



South Kyle II Wind Farm

Scoping Report

Prepared by Natural Power on behalf of Vattenfall
Wind Power Ltd.

Confidentiality class: None (C1)

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1. Introduction

This Scoping Report has been prepared by Natural Power Consultants Limited (Natural Power) with ornithological input from MBEC environmental consulting (MBEC) on behalf of Vattenfall Wind Power Ltd (Vattenfall). It is provided in anticipation of an application under Section 36 of the Electricity Act 1989 for a wind farm development south of Dalmellington and south-west of New Cumnock in East Ayrshire.

Under the statutory procedures set out in the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations), it is proposed that any such application is accompanied by an Environmental Impact Assessment Report (EIAR). Under Regulation 12 of these EIA Regulations, a formal opinion on the information to be supplied in the EIAR is sought from Scottish Ministers.

The purpose of this Scoping Report is to provide information to consultees for determining the scope of the Environmental Impact Assessment (EIA) and EIAR. Consultees will note that the Scoping Report contains a number of questions for which it would be useful to receive feedback. Not all questions will be relevant to all consultees, therefore we request that consultees provide feedback only on those questions appropriate to them. The questions should not be considered an exhaustive list, and consequently feedback is welcome on any issue considered relevant to South Kyle II Wind Farm (herein referred to as the Proposed Development) from consultees. If consultees elect not to respond, Vattenfall will assume that consultees are satisfied with the approach proposed. Further consultation will take place with affected stakeholders throughout the EIA process, including with local communities.

The design of the Proposed Development to date is a result of maximising the potential wind resource on site whilst recognising site-specific and broader constraints as they are understood at the date of submitting this Scoping Report. The layout presented in this Scoping Report is expected to be further refined during the EIA process and through further consultation. Therefore, it should be noted that any amendments to the design are unlikely to increase the likelihood of a significant effect. However, should any changes occur that are likely to result in a significant or unknown effect on an important feature or impact previously scoped out, then this will be scoped back into the EIA process. Changes of this nature will be discussed with the relevant consultees, to ensure that they are in agreement with Vattenfall's understanding and before altering the inclusion or

exclusion of features from the EIA. Further general information about embedded mitigation and layout iterations is provided in Chapter 6.

1.1. The Applicant

Vattenfall is a leading European energy company with approximately 20,000 employees, owned by the Swedish state. For more than 100 years Vattenfall has powered industries, supplied energy to people's homes and modernised the way its customers live through innovation and cooperation.

Vattenfall aims to make fossil-free living possible within a generation and is leading the transition to a more sustainable energy system through growth in renewables and climate-smart energy solutions for our customers.

Vattenfall has over 50 wind farms, onshore and offshore, across five countries and pioneered co-locating wind with solar energy generation and battery storage. They have been in the UK since 2008, investing over £3.5 billion in enough wind to power nearly a million British homes. Vattenfall owns the largest onshore wind farm in England and Wales, Pen y Cymoedd, and in Scotland operates wind farms on the Isle of Skye and in Aberdeenshire. At a local level Vattenfall is constructing the neighbouring consented South Kyle Wind Farm, due to begin commercial operation in Quarter 1 of 2023, and Quantans Hill Wind Farm in Dumfries and Galloway, currently in the planning process.

Vattenfall are committed to promoting a wellbeing economy by ensuring they achieve long term investment in the local communities where they operate. They focus on the environmental and social aspects of their developments and work together with local and national stakeholders to achieve shared goals.

As part of this Scoping Report, Vattenfall have produced a Scoping Report Non-Technical Summary which can be used to convey a summarised version of the development plans to the wider community. This can be viewed in Appendix 4 and includes a brief overview of the details described within this Scoping Report.

Chapter 2

Proposed Development

South Kyle II Wind Farm



2. Proposed Development

The Proposed Development is situated south-east of the B741, south of Dalmellington and south-west of New Cumnock, in East Ayrshire. It covers an area of approximately 21.8 hectares. The maximum topographic height of the site is 516 m. Figure 2 shows the regional context of the Proposed Development. Figure 3 illustrates the current proposed turbine layout, which is subject to change on the basis of environmental survey and stakeholder feedback, and location of the site. Figure 3 also presents the site constraints identified to date which will be considered in the design process.

Figures 8a and 8b show the Zone of Theoretical Visibility (to tip height) for the current site layout. The Proposed Development presented in this Scoping Report is considered by Vattenfall to comprise the largest extent of land and the tallest and greatest number of turbines, expected to be put forward for permission. It therefore represents the greatest benefit in terms of electricity generation, climate mitigation, net biodiversity gain, the supply chain, and community benefit.

The design of the Proposed Development currently includes:

- Up to 17 wind turbines - tip heights expected to range from 180 m to 220 m in height to blade tip
- Reinforced concrete gravity turbine foundations
- Crane hardstand and temporary laydown areas
- Upgrading of existing and creation of new access tracks
- Temporary borrow pits
- Underground electricity cables
- Anemometry mast(s)
- External transformer housing
- Signage
- Temporary construction and storage compounds, laydown areas and ancillary infrastructure (toilets and temporary portacabins)
- Drainage and drainage attenuation measures (as required)
- Substation, compound and control building
- Battery/energy storage; and
- Green hydrogen generation and storage.

A 30-year operational period is likely to be sought for the Proposed Development, following which decommissioning of this project would be undertaken.

2.1. Wind Turbines

The specific turbine model has not yet been selected but it is expected to be a horizontal axis machine with three rotor blades. Current models have approximately 6 – 7 megawatt (MW) generating capacity and by the time the project is constructed, such wind turbine models may be capable of generating more. Should the candidate turbine require it, external transformers will also be placed adjacent to each turbine. It is anticipated that the Proposed Development will have an installed capacity of around 102 MW and 119 MW which is enough energy to power approximately 60,000 homes.

2.2. Turbine Foundations

Reinforced concrete gravity foundations may be used on the Proposed Development. A typical turbine foundation specification is generally an inverted T-shape consisting of a large square pad with protruding upstand approximately 200 mm proud of the finished ground level. Detailed design specifications for each foundation would depend on site-specific factors such as ground conditions, the specific turbine used and various other engineering considerations. Each turbine foundation would comprise concrete reinforced with steel bar. Following construction of the foundations, a layer of peat, peat turfs and/or mineral soils that were excavated from the turbine foundation area would be reinstated. Stability for the turbine is provided through the weight of the foundation, plus the material being replaced and compacted over it. Depending on the height of the water table at the foundation location, a drainage system may be installed around the foundation to prevent the build-up of water pressure under the foundation. Alternatively, in locations particularly sensitive to hydrological disturbance a submerged foundation design could be employed, which would not require a drainage system around the foundation.

2.3. Crane Hardstand and Temporary Laydown Areas

To enable the construction and subsequent maintenance of the proposed wind turbines, crane hard stands and temporary laydown areas will be required. The final design, location and orientation of this infrastructure has yet to be agreed but will be undertaken in line with the principles identified elsewhere in this report and any potential residual impacts identified in the EIAR.

Crane pads would be left in-situ following erection of turbines to allow for maintenance and replacement of parts, as necessary, during the lifetime of the project.

2.4. Access Tracks

Existing access routes will be utilised where possible, but additional site routes would also be required. The routes for the tracks will be chosen to minimise potential impacts on the environment, while taking account of other site-specific constraints. The EIAR will include a rationale for their final location.

The construction of the site tracks falls under two main categories, which can be categorised as follows:

1. 'Cut' track – superficial layers are removed, along with soft subsoils until reaching a competent bearing layer, which can be used as a formation level using methods including blasting of rock. The 'cut' track construction method will be used on steeper topography where floating track is deemed unacceptable due to ground conditions or slope stability and will generally generate higher volumes of excavated material.
2. 'Floating' track – superficial layers and subsoils are left in-situ with the track built off the existing ground level, utilising geotextiles and geogrids to reinforce the track materials. This technique is generally used where there are deep soft underlying materials e.g., peat or soft clays.

Watercourse crossings will be minimised as far as possible and where these cannot be avoided then suitable water crossings will be identified and assessed.

2.5. Temporary Borrow Pits

Temporary borrow pits on site may be used to reduce the potential effects on the environment and transport network, associated with transporting stone to the site. Using stone excavated on site is less likely to affect the pH of groundwater systems on site. The EIAR will include search areas of the proposed locations for on-site borrow pits.

The EIAR will present high-level details of the borrow pit designs, including indicative borrow pit plans. A detailed working borrow pit scheme, plus a decommissioning and restoration strategy would be produced pre-construction, as part of a planning condition.

2.6. Underground Electricity Cables

High voltage underground cables, between the turbines and substation, will be placed in trenches generally following the route of the on-site tracks. Electrical marker posts will be used to identify the locations of these cables.

2.7. Anemometry Mast(s)/Lidar

Anemometry masts (or met masts) or Lidar equipment is used to monitor wind speed and direction across wind farm sites to ascertain the available wind resource. This allows for a greater degree of certainty within the gathered wind data, overcoming seasonal variations in wind flow and addressing the potential for turbine mechanical or electrical failure. In larger sites, particularly those with a complex wind regime, there is often a need to move masts around sites to gain a fuller understanding of wind characteristics in different locations.

2.8. External Transformer Housing

The proposed wind turbines would produce electricity at 690 –1,000 Volts. The electricity would then be transformed to 33,000 Volts (33 kV) via a transformer located external to the tower of each turbine. The exact location of the transformer may differ depending on the final turbine model used. The transformers are likely to be linked to an on-site substation via the high voltage underground cables.

2.9. Temporary Construction and Storage Compounds, Laydown Areas and Ancillary Infrastructure

To facilitate construction, temporary compounds may be required, located strategically across the site. Infrastructure ancillary to the construction and operation of the Proposed Development will be required. These would be constructed in accordance with best practice and relevant guidelines, to minimise environmental impact.

2.10. Drainage and Drainage Attenuation Measures (as required)

A drainage strategy will be produced to include a design incorporating sediment management measures to attenuate and treat runoff from wind farm infrastructure.

2.11. Substation, Compound and Control Building

A control building would serve as an operational hub. Its compound would provide services including waste storage and car parking. A substation will transmit the electricity generated on site for connection to the national grid.

2.12. Battery/Energy Storage and Green Hydrogen Generation

A battery energy storage facility, primarily consisting of a container(s) with external ancillary equipment, may be proposed to store excess electricity generated by the Proposed Development and support its export when required. It is likely to be similar in size and shape to a small shipping container with lithium-ion battery cells inside.

A green hydrogen generation and storage facility may also be proposed, which would generate hydrogen electrolysed from water by electricity supplied by the wind farm. This may entail an electrolyser compound comprising electrolyser fuel stacks, a water purification plant, compressors, a water storage tank, and a hydrogen storage tank. Hydrogen produced by such a facility could be used to provide green transport fuel, e.g., for bus services.

2.13. Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) would be created and agreed with East Ayrshire Council prior to construction commencing through an

appropriately worded condition to ensure the impacts from construction are kept to a practical minimum.

The CEMP would set out the method statements for constructing site infrastructure and measures that would be undertaken by contractors to ensure good site practice with regards to construction practices and environmental management. Such measures would be set out for the transport and storage of potentially polluting substances, such as oils and lubricants, as well as waste management, for example.

In the past, the inclusion of and compliance with a CEMP in the construction phase has ensured the environment, in particular the integrity of drinking water reservoirs and catchments, have not been significantly adversely affected as a direct result of constructing the wind farm. Should the Proposed Development be consented, best practice guidelines and method statements, agreed in the CEMP, will be adopted to ensure that the development does not negatively impact the local environment.

2.14. Forestry

The Proposed Development lies wholly within an area of forestry owned and managed by Forestry and Land Scotland (FLS). It is proposed that the turbine layout be designed in such a way that felling is minimised as far as possible, in line with Scottish Government guidelines. Following discussions with landowners, we will seek to use existing forest tracks where possible.

2.15. Grid Connection

Connection of the Proposed Development to the national grid will be subject to a separate application.

2.16. Operational Period

The Proposed Development would be monitored locally by an experienced team at a control building on site as well as controlled remotely by Vattenfall using specialised systems. Individual turbines will operate independently from each other. Within the operational wind speed range, the pitch angle of the turbine blades of each individual turbine will automatically adjust through the control system within the turbine, as appropriate for the measured wind speed at any given time.

Should sensors placed within the nacelle of the turbine register any instability in the structure or any other

malfunction in operation, or should wind speeds increase over safe limits, the turbine will automatically shut down. If the cause of the shutdown is high wind speeds, then the turbine will automatically recommence operation once average wind speeds fall to within the operational range (generally between approximately 4 metres per second (m/s) and 25 m/s, i.e., 9 miles per hour (mph) and 56 mph, although technological improvements may allow for operation during stronger winds). Under other causes of shutdown, the turbine would remain offline and in a safe condition until manually restarted by a member of the operations and maintenance team.

The lifetime of the project is envisaged to be approximately 30 years from commissioning to decommissioning. Turbines are now generally designed with a warranty life in excess of 30 years, although advances in technology and understanding of turbine maintenance may prolong this. To ensure that turbines continue to operate with acceptable availability in addition to maintenance in the event of malfunctions, regular, planned maintenance and servicing programmes will be performed at the Site on each turbine. Minor scheduled maintenance checks tend to be carried out every six months with major services being performed annually throughout the lifetime of the turbine.

Each turbine would contain lubricating and hydraulic oils. These are often replaced during regular maintenance operations. In the unlikely event of a lubricant leak, the fully sealed tower bottom would act as a bund containing the spillage, until it can be appropriately cleaned up. Spill kits would be made readily available on site.

