Consultee List

9.7.1 It is proposed that the following stakeholders will be consulted in relation to the assessment:

- SEPA;
- NatureScot;
- Scottish Water;
- East Ayrshire Council; and
- East Renfrewshire Council.

Questions for Consultees

Q9.1: Are there any additional sources of baseline information which should be referred to, to inform the appraisal of effects on hydrology, hydrogeology, geology and peat?

Q9.2: Is the proposed methodology appropriate?

Q9.3: Are the proposed list of effects which are scoped in appropriate?

Q9.4: Is the proposed approach to mitigation appropriate?

[76] SEPA (2024) Guidance on Assessing the Impacts of Developments on Groundwater Dependent Terrestrial Ecosystems
[77] SEPA (2024) Guidance on Assessing the Impacts of Development on Groundwater Abstractions
[78] CIRIA SUDS Manual (2015) C753
[79] CIRIA Control of water pollution from construction sites. Guidance for consultants and contractors, (2001) C532
[80] Forestry Commission Scotland, Historic Environment Scotland, Scottish Renewables, Scottish Environment Protection Agency, NatureScot et al. (2024): Good Practice during Wind Farm Construction Version: July 2024

10. Noise and Vibration

10.1 Introduction

10.1.1 This chapter sets out the proposed approach to the assessment of potential noise and vibration effects during construction, operation and decommissioning of the Proposed Development.

10.1.2 Potential noise-sensitive receptors or vibration-sensitive receptors in this case are nearby residential properties. During the construction and decommissioning phases, the effects can be classified into noise and vibration from on-site activities, and from construction/decommissioning traffic accessing the Site. During operation, noise will be generated by the turbines as they rotate and from associated onsite infrastructure (e.g. the substation), with noise output depending on wind speed, and from occasional service vehicles accessing the site.

10.2 Study Area

10.2.1 The criteria for scoping in properties for construction/decommissioning and operational effects are different, with construction/decommissioning effects typically only considered for the nearest residential property or properties, on the basis that if effects are acceptable at the nearest receptor(s), at more distant noise sensitive receptors, noise levels will be lower and also acceptable.

10.2.2 Determination of the noise-sensitive receptors scoped into the operational noise impact assessment is carried out on the basis of assessing all residential properties where predicted operational noise levels from the Proposed Development are higher than the level 10 dB below the lowest applicable cumulative operational noise limit (in this case 30 dB L_{A90}). This is because the operational noise assessment determines if a proposal can operate concurrently with other wind farms, and if other schemes are at distance, then it can be assumed that they will not make an acoustically significant contribution. The scoped in receptors are determined from the results of operational noise modelling and not based on a defined separation distance, as the operational noise levels at receptor locations are a function primarily of turbine noise emissions at source, the layout and dimensions of the Proposed Development, and the intervening ground topography. Where there are a number of noise-sensitive receptors in one area, the nearest receptor to the Proposed Development may be considered to be representative of other receptors in that area on the basis that operational noise levels will be acceptable at other receptors if the relevant noise limits are met at the nearest receptor. Therefore, the assessment may not necessarily consider all noise-sensitive receptors in detail where predicted operational noise levels from the Proposed Development are above 30 dB L_{A90} but will ensure that all representative noise sensitive receptors are appropriately assessed.

10.3 Existing Conditions

10.3.1 The site location is near to the M77 motorway and a number of other operational wind turbine developments. Baseline noise conditions may vary between noise sensitive receptors and may consist of road traffic noise, farming activities, operational wind turbine noise, noise from animals and birds, watercourses, and from wind around trees and foliage.

10.3.2 Baseline noise levels will depend on the local noise environment together with their distance from the road network, other sources of noise, and other wind turbine developments, and may vary with wind speed and direction.

10.3.3 Baseline noise measurements were carried out in 2006 for the previous Glenouther Renewable Energy Park, and the results were then used in the subsequent application. As measured baseline noise levels are correlated with on-site measured hub height wind speeds, and as a significant amount of time has passed since the previous measurements, it is considered that updated baseline noise measurements are desirable. It is, therefore, proposed that updated baseline noise measurements are carried out at a number of the nearest noise sensitive receptors as detailed in section 10.5 below. The baseline noise measurements will enable baseline conditions to be quantified and allow for appropriate noise limits to be determined for all properties assessed.

10.4 Proposed Surveys and Assessments Methodologies

Proposed Surveys

10.4.1 The noise sensitive receptors scoped into the noise assessment are shown on **Figure 10.1**. These have been scoped in on the basis that predicted operational noise levels are above 30 dB L_{A90}, which is 10 dB below the lowest cumulative noise criteria applied (see **Table 10.3** below).

10.4.2 Baseline noise measurements are proposed at six noise sensitive receptor locations in the vicinity of the Proposed Development where predicted operational noise levels are above 35 dB L_{A90} for the Scoping Layout. The proposed baseline noise measurement locations are presented in **Table 10.1** below and also shown on **Figure 10.1**. The measurement locations proposed will be subject to the agreement of the residents and EAC. Where it is not possible to carry out baseline noise measurements at these precise locations, a suitable alternative (proxy) measurement location or assessment methodology will be sought and agreed with residents and EAC.

Table 10.1 Proposed Baseline Measurement Locations (subject to agreement)

Location Name	Easting	Northing
Corsehouse Farm	247771	650263
Corsehouse Cottage	247346	650018
Glenouther Farm	246501	648218
Greelaw Farm	247215	647152
Marramead	249403	648916
Blair Farm	248690	647351

10.4.3 It is possible to quantify existing representative baseline noise levels appropriate for the derivation of noise limits for all noise sensitive receptors scoped into the noise assessment based on the proposed baseline measurement locations. For example, noise limits for the properties to the north-east of the Proposed Development at Floak, may be derived from baseline noise measurements carried out at Blair Farm given the similar distance from the M77 if it is considered appropriate.

10.4.4 It is noted that baseline noise measurements for the purposes of deriving operational noise limits must not be significantly affected by existing wind turbine noise. The equipment will, therefore, be positioned to minimise any contribution from existing wind turbines, and the results will be reviewed and filtered where appropriate to exclude operational wind turbine noise.

Assessment Methodologies

Construction Noise Assessment Methodology

10.4.5 Construction noise will be assessed using BS 5228, *Noise and Vibration Control on Construction and Open Sites*, which is described in the Technical Advice Note accompanying Planning Advice Note (PAN) 1/2011, *Planning and Noise* as being applicable for Environmental Impact Assessment (EIA) and planning purposes.