Storage of other potentially polluting substances at the Site during the operational period of the wind farm would only take place in locations agreed with the relevant authorities and would comply with UK control of substances hazardous to health (COSHH) regulations.

Maintenance and operation staff on site would make use of the control building for work-related activities and welfare.

2.17. Decommissioning

At least six months prior to the decommissioning of the site, a Decommissioning Method Statement would be prepared and agreed with the relevant consultees. The most up to date best practice guidelines would be utilised at this time. Vattenfall expects a planning condition regarding decommissioning to be attached to the consent. Should the Proposed Development be consented, an associated restoration fund may include

salvage from turbine components. The provision of the fund should be made so as to not burden the landowner and the planning authority.

If, nearer the time of decommissioning, it is considered that the development area may be suitable for re-powering, or if the existing wind farm infrastructure is suitable for a lifetime extension, the Applicant may submit a new application to the relevant authority for such continuity or development.

Chapter 3

Consultation

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3. Consultation

3.1. Community Consultation

Vattenfall considers consultation with the community to be a crucial part of the wind farm development process and will engage with the local community throughout the application process.

A programme of statutory and public consultation will be undertaken to provide information to, and seek feedback from, interested parties. This may include public exhibitions, virtual meetings and webinars, a project website, online consultation, one-to-one meetings with local stakeholders, leaflet drops and an established contact for project information requests.

It is also proposed to establish a Community Liaison Group, consisting of representatives from relevant community councils in the area and other local representatives. The engagement process will outline the findings of the baseline studies and assessment process. These meetings will be designed to support two-way communication and address any questions or concerns that representative community groups wish to raise. Public information events may be organised for the local community later in the EIA process, designed to present the concepts of the scheme. These will be followed by further public consultations as the design evolves through the EIA process. Vattenfall proposes to prepare a Pre-Application Consultation (PAC) Report to accompany the Section 36 application, detailing the key outcomes of the consultation process.

3.2. Stakeholder Consultation

Vattenfall considers consultation with statutory and non-statutory consultees as an integral part of the iterative EIA process and recognises the benefits in carrying out early consultation with all relevant parties.

The consultation will progress with the circulation of this Scoping Report and will continue for the duration of the EIA process.

Vattenfall will discuss the Proposed Development with a broad range of interested organisations including government bodies and agencies, local businesses, interest groups and charities.

3.3. COVID -19

At the time of writing this Scoping Report, Vattenfall is continuing to monitor COVID-19 local guidelines and restrictions. Due to public health risks, public gatherings such as exhibitions may not be permitted at the appropriate time in the EIA process. Vattenfall is assessing alternative means of communicating project information virtually to comply with the COVID-19 regulations, such as planning guidance on pre-application consultations for public events and the Coronavirus (Extension and Expiry) (Scotland) Act 2021. Consultation will be conducted in person if regulations allow.

3.4. Consultee Questions

- *Do consultees have any comments in relation to public consultation?*

Chapter 4

Approach to the Environmental Impact Assessment

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4. Approach to the Environmental Impact Assessment

The EIA is a statutory procedure which draws together in a systematic way, an assessment of the potential significant environmental effects arising from a Proposed Development. As the process has numerous steps, it allows for the opportunity to ‘design out’ adverse environmental effects at an early stage through the design of the project. This of course is generally preferable to mitigation or remedy at a later stage.

An iterative design approach is already underway for this project and will continue throughout the EIA process, which will allow the Proposed Development to have a design that works well for both the local environment and environmental resources within the area as well as being an economically viable scheme. The steps taken for informing and developing the EIA process are identified in the flow diagram below (Diagram 4.1).

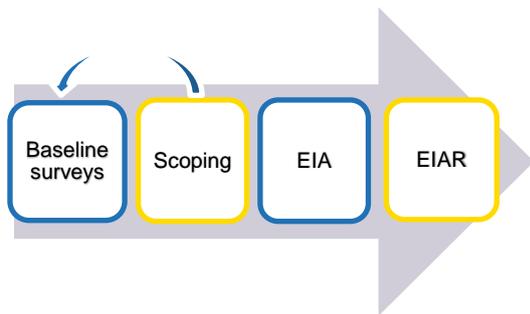


Diagram 4.1: EIA Process

Feasibility studies have been undertaken and some baseline surveys commenced, see Chapter 8 for example.

Consultees are requested to respond where possible to scope in those features and topics that are likely to experience a significant impact, and thus scope out the rest. In doing so the impact assessment will be focussed on those effects that will influence the determination.

The impact assessment will determine what the impact may be for the assessed receptors from the inclusion of the Proposed Development, either directly or indirectly. This will be done by comparing the baseline conditions with the conditions that would prevail should the Proposed Development be constructed, operated and subsequently, decommissioned. The environmental

effects of the Proposed Development will be predicted in relation to environmental receptors (i.e., people), built resources and natural resources.

A distinction will be made in the assessments between impacts and effects, where:

- ‘Impacts’ mean the predicted change to the baseline environment attributable to the scheme; and
- ‘Effects’ which are the consequence of impacts on environmental resources or receptors.

4.1. What will the EIA Assess?

The EIA will address:

- The construction phase of the wind farm which may last approximately 12 to 18 months;
- The operational and maintenance phase which would last approximately 30 years; and
- The decommissioning phase, expected to take around two years.

The geographical coverage of the EIA will take account of the following:

- The physical extent of the proposed works;
- The nature of the baseline environment and the manner in which effects are propagated; and
- The governmental administrative boundaries which provide the planning and policy context for the scheme.

4.2. Gathering Baseline Information

Baseline data is being collected for this project and the assessment team will ensure that sufficient data is obtained to enable a robust assessment, appropriate to the nature and scale of the Proposed Development. The extent of the baseline assessment will be determined using both professional judgement and industry and consenting authority best practice. The EIA will also identify areas where the baseline may change, prior to the construction and operational phases of the project from current conditions (for example, maturation of landscaping).

The collection of baseline data will be achieved through desk study, consultation, field survey and monitoring, and will be clearly reported in the subsequent sections within the EIAR (should there be an expected significant

impact from the development). In line with the regulations, the EIAR will also indicate any difficulties encountered in compiling environmental baseline conditions, such as not being granted permission to access areas where surveys were required.

Due to The Applicant’s existing presence within the development area, extensive baseline data is also available from the neighbouring South Kyle Wind Farm. This will ensure the most accurate assessment approach is adopted throughout the EIA process.

4.3. Prediction and Evaluation of Impacts and Effects

The prediction of impacts examines the change to the baseline environment that could result from the construction and operation of the Proposed Development. The effects will be classified in to one or more of the following:

- Positive effects that have a beneficial influence, negative effects that have an adverse influence;
- Temporary effects that persist for a limited period only due, for example, to particular construction activities;
- Permanent effects that result from an irreversible change to the baseline environment or which persist for the foreseeable future;
- Direct effects that arise from activities that form an integral part of the project;
- Indirect effects that arise from activities not explicitly forming part of the project;
- Secondary effects that arise as a result of an initial effect of the scheme; and
- Cumulative effects that arise from the combination of different impacts at a specific location, the recurrence of impacts of the same type at different locations, the interaction of different impacts over time, or the interaction of impacts arising from the scheme in conjunction with other development projects.

There is no statutory definition of what constitutes a significant effect although each EIA discipline aims to provide its own guidance. A significant effect may be broadly defined as an effect which, either in isolation or combination with others, should be taken into account in the decision-making process. This general definition will be used as the basis against which the significance criteria for environmental disciplines will be developed. The assessment team will ensure that a consistent approach is applied between disciplines to prevent

undue weight being given to a particular discipline to the detriment of another.

4.4. Mitigation of Environmental Effects

Mitigation measures will be considered for each significantly adverse effect. The EIAR will include a description of the measures envisaged to prevent, reduce and, where possible, remedy any significant adverse effects. In line with the regulations, when identifying mitigation measures, the project will take into account the practicability and cost effectiveness of the proposals and their efficiency in reducing environmental impacts. Where practical, mitigation measures will be set out as commitments, which will ensure they are implemented.

Once the final design has been adopted and account has been taken of any mitigation measures, residual adverse effects will be listed. The significance of a residual adverse effect will be determined by correlating the magnitude of the change arising from the Proposed Development with the sensitivity of the particular attribute under consideration. The magnitude of change will be evaluated in accordance with Table 4.1.

High	Total loss or major alteration to key elements/features of the baseline conditions
Medium	Partial loss or alteration to one or more key elements/features of the baseline conditions
Low	Minor shift away from the baseline conditions
Negligible	Very slight change from baseline conditions

Table 4.1: Magnitude of Change

Where applicable in carrying out individual assessments, a scale of increasing sensitivity of the resource or receptor will be defined. This may be defined in terms of quality, value, rarity or importance and can be classed as ‘Low’, ‘Medium’ or ‘High’. For certain assessment areas, guidance will be taken from the value attributed to elements through designation or protection under law. Where assessment of this nature takes place the correlation of magnitude against sensitivity will determine a qualitative expression for the significance of the residual adverse effect. This is demonstrated in the matrix in table 4.2.

		Sensitivity of Resource / Receptor		
		Low	Medium	High
Magnitude of Impact	High	Moderate	Moderate / Major	Major
	Medium	Low / Moderate	Moderate	Moderate / Major
	Low	Low	Low / Moderate	Moderate
	Negligible	Negligible / Low	Low	Low / Moderate

Table 4.2: Significance of Effect

Those residual adverse **effects indicated as Major and Moderate/Major will be regarded as being significant** effects in terms of the relevant legislation. However, other factors may have to be considered including the duration and the reversibility of the effect.

As per the aim of the Scoping Report, we intend to focus the EIAR on the significant effects and will therefore seek agreement that non-significant effects can be scoped out.

4.5. Securing Commitments and Mitigation through Planning Conditions

Where commitments have been discussed within this Scoping Report, they will form part of the EIAR and therefore ensure that they are secured through specific planning conditions if the Proposed Development receives consent. These conditions may include, for example, requirements for detailed documents including a CEMP to be produced prior to construction.

4.6. Consultee Questions

- *Do consultees have any comments in relation to the approach to the EIA?*

Chapter 5

Environmental Impact Assessment Report (EIAR)

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5. Environmental Impact Assessment Report (EIAR)

5.1. EIAR Production

The EIA process will result in the production of an EIAR. The EIAR will identify the features/receptors that have been agreed with the competent authority and their advisers as features that are likely to be affected by a significant effect from the Proposed Development and will make an influence on their decision process.

It will focus on each of the broad topics identified within this Scoping Report, plus any others that develop through the progression of the EIA process, until submission.

Where features are considered, the assessment methodology, results, effects, and any mitigation proposed will be included. This will allow for the residual effect from the Proposed Development to be identified to give the competent authority sufficient information to consider the application.

The EIAR will supplement the application and will also be accompanied by a Non-Technical Summary (NTS). A PAC Report, a Planning Statement and a Design and Access Statement (DAS) are also likely to be provided. The EIAR is likely to follow the structure below:

- Chapter 1: Introduction
- Chapter 2 Approach to EIA
- Chapter 3: Site Selection and Design Evolution
- Chapter 4: Project Description
- Chapter 5: Legal/planning policy and carbon balance context
- Chapter 6: Landscape and Visual Impact Assessment (LVIA)
- Chapter 7: Ecology
- Chapter 8: Ornithology
- Chapter 9: Hydrology, Geology and Hydrogeological
- Chapter 10: Noise
- Chapter 11: Population and Human Health
- Chapter 12: Cultural Heritage
- Chapter 13: Traffic and Transport
- Chapter 14: Existing Infrastructure and Aviation
- Chapter 15: Forestry

- Chapter 16 Synergistic Effects, Summary of Mitigation and Residual Effects

As per Regulation 17 of the EIA Regulations, the EIAR will be submitted to Scottish Ministers. Upon submission of the application, the EIAR will be made available for public inspection at appropriate locations to be agreed with East Ayrshire Council and will be distributed to the relevant consultees. An NTS will be submitted alongside the EIAR, which will provide a summary of the main findings and will be written in a non-technical language for ease of understanding by the general public.

5.2. Legal and Policy Context

The application will conform to the statutory requirements legislated by Section 36 of the Electricity Act 1989 and The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (referred to in this report as the EIA Regulations). Deemed planning permission will be sought by the Scottish Ministers under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 as amended.

Planning policy will be covered by an appropriate chapter in the EIAR, including carbon balance. The Planning Statement would assess the Proposed Development in a legal and policy context against the relevant legislation and planning policies in force. The Planning Statement would also consider such documents at international, national, regional and local levels, where applicable, including but not limited to:

- Paris Agreement (effective of November 2016);
- Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, which amends the Climate Change (Scotland) Act 2009;
- Scottish Energy Strategy (2017)
- Onshore Wind Policy Statement (2017 and draft 2021 refresh)
- National Planning Framework for Scotland 3 (NPF3);
- Scottish Planning Policy 2014 (SPP);
- Draft National Planning Framework for Scotland 4 (NPF4);
- East Ayrshire Local Development Plan 2 (adopted October 2019).

5.3. Consultee Questions

- *Do consultees have any comments in relation to the proposed chapters to be included in the EIA?*

Chapter 6

Embedded Mitigation and Further Layout Iterations

South Kyle II Wind Farm



6. Embedded Mitigation and Further Layout Iterations

The design of the Proposed Development has generally avoided environmental and physical constraints, which have been identified during initial feasibility studies (embedded mitigation). These will be refined as the EIA progresses.

The layout and design of the development will be amended through the remainder of the EIA process, until just before the submission of the EIAR and application when the design will be 'frozen' to allow final assessment. As stated previously the layout and design provided at scoping are considered to be the optimum from an energy generation perspective. Any amendments to the design will retain or preferably decrease the likelihood of a significant effect.