10.4.6 BS 5228 describes appropriate construction noise limits, and likely construction noise levels will be compared with these relevant noise limits. The relevant construction noise limits taken from BS 5228 applicable to construction activities with a duration of greater than one month are shown in **Table 10.2** below.

Table 10.2 Construction Noise Limits

Period	Limit (dB $L_{Aeq,T}$)
Daytime (07.00−19.00) and Saturdays (07.00−13.00)	65
Evenings and weekends (except Saturday morning)	55

Period	Limit (dB $L_{Aeq,T}$)
Night-time (23.00−07.00)	45

10.4.7 For noise-sensitive receptors that are further than 200 m from construction and decommissioning activities, significant noise effects are not anticipated, and a detailed assessment of noise effects for these properties is scoped out of the noise assessment. A commitment to comply with the relevant limits will be provided. For properties within 200 m of construction of the access track, detailed predictions and assessment will be carried out.

10.4.8 The construction noise assessment will provide a summary of relevant guidance and best practice construction methods, along with a commitment to adhere to good practice measures for controlling noise from construction activities, as advocated by BS 5228. The construction noise assessment will be drawn upon to consider the likelihood of any potentially significant effects associated with the decommissioning phase.

10.4.9 The potential influence of construction traffic will be reviewed and assessed as necessary in terms of the increase in traffic noise at roadside locations, except where there is little or very little traffic movement in which case it will be assessed against the criteria in BS 5228. It is considered that if the predicted noise increase due to construction traffic is less than 3 dB, or the construction noise criteria are met, where applicable, then the effect can be considered to be not significant. Where traffic noise modelling and assessment is required, reference will be made to the Calculation of Road Traffic Noise (CRTN) and the Design Manual for Roads and Bridges (DMRB) guidance, in addition to BS 52258, where relevant.

10.4.10 As proposed forestry works include tree felling within the Site, any potential effects on baseline background noise levels will be considered. It is likely that background noise at measurement locations will be dominated by local wind-induced effects and road traffic noise, and that baseline background noise levels are unlikely to be significantly affected by on-site tree felling.

Operational Noise Assessment Methodology

ETSU-R-97 The Assessment and Rating of Noise from Wind Farms

10.4.11 Operational noise will be assessed using the methodology described in ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*. Additional guidance on assessment of operational noise is contained in the UK Institute of Acoustics (IOA) document *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (GPG) which has been endorsed by the Cabinet Secretary for Finance, Employment and Sustainable Growth of the Scottish Government.

10.4.12 ETSU-R-97 recommends that noise limits should be set relative to existing background levels and should reflect the variation of both turbine and background noise with wind speed, but subject to lower fixed limits where background noise levels are very low.

10.4.13 For daytime periods (07:00 to 23:00), the noise limit is 35-40 dB L_{A90} or 5 dB(A) above the 'quiet day-time hours' prevailing background noise, whichever is the greater to protect the amenity of residents in outdoor spaces (i.e. gardens). The actual value within the 35-40 dB(A) range depends on the number of dwellings in the vicinity; the impact of the limit on the number of kWh generated; and the duration and level of exposure. In terms of the background level to represent the daytime period, this should be taken from the 'quiet daytime hours', defined as evenings from 18:00 to 23:00 plus Saturday afternoons from 13:00 to 18:00 and Sundays from 07:00 to 18:00.

10.4.14 For night-time periods (23:00 to 07:00), the noise limit is 43 dB L_{A90} or 5 dB(A) above the prevailing night-time hours background noise, whichever is the greater. The 43 dB(A) lower limit is to protect against sleep disturbance.

10.4.15 With regards to multiple wind farms in a given area, ETSU-R-97 specifies that the absolute noise limits and margins above background should relate to the cumulative impact of all wind turbines in the area contributing to the noise received at the properties in question. Existing wind farms should therefore be included in predictions of noise levels for proposed wind turbines and not considered as part of the prevailing background noise.

10.4.16 Where predicted operational noise levels meet the relevant derived noise limits, operational noise effects will be considered to be not significant in EIA terms.

Institute of Acoustics (IOA) Good Practice Guide (GPG) to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise

10.4.17 The IOA GPG builds on the principles of ETSU-R-97 and adds clarifications where the guidance is ambiguous. The operational noise assessment will therefore be carried out in line with the ETSU-R-97 and the IOA GPG, in accordance with the requirements of the Scottish Government.

Noise Limits Applied to the Proposed Development

10.4.18 The relevant noise limits applied to the Proposed Development are shown at **Table 10.3** below. The choice of daytime noise limit value for the Proposed Development in the range 35-40 dB L_{A90} depends on a number of factors, and where a lower limiting value higher than 35 dB is applied, this will be justified in line with ETSU-R-97 and agreement sought from EAC.

10.4.19 The cumulative daytime lower limiting value of 40 dB L_{A90} has been applied on the basis that other wind turbine developments in the vicinity have planning conditions on noise that set the minimum daytime noise limit at 40 dB L_{A90}. This is consistent with the previous application on the site where a 40 dB lower limiting value was agreed with EAC.

Table 10.3 Operational Noise Limits

Operational noise limits for different periods	Limit (dB L_{A90})
Daytime	35-40 or plus 5 dB above background, whichever is the greater
Night-time	43 or plus 5 dB above background, whichever is the greater
Financially involved daytime and night-time[81]	45 or plus 5 dB above background, whichever is the greater
Cumulative Daytime	40 or plus 5 dB above background, whichever is the greater
Cumulative Night-time	43 or plus 5 dB above background, whichever is the greater
Financially involved cumulative; daytime and night-time	45 or plus 5 dB above background, whichever is the greater

10.4.20 No receptor properties have a financial involvement in the Proposed Development. In the case where a noise sensitive receptor is financially involved with another wind turbine development, but not involved with the Proposed Development, the non-involved noise limits apply.

10.5 Potential Significant Effects

Potential Effects Scoped Into the Assessment

10.5.1 Construction (and decommissioning) noise effects may occur at noise sensitive receptors within 200 m of a construction activity. Where predicted construction noise effects occur at distances of more than 200 m, or where the relevant construction noise limits described at **Table 10.2** are met, construction noise effects will be considered to be not significant in EIA terms.

10.5.2 Operational wind farm noise at noise sensitive receptors where predicted operational noise levels from the Proposed Development acting alone are greater than 30 dB L_{A90} will be assessed.

10.5.3 Cumulative operational noise will be assessed at noise-sensitive receptors where predicted operational noise levels from other wind turbine developments are more than 30 dB L_{A90} (i.e. at scoped in receptors) i.e. higher than the level 10 dB below the lowest applicable cumulative operational noise limit of 40 dB LA_{90}. An initial screening exercise has

been undertaken to determine which wind turbine developments should be scoped into the assessment based on this criterion, and these are set out in **Table 10.4** below (with grey shading denoting schemes scoped out).

Table 10.4 Wind Turbine Developments Considered for Scoping into the Cumulative Operational Assessment

Wind farm name	Number of turbines	Assumed model	Predicted contribution >30 dB L_{A90}	Scoped in yes/no
Blacklaw Hill	1	EWT DW54	Yes	Yes
Carswell Hill	1	Enercon E48	No	No
Clonherb	1	Enercon E33	No	No
Dareduff	1	EWT DW54	No	No
Harelaw Wood	1	EWT DW54	No	No
Middleton	6	Gamesa G90	No	No
Moorshield	3	Enercon E138	Yes	Yes
Neilston Community (and extension)	5	Nordex N90	No	No
Nether Carswell	1	EWT DW54	No	No
Sneddon Law	15	Vestas V100	No	No
Whitelee	140	SWT 2.3-82 & SWT 2.3-93	Yes	Yes
Whitelee P1	36	ECO100	No	Yes
Whitelee P2	39	ECO74 & ECO100	No	Yes

10.5.4 The results of the initial screening exercise indicate that the following wind turbine developments will be scoped into the operational noise impact assessment: Blacklaw Hill, Moorshield, Whitelee (three phases). All three phases of the Whitelee Wind Farm have been scoped in as a worst-case scenario as the cumulative contribution from the three phases are above 30 dB L_{A90} at one or more scoped in noise sensitive receptors.

10.5.5 Where there are other proposed wind turbine developments in the vicinity, they will be included if an application has been submitted. Wind turbine developments that are at the scoping stage are usually not included within the cumulative operational noise impact assessment as there is often insufficient information to enable a robust assessment.

Micrositing

10.5.6 The noise assessment will also consider the potential implications of the proposed 50 m micro-siting allowance on whether the relevant noise limits can still be met.

Potential Effects Scoped Out of the Assessment

10.5.7 Vibration from construction, operation and decommissioning has been scoped out of the assessment as such effects will not be significant. Vibration from on-site construction and decommissioning activities are unlikely to be perceptible at noise-sensitive receptors, and levels of vibration from vehicles accessing the site during these phases will be not substantially higher than typically expected from heavy vehicles on the road network. During the operational phase of the development, no perceptible vibration at noise sensitive receptors will arise.

10.5.8 Construction and decommissioning noise effects are not anticipated beyond 200 m. Noise at receptors beyond 200 m of proposed construction and decommissioning works will therefore be scoped out. Nevertheless, the noise limits described in Table 10.2 will apply at all noise sensitive receptors in the vicinity of the Proposed Development.

10.5.9 Operational noise from on-site infrastructure other than the wind turbines, will be scoped out of the assessment. This includes operational noise from the substation, and noise from occasional maintenance vehicles accessing the site. These effects are considered to be not significant.

10.5.10 Operational noise will be scoped out of the assessment where the predicted operational noise levels from the Proposed Development are 30 dB L_{A90} or lower. Where this is the case, operational noise from the Proposed Development is considered to be negligible and not significant.

10.5.11 Wind turbines with a generating capacity of less than 50 kW will be scoped out of the cumulative operational noise impact assessment, acknowledging that the scope of the assessment methods described in the IOA GPG are restricted to wind turbine developments with a capacity of greater than 50 kW. This is on the basis that the noise output of small turbines is of different character and only affects receptors in the immediate vicinity, and therefore assessing cumulatively with large scale wind turbine development is generally not appropriate. In addition, their energy contribution is not significant relative to the Proposed Development and as only local cumulative effects arise, cumulative operational noise effects with small wind turbines are considered to be not significant. The small-scale wind turbine developments scoped out of the assessment are shown in **Table 10.5**.

Table 10.5 Small Wind Turbine Developments Scoped Out of the Cumulative Operational Assessment

Wind turbine development name	Number of turbines	Assumed model	Predicted contribution >30 dB L_{A90}
Corsehouse	1	CF20	Yes (at Corsehouse Farm only)
High Clunch	1	Gaia11	Yes (at High Clunch Farm only)
Whitelee Poultry Farm	1	Proven6 (6 kW)	No (not at any properties where predicted noise levels from the Proposed Development are also>30 dB L_{A90})
South Drumboy	1	Proven6 (6 kW)	Yes (at South Drumboy only)

10.5.12 Other potential noise effects from the operation of the Proposed Development will be scoped out of the assessment, including tonal noise, amplitude modulation, infrasound, and low frequency sounds. Tonal and amplitude modulation sound cannot be predicted at the pre-construction stage, and, if necessary, can be controlled through suitably worded planning conditions. Low frequency and infrasound are scoped out as the relevant assessment method and derived noise limits offer sufficient protection from these effects such that additional assessment is not required.

10.6 Approach to Mitigation

10.6.1 It is unlikely that specific mitigation will be required for the majority of construction and decommissioning activities, and good practice measures will be incorporated into site design, such as avoiding work outside of normal day-time construction hours, wherever possible.

10.6.2 There is the possibility that noise from construction could be close to the relevant limit if there are noise sensitive receptors close to the site access track during its construction. In this case, detailed predictions will be carried out to ascertain whether mitigation is required. If noise from construction activities is predicted to exceed the relevant noise limits, mitigation will be implemented through plant selection, working hours, and with the use of noise barriers, and the significance of residual effects will be likely to be not significant due to the short term nature of these works.

10.6.3 For operational noise, the intention is that the relevant noise limits will be met at all sensitive receptor locations as the design progresses, avoiding the need for any specific mitigation. Furthermore, it should be noted that modern pitch regulated turbines, of the type proposed, have the ability to reduce noise under critical wind speed and direction conditions by reducing rotor speed, at the cost of a certain amount of power output, in the event that this is required to meet noise limits in practice. If this is required, it will be considered as embedded design mitigation.

10.7 Consultee List

10.7.1 It is proposed that the following stakeholders will be consulted in relation to the assessment:

- East Ayrshire Council.

10.7.2 East Ayrshire Council Environmental Health will be separately consulted on the noise assessment methodology and selection of baseline noise monitoring locations and will be invited to attend the installation of the noise measurement equipment.

Questions for Consultees

Q10.1: Do consultees agree with the proposed noise assessment methodology and adopted noise limits?

Q10.2: Are the selected baseline noise measurement locations appropriate and representative of all noise-sensitive receptors, and are there any other noise sensitive receptors in the vicinity that should be considered in the operational noise impact assessment?

Q10.3: Are there any other wind turbine developments in the vicinity of the Proposed Development that should be considered for inclusion in the cumulative operational noise impact assessment?