Should any changes occur that are likely to have a significant effect on a receptor these will be included within the EIAR. If the changes are not likely to have a significant effect, where possible, these will be discussed with the relevant consultees, to ensure that they too are in agreement with Vattenfall's understanding before excluding them from the EIAR.

In the following sections, the subject areas to be covered in the Scoping Report and EIAR are provided. When it is considered that certain subjects or particular aspects within subjects can be scoped out of the EIAR, evidence and a rationale is provided.

Chapter 7

Landscape and Visual Impact Assessment

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7. Landscape and Visual

7.1. Introduction

This chapter sets out the proposed methodology and approach to be applied to the Landscape and Visual Impact Assessment (LVIA) of the Proposed Development. The objective of the LVIA is to identify and assess the potential significant effects that the Proposed Development may have on physical elements of the landscape such as the landscape fabric and character of the Site; landscape character; designated and protected landscapes; and visual amenity within an identified study area.

The purpose of this Scoping Report is to establish the landscape, visual and cumulative baselines of the study area for the Proposed Development and focus on the key landscape and visual effects likely to arise which will be reported on in the LVIA EIAR Chapter.

The key project components likely to result in effects include the following:

- Wind turbines;
- Anemometer mast (if required);
- Temporary and permanent infrastructure including crane pads, construction compound and borrow pits;
- Access (both to and within the site boundary); and
- Cabling, control building and substation.

Each of the above elements will be considered during the following development stages:

- Construction;
- Operation; and
- Decommissioning.

The LVIA will be undertaken by Chartered Members of the Landscape Institute (CMLI) experienced in undertaking siting, design and assessment of onshore wind energy developments in accordance with best practice guidance.

7.2. Landscape Policy and Guidance

The LVIA would be prepared in accordance with the *Guidelines for Landscape and Visual Impact*

Assessment, Third Edition (GLVIA3) (Landscape Institute and the *Institute of Environmental Assessment* (2013).

In addition to the above, the LVIA will take account of the following guidance and policy documents:

- *GLVIA3 Statement of Clarification 1/13 10-06-13* (Landscape Institute, 2013);
- *Landscape Character Assessment, Guidance for England and Scotland*, (The Countryside Agency and Scottish Natural Heritage (SNH) 2002 Edition);
- *Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland*. (SNH, Historic Environment Scotland, April 2018);
- *Spatial Planning for Onshore Wind Turbines – natural heritage considerations, Guidance* (SNH, June 2015);
- *Siting and Designing Windfarms in the Landscape, Version 3a*, (SNH, August 2017);
- *Good Practice during Wind Farm Construction, 4th Edition 2019* (Scottish Renewables, SNH, SEPA, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science, AEECoW);
- *Visual Representation of Windfarms, Version 2.2*, (SNH February 2017);
- *Visual Representation of Development Proposals, Technical Guidance Note 06/19* (Landscape Institute, July 2019);
- *Residential Visual Amenity Assessment (RVAA), Technical Guidance Note 2/19* (Landscape Institute, March 2019);
- *Assessing the Cumulative Impact of Onshore Developments* (SNH, March 2012);
- East Ayrshire Local Development Plan, Supplementary Guidance, Planning for Wind Energy (East Ayrshire Council, 2017); and
- East Ayrshire Local Development Plan, Non-statutory Planning Guidance, East Ayrshire Landscape Capacity Study (East Ayrshire Council, 2018).

The assessment would also take cognisance of relevant national and local landscape planning policy, plus other such material that may be published during the preparation of the LVIA.

7.3. Assessment Methodology

A methodology including detailed criteria for assessing landscape and visual effects will be included as an

appendix document to the main LVIA EIAR Chapter. Below is a summary of the intended methodology that has been used for initial assessments to determine the landscape and visual baseline.

7.3.1. Study Area

A Zone of Theoretical Visibility (ZTV) map has been produced to illustrate the potential extent of visibility of the Proposed Development at both hub and tip height (Figures 8a & 8b, Appendix A). The ZTV assumes a bare earth surface, i.e. no trees or buildings etc. that might otherwise obscure the view of the turbines and therefore is a worst-case illustration. The ZTV has been produced with an extent of 45 km based on NatureScot guidance¹ for ZTV production in relation to turbines of greater than 150 m in height. Following further evaluation of potential effects within this 45 km area, the assessment will focus on the potential significant landscape and visual effects of the Proposed Development.

7.4. Landscape Assessment

The assessment of the levels of effect on the landscape resource will be carried out in the detailed LVIA to be contained in the EIAR and will adopt the following general process:

- Identify and describe the key landscape characteristics of the Proposed Development site;
- Describe the Landscape Character Types (LCTs) and landscape designations identified in the Landscape Baseline to represent the wider landscape resource;
- Identify and describe the type of changes which are likely to occur to the Proposed Development site and wider landscape resource as a result of the construction and operation of the Proposed Development;
- Describe the extent to which the key characteristics of the Proposed Development site and the wider landscape resource would be altered in terms of being weakened or strengthened by the introduction of the Proposed Development; and
- Assess the nature of the effect (magnitude) on the development site and wider landscape resource, which are likely to result from the introduction of the proposed wind farm, at

construction, operational and decommissioning stages.

7.4.1. Landscape Baseline

The assessment of landscape effects of the Proposed Development will consider the effect on the landscape as a resource or a group of identifiable receptors. These include:

- Landscape fabric and character of the Proposed Development area;
- NatureScot LCT mapping database² ; and
- Protected and designated landscapes, at international, regional, and local level.

The Proposed Development would be entirely located within LCT 82: Southern Uplands with Forest. The LVIA will include an analysis of all LCTs and designated landscapes within the study area and will focus on those considered to receive an adverse effect. This analysis will be presented during consultation with East Ayrshire Council, Dumfries & Galloway Council and NatureScot.

7.5. Visual Assessment

The assessment of the visual effect of the Proposed Development considers the effect on visual receptors throughout the study area. Visual receptors identified within the study area will comprise the visual baseline.

Visual receptors are people who will be affected by changes in views or visual amenity at different places. They are usually grouped by what they are doing at these places, such as residents, road users and walkers. They include people living and working in the area, people who view the Proposed Development sequentially such as people travelling through the area on road, rail or other forms of transport; walking routes; people visiting promoted tourist attractions/landscapes; and people pursuing other recreational activities.

7.5.1. Zone of Theoretical Visibility Mapping

Computer generated ZTV mapping has been undertaken to assist in determining the likely extent of visibility of the Proposed Development within the study area and the likely landscape and visual receptors affected by the proposed development. The ZTVs (Figures 8a & 8b –

¹ Scottish Natural Heritage Visual Representation of Wind Farms, Guidance, Version 2.2 (SNH, February 2017)

² Scottish Natural Heritage Landscape Character Types Map and Description (SNH, 2019)

Appendix 1) have been undertaken in accordance with best practice guidance³.

7.5.2. Viewpoint Locations

The viewpoints selected should represent the views experienced towards the Proposed Development throughout the study area by various groups of people or receptors. Selected viewpoints will include representative, specific and illustrative views from publicly accessible locations, which are defined as:

- **Representative viewpoints:** selected to represent the experience of different types of visual receptors, where larger number of viewpoints cannot all be included individually and where the significant effects are unlikely to differ. For example, certain points may be chosen to represent the views of users of particular public footpaths and bridleways;
- **Specific viewpoints:** chosen because they are key views and sometimes promoted viewpoints within the landscape, including for example scenic viewpoints from roads, specific local visitor attractions, and viewpoints in areas that are particular noteworthy for visual and/or recreational amenity (such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations); and
- **Illustrative viewpoints:** chosen specifically to demonstrate a particular effect or specific issue.

In accordance with NatureScot guidance, '*The aim is to choose a range of viewpoints from where there are likely to be significant effects and those that are representative of views within the study area...It is preferable not to include too many viewpoints as this can distract attention from the key significant effects... We therefore encourage all applicants and consultees to further scrutinise the list of viewpoints selected and reduce these where possible.*' (SNH, 2017⁴).

Computer generated wire-frame visualisations of the Proposed Development will then be produced for each selected viewpoint to determine the potential view and suitability for EIA. It is suggested that up to 20 viewpoints would be an appropriate quantity, based on windfarms of a similar size and locality.

A list of viewpoints used for the neighbouring South Kyle Wind Farm LVIA is provided in Appendix 2 for preliminary assessment. Further consultation on

³ Scottish Natural Heritage Visual Representation of Wind Farms, Guidance, Version 2.2 (SNH, February 2017)

viewpoints will be undertaken during the design evolution of the project.

7.6. Landscape & Visual Effects

A distinction will be made in the assessments between impacts and effects:

- Impacts are defined as the predicted change to the landscape and visual baseline, as a result of the construction and operation of the Proposed Development; and
- Effects are the consequence of those impacts on landscape resources or visual receptors.

It is a requirement of the EIA Regulations to state whether effects are positive, neutral or adverse. However, as a precautionary approach, effects on landscape character and views will be considered in the LVIA to be adverse. It should be noted however, that not all people would experience effects on landscape character, views and visual amenity as adverse, as people's perception of wind turbines varies between negative and positive attitudes. An additional point is that simply because turbines are visible from a particular location or receptor, this does not mean that there will be an adverse effect. Rather, it is dependent on the level (or significance) of that effect or change.

7.6.1. Landscape and Visual Effects

In accordance with GLVIA3 the assessment of landscape effects and visual effects are considered separately. Landscape effects are defined as the potential changes as a result of the proposal on the physical landscape resource, including landscape features, which may give rise to changes in its' character, or constituent parts of its' character. This in turn may affect the perceived value ascribed to the landscape. Landscape resources evaluated include whole LCT, individual elements, features and perceptual aspects and those areas designated for their scenic or landscape qualities at a national, regional or local policy level.

Visual effects consider potential changes as a result of the proposal on population or people. It considers changes to available views as a result of changes to the landscape and people's responses to these changes, otherwise referred to as visual amenity. Changes in views consider the appearance and prominence of the development from key viewpoint locations, settlements,

⁴ Scottish Natural Heritage Visual Representation of Wind Farms, Guidance, Version 2.2 (SNH, February 2017)

routes and recreational areas. Viewers from such areas are collectively known as visual receptors. Visual effects include issues of intrusion (turbines encroach in the view) or obstruction (turbines intercept or block a view) and whether important opportunities to enjoy views may be improved or reduced as a result of the proposal. The two principal criteria for determining the significance of both landscape and visual effects are:

- The nature of the location or receptor (sensitivity); and
- The nature of an effect (magnitude).

7.6.2. Landscape Effects

As guided by GLVIA3, the nature of the landscape receptors (sensitivity) will be assessed in terms of the susceptibility of the receptor to the proposed change and the value of the receptor, and will be expressed in terms of Very High, High, Medium, Low and Very Low sensitivity. The nature of the effect (magnitude) on each landscape receptor will be assessed in terms of the size and scale, geographical extent, duration and reversibility of that effect and will be expressed in terms of Substantial, Moderate, Slight and Negligible.

7.6.3. Visual Effects

As guided by the GLVIA3, the nature of the visual receptors (sensitivity) will be assessed in terms of the susceptibility of the receptor or viewer (not the view) to the proposed change in views and visual amenity and the value attached to particular views. This will be expressed in terms of Very High, High, Medium, Low or Very Low. The nature of the effect (magnitude) on each visual receptor will be assessed in terms of the size and scale, geographical extent, duration and reversibility of that effect and will be expressed in terms of Substantial, Moderate, Slight and Negligible.

7.6.4. Significance of Landscape and Visual Effects

For both landscape and visual effects, an overall judgement is made on the nature of the receptor and the likely change resulting from the Proposed Development. This judgement is based on evaluations of the individual aspects of sensitivity (value and susceptibility) and magnitude (size and scale, geographical extent, duration and reversibility). Table 8.1 illustrates the four main levels of landscape and visual effects that will be used in this LVIA; Major, Moderate, Minor and Negligible. Three intermediate combinations are also used for determining landscape and visual effects; Major/moderate, Moderate/minor and Minor/negligible. The table is not a prescriptive tool and the evaluation of potential effects

makes allowance for the use of professional judgement and experience.

Landscape Institute advice, contained in GLVIA3 statement of clarification⁵, states that following the determination of magnitude and sensitivity, *'the assessor should then establish (and it is for the assessor to decide and explain) the degree or level of change that is considered to be significant'*. In accordance with this advice, the LVIA will establish at what level in the assessor's opinion, 'significant' effects arise, as referred to in the EIA Regulations⁶.

Those effects considered to be Major and Major/moderate, and some Moderate effects by virtue of the more sensitive receptors and the greater magnitude of effects, are considered to be significant Landscape or Visual Effects. Some Moderate, Moderate/minor, Minor, Minor/negligible and Negligible effects are considered to be not significant Landscape or Visual Effects. However, whilst assessments are based on factual and objective data, where possible, they involve qualitative considerations, and are therefore essentially and inevitably a matter of professional judgement undertaken on an individual basis. In some instances, Moderate effects may be judged to be significant by the assessor and equally some Major/moderate effects may be judged to be not significant. In these instances, the level of significance of the effect determined by the assessor will be explained in detail.

Examples of significant landscape effects can arise where changes to important key elements or attributes of LCTs occur without necessarily giving rise to a change in character, or where a new landscape type or sub-type, and therefore new character type (at various scales), would result from the introduction of the Proposed Development.

A significant visual effect is considered to be a change in the view that would markedly change the composition of that view. It should be noted that significant effects need not be unacceptable or necessarily adverse and may be reversible.

⁵ GLVIA3 Statement of Clarification 1/13 10-06-13 (Landscape Institute, 2013);

⁶ The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017

Nature of effect (magnitude)	Nature of Receptor (Sensitivity)		
	High	Medium	Low
Substantial	Major		
Moderate		Moderate	
Slight			Minor
Negligible			Negligible

Table 7.1 Levels of Landscape & Visual Effects and Overall Significance

- **Scenario 2** considers the addition of the Proposed Development in the context of operational wind farms, those under construction and additionally those developments currently consented. This represents the likely future scenario; and
- **Scenario 3** considers the addition of the Proposed Development in the context of operational, under construction, consented, undetermined planning applications and wind farm developments currently at appeal i.e. a less certain future scenario.

7.7. Cumulative Effects

The Cumulative Landscape and Visual Impact Assessment (CLVIA) will be undertaken in a similar process to the LVIA. The aim of the CLVIA is to identify, predict and evaluate potential key effects arising from the addition of the Proposed Development to a theoretical landscape baseline which includes cumulative sites currently present in the landscape and those which may or may not be present in the landscape in the future. Cumulative sites consist of other wind farm developments only. As with the LVIA, the CLVIA deals with the effects on landscape and visual receptors separately.

The difference between LVIA and CLVIA is the different baseline conditions in terms of other wind farm developments that are assumed to be present in the landscape. The LVIA baseline conditions consider the introduction of the Proposed Development to a landscape with other operational wind farm developments and those under construction. The CLVIA baseline conditions consider the introduction of the Proposed Development to a landscape with other wind farm developments at more speculative stages of the planning system, such as:

- Consented wind farms which have been granted planning consent but are not yet constructed; and
- Submitted valid wind farm applications awaiting determination, including those at appeal.

For clarity, the cumulative assessment separates out these different speculative stages of development by identifying different ‘**cumulative baseline scenarios**’:

The existing scenario of operational wind farms and those under construction is assessed in the LVIA and is referred to as **Scenario 1**.

The CLVIA considers the following scenarios;

Scenario 3 represents the most unlikely cumulative baseline as not all planning applications would necessarily be approved. The detailed cumulative assessment will comprise the analysis of the introduction of the Proposed Development into each scenario baseline. Projects which have come forward of relevance at the scoping or pre-application stage would be acknowledged.

Should other cumulative schemes be present in the different baseline scenarios, over and above the effects identified in the LVIA, in the CLVIA, these cumulative effects will be reported as the additional effects of the introduction of the Proposed Development. For each receptor, it is clarified as to whether the effect has increased or decreased relative to the LVIA or whether the effects will be the same as in the LVIA.

7.7.1. Proposed Mitigation

By their nature landscape and visual effects require early consideration of mitigation which is embedded in the design of the Proposed Development which has been specifically designed to avoid or to minimise the occurrence of adverse environmental impacts. All effects identified in the final detailed assessment will therefore be ‘*residual effects*’.

7.7.2. Aviation Lighting

At time of writing the Civil Aviation Authority (CAA) requires visible red aviation warning lighting at up to 2000 candela light for any structure at and greater than 150 m in height. The worst-case scenario lighting scheme would require a 2000 candela light positioned on the nacelle and 32 candela lights on the tower of each turbine.

At time of writing the CAA guidance for lighting onshore wind turbines allows for the lighting intensity to be reduced to 10% in good visibility conditions and furthermore that the lighting be omni-directional and therefore dim in intensity outside of a 0° - 3° viewing

angle. The current guidance is that the lighting would be static and only be operating during night-time hours. The above methods mitigate the potential effects of the lighting.

As a precautionary measure, it is proposed a description of any lighting proposals visible from each selected viewpoint will be included in the viewpoint assessment. A limited number of viewpoints may be illustrated in additional photomontages using photographs taken at dusk.

The Applicant has engaged the services of Pager Power Ltd with a view to propose and agree a reduced lighting scheme from the outset of this Proposed Development. Pager Power Ltd will engage with the CAA to identify the aviation stakeholders to be consulted.

7.7.3. Residential Visual Amenity Assessment

The Residential Visual Amenity Assessment (RVAA) consists of a detailed study of the visibility from individual properties within a 3 km radius of the outermost turbine of the Proposed Development. In the absence of published guidance on the distance from the Proposed Development that should be adopted for a detailed study of visual amenity from residential properties, a 3 km study area is considered appropriate.

7.7.4. Sequential Receptors

Sequential impacts occur when an observer moves through a landscape along a linear route. This can lead to a series of viewpoints and experiences which may include other developments in addition to the Proposed Development.

The aim of the assessment will be to ascertain which sequential routes have the potential to experience significant visual effects, including significant cumulative sequential effects. Routes to be included in the assessment will be agreed during consultation.

7.8. Consultee Questions

- *Do the consultees agree with the LVIA and CLVIA methodologies proposed?*
- *Do the consultees agree with the suggested viewpoint locations and visualisations detailed in Appendix 2?*
- *Do consultees agree with the approach suggested for aviation lighting?*

- *Do the consultees agree with the approach to the sequential assessment?*

Chapter 8

Ornithology

South Kyle II Wind Farm



8. Ornithology

8.1. Introduction

This chapter of the Scoping Report sets out the proposed approach to the assessment of potential effects on important ornithological features (IOFs) during construction and operation of the Proposed Development. IOFs are bird species that are protected by legislation, are of high conservation importance or are particularly sensitive to effects. Baseline survey work to inform this Scoping Report commenced in April 2021. The results of these initial surveys are summarised here along with historical data from a number of developments within the Carsphairn Forest area, as shown in Figure 2 (Appendix 1). This report also provides details on further baseline surveys to be undertaken along with the proposed EIA scope and assessment methods.

In addition, this chapter also provides information on statutory sites of international importance, upon which the Proposed Development may have a 'Likely Significant Effect' (LSE). A screening process will be undertaken alongside the EIA to determine whether the predicted impacts of the Proposed Development will result in a LSE. The screening process will allow the competent authority to determine whether an Appropriate Assessment (AA) will be required.

8.2. Legislation and Guidance

The ornithological baseline surveys and preliminary assessment presented in this report have been carried out with reference to a number of national policy documents. Legislative and guidance documents with relevance to ornithology are listed below:

Legislation:

- EU Exit: The Habitats Regulations in Scotland;
- Council Directive 2009/147/EC on the Conservation of Wild Birds (the Birds Directive);

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive);
- The Conservation of Habitats and Species Regulations 2017 (as amended), relating to reserved matters in Scotland including the granting of consent under section 36 of the Electricity Act (together, "the Habitats Regulations");
- The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2012;
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations), which transposes the Habitats Directive into UK law⁷;
- Wildlife and Countryside Act 1981 (as amended);
- The Nature Conservation (Scotland) Act 2004;
- The Wildlife and Natural Environment (Scotland) Act 2011;
- Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, which transpose the EIA Directive into the Scottish planning system; and
- The Electricity Works, EIA Regulations.

National policy guidance

- Planning Advice Note (PAN) 51: Planning, Environmental Protection and Regulation⁸;
- Planning Advice Note (PAN) 60: Planning for Natural Heritage (Scottish Government 2000)⁹;
- PAN 1/2013 – Environmental Impact Assessment¹⁰;
- Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives: Scottish Executive Circular 6/1995 as amended¹¹; and
- Scottish Planning Policy (SPP)¹².

⁷UK Government. The Conservation (Natural Habitats, &c) 1994
<https://www.legislation.gov.uk/ukxi/1994/2716/contents/made>

⁸ Scottish Government. (2006). PAN 51. Planning, Environmental Protection and Regulation. Scottish Government, Edinburgh.

⁹ Scottish Government (2000). PAN 60: Planning for Natural Heritage. Scottish Government, Edinburgh.

¹⁰ Scottish Government. (2013 (updated 2017)). PAN 1/2013 – Environmental Impact Assessment. Scottish Government, Edinburgh.

¹¹ Scottish Executive (1995 (updated 2000)). Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives. Scottish Executive, Rural Affairs Department, Edinburgh.

¹² Scottish Government. (2014). *Scottish Planning Policy (SPP)*. Scottish Government, Edinburgh.

Other guidance

Particular attention has also been given to the guidance documents listed below, that are applicable to assessing the effects of wind farm developments on ornithology. Reference has also been made to guidance documents throughout the Scoping Report where relevant:

- Guidelines for Ecological Impact Assessment in the UK and Ireland¹³;
- *Recommended bird survey methods to inform impact assessment of onshore wind farms*. Scottish Natural Heritage, Battleby¹⁴;
- *Monitoring the impact of onshore wind farms on birds* (Guidance note)¹⁵;
- *Guidance on methods for monitoring bird populations at onshore wind farms*.¹⁶;
- *A Review of Disturbance Distances in Selected Bird Species*.¹⁷;
- British Standard 42020:2013 Biodiversity – code of practice for planning and development;
- *Natural Heritage Zone bird population estimates*.¹⁸;
- *Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man*.¹⁹;
- Dumfries and Galloway Local Biodiversity Action Plan (LBAP)²⁰; and
- Scottish Biodiversity List (SBL)²¹.

¹³ CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

¹⁴ SNH (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage, Battleby.

¹⁵ SNH (2009). Monitoring the impact of onshore wind farms on birds (Guidance note). Scottish Natural Heritage, Edinburgh.

¹⁶ SNH (2009). Guidance on methods for monitoring bird populations at onshore wind farms. Scottish Natural Heritage, Edinburgh.

¹⁷ Ruddock, M. & Whitfield, D.P., (2007). A Review of Disturbance Distances in Selected Bird Species. A report from Natural Research (Projects) Ltd to Scottish Natural Heritage.

¹⁸ Wilson, M.W., Austin, G.E., Gillings, S. & Wernham, C.V. (2015). Natural Heritage Zone bird population estimates. SWBSG commissioned report number 1504. Pp72. Available from www.swbsg.org

¹⁹ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and 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.

²⁰ Dumfries and Galloway Local Biodiversity Action Plan (LBAP): [Local Biodiversity Action Plan.pdf](http://www.dumgal.gov.uk) ([dumgal.gov.uk](http://www.dumgal.gov.uk))

²¹ Scottish Biodiversity List (SBL): <https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list>

8.3. Baseline Conditions

This section outlines the ornithological baseline of the Proposed Development.

8.3.1. Contextual Data

The Proposed Development is adjacent to both South Kyle Wind Farm and the South West Scotland Interconnector Project (SWS), both of which have been subject to ornithological survey work and monitoring for different phases since 2010 and 2007 respectively. In addition, the Windy Standard Complex (which consists of Windy Standard, Windy Standard II and Windy Standard III Wind Farms) and Afton Wind Farm are located approximately 3.6 km and 5.6 km to the east. Enoch Hill, Pencloe and Benbrack Wind Farms are also present within the local area. The Enoch Hill Wind Farm is less than 1 km from the Proposed Development. Pencloe and Benbrack Wind Farms are located 3.5 km and 1.8 km from the Proposed Development respectively. As such, there is a considerable amount of existing ornithological data for the Carsphairn Forest area around South Kyle II Wind Farm to provide context for this proposal. A summary of available data is provided in Section 8.4. Figure 2 - Appendix 1 shows the site boundaries of all relevant sites and their proximity to the Proposed Development. North Kyle and Overhill wind farms are also in close proximity to the Proposed Development. For the purposes of this Scoping Report, existing data from the below wind farms will be utilised:

- Windy Standard Complex;
- Afton Wind Farm;
- Enoch Hill Wind Farm;
- Pencloe Wind Farm; and
- Benbrack Wind Farm

8.3.2. Desk Study

To assess any connectivity between ornithological features recorded within the Proposed Development with populations protected on designated sites, a desk study was undertaken involving an online search using the NatureScot Sitelink **Error! Bookmark not defined.** website²² and the online GIS tool MAGIC²³ (Multi-Agency Geographic Information for the Countryside). At this stage, data has been sought for the following:

- Special Protection Areas (SPAs) – within 10 km of the Proposed Development (out to 25 km for SPAs designated for goose and swan species);

²² NatureScot Sitelink: <https://ProposedDevelopmentlink.nature.scot/home>

- Ramsar sites (Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat) – within 10 km of the Proposed Development (and 25 km for geese and/or gulls);
- Sites of Special Scientific Interest (SSSIs) – within 5 km of the Proposed Development; and
- Local and National Nature Reserves (including Royal Society for Protection of Birds (RSPB) and Wildlife Trust Reserves) – within 5 km of the Proposed Development.

Information on locally designated sites such as Sites of Importance for Nature Conservation (SINCs) and Sites of Nature Conservation Interest (SNICs) within 5 km of the Proposed Development will be sought from the Local Planning Authority (LPA).

Only sites with ornithological interest features are assessed in this section. Any sites with habitats or protected species as an interest feature will be discussed in Section 9 Ecology.

Before the EIAR is submitted further records of relevant ornithological data shall be requested from the following organisations, to obtain any records they hold for South Kyle II and the surrounding area:

- Dumfries and Galloway Raptor Study Group (D&GRSG);
- RSPB; and
- The South West Scotland Environmental Information Centre (SWEIC).

Searches for ornithological data will be limited to:

- Data from within 25 km of the Proposed Development for goose species;
- Data from within 10 km from the Proposed Development for eagle species; and
- Data from within 5 km from the Proposed Development for all other protected species.

8.3.3. Field Surveys

Baseline ornithology surveys are described below.