11. Access, Traffic and Transport

11.1 Introduction

11.1.1 The chapter sets out the predicted transport and access issues that may arise from the construction of the Proposed Development, the proposed methodology for assessing these effects and what suitable mitigation can be put in place to avoid, minimise or offset any adverse impacts.

11.1.2 The Access, Traffic and Transport EIA Report Chapter will be supported by a Transport Assessment (TA) report, Abnormal Load Route Survey Report (RSR) and technical figures.

11.2 Study Area

11.2.1 The Site will be accessed by construction delivery vehicles via Floak Road and the existing bridge at Drumboy (Floak Farm Bridge) off the A77, to the east of the Site boundary. An existing junction is located on Floak Road and provides access to private tracks. This will form the main site access for general traffic during the construction, operational and decommissioning phases.

11.2.2 There are currently two potential access options under investigation for the delivery of abnormal indivisible loads (AILs) to Site (see **Chapter 3**); however, it should be noted that only one of these AIL access options will be taken forward as part of the Proposed Development.

11.2.3 The two potential AIL deliveries access options are as follows:

- Option 1: AIL vehicles will exit Junction 6 of the M77 and travel back north via the A77. AIL vehicles will leave the A77 and travel into site via Floak Road and Floak Farm Bridge. A blade lifter will be used from port to site to enable safe passage over Floak Farm Bridge, if this option is taken forward; and
- Option 2: AIL vehicles will travel south via the M77 and A77 before making a U-turn at the Bellfield interchange at Kilmarnock. From there, AIL vehicles will travel back north via the A77 and M77 and exit the M77 via a new slip road off the M77 to the east of the Site. It is anticipated that AILs will be delivered using typical delivery vehicles such as a Superwing Carrier Trailer and a Tower Trailer for this option. The new slip road will be used for AIL vehicles only, if taken forward.

11.2.4 Loads will then proceed to the proposed turbine locations using a combination of upgraded and new access tracks.

11.2.5 A detailed RSR will support the application and will identify the necessary access improvements that will be required to enable loads to access the Site. This will include an initial Electronic Service Delivery for Abnormal Loads (ESDAL) weight review for structures on the proposed access route, including Floak Farm Bridge. Whilst the port of entry (PoE) has not yet been confirmed, it is anticipated that AILs will be delivered from King George V Docks in Glasgow. Further details of the proposed PoE and AIL delivery route will be provided in the RSR.

11.2.6 Locally sourced material (such as from local quarries) will be investigated and used where feasible, and traffic will avoid impacting on local communities as far is possible.

11.2.7 Based on the access review undertaken to date, the suggested study area for the assessment of access, traffic and transport effects is therefore defined by the following road links, which are considered to be where increased construction traffic volumes will occur:

- Floak Road, between the A77 and Floak Quarry access;
- The A77, between M77 Junction 5 and Junction 8; and
- The M77, between Junction 5 and Junction 8.

11.2.8 These will be indicated on a figure supporting the Access, Traffic and Transport EIAR chapter.

11.3 Existing Conditions

11.3.1 Within the study area, Floak Road is a two-way single carriageway road which connects to the A77, to the east of the Site access, and provides access to three farmsteads and Floak Quarry. The road narrows on approach to the access to Floak Quarry, to the west of the proposed Site access. Within the study area, Floak Road appears to be in mainly good condition and is maintained by East Renfrewshire Council.

11.3.2 Within the study area, the A77 is a two-way single carriageway road which is mainly subject to the national speed limit, however, this reduces to 40 miles per hour (mph) approximately 450 metres (m) to the north-west of its junction with Blacklock Road for the remainder of the northern section of the A77 within the study area. The A77 appears to be in reasonable condition; however, there are locations where deterioration appears to be present from online imagery. Within the study area, the A77 is maintained by both East Renfrewshire Council and the Ayrshire Roads Alliance (ARA). A shared path is located along the western side of the A77.

11.3.3 The M77 is a motorway which operates with two lanes in each direction within the study area. The M77 is mainly subject to the national speed limit within the study area; however, this reduces to 60 mph on approach to Junction 5. It forms part of the trunk road network and is maintained by Connect / Balfour Beatty on behalf of Transport Scotland (TS).

11.3.4 There are no Core Paths within the Site boundary. The closest Core Paths are located along the A77 shared path, to the east of the Site.

11.3.5 Traffic accident data will be obtained from Crashmap UK for the study network to inform the accident review for the immediate road study area. Five years' worth of data will be collated.

11.4 Proposed Surveys and Assessments Methodologies

Desk-based Study and Surveys

11.4.1 Baseline traffic count data will be obtained from a new Automatic Traffic Count (ATC) survey located on Floak Road.

11.4.2 Further traffic data for the A77 and the M77 will be obtained from UK Government Department for Transport (DfT) traffic count data and the TS database. National Road Traffic Forecast (NRTF) Low Traffic Growth assumptions will be used to provide a common future year baseline to coincide with the expected construction traffic peak.

Policy and Guidance

11.4.3 The following policy and guidance documents will be used to inform the Access, Traffic and Transport Chapter:

- Transport Assessment Guidance (Transport Scotland, 2012);
- The Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment (IEA), 1993);
- Guidelines for Environmental Impact Assessment (Institution of Environmental Management and Assessment (IEMA), 2005);
- The Environmental Assessment of Traffic and Movement (IEMA, 2023);
- National Planning Framework (NPF) 4 (Scottish Government, 2023);
- Onshore Wind Turbines; Online Renewables Planning Advice (Scottish Government, 2014); and
- East Ayrshire Local Development Plan 2 (East Ayrshire Council, 2024).

Assessment Methodology

11.4.4 The Environmental Assessment of Traffic and Movement (IEMA 2023) sets out a methodology for assessing potentially significant environmental effects associated with traffic and transport. In accordance with this guidance, the scope of assessment will focus on:

- Potential impacts (of changes in traffic flows) on local roads and the users of those roads; and
- Potential impacts (of changes in traffic flows) on land uses and environmental resources fronting these roads, including the relevant occupiers and users.

11.4.5 The following rules taken from the guidance will be used as a screening process to define the scale and extent of the assessment:

- Rule 1 – Include highway links where traffic flows will increase by more than 30% (or where the number of heavy goods vehicles (HGVs) is predicted to increase by more than 30%); and

- Rule 2 – Include any other specifically sensitive areas where total traffic flows are predicted to increase by 10% or more.

11.4.6 Increases below these thresholds are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level predicted as a consequence of the Proposed Development will therefore be assumed to result in no discernible environmental impact, and as such no further consideration will be given to the associated environment effects.

11.4.7 The estimated traffic generation of the Proposed Development will be compared with future baseline traffic flows for each road link in the study area in order to determine the percentage increase in traffic. The future baseline traffic flows will take into account a low National Road Traffic Forecast (NRTF) factor, which will be applied to the anticipated construction year.

11.4.8 Potentially significant environmental effects will then be assessed in detail for identified sensitive receptors within the study area where the thresholds defined above are exceeded. The significance of effects will be determined via a combination of a defined set of sensitivity and magnitude criteria in accordance with The Environmental Assessment of Traffic and Movement (IEMA 2023). Suitable mitigation measures will be proposed, where appropriate.

11.4.9 Committed development traffic, i.e. those developments with planning consent, will be included in baseline traffic flows, where traffic data for these schemes is considered significant and is publicly available. Developments that are proposed or at Scoping stage will not be included as TA Guidance from the UK Government advises that only those projects with extant planning permission or local development plan allocations within an adopted or approved plan require to be included in any assessment. Those projects in scoping or at the application stage should not be included in cumulative assessments as they have yet to be determined, and when considering traffic impacts specifically in relation to the construction phase of a project, the potential traffic impact is highly speculative and as such, cannot be included in the assessment.

11.4.10 It is not anticipated that a formal TA will be required as these are not generally considered necessary for temporary construction works. A reduced scope TA is therefore proposed.

11.4.11 Each turbine is likely to require between 11 and 14 AILs to deliver the components to Site. The components will be delivered on extendable trailers which will then be retracted to the size of a standard HGV for the return journey. Detailed swept path analyses will be undertaken for the main constraint points on the route from the PoE through to the site access junction to demonstrate that the turbine components can be delivered to Site, and to identify any temporary road works which may be necessary. The findings will be set out in the RSR Report.

11.5 Potential Significant Effects

11.5.1 The key issues for consideration as part of the assessment will be:

- The temporary change in traffic flows and the resultant, temporary effects on the study network during the construction and decommissioning phases;
- The physical mitigation associated with the delivery of abnormal loads;
- The design of new access infrastructure; and
- The consideration of appropriate and practical mitigation measures to avoid, minimise or offset any temporary effects.

Potential Effects Scoped Into the Assessment

11.5.2 Potential effects that may arise from increased traffic for users of the roads within the study area and those residents along the delivery routes include:

- Severance;
- Driver delay;
- Pedestrian delay;
- Non-motorised user amenity;
- Fear and intimidation; and

- Road safety.

11.5.3 The effects on identified sensitive receptors within the study area will be reviewed during the construction phase, with a peak construction period assessment undertaken. This will review the maximum impact and present a robust assessment of the effects of construction traffic on the local and trunk road networks. This assessment will then be drawn upon to consider potential effects during the decommissioning phase.

Potential Effects Scoped Out of the Assessment

11.5.4 Once operational, it is envisaged that the level of traffic associated with the Proposed Development will be minimal. Regular monthly or weekly visits will be made to the Site for maintenance checks. The vehicles used for these visits are likely to be 4x4 vehicles and there may also be the occasional need for an HGV to access the Site for specific maintenance and/or repairs. It is considered that the effects of operational traffic will be negligible and; therefore, no detailed assessment of the operational phase of the Proposed Development is proposed.

11.6 Approach to Mitigation

11.6.1 Standard mitigation measures that are likely to be included in the assessment are:

- Production of an outline Construction Traffic Management Plan (CTMP);
- The design of suitable access arrangements with full consideration given to the road safety of all road users;
- A Staff Travel Plan; and
- A Framework Abnormal Load Transport Management Plan.

11.6.2 Additional mitigation will be included should the assessment identify significant effects following the application of the above standard mitigation measures.

11.6.3 Site specific physical improvements, based upon experience of other schemes in the surrounding area, will include:

- A Section 96 Agreement of the Roads (Scotland) Act to protect the public road against abnormal wear and tear;
- Design of the temporary site access junction (if required) to ensure that approved access routes are adhered to; and
- Enhanced temporary construction warning and direction signage.

11.6.4 Details of these measures will be detailed in the EIAR chapter.

11.7 Consultee List

11.7.1 It is proposed that the following stakeholders will be consulted in relation to the assessment:

- East Ayrshire Council (Ayrshire Roads Alliance); and
- Transport Scotland.

Questions for Consultees

Q11.1: Confirmation is requested that the proposed methodology is acceptable.

Q11.2: Confirmation is requested that the methods proposed for obtaining traffic flow data are acceptable.

Q11.3: Confirmation is requested that the use of Low National Road Traffic Forecasts (NRTF) is acceptable for the whole of the study area.

Q11.4: Feedback is requested on the cumulative traffic flows from committed development that should be included in the assessment.

12. Other Issues

12.1 Introduction

12.1.1 This chapter sets out the proposed approach to the following other topics typically assessed, and how these will be included in the EIA Report:

- Socio-Economics and Tourism and Recreation;
- Aviation and Defence;
- Climate Change (incorporating carbon balance);
- Telecommunications;
- Shadow Flicker;
- Population and Human Health including dust; and
- Major Accidents and Disasters.

12.2 Socio-Economics, Tourism and Recreation

12.2.1 BiGGAR Economics has been commissioned to undertake a socio-economic assessment of the Proposed Development. Socio-economic, tourism and recreation assessments of onshore wind farms over the last decade have not identified adverse significant effects, in terms of the EIA Regulations, and there is no reason to expect significant adverse effects for the Proposed Development. It is therefore proposed to scope this topic out of the EIA.

12.2.2 Nevertheless, it will be necessary to determine whether the Proposed Development is likely to comply with Policy 11 of Scotland's fourth National Planning Framework (NPF4), specifically paragraph (c), which states that "*development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities*". It is therefore proposed that a separate report on socio-economics will be provided in support of the application.

12.2.3 Guidance for wind farm developers on what is expected in relation to Policy 11(c) in Scotland's NPF4 was published in early 2025 by Scottish Renewables[82]. The approach set out below is consistent with this guidance.

12.2.4 The impacts that will be considered in this assessment will include the potential socio-economic, tourism and recreation impacts associated with the Proposed Development.

12.2.5 An economic impact analysis will be undertaken using the methodology developed by BiGGAR Economics; which has been used to assess over 150 onshore wind farms across the UK. The potential socio-economic impacts that will be considered are:

- temporary effects on the regional and/or national economy due to expenditure during the construction phase;
- permanent effects on the regional and/or national economy due to expenditure associated with the ongoing operation and maintenance of the Proposed Development;
- permanent effects as a result of any additional public expenditure that could be supported by the additional tax revenue that would be generated by the Proposed Development during the operational phase; and
- permanent effects on the local economy that could be supported by any community funding and/or shared ownership proposals during the operational phase of the Proposed Development.