Survey methodologies will follow standard NatureScot guidance¹⁴. All surveys will be carried out by

²³ MAGIC: <https://magic.defra.gov.uk/MagicMap.aspx>

appropriately qualified and experienced personnel, in possession of a Schedule 1 licence where appropriate, and undertaken in suitable weather conditions.

Full information on the dates, times and weather conditions for all ornithology surveys undertaken at the Proposed Development to date can be provided upon request.

8.3.4. Target Species

NatureScot guidance¹⁶ states that work to establish the ornithological baseline should focus on those species which are afforded a higher level of legislative protection, or those which, as a result of their behaviour, may be more likely to be subject to impact from wind farms. There are three important species lists from which target species may be drawn:

- Annex I of the EC Birds Directive;
- Schedule 1 of the Wildlife & Countryside Act (WCA) 1981^{Error! Bookmark not defined.}; and
- Red-listed Birds of Conservation Concern (BoCC)¹⁹.

Target species should be restricted to those likely to be affected by wind farms. It is generally considered that passerine species are not significantly impacted by wind farms. As such, and in accordance with the NatureScot guidance, surveys will focus on the following target species:

- All species of raptors and owls listed in Annex I of the EC Birds Directive and/or Schedule 1 and 1A of the WCA 1981 (as amended)^{Error! Bookmark not defined.};
- All species of wildfowl (with the exception of Canada goose and mallard);
- Black grouse; and
- All wader species.

Due to the proximity of Loch Doon SSSI, all gull species are considered target species, and have been recorded as such from October 2021.

Raptor species that do not appear on the Annex I/Schedule 1 lists, and which are considered to be of lower conservation concern than target species (such as kestrel and buzzard), are termed secondary species. Recording of secondary species is subsidiary to recording of target species. The following species were

considered secondary species for the purposes of flight activity Vantage Point (VP) surveys:

- All other raptor and species (buzzard, sparrowhawk, kestrel);
- Tawny owl;
- Grey heron; Canada goose and mallard;
- Red grouse;
- Raven;
- Schedule 1 passerines (e.g. crossbill); and
- Any large aggregations of red-listed passerines.

8.3.5. Breeding Season Surveys 2021

Baseline ornithological surveys were completed between April 2021 and August 2021²⁴ with VP locations and survey buffers provided in Figure 5 -Appendix 1. A minimum of 36 hours of observation were completed at six VPs between April and August 2021, with the surveys spread evenly throughout the survey period.

A suite of breeding bird surveys were also completed to determine the presence and approximate location of breeding territories/sites. This included:

- Moorland breeding bird surveys (MBBS) in April to July 2021;
- Breeding raptor surveys, focusing on species listed on Schedule 1 of the Wildlife & Countryside Act 1981, within suitable habitats between April and August 2021; and
- Black grouse reconnaissance and lek surveys in April and May 2021.

8.3.6. Surveys to be completed

Non-breeding season VP surveys are currently being undertaken at the Proposed Development at the same six locations used during the breeding season in 2021. It is proposed that baseline ornithological surveys are continued until the end of August 2022 and that this will include:

- VP surveys: six VPs with a minimum of 72 hours of survey effort per VP location during the months of September 2021 to August 2022;

²⁴ MBEC Environmental Consulting. South Kyle II Wind Farm. Ornithological Survey Report. October 2021.

- Breeding raptor surveys between March and August 2022 including the Proposed Development and a 2 km buffer;
- MBBS between April and July 2022 on open ground within the Proposed Development; and
- Black grouse surveys between April and May 2022 within the Proposed Development and a 1.5 km buffer.

On completion of these surveys, the EIAR will present the results from two breeding seasons and one winter season. It is not proposed to conduct ornithology surveys for a second winter, justification is provided in Section 8.5.

8.3.7. Collision Risk Modelling

Collision Risk Modelling (CRM) uses data collected during VP surveys to predict the number of individuals per species that have the potential to collide with turbine rotors. CRM has not been undertaken at this stage as surveys have not been completed; however, the methodology is briefly described here to provide assurance that this will be included within the EIA. The EIA shall provide full details of CRM undertaken using the data collected over the baseline surveys (proposed to be two breeding seasons and one non-breeding season).

CRM will be carried out based upon the Band *et al.* (2007)²⁵ model recommended by NatureScot. When using the Band model, height bands are typically chosen such that all flights recorded within certain height bands can be considered to be at potential collision height (PCH); i.e. the height at which rotor blades sweep.

Flight activity data for the Proposed Development have been recorded using the following height bands:

- Height band 1: <10 m;
- Height band 2: 10-210 m; and
- Height band 3: >210 m.

CRM will be undertaken on all relevant flights noted within the EIAR. Three or more flights and/or 10 or more individuals at PCH that are also within the collision risk zone (CRZ) (blade width plus 200 m buffer) are considered as qualifying a species for CRM. At present the dimensions of the turbines have not been finalised. Full CRM will be undertaken for the EIAR, using the finalised dimensions of the proposed turbines and full

determination of those flights that occurred at PCH within the CRZ.

8.3.8. Survey Limitations

Whilst survey buffers are provided, access is not always fully available to the entire buffer. A figure identifying access limitations and discussion on any potential constraints will be provided within the EIAR. Where access is not available, buffers will be surveyed visually from the closest section of boundary where possible.

²⁵ 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. & Ferrer, M. (eds.) Birds and Wind Power. Quercus, Madrid.

8.4. Results

8.4.1. Contextual Data

Table 8.1 summarises the historical surveys conducted for the South Kyle, SWS, Windy Standard Complex Afton, Benbrack, Enoch Hill and Pencloe wind farm projects adjacent to the Proposed Development. The locations of these consented and built developments can be seen in Figure 2 - Appendix 1.

Key results of these surveys are provided below and in Table 8.2.

8.4.2. South Kyle Wind Farm EIA

Surveys for the pre-planning stage of South Kyle Wind Farm were started in 2009 and conducted until 2012, prior to submission of the planning application in 2013. Pre-construction surveys were undertaken between 2018 and 2019. Construction and associated surveys began in 2020 and are ongoing.

The 2013 EIA for South Kyle concluded that “the moorland breeding bird assemblage is considered to be relatively species-poor due to the near absence of evidence of breeding waders and the relatively low density and species richness of the breeding moorland passerines assemblage.”

Key species of note include merlin, peregrine, black grouse, oystercatcher, lapwing, common snipe, curlew, common sandpiper and barn owl; however, these were recorded in very low numbers.

During the flight activity surveys the most frequently recorded species within the flight risk area (within 500 m of proposed turbines) were goshawk and merlin with nine flights recorded each. These were followed by hen harrier and peregrine which both had six flights recorded across all the combined survey periods (2009 – 2012).

The Environmental Statement (ES) states that the low levels of flight activity recorded from target species “reflects the generally poor habitat quality for most of the key ornithological receptors”.

CRM was conducted for hen harrier, goshawk, osprey, merlin and peregrine. The magnitude of the collision risk effect was considered to be low resulting in a minor impact in the long-term for all of these species as well as other raptors and owls. A collision risk assessment was also conducted for black grouse, golden plover, wader species, wintering/passage geese, common crossbill, woodland and moorland songbirds. The assessment found that the magnitude of the collision risk effect was

considered to be negligible resulting in a negligible impact in the long-term for all of these species.

South Kyle Pre-construction

During pre-construction raptor surveys there was a single goshawk recorded in 2018 and again in 2019, with no breeding confirmed.

Crossbills were recorded calling in the forestry blocks during the pre-construction surveys in 2019.

No other target species were recorded in this time.

South Kyle Construction

During the construction of South Kyle, which started in 2020, ongoing breeding bird checks are being undertaken by the Ecological Clerk of Works (ECow) prior to any felling or construction work taking place.

In 2020 no target species were found to be breeding on site; however, one sparrowhawk nest and three buzzard nests were located on site.

In 2021 no target species were found to be breeding on site.

South Kyle Habitat Management Area

Raptor surveys were conducted within the South Kyle Habitat Management Area (HMA) during 2021. During the survey period no target species were recorded.

8.4.3. South West Scotland Interconnector Project (SWS) EIA

The surveys for the SWS EIA concluded that there would be no significant effects considered likely on raptors, owl, wildfowl, waders and black grouse from the SWS overhead lines project.

The whole SWS route from A to C is shown in Figure 2 - Appendix 1. Part A of the route runs from Coylton substation to New Cumnock substation, to the north of the Proposed Development. Key species of note were: hen harrier, goshawk, merlin, peregrine, short-eared owl, barn owl, black grouse, whooper swan, greylag goose, pink-footed goose, greenland white-fronted goose, lapwing and curlew. Flights were recorded for all these species with only peregrine, short-eared owl, barn owl, black grouse, lapwing and curlew confirmed as breeding. Most of the records were concentrated to the north of the route approximately 5 km or more from the Proposed Development; however, the black grouse lek and breeding peregrine were recorded at Lingie Hill (approx 3 km) and Marryrs Moss (approx 4 km) to the north-west of the Proposed Development.

As shown in Figure 2 - Appendix 1, the part of the route that runs through the Proposed Development is Part B, which runs from the New Cumnock substation to the Black Hill substation at the Windy Standard Complex. The key species recorded in this section were: bean goose, hen harrier, goshawk, merlin, peregrine, barn owl, golden plover, crossbill and black grouse. From these surveys barn owl was recorded breeding within 1 km of the route and two small black grouse leks (1-2 males) were recorded at Harthorn Hill and Mossdale Burn. Winter flights of hen harrier, peregrine and goshawk were recorded in low numbers during VPs between 2006-2008. Four flights from migratory greylag goose, bean goose and golden plover were recorded in this section between 2007-2008. Common crossbill was also recorded within the plantation.

Part C of the SWS route is approximately 5 km to the east of the proposed site and runs from the Black Hill substation to the Glenglass substation approximately 8 km east of Afton Wind Farm. Key species recorded on this part of the route were: merlin, peregrine, short-eared owl, hen harrier, black grouse, greylag goose and white-fronted goose.

Breeding merlin were confirmed in 2007 and 2008 adjacent to the route as well as a second breeding pair in 2008 within 940 m of the section. Peregrine were confirmed as successfully breeding in 2007 and failed breeding in 2008.

A small population consisting of four male black grouse were confirmed to be utilising six lek sites to the west of Afton reservoir in 2007 – 2008.

During migration VPs a single flight of greylag goose and a single flight of white-fronted goose were recorded between 2007-2008. Afton reservoir and the moorland above it supported breeding curlew during 2007-2008.

A summary of residual operational effects for each part of the SWS route for collisions with the overhead lines was assessed at negligible/low in the long term for whooper swan, white-fronted goose, merlin, peregrine, black grouse, golden plover, lapwing and curlew.

8.4.4. Windy Standard Complex wind farms

The Windy Standard Complex includes Windy Standard, Windy Standard II and Windy Standard III Wind Farms.

The EIA for Windy Standard Wind Farm was completed in 1995 and due to differences in the guidance for wind development at this early stage of the industry, minimal surveys (by current standards) were undertaken at that

time. The 1995 Windy Standard EIA concluded that “both the breeding and wintering bird faunas of the site appear to be poor in species”, with peregrine being the only notable species recorded.

At Windy Standard II, the majority of the birds which were considered in the 2001 EIA were passerines. All notable species were assessed in the EIA as being at negligible risk.

Baseline VP survey work undertaken between 2009-2010 for Windy Standard III recorded a total of 40 flights of 10 species, so flight activity was very low. Key species recorded were hen harrier, red kite, osprey, goshawk and snipe. None of the recorded flights were in the collision risk zone, so no CRM was undertaken for the EIA for Windy Standard III. Black grouse lek locations were recorded during baseline surveys for Windy Standard III in 2010, but no breeding black grouse have been recorded within 1.5 km of Windy Standard Wind Farm since this date.

No greater than low magnitude non-significant effects were predicted for any ornithological feature as a result of the construction and operation of any of the Windy Standard Complex wind farms.

8.4.5. Afton Wind Farm EIA

Ornithology surveys completed at Afton Wind Farm for the EIA in 2004 recorded low numbers of target species. The breeding bird surveys recorded four curlew, three snipe and at least one common sandpiper territory. No black grouse were recorded during black grouse surveys; however, three birds were recorded within the survey area during winter visits.

Across the two years of vantage point surveys 2003-2004 key species recorded included peregrine, merlin, short-eared owl, black grouse and snow bunting. One peregrine nesting site was confirmed within 500 m of an existing access track; however, there was no evidence of the other key species breeding onsite.

CRM was undertaken for peregrine, black grouse, short-eared owl and barn owl. Barn owls were known to be breeding locally so were assumed to be using the Site for nocturnal foraging. The collision effects on all of the species were considered to be low, resulting in an impact of minor significance.

Benbrack Wind Farm EIA

Ornithology surveys completed at Benbrack Wind Farm for the EIA in 2014 recorded low numbers of target species.

No Annex 1 or Schedule 1 raptor species were identified as nesting within 2 km of the Proposed Development.

Two black grouse leks were identified of two, and one male respectively approximately 2 km and 1.4 km from the nearest proposed turbine.

Densities of breeding wader were considered low with a single curlew and two snipe territories identified within 600 m in 2013.

Very low levels of target species flight activity were recorded throughout the survey periods. Species recorded included whooper swan (two flights), pink footed and greylag goose (two flights each), hen harrier (two flights), goshawk (four flights) white-tailed eagle (one flight), hobby (two flights), merlin (one flight), peregrine (one flight) and golden plover (one flight, one calling).

CRM was undertaken for pink footed goose and goshawk only, with a predicted collision rate of 1.05 and 0.2 per annum for each species respectively. Impacts for all species were assessed as negligible or slight and not significant.

Enoch Hill Wind Farm EIA

Ornithology surveys completed at Enoch Hill Wind Farm for the EIA in 2015 recorded low numbers of target species.

Merlin and barn owl were identified as nesting within/adjacent to the raptor survey area in 2013 and 2012 respectively.

A black grouse lek was identified with peak counts of 3 lekking males and 2 females in 2014 within the site boundary. Densities of breeding wader species were considered to be low, with 3 curlew territories identified in 2013.

Low levels of target species flight activity was recorded throughout the breeding season, with moderate levels of flight activity in winter (specifically golden plover); and small flocks of golden plover and small numbers of black grouse utilising onsite habitats throughout the winter seasons.

Species recorded included whooper swan (one flight), pink footed goose (one flight) greylag goose (two flights),

barnacle goose (two flights), hen harrier (five flights), goshawk (three flights), merlin (14 flights), peregrine (two flights) and golden plover (72 flights).

CRM was undertaken for golden plover only, which identified a theoretical annual collision mortality of 4.4 individuals (80 birds over the 25-year operational life of the project).

Impacts for all species were assessed as negligible or slight and not significant.

Pencloe Wind Farm EIA

Ornithology surveys completed at Pencloe Wind Farm for the EIA in 2015 recorded low numbers of target species.

No Annex 1 or Schedule 1 raptor species were identified as nesting within 2 km of the proposed development.

Three separate individual male black grouse were observed at different locations but no females were recorded.

Densities of breeding wader were considered low with three curlew and snipe territories identified. Small numbers of golden plover and snipe were recorded in winter, with commuting gulls flying down Glen Afton to Afton Reservoir.

Due to the low number of flights, CRM was not undertaken for any species. Impacts for all species were assessed as negligible or slight and not significant.

8.4.6. Desk Study

Designated Sites

There are three statutory sites, designated fully or in part for their ornithological interest, located within 25 km of the Proposed Development. They are listed in Table 8.3 along with a summary of their cited interest and shown on Figure 4 - Appendix 1.

8.4.7. Field Surveys

Baseline ornithological surveys were completed during the breeding season 2021 (April to August)²⁴. A summary of results is provided below.

Vantage Point Surveys

Flight activity by target species was infrequently recorded with only three species identified:

- One hen harrier flight in August of a young bird passing through the site;

- One goshawk flight in April of an adult female circling over the Chair Hill and Benbrack area on the south-east of the site; and
- Six snipe flights, five in May and one in August. Flight activity was recorded on the south-west side of Peat Hill, on the north-east side of the survey area.

In addition to the target species, secondary species were recorded with a higher frequency with two species identified:

- 18 Lesser black-backed gull; and
- 14 common kestrel flights.

Breeding Bird Surveys Moorland Breeding Birds (MBBS)

During the 2021 MBBS only one wader species, snipe, was recorded. Potential breeding activity (one pair) was observed outside the site boundary concentrated around the south-west side of Peat Hill. This included flight displays and drumming.

A small flock of nine golden plover was recorded in April 2021. The birds were in summer plumage and believed to most likely be passing through site to breeding grounds further north. There was no evidence of golden plover breeding activity on site.

Breeding Raptors

During the breeding raptor surveys conducted in 2021 no evidence was observed to indicate any breeding activity by any Schedule 1 raptor or owl species within the survey area.

Whilst there are two traditional peregrine roosts present within the wider area, no evidence of breeding activity or occupancy was observed during raptor or flight activity surveys.

Common kestrel, sparrowhawk and common buzzard were observed on site and within the wider survey area. The relatively high frequency of observations suggests that these species are breeding within the Proposed Development and the wider area.

Black grouse

Initial surveys identified that the habitat suitability for black grouse was relatively poor within the area of the Proposed Development.

No evidence of the presence of black grouse was recorded during the 2021 black grouse surveys.

8.4.8. Ongoing field surveys

At present, VP surveys are being undertaken in the area. Surveys started in October 2021 and are proposed to continue until end of August 2022.

At the time of writing, no target species have been recorded.

Source: South Kyle Wind Farm EIA, Natural Power; SWS Interconnector Project EIA, Scottish Power; Windy Standard EIA, Natural Power; Windy Standard II EIA, Natural Power, Windy Standard III EIA, Natural

Table 8.1: Ornithological survey works undertaken between 1993 – 2021 at developments immediately adjacent to and surrounding the proposed South Kyle II Wind Farm (blank boxes indicate no surveys undertaken).

Survey Type	South Kyle	South Kyle HMA	South West Scotland Interconnector (SWS)	Windy Standard Complex	Afton Wind Farm	Benbrack Wind Farm	Pencloe Wind Farm	Enoch Hill Wind Farm
Baseline Development Phase (EIA)								
Vantage Point	2009-2012		2006-2008	2009, 2010	2003-2004	2011-2013	2006-2007, 2010-2011	2011-2014
Raptors	2009-2012	2021	2006-2008	2009, 2012, 2013, 2020		2011, 2013	2007, 2010	2013
Moorland Breeding Bird	2009-2012		2006-2008	1993-1994, 1994-2001, 2013	2003-2004	2011, 2013	2006, 2007	2012
Woodland Breeding Bird	2009-2012		2006-2008				2006, 2007, 2010	
Black grouse	2009, 2012		2006-2008	2009, 2010, 2020	2003	2013	2007, 2010	2012, 2013
Forest owl, woodcock and nightjar	2012						2007, 2010, 2013	
Barn Owl								2012
Non-breeding / wintering bird	2011 - 2012					2011, 2013	2007, 2010	2011-2014
Pre-construction Phase								
Breeding Raptors	2018- 2019							
Construction Phase								
Breeding raptors	2020 – present Ongoing ECoW checks for breeding raptors							
Breeding bird	2020 – present Ongoing ECoW checks for breeding birds							

Power; Afton Wind Farm EIA, Eon; South Kyle Pre-construction, Natural Power; South Kyle ECoW Reports, Natural Power.

Table 8.2: Summary of bird species presence from surrounding developments from 1993-2021 (blank boxes indicate no records of species).

Species	Development												
	South Kyle I			South West Scotland Interconnector (SWS)			Windy Standard Complex			Afton Wind Farm	Benbrack Wind Farm	Enoch Hill Wind Farm	Pencloe Wind Farm
	EIA	Pre-construction	Habitat Management Plan (HMP)	A	B	C	WS	WSII	WSIII				
White-fronted goose				Passage		Passage							
Pink-footed goose	Passage			Passage							Passage	Passage	
Bean goose				Passage	Passage								
Greylag goose	Passage			Passage	Passage	Passage		Passage	Passage		Passage	Passage	
Barnacle goose				Passage								Passage	
Goose sp. (Unidentified geese)				Passage					Passage				
Whooper swan				Passage							Passage	Passage	
Hen harrier	Present			Wintering	Wintering	Wintering		Passage	Present		Present	Present	Present
Goshawk	Present (Breeding not confirmed)	Present		Wintering					Present		Present	Present	
Osprey	Passage								Passage				
Merlin	Breeding			Present; Wintering	Breeding	Breeding			Present	Present	Present	Breeding	Present
Hobby											Present		
Peregrine	Breeding			Breeding	Wintering	Breeding	Present	Present	Present	Breeding	Present	Breeding	Present
Red Kite	Passage								Passage				
White-tailed Eagle											Passage		

Species	Development												
	South Kyle I			South West Scotland Interconnector (SWS)			Windy Standard Complex			Afton Wind Farm	Benbrack Wind Farm	Enoch Hill Wind Farm	Pencloe Wind Farm
	EIA	Pre-construction	Habitat Management Plan (HMP)	A	B	C	WS	WSII	WSIII				
Barn owl	Breeding in wider area (>3 km from site)			Breeding	Breeding	Present		Present				Breeding in wider area (>3 km from site)	
Short-eared owl							Present	Passage	Present	Present			
Black grouse	Breeding			Breeding	Breeding	Breeding	Breeding (in wider area)		Breeding	Wintering	Breeding	Breeding	Present
Oystercatcher									Present		Present	Present	
Lapwing	Breeding			Breeding									
Curlew	Breeding			Breeding		Breeding			Present	Breeding	Breeding	Present	Breeding
Common sandpiper									Breeding	Breeding	Present		
Black tailed godwits				Passage									
Whimbrel	Passage (One flight of three birds passing through site.)			Passage									
Snipe									Present	Breeding	Present	Present	Breeding
Golden plover	Wintering / Passage			Passage	Passage				Passage		Passage	Wintering	Passage
Dotterel												Passage	
Dunlin												Passage	
Snow bunting										Passage			

Species	Development												
	South Kyle I			South West Scotland Interconnector (SWS)			Windy Standard Complex			Afton Wind Farm	Benbrack Wind Farm	Enoch Hill Wind Farm	Pencloe Wind Farm
	EIA	Pre-construction	Habitat Management Plan (HMP)	A	B	C	WS	WSII	WSIII				
Common crossbill	Breeding	Present		Present	Present	Present	Present	Present	Present				Present

Source: South Kyle Wind Farm EIA, Natural Power; SWS Interconnector Project EIA, Scottish Power; Windy Standard EIA, Natural Power; Windy Standard II EIA, Natural Power, Windy Standard III EIA, Natural Power; Afton Wind Farm EIA, Eon; South Kyle Pre-construction, Natural Power; South Kyle ECoW Reports, Natural Power, Enoch Hill Wind Farm EIA Eon September 2015, Benbrack Wind Farm Eon November 2014, Pencloe Wind Farm Pencloe Wind Energy Limited March 2015.
 Breeding = breeding confirmed; Present = recorded onsite during breeding season but not confirmed breeding; Wintering = recorded onsite during non-breeding season; Passage = low number of records of species passing through site between March/April or September/October.

Table 8.3: Statutory Designated Sites with Ornithological Interest

Name	Designation	Distance from Site	Summary of Species Interest / Condition
Muirkirk and North Lowther Uplands	SPA (various SSSIs)	12.3 km north-east	This SPA supports populations of European importance of: hen harrier, short-eared owl, merlin, peregrine falcon and golden plover.
Bogton Loch	SSSI	1.3 km north north-west	The SSSI is designated for its breeding bird assemblage which includes; song thrush, grasshopper warbler, spotted flycatcher, willow tit, reed bunting and, sporadically, a small colony of black-headed gulls.
Merrick Kells	SSSI	13.4 km south-west	The SSSI is designated for its breeding bird assemblage with raptors and upland breeding birds present in low densities.

Source: MAGIC Online GIS Tool; Sitelink

8.5. Justification for Survey Approach

Due to the level of existing survey data which provides context and a good understanding of how this area is used by birds (Section 8.4), it is proposed that two seasons of breeding bird surveys and one season of non-breeding bird surveys would be sufficient to allow a robust assessment of ornithological interest within the site.

Existing baseline information has identified that the main IOFs are likely to be hen harrier, goshawk, peregrine and snipe. Historical and survey data suggests that the open habitat present on and in the area surrounding the Proposed Development is of relatively poor quality for most moorland breeding waders and for black grouse. Relatively low numbers of wader species and black grouse have been recorded in the period between 1993 and 2021.

8.6. Relevant Embedded Mitigation and Design Principles

The Proposed Development will incorporate a number of embedded mitigation measures to achieve the design objectives and avoid, prevent or minimise likely significant adverse environmental effects. At this early stage in the design process, this includes the following relevant design principles which will be incorporated into the final design of the Proposed Development:

- Key ornithological constraints will be mapped, based on the existing baseline data. This information will be used to inform the development of the detailed wind farm layout to help reduce potential impacts on sensitive ornithological receptors; for example, important flight corridors or activity areas and breeding sites of Schedule 1 bird species will be identified as a wind farm design constraint with appropriate set-back zones.
- A suitably qualified and experienced ECoW will be appointed in advance of works commencing on the site. The ECoW will oversee the implementation of the suite of measures proposed to avoid or minimise potential impacts from the construction phase on sensitive habitats and species. The ECoW will have the authority to halt works on site and help ensure

that the environmental commitments made within the EIAR are properly implemented.

- A CEMP will be developed in advance of works commencing on the site. The CEMP will detail all measures, protocols, method statements and monitoring that will be implemented to protect the environment during the works.
- A Site Restoration Plan will be prepared in outline which will set out the proposed site restoration measures following construction.
- Pre-construction surveys for breeding birds will be completed to ensure that current baseline information is available and that proposed works that have the potential to disturb such species, or destroy important habitats or nest sites proceed lawfully with respect to the legislation protecting the relevant species (e.g. ground-nesting birds, Schedule 1 raptor species).
- A Habitat Management Plan (HMP) will be provided in outline within the EIAR, and will be developed in detail prior to works commencing on the site. The HMP will include measures to improve the quality of upland habitats within to the site (or off site).
- A plan to monitor breeding birds prior to and following wind farm construction and to monitor bird collision rates during wind farm operation will be provided in the EIAR and will follow current good practice methods.

8.7. Scope of the Assessment

8.7.1. Likely Significant Effects

Having regard to the characteristics of the site, the Proposed Development, key baseline characteristics and proposed embedded mitigation measures, it is considered that the following effects require further consideration through the EIA process:

- a) Likely, adverse effects during construction, which will be considered in detail in the EIA:
 - Disturbance and displacement to key receptors (breeding and non-breeding) caused by the presence of construction workers, noise, vibration and artificial lighting during construction;
 - Loss of degradation of important supporting habitats for key receptors during construction; and
 - The potential for cumulative construction related effects with other existing and Proposed Developments.
- b) Likely adverse effects during the operational phase that will be considered in detail in the EIA:
 - Mortality from collision with turbine blades and turbine tower for key receptor species (including potential consideration of aviation warning lighting and the potential for this to increase bird collision risk);
 - Operational displacement from or disturbance to important habitats supporting key receptor populations (e.g. displacement from foraging, nesting, roosting habitats due to the presence of the wind farm including consideration of potential 'barrier effects'); and
 - The potential for cumulative operational effects with other existing and Proposed Developments.