12.2.6 If the wider EIA identifies significant environmental effects on key tourism and recreation receptors (such as in the LVIA), the socio-economic impact assessment will also consider how visitors to these receptors will respond as a result of these significant environmental effects. The potential impact on tourism and recreation receptors will also be considered as part of the assessment of contribution to environmental protection and enhancement.

12.2.7 It is anticipated that the contents of the standalone report will include:

- Introduction and policy context;

[82] Scottish Renewables (2025). Maximising Net Socio-Economic Benefit of Renewable Energy Guidance and Reporting Framework.

- Economic development strategic context;
- Assessment of potential supply chain effects (and actions to maximise);
- Assessment of potential labour market effects (and actions to maximise);
- Assessment of contributions to community empowerment (and actions to maximise);
- Assessment of contribution to environmental protection and enhancement (and actions to maximise);
- Economic impact assessment;
- Assessment of the potential effects on tourism in the local area; and
- Summary of findings and conclusion.

12.2.8 This will primarily be a desk-based study with consultation undertaken by the Applicant with the local community to further inform the socio-economic, recreation and tourism baseline, and inform any opportunities from the Proposed Development which arise therein.

12.2.9 Government and Industry reports will be used to determine the expected capital and operational expenditure associated with the Proposed Development, as well as the breakdown of expenditure by different contracts (e.g. turbine, balance of plant). An assumption will then be made based on the share of each type of contract that can be secured regionally and nationally. This increase in turnover will then be used to estimate the economic impact associated with the Proposed Development.

12.2.10 The method to assess the socio-economic effects will be based on Industry best practice and will consider the share of contracts that can be secured in each study area, and the level of employment that can be supported as a result.

12.3 Aviation and Defence

Introduction

12.3.1 This section sets out the proposed approach for assessing the effects of the Proposed Development on aviation and defence. Wind turbines have the potential to cause degradation to air traffic control, air defence and meteorological radars and aeronautical radio navigation equipment. They can also pose a hazard to low flying aircraft and affect the flight procedures for aircraft in the vicinity of airports.

12.3.2 It is proposed that the consideration of effects on aviation and defence is included as a technical appendix to the development description chapter of the EIA.

Study Area

12.3.3 It is proposed to adopt study areas for different categories of aviation and defence asset as follows. These are based on the criteria set out in Civil Aviation Authority guidance CAP 764, modified to ensure that all aviation and defence infrastructure with the potential to be affected is included:

- 60 km radius from the Site for assessing impacts on air traffic control and air defence primary surveillance radars (PSRs);
- 60 km radius from the Site for assessing impacts on Instrument Flight Procedures (IFPs);
- 20 km radius from the Site for assessing Meteorological Office radars and secondary surveillance radars (SSRs);
- 30 km radius from the Site for certificated and licensed aerodromes; and
- 10 km radius from the Site for aeronautical radio navigation aids and unlicensed aerodromes.

Existing Conditions

12.3.4 The site is located approximately 17 km south of Glasgow Airport. The site is wholly contained within the Class D controlled airspace of the Glasgow Control Zone (CTR), which extends from ground level up to 6,000 feet (ft) above sea level. All aircraft require a clearance from Glasgow Airport Air Traffic Control (ATC) to enter this airspace and are under mandatory ATC instructions while flying within it. Above 6000 ft is also controlled airspace, under the authority of the NATS En Route Scottish Area Control Centre at Prestwick.

12.3.5 Primary Surveillance Radars (PSRs) with the potential to detect turbines at the Site are as follows:

- NATS En Route Lowther Hill;
- NATS En Route Cumbernauld;
- Glasgow Airport; and
- Prestwick Airport.

12.3.6 The Site is within the assessment area for Instrument Flight Procedures (IFP) at Glasgow and Prestwick Airports.

12.3.7 Military low flying does not take place within the Glasgow CTR.

12.3.8 There are no meteorological radars within range and/or line or sight of turbines, and no airfields, airstrips, gliding or other aviation sites within 10 km which would require consideration.

Proposed Surveys and Assessment Methodologies

12.3.9 Impacts will be assessed by taking into account key legislation and guidance, including the Air Navigation Order (ANO) 2016, CAP 764: Policy and Guidelines on Wind Turbines (including any forthcoming update) and the CAA Policy Statement on the Lighting of Onshore Wind Turbine Generators (2017).

12.3.10 Significance criteria for the assessment of effects on aviation, unlike those for environmental effects, are not based on the sensitivity of the receptor. Furthermore, while magnitude of change can be determined in some circumstances, this typically does not provide a standardised metric on which to measure the significance of effects. The significance of effects will be determined by applying professional judgement, aviation regulations and procedures and safeguarding policies and practices in use by specific aviation stakeholders, as well as consultation responses from these stakeholders.

12.3.11 The line of sight from all potentially affected PSRs to turbines on the site will be modelled using specialist software to determine the extent of detectability.

12.3.12 IFP assessments will be commissioned from the Approved Procedure Design Organisations (APDOs) of Glasgow and Prestwick Airports to determine the impact of the Proposed Development on established and proposed flight procedures in the vicinity of these airports.

12.3.13 All structures with a height of 150 m or more above ground level are required by Article 222 of the ANO to be fitted with lighting. Consideration will be given as to the feasibility of a reduced lighting scheme for this five-turbine development, where not all of the turbines are lit, with the proposed lighting scheme submitted to the CAA for approval.

Potential Significant Effects

12.3.14 PSRs with line of sight to turbines on the Site may be affected by unwanted plots on the radar screen and by a reduction of the probability of detection of aircraft above the Site.

12.3.15 Turbines at the Site may require the specified minimum altitudes in Glasgow and/or Prestwick Airport IFPs to be revised upwards if they will impact on current flight procedures.

12.3.16 There may be a requirement for assessment of the potential effects of the Proposed Development on Very High Frequency (VHF) ground-to-air radio communications at Prestwick Airport.

Approach to Mitigation

12.3.17 For mitigation of impacts on PSRs, the available range of operational and technical measures will be considered in consultation with the relevant stakeholders. Consultation is ongoing and available mitigation options will be discussed in the EIAR.

12.3.18 In the event of the Proposed Development requiring revision of Glasgow and Prestwick Airport IFPs, the Applicant will engage with the aerodrome operator to agree the appropriate path to implementation of mitigation measures.