8.7.2. Assessment Methodology

An assessment of the likely significant effects and impacts associated with the Proposed Development will be carried out in accordance with relevant and applicable legislation, policies and technical standards.

The assessment will follow a standard, systematic approach which will be informed by the best available scientific evidence and experienced professional judgement. Where there are uncertainties, reasonable

greatest extent assumptions are made to minimise the risk of effects being under-estimated. The assessment methods will follow guidance produced by NatureScot¹⁶ and the Chartered Institute of Ecology and Environmental Management (CIEEM)¹³.

The ornithological assessment will be supported by a Technical Appendix, which will provide further detail on the baseline survey results and background to some aspects of the assessment. Data from the baseline surveys, along with information from other sources (e.g. local Raptor Study Group, RSPB, British Trust for Ornithology, Scottish Ornithologists' Club) will be used to inform the evaluations of the relative importance of the Proposed Development site for key receptor species.

A confidential annex will be produced (if required) which will provide details of the locations of breeding sites of bird species at risk of human persecution (e.g. nest locations of species listed on Schedule 1 to the Wildlife & Countryside Act). These details will not be included in the publicly available EIA documents.

8.8. Consultee Questions

A collaborative design process is being adopted and comments are therefore sought at this stage from consultees regarding both the proposed scope of assessment and the optimum design of the Proposed Development within the maximum development parameters. Specifically, in responding to this Scoping Report, consultees are asked to consider the following key questions:

- *Are consultees satisfied with the coverage provided by the vantage point locations?*
- *Is the proposed scope and extent of the available and proposed baseline data considered to be sufficient to inform a reliable assessment of the potential effects of the Proposed Development?*
- *Are there any other key ornithological features that consultees believe should be considered that have not been discussed above?*
- *Do consultees consider any Natura 2000 not discussed above as requiring consideration as part of screening for Appropriate Assessment?*
- *Do consultees see value to any particular mitigation and/or enhancement measures for any local or regional species, whether referred to above or otherwise?*

Chapter 9

Ecology

South Kyle II Wind Farm



9. Ecology

9.1. Introduction

This chapter of the Scoping Report sets out the proposed approach to the assessment of potential effects on important ecological features (IEFs). IEFs are species (except birds) and habitats that are protected by legislation, are of high conservation importance or are particularly sensitive to effects. This will allow for an EIAR that focusses on features which could be significantly affected, or for which the predicted effects are currently unknown. Baseline survey work on the Proposed Development to inform the EIA is still to commence, therefore this Scoping Report is based on contextual data from a number of developments within the Carsphairn Forest area (Figure 2 - Appendix 1). This contextual data has provided robust background information on the species and habitats most likely to be present and potentially impacted by the Proposed Development.

This report also provides details on baseline ecology surveys to be undertaken, statutory sites within 10 km of the Proposed Development, along with the proposed EIA scope and assessment methods.

9.1.1. Legislation and Guidance²⁶

The proposed ecological baseline surveys and preliminary assessment presented in this Scoping Report have been carried out with reference to a number of national and international policy documents. Legislative and guidance documents with relevance to ecology are listed below.

Legislation

- EU Exit: The Habitats Regulations in Scotland;
- The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations),

which transposes the Habitats Directive into UK law;

- The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2012;
- The Conservation of Habitats and Species (Amendment) Regulations 2017, relating to reserved matters in Scotland;
- Wildlife and Countryside Act (WCA) 1981 (as amended);
- The Nature Conservation (Scotland) Act 2004;
- The Wildlife and Natural Environment (Scotland) Act 2011;
- Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, which transpose the EIA Directive into the Scottish planning system; and
- The Electricity Works, EIA Regulations.

National Policy Guidance

- Planning Advice Note (PAN) 51: Planning, Environmental Protection and Regulation²⁷;
- Planning Advice Note (PAN) 60: Planning for Natural Heritage²⁸;
- PAN 1/2013 – Environmental Impact Assessment²⁹;
- Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives: Scottish Executive Circular 6/1995 as amended³⁰; and
- Scottish Planning Policy (SPP)³¹.

Other Guidance

- Guidelines for Ecological Impact Assessment in the UK and Ireland³²;
- European Protected Species, Development Sites and the Planning System: Interim guidance for Local Authorities on licensing arrangements³³;
- British Standard 42020:2013 Biodiversity – code of practice for planning and development;

²⁶ Existing EU environmental legislation will continue to operate in UK law after 1 January 2021

²⁷ Scottish Government. (2006). PAN 51. Planning, Environmental Protection and Regulation. Scottish Government, Edinburgh.

²⁸ Scottish Government. (2000 (updated 2008)). PAN 60. Planning for Natural Heritage. Scottish Government, Edinburgh.

²⁹ Scottish Government. (2013 (updated 2017)). PAN 1/2013 – Environmental Impact Assessment. Scottish Government, Edinburgh.

³⁰ Scottish Executive. (1995 (updated 2000)). Nature Conservation: Implementation in Scotland of the Habitats

and Birds Directive. Scottish Executive, Rural Affairs Department, Edinburgh.

³¹ Scottish Government. (2014). Scottish Planning Policy (SPP). Scottish Government, Edinburgh.

³² CIEEM. (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

³³ Scottish Executive. (2001 (updated 2006)). European protected species, development sites and the planning system. Interim guidance for local authorities on licensing arrangements. Scottish Executive, Edinburgh.

- Land Use Planning System SEPA Guidance Note 4: Planning Guidance on Windfarm Developments³⁴;
- Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems³⁵;
- Good Practice during Wind Farm Construction³⁶;
- Bats and Onshore Wind Turbines (August 2021)³⁷; and
- SBL³⁸.

- Enoch Hill Wind Farm
- Pencloe Wind Farm
- Benbrack Wind Farm

9.2. Methodology

9.2.1. Contextual Data

The Proposed Development is adjacent to both South Kyle Wind Farm and South West Scotland Interconnector Project (SWS), both of which have been subject to ecological survey work and monitoring for different phases since 2010 and 2007 respectively. In addition, the Windy Standard Complex wind farms (which consists of Windy Standard, Windy Standard II and Windy Standard III Wind Farms) and Afton Wind Farm are located approximately 3.6 km and 5.6 km to the east. Enoch Hill, Pencloe and Benbrack Wind Farms are also present within the local area. The Enoch Hill Wind Farm is less than 1 km from the Proposed Development. Pencloe and Benbrack Wind Farms are located 3.5 km and 1.8 km from the Proposed Development respectively. As such, there is a considerable amount of existing ecological data for the Carsphairn Forest area around South Kyle II Wind Farm to provide context for this proposal. A summary of available data is provided in Section 9.3. Figure 2 -Appendix 1 shows the site boundaries of all relevant sites and their proximity to the Proposed Development. North Kyle and Overhill wind farms are also in close proximity to the Proposed Development. For the purposes of this Scoping Report, existing data from the below wind farms will be utilised:

- Windy Standard Complex
- Afton Wind Farm

³⁴ SEPA. (2017a). Land use Planning System Guidance Note 4: Planning guidance on windfarm developments. Appendix 2. Issue 9: 11 September 2017.

³⁵ SEPA. (2017b). Land Use Planning System Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Version 3: 11 September 2017.

³⁶ Scottish Renewables, SNH, SEPA, Forestry Commission Scotland, Historic Environment Scotland,

9.2.2. Desk Study

To assess any connectivity between ecological features recorded within the Proposed Development with populations protected on designated sites, a desk study was undertaken involving an online search using the NatureScot Sitelink²⁹ website and the online GIS tool MAGIC³⁰ (Multi-Agency Geographic Information for the Countryside).

Data was sought for the following:

- Special Areas of Conservation (SACs) – within 10 km of the Proposed Development;
- SSSIs– within 10 km of the Proposed Development; and
- Local and National Nature Reserves (including Wildlife Trust Reserves) – within 5 km of the Proposed Development.

Information on locally designated sites such as SINCs and SNCIs – within 5 km of the Proposed Development will be sought from the LPA.

Only sites with ecological interest features are assessed in this section. Any sites with birds as an interest feature are discussed in Section 8: Ornithology.

Species of Note

Before the EIAR is submitted further records of relevant ecological data shall be requested from the local environmental records centre (SWSEIC) to obtain any records they hold for South Kyle II and the surrounding area.

Data requested will be for all species of conservation interest and protected sites within the Proposed Development site boundary and a 5 km buffer, extended to 10 km for bat species.

For the purpose of this data search, these are classified as:

Marine Scotland Science, AEECoW. (2019). Good practice during windfarm construction. Version 4.

³⁷ NatureScot. (2021). Bats and onshore wind turbines: survey, assessment and mitigation. Version August 2021.

³⁸ The SBL forms a list of species and habitats of importance for biodiversity conservation in Scotland, produced by the Scottish Government.

- Habitats listed in Annex I and species listed in Annex II under the Habitats Regulations;
- Species listed under Schedules 5, 8 and 9 of the WCA^{Error! Bookmark not defined.};
- Badgers, protected by the Protection of Badgers Act³⁹; and
- Species and habitats as listed under the SBL²¹.

9.2.3. Field Surveys

Baseline ecology surveys are due to be undertaken in 2022 as described below.

Habitat Surveys

Habitat survey work proposed will include:

a) Extended Phase 1 surveys

A walkover habitat survey, following standard methodology as described in JNCC⁴⁰, of the Proposed Development including a 250 m buffer, will be undertaken. The habitats present will be mapped digitally in the field and assigned a Phase 1 habitat code. This survey will be 'extended' to record the presence of any relevant ecological receptors encountered such as protected species signs and invasive non-native species.

Figure 7 - Appendix 1 provides a map of the existing habitat data for the site as a result of surveys conducted for South Kyle Wind Farm. This figure will be used as a base map and already mapped habitats will be ground-truthed, whilst habitat codes will be assigned for areas not previously surveyed.

b) National Vegetation Classification (NVC)

In conjunction with the Phase 1 habitat survey, National Vegetation Classification (NVC) surveys will be undertaken in any areas with potential to be Groundwater Dependent Terrestrial Ecosystems (GWDTE). Following standard methodologies as described in Rowell (2006)⁴¹, the NVC habitat polygons will be mapped digitally in the field and identified to sub-community level. The surveyor will work to a minimum polygon size of 10 m², areas of habitat smaller than this will be recorded as target notes or mosaics, whichever is most appropriate. Where mosaics are recorded, target notes will include a description, which will indicate mean habitat patch sizes and integration. As far as practical,

the surveyor will avoid recording mosaics that are a mix of potential GWDTE and non-GWDTE habitats, this will aid accurate mapping of potential GWDTE habitats.

Target notes will be taken for any other notable observations e.g., habitat patches that are botanically rich, protected or invasive plant species.

Vegetation surveys will be conducted when most plant species are easily detectable (May-August 2022).

9.2.4. Species Specific Surveys

The Extended Phase 1 survey will allow further ecological surveys to be tailored. Based on contextual data, the following species are considered likely to be present:

- Bats;
- Otter;
- Water vole;
- Badger;
- Red squirrel;
- Pine marten;
- Reptiles;
- Fish; and
- Fresh water pearl mussel.

Survey methodologies are as follows.

Bats

Preliminary Roost Assessment

Structures and mature trees within the Site may provide suitable locations for roosting or hibernating bats and will require a roost assessment survey to determine their suitability and any evidence of occupation.

Surveys will follow methods set out in Collins (2016)⁴². Should evidence of bat roosts be recorded, emergence and re-entry surveys will be undertaken to count the species and number of bats involved. Preliminary roost assessments can be undertaken at any time of year, however trees are easier to assess when they have no leaves.

Surveys will be conducted in 2022.

³⁹ Protection of Badgers Act = UK Protection of Badgers Act 1992

<https://www.legislation.gov.uk/ukpga/1992/51/contents>

⁴⁰ JNCC. (2010). Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit. Joint Nature Conservation Committee, Peterborough.

⁴¹ Rodwell, J. S. (2006). National Vegetation Classification: Users' handbook. JNCC, Peterborough.

⁴² Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists. Good practice Guidelines (3rd edition). The Bat Conservation Trust, London.

Ground level bat detectors

Baseline surveys for bats for the Proposed Development are required as per guidance³⁷. Automated full spectrum static bat detectors will be deployed at 13 locations based on a layout that includes 17 turbines. Should the layout change through the design process and include fewer turbines, the deployed locations will be reduced in line with the prescribed guidance. Detectors will be sited as close as possible to the location of proposed turbines for three ten-day (minimum) periods of good weather.

Surveys are required in spring (April-May), summer (June-early August) and autumn (late August-September). The deployment of static bat detectors at height is not currently required unless there are site-specific reasons. At height detectors are not proposed in this instance.

Weather data including wind speed, temperature and rainfall will be recorded nightly during deployments.

Static detector surveys will be conducted in 2022.

Otter and Water Vole

Within the Site and immediately adjacent to its boundary, there are a number of watercourses present including Benbrack Burn, Mossdale Burn, Powkelly Burn, Linn Water and the Source of the Nith. Species specific surveys will be required to provide detailed information about the status of otter and water vole within the Proposed Development.

Surveys will follow standard methodologies^{43,44} and the survey area will encompass all suitable habitat (i.e., all watercourses and the edge of water bodies) within the site boundary plus a 200 m buffer.

Otter and water vole surveys will be conducted between June and September 2022.