12.4 Climate Change (incorporating Carbon Balance)

12.4.1 By its very nature, the Proposed Development will reduce demand for fossil fuel electricity generation and support the electrification of heating and transport (which use fossil fuel) using renewable electricity, therefore contributing to the Scottish Government's carbon reduction targets.

12.4.2 A carbon balance assessment will be undertaken using the latest version of the Scottish Government guidance to produce a carbon calculator assessment report. This will detail input parameters and methodology, sensitivity analysis and presentation of results (carbon payback period and emissions intensity of the units generated) using SEPA approved metrics.

12.4.3 The main aims of the calculation are: to quantify sources of carbon emissions associated with the Proposed Development (e.g. from the manufacture of turbines and other construction materials as well as site-based ecological carbon losses from peat and/or forestry); to quantify the carbon emissions which will be saved by operating the Proposed Development; and to calculate the length of time for the project to become a 'net avoider', rather than a 'net emitter' of carbon dioxide emissions.

12.4.4 With respect to climate adaptation, consideration will be given to the resilience of the Proposed Development to projected climate change and to the likely consequences of climate change for the baseline conditions/assessment findings reported elsewhere in the EIAR, and the resilience of proposed mitigation measures to any projected changes. The latest climate change projections (UKCP) will be used, which allow climate change to be projected at the regional level; in this case, southwest Scotland. IEMA (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance (2nd Edition) and IEMA (2020) The Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation guidance will be used to inform the climate change assessment.

12.5 Telecommunications

12.5.1 Wind turbines can cause electromagnetic interference through physical and electrical interference. Physical interference can cut across electromagnetic signals resulting in a 'ghosting' effect which largely affects television signals and radar. Electrical interference arises as a result of the operation of the generator within the nacelle of the turbine and can also affect communication equipment in proximity to the turbines. Consultation has been undertaken with telecommunications stakeholders to identify any links crossing the Site which could act as a constraint to design. There are two links that run north-south through the eastern side the Site. No turbines are proposed to be moved directly into the link paths or within the 200 m exclusion zone (100 m either side of the link) established as part of the constraints mapping exercise. As such, these links are not considered to be at risk of interference from the operation of the Proposed Development turbines, and effects on telecommunications will be scoped out.

12.6 Shadow Flicker

12.6.1 Under certain combinations of geographical position and time of day, the sun may pass behind rotors of a wind turbine and cast a shadow over neighbouring properties. Shadow flicker is an effect that can occur when the shadow of a blade passes over a small opening (such as a window), briefly reducing the intensity of light within the room, and causing a flickering to be perceived. Shadow flicker effects only occur inside buildings where the blade casts a shadow across an entire window opening.

12.6.2 An assessment of the potential for the Proposed Development to cause shadow flicker effects at the nearest sensitive receptors will be undertaken. There is, however, no adopted formal guidelines in Scotland which quantify what exposure levels are acceptable. In the absence of such guidelines, the Department for Environment Northern Ireland (2009) Best Practice Guidance for Planning Policy Statement 18 (PPS18): Renewable Energy[83] provides an indication of what may be an acceptable duration of shadow flicker, stating that "*It is recommended that shadow flicker at neighbouring offices and dwellings within 500m should not exceed 30 hours per year or 30 minutes per day*" (page 29).

12.6.3 This limit has also been utilised in the rest of the UK, Republic of Ireland, Germany and Belgium.

12.6.4 As this limit is widely accepted as a suitable metric in shadow flicker analysis for wind farms, it is considered to be an appropriate threshold in which to make a professional judgement on the significance of the Proposed Development's

[83] Department for Environment Northern Ireland (2009) Best Practice Guidance for Planning Policy Statement 18 (PPS18): Renewable Energy. Available [online] at: https://www.infrastructure-ni.gov.uk/publications/best-practice-guidance-pps-18-renewable-energy.

effects on shadow flicker. In this way, predicted effects will be judged as being significant and require mitigation whereby shadow flicker occurrence is estimated to exceed the aforementioned thresholds. Any values below these thresholds represent effects that are not significant. Where a significant effect is identified, this is considered to be significant in the context of the EIA Regulations.

12.6.5 The modelling will be based on the final proposed wind turbine locations and dimensions, and the nearest residential properties within x10 rotor diameters (up to 1,620 m from turbines) and within 130 degrees either side of north as recommended by the Scottish Government's web-based renewables advice on Onshore Wind Turbines (2014)[84].

12.6.6 The assessment will be undertaken in two steps. The first step will quantify the theoretical 'maximum case' shadow flicker occurrence based on a number of assumptions. The second step will be to quantify the 'realistic' shadow flicker occurrence by taking into account the annual monthly percentage of sunshine hours (derived from data from the Met Office and the National Oceanic and Atmospheric Administration (NOAA)). This value will then be applied to the shadow flicker occurrence values under Step 1 to give a more realistic shadow flicker value for each of the properties assessed.

12.6.7 If required, there are mitigation measures that can be put in place to reduce shadow flicker impacts. These include screening or blocking the flicker through the planting of trees or switching the turbine(s) off during periods when conditions are such that long periods of shadow flicker effects occur. It is considered unlikely that significant effects as a result of shadow flicker will occur as even with weather data applied, the modelling assumes a set of worst case (unrealistic) parameters such as: the sun is shining at all times, there is always a receptor at the properties which will experience shadow flicker, the turbines operate constantly etc. These assumptions will be fully reported within the assessment.

12.7 Population and Human Health (including Dust)

12.7.1 A proportionate approach will be taken with regards to the assessment of effects on health, and based on experience, published studies and professional judgement. At this stage, it is anticipated that the assessment of potential health effects will be undertaken in the context of noise and shadow flicker. Where significant effects associated with these topics are not predicted (i.e. as a primary effect) then it is expected that there will be no resulting effects on health (i.e. as a secondary effect). This will be determined as the EIA progresses.

12.7.2 Dust emissions will arise from construction activities and could be experienced by nearby receptors. The Design Manual for Roads and Bridges (DMRB), Volume 11 Environmental Assessment Techniques, Part 1, Air Quality states that dust generated during construction should be mitigated, and that the locations of 'sensitive receptors' within 200 m of construction activities should be identified and mitigation measures to reduce dust effects be applied. It is likely, however, that standard dust suppression measures, such as ensuring construction vehicles are sufficiently covered when transporting transferrable materials and wheel washing facilities are in place (which will be secured by the CEMP) will be sufficient to address dust emissions such that no significant effects are likely, and dust effects will be scoped out of the EIA.

12.8 Major Accidents and Disasters

12.8.1 The Proposed Development is not located in an area with a history of natural disasters such as extreme weather events. Peat slide risk will be covered fully in the Hydrology, Hydrogeology and Peat chapter, and the risk of traffic accidents will be assessed in the Access, Traffic and Transport chapter. The construction and operation of the Proposed Development will also be managed within the requirements of a number of health and safety related legislation, including the Construction (Design and Management) Regulations 2015 and the Health and Safety at Work etc. Act 1974. As the Proposed Development is not considered vulnerable to any major accidents or disasters that could result in likely significant environmental effects, it is proposed that this topic is scoped out from further assessment within the EIAR.

12.9 Consultee List

12.9.1 It is proposed that the following stakeholders will be consulted in relation to the topics above:

[84] Scottish Government (2014). Onshore Wind Turbines: Planning Advice. Available [online]: https://www.gov.scot/publications/onshore-wind-turbines-planning-advice/

- NATS En Route plc (in relation to the Lowther Hill and Cumbernauld PSRs);
- The Ministry of Defence;
- Glasgow Airport; and
- Prestwick Airport.

Questions for Consultees

Q12.1: Do consultees agree that Socio-Economics, Tourism, and Recreation can be scoped out of the EIA and reported on in a separate report to accompany the planning application?

Q12.2: Does the proposed scope of assessment for Aviation and Defence address all potentially significant issues?

Q12.3: Do consultees agree that Population and Human Health (dependent on the findings of the individual EIA assessments), Telecommunications, and Major Accidents and Disasters can be scoped out of the EIA?

13. Summary of the EIA Scope

13.1.1 A summary of the topics proposed to be scoped in and out of the EIA is provided in **Table 13.1** below.

Table 13.1 Topics Scoped In and Out of the EIA

Topic	Scoped In	Scoped Out
Landscape and Visual Amenity	X	
Ecology	X	
Ornithology	X	
Cultural Heritage	X	
Hydrology, Hydrogeology, and Peat	X	
Nosie and Vibration	X	
Access, Traffic and Transport	X	
Other Issues		
Socio-Economics and Tourism		X
Aviation and Defence	X	
Climate Change	X	
Telecommunications		X
Shadow Flicker	X	
Population and Human Health including dust		X*
Major Accidents and Disasters		X

*Dependent on the findings of the individual EIA assessments.

Appendix 1. Questions for Consultees

Chapter	Question
2	**Q2.1**: Confirmation is requested on the proposed structure of EIAR topic chapters.
4	**Q4.1**: Are there any other policies or material planning considerations of relevance to the Proposed Development which should be considered in the course of preparing the EIAR and Planning Statement?
5	**Q5.1**: Are there any comments on the overall methodology proposed to assess effects on landscape and visual receptors, and cumulative effects? **Q5.2**: Are there any comments on the proposed list of assessment viewpoint locations? **Q5.3**: Do consultees have any early advice on which viewpoints would be suitable for night time assessment locations? It is proposed to select night time assessment viewpoints from more accessible locations, more likely to be frequented during the hours of darkness. **Q5.4**: Are there any further wind farm sites or changes to status, to those shown on Figure 5.4, to consider as part of the cumulative assessment? **Q5.5**: Have consultees identified any further landscape or visual receptors to be considered within the assessment (i.e. where it is expected that significant effects may occur)? **Q5.6**: Are there any other relevant consultees who should be consulted with respect to the LVIA? **Q5.7**: Are there any comments on the scope of the RVAA with regard to the Study Area/ receptors for inclusion?
6	**Q6.1**: Do consultees agree that, subject to further information coming to light from any further field surveys and the desk study, the scope of IEFs to be included in the assessment is appropriate? **Q6.2**: Do consultees agree that the suite of field surveys undertaken in 2024 in addition to a desk study and review of the data associated with the 2015 ES are sufficient to inform a robust impact assessment? **Q6.3**: Do consultees agree that the methodology and scope of assessment is appropriate? **Q6.4**: Do consultees agree with the potential effects to be scoped out of the assessment?
7	**Q7.1**: Do the consultees agree that all international, European and national designated sites for ornithology can be scoped out of the EIA given the lack of connectivity? **Q7.2**: Are the consultees content with and / or have any comments on the baseline survey methods and level and timing of survey effort? **Q7.3**: Are the consultees content with and / or have any comments on the list of potential effects and impact assessment methods?
8	**Q8.1**: Are there any additional sources of baseline information which should be referred to, to inform the appraisal of effects on cultural heritage? **Q8.2**: Are the proposals to scope out certain elements of cultural heritage from detailed assessment appropriate? **Q8.3**: Is the proposed methodology clear and appropriate? **Q8.4**: Are there further specific heritage assets that should be considered in the impact assessment? **Q8.5**: Are there further assets or locations which you wish to see visualisations for in addition to those included in Table 8.1?
9	**Q9.1**: Are there any additional sources of baseline information which should be referred to, to inform the appraisal of effects on hydrology, hydrogeology, geology and peat? **Q9.2**: Is the proposed methodology appropriate? **Q9.3**: Are the proposed list of effects which are scoped in appropriate? **Q9.4**: Is the proposed approach to mitigation appropriate?

Chapter	Question
10	**Q10.1**: Do consultees agree with the proposed noise assessment methodology and adopted noise limits? **Q10.2**: Are the selected baseline noise measurement locations appropriate and representative of all noise-sensitive receptors, and are there any other noise sensitive receptors in the vicinity that should be considered in the operational noise impact assessment? **Q10.3**: Are there any other wind turbine developments in the vicinity of the Proposed Development that should be considered for inclusion in the cumulative operational noise impact assessment?
11	**Q11.1**: Confirmation is requested that the proposed methodology is acceptable. **Q11.2**: Confirmation is requested that the methods proposed for obtaining traffic flow data are acceptable. **Q11.3**: Confirmation is requested that the use of Low National Road Traffic Forecasts (NRTF) is acceptable for the whole of the study area. **Q11.4**: Feedback is requested on the cumulative traffic flows from committed development to be included in the assessment?
12	**Q12.1:** Do consultees agree that Socio-Economics, Tourism, and Recreation can be scoped out of the EIA and reported on in a separate report to accompany the planning application? **Q12.2**: Does the proposed scope of assessment for Aviation and Defence address all potentially significant issues? **Q12.3:** Do consultees agree that Population and Human Health (dependent on the findings of the individual EIA assessments), Telecommunications, and Major Accidents and Disasters can be scoped out of the EIA?

Appendix 2. Scoping Turbine Coordinates

Turbine	Easting	Northing	Tip Height
1	247618	648791	200 m
2	248009	648700	200 m
3	248244	649147	200 m
4	247710	648324	200 m
5	248282	648406	200 m

Appendix 3. Confidential Ornithology Report