Badger

Within the site boundary there are habitats present such as dense vegetation and woodland that have the potential to support badgers. Habitats will be assessed for their potential to support badgers during the extended Phase 1 habitat survey. Species specific surveys will be required to provide detailed information on the

use of the Proposed Development by this species.

Surveys will follow standard methodology^{45,46,47} and the survey area would encompass all suitable habitat within the site boundary, plus a 150 m buffer.

It is expected that the surveys will be carried out in late summer between July and September 2022.

Red Squirrel, and Pine Marten

Within the site boundary there are woodland habitats present that have the potential to support pine marten and red squirrel. Suitable habitats will be assessed and mapped during the extended Phase 1 habitat survey.

As both species are known to be present within woodland surveyed as part of nearby developments, the presence of both species will be assumed in areas of suitable habitat and species specific surveys will not be undertaken.

Incidental sightings will be recorded during other surveys.

Reptiles

Within the site boundary there are habitats present that have the potential to support reptiles. Suitable habitats will be assessed and mapped during the extended Phase 1 habitat survey.

As reptiles are known to be present, as a result of surveys undertaken for nearby developments, their presence will be assumed in areas of suitable habitat and species specific surveys will not be undertaken.

Incidental sightings will be recorded during other surveys.

9.2.5. Freshwater Surveys

Fish habitat surveys

There are watercourses present within the site boundary that have the potential to support fish. A habitat suitability survey will be undertaken to determine the potential for juvenile salmon and trout, and to identify any change in conditions which may drive changes in fish numbers. Habitat monitoring will be undertaken during the summer months, in conjunction with otter and water vole surveys,

⁴³ Chanin, P. 2003. Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers: Monitoring Series No.10. English Nature, Peterborough.

⁴⁴ Strachan, R., Moorhouse, T. & Gelling, M., (2011). The Water Vole Conservation Handbook. Third Edition, Wildlife Conservation Research Unit, University of Oxford, Abingdon.

⁴⁵ Neal, E. & Cheeseman, C. 1996. Badgers. Poyser Natural History, London

⁴⁶ Sargent, G., Morris, P. and Troughton, G. 2003. How to Find and Identify Mammals, 3rd Edition. The Mammal Society, Southampton

⁴⁷ Bang, P. & Dahlström, P. 2001. Animal Tracks and Signs. Oxford University Press, Oxford

and will comprise a walkover survey of all suitable habitat within the site boundary plus a 150 m.

Habitat monitoring will be carried out following the Hendry & Cragg-Hine method⁴⁸ for recording salmonid habitat. The method has been developed specifically for juvenile Atlantic salmonids. Habitat characteristics, including water depth, flow, quality, substrate type and size, vegetation cover and bankside structure, will be estimated and recorded within 100 m stretches. Notes will be taken regarding potential pollution sources and obstructions to migration. This data will be used to evaluate habitat quality and important features such as pools deep enough for spawning locations, shelter and food availability using guidance provided by the Scottish Fisheries Coordination Centre (SFCC)⁴⁹

Electrofishing and macro-invertebrate sampling are currently being undertaken at South Kyle Wind Farm (see Figure 6 – Appendix 1 for the existing locations of electrofishing and macro-invertebrate monitoring points for South Kyle Wind Farm). Baseline/ pre-construction surveys were conducted in 2018 and construction surveys in years 2020 and 2021 surveys. Given this level of monitoring in relevant watercourses, no specific electrofishing or macro-invertebrate surveys are proposed at this stage. Instead, discussions will be undertaken with the relevant local fisheries groups to identify whether this existing information is sufficient to present a baseline assessment for fish within the EIAR. A fish monitoring plan will be proposed to be conditioned should consent be granted.

Freshwater pearl mussel

As there has been a historic population of freshwater pearl mussel within the River Doon, an assessment for the suitability of watercourses on site to support freshwater pearl mussels will be undertaken. This will be carried out in conjunction with the fish habitat survey following standard methodology⁴⁹.

9.2.6. Survey Limitations

Whilst survey buffers are provided, access may not be fully available to the entire buffer. A figure identifying access limitations and discussion on any potential constraints as a result of this will be provided within the EIAR. Where access is not available, buffers will be surveyed visually from the closest section of site boundary where possible.

⁴⁸ SFCC, (2007). Habitat Surveys: Training Course Manual. Scottish Fisheries Co-ordination Centre, Pitlochry.

9.3. Results

9.3.1. Contextual Data

Tables 9.1 and 9.2 summarise the historical data from South Kyle, SWS, Windy Standard Complex and Afton projects adjacent to the Proposed Development.

The locations of these consented and built developments can be seen in Figure 2 -Appendix 1.

Features that have been considered in previous surveys are:

- A variety of habitats;
- Otter;
- Water vole;
- Red squirrel;
- Pine marten;
- Badger;
- Bats;
- Fish and macroinvertebrates;
- Freshwater pearl mussels;
- Great-crested newt; and
- Reptiles.

All have been found present except for freshwater pearl mussel and great-crested newt.

On all the projects that used bat transect surveys and static bat detectors, the bat activity levels have been found to be relatively low.

Key results of these surveys are provided below in Table 9.1 and bat activity levels for each site are provided in Table 9.2.

Habitat data for South Kyle and Parts A and B of SWS have been included in the results, as the Proposed Development overlaps or is adjacent to these sites. Habitat data for Part C of SWS, the Windy Standard complex and Afton Wind Farm have not been included as they are not within the site boundary or 250 m buffer.

9.3.2. Desk Study

Four designated sites were located within 5 km of the Proposed Development. Details of these sites are shown below in Table 9.3.

⁴⁹ <https://www.nature.scot/doc/freshwater-pearl-mussel-survey-protocol-use-site-specific-projects>

Table 9.1: Ecological surveys undertaken between 1993 – 2021 at developments immediately adjacent to and surrounding the proposed South Kyle II Wind Farm (blank boxes indicate no surveys undertaken).

Protected Species	South Kyle		SWS		Windy Standard Complex (Windy Standard, II and III (WS, WSII & WSIII))		Afton Wind Farm		Enoch Hill Wind Farm		Benbrack Wind Farm		Pencloe Wind Farm	
	Survey Date	Details	Survey Date	Details	Survey Date	Details	Survey Date	Details	Survey Date	Details	Survey Date	Details	Survey Date	Details
Habitats (Phase 1 & NVC)	EIA: 2012	Key habitats: EIA: coniferous plantation, coniferous recently felled woodland, marshy grassland, wet modified bog, acid dry and wet dwarf shrub heath, blanket bog and wet and dry heath/acid grassland mosaic.	July-September 2007	Key habitats Part A: coniferous plantation woodland, recently felled coniferous woodland, mixed semi-natural, broadleaf, wet dwarf shrub heathland, mire, blanket bog, improved grassland, marshy grassland. Part B: coniferous plantation woodland, recently felled coniferous woodland, dense scrub, dry and wet dwarf shrub heath, mire, blanket bog, marshy grassland, semi-improved acid and neutral grassland.	WS: August 1995 WSII: June 2000, May-June 2001. WSIII: September 2012, July-August 2015		EIA: 2003-2004	Five habitats recorded; coniferous plantation, acid grassland, marshy grassland, wet modified bog and flushes. Loss of 5 ha of modified bog as a result of turbines and infrastructure construction.	Phase 1: 2012 NVC: 2014	The habitats within the NVC survey area is dominated by mire vegetation communities, of which about 95% is blanket mire (M17 and M20) with the remainder being soligenous mire (M6 and M23). Grasslands are predominately acid grassland vegetation communities (U4, U5 and U6) with a sparse cover of neutral grassland vegetation communities (MG6 and MG9). Bracken-dominated vegetation	2011, 2013	Enoch Hill Wind Farm	2012, 2013, 2014	Most of the site is a coniferous plantation, with areas of neutral and marshy grassland. Some blanket mire and bog habitats are present.

										is rare, covering a total of approximately 5 ha (1%) of the NVC survey area.				
Bats	EIA: 2010, 2012 Construction: 2020-2021	EIA: one bat roost confirmed in a small redbrick building adjacent to the bridge crossing the Water of Deugh adjacent to Shalloch Rig. No trees with potential bat roost features identified. Transects identified four species. Five species identified from static detectors. Construction: potential bat roost located.	Bat roost potential recorded during Extended Phase 1 survey: July - September 2007 Bat Activity surveys undertaken between 29 August – 5 September 2007.	Part A: one male noctule bat recorded roosting in rot hole in mature ash tree near Bent Farm. Single male soprano pipistrelle recorded inhabiting tree near Bardarroch Farm. Part B: no evidence recorded. Part C: no evidence recorded.	WS/WSII: 1993 – 2001 WSIII: Bat roost potential: April 2012 Bat transects: April-September 2012 Static bat detectors: April – September 2012	WS/WSII: No specific protected species surveys undertaken. WSIII: no buildings or trees with potential bat roost features were identified. Transects identified very low levels of activity from three species. Static detectors indicated low levels of activity from four species.	EIA: 2003-2004	Roost assessment only, no bat roost identified	2012, 2013, 2014	No roost locations within the site boundary and activity considered to be low during transects and static detector surveys for Pipistrell, Myotis and Plecotus species. Nyctalus species activity was considered to be high.	2011, 2013	No bat roosts identified, low numbers of passes of all species	2012	No bat roosts identified, low numbers of passes of all species
Otter	EIA: 2009, 2012 Pre-construction: 2019 Construction: 2020-2021	EIA: high levels of otter activity recorded onsite with spraint, active rest sites, footprints, live sighting, potential holt and suitable habitat identified. Pre-construction: otter spraint and	July and September 2007	Part A: numerous signs recorded including spraint and footprints. All major stream and rivers likely to be utilised for foraging and shelter. Part B: numerous signs recorded	WSIII: July 2012, May 2014	WS: no specific protected species surveys undertaken. WSII: no specific protected species	EIA: 2003-2004	No evidence found within turbine area. Spraint located at edge of reservoir approximately 550 m from nearest turbine. A number of possible	2013, 2014	Potential resting sites and spraints identified in both 2013 and 2014 on various watercourses throughout	2011, 2013	Occasional signs but no holts or couches.	2013	Evidence of otter was recorded along the main watercourses with numerous couches, recent

		a rest site were identified. Construction: ongoing EcoW checks identified spraints and paths on the Powkelly and Pochriegavin burns.		including spraint, holts, couches and footprints. All major stream and rivers likely to be utilised for foraging and shelter. Potential holt located on Penniquite Burn and couches identified on Mossdale, Benbrack and Pougherygown Burns. Part C: high level of otter signs, feeding signs, rest sites, spraints and three holts identified.		surveys undertaken for EIA. WSIII: spraints and feeding signs recorded in 2014.		shelters (holts and couches).		t the site. No holts or couches recorded				tracks and spraints.
Water vole	EIA: 2009, 2012 Pre-construction: 2019 Construction: 2020-2021	EIA: One old and inactive burrow recorded. Suitable habitat identified. Pre-construction: no evidence recorded. Construction: no evidence recorded.	July-August 2007	Part A: water vole presence confirmed and burrows recorded along Taiglum burn, Black Water, and a burn approximately 0.5 km east of Macquittiston. Part B: burrows recorded along Pougherygown, Fingland and Benbrack Burns. Many waterways provide suitable habitat. Part C: three inactive burrows identified.	WSIII: July 2012, May 2014	WS/WSII: no specific protected species surveys undertaken. WSIII: incidental record of potential burrow recorded during ornithological survey in 2013. Limited habitat suitability within development boundary.	EIA: 2003-2004	No evidence recorded	2013, 2014, 2015	Two holes identified in 2013 to the north of the site boundary but no signs in 2014 or 2015.	2011, 2013	No signs	2013	Active water vole populations were recorded on the upper reaches of Sandy Syke and Glenhastel and Lochingerr och Burns.
Pine marten	EIA: 2009, 2012 Pre-construction: 2019	EIA: Live sighting and scat recorded.		No surveys undertaken.	WSIII: May 2014	WS/WSII: no specific protected species	Not considered.		No suitable habitats		No suitable habitats		No signs recorded	

	Construction: 2020-2021	Pine marten were originally identified on trail cameras used during monitoring work undertaken in January 2020. Subsequently footage of pine marten adults and kits was captured on the northern section of the site during May 2020. The footage indicated that the kits had moved out of the breeding den and were able to move away from any disturbance. No pine marten dens have been identified on the site to date.				surveys undertaken. WSIII: no evidence recorded.							
Red squirrel	EIA: 2009, 2010, 2012 Pre-construction: 2019 Construction: 2020-2021	EIA: feeding signs recorded across site, one potential drey recorded in 2009 and three dreys recorded in 2012. Pre-construction: feeding signs recorded in small numbers. Construction: feeding signs recorded in small numbers but no dreys.	August 2007	Part A: Live sighting of red squirrel recorded near Loupshough Rig. Habitat sub-optimal. Part B: large area of suitable habitat present in the vicinity of Part B. Squirrel feeding signs throughout the habitat. Part C: small number of feeding signs. Most of habitat unsuitable.	WSIII: July 2012, May 2014	WS/WSII: no specific protected species surveys undertaken. WSIII: Feeding signs recorded across the site. Incidental records of feeding signs and live red squirrel sighting.	Not considered.	No suitable habitats.	No suitable habitats.	No signs recorded.			
Badger	EIA: 2009, 2012 Pre-construction: 2019	EIA: active single entrance sett and two latrines recorded.	July 2007 – January 2008	Part A: setts, paths and hair recorded.	WSIII: July 2012, May 2014	WS/WSII: no specific protected species surveys	EIA: 2003-2004	No evidence recorded.	2013	No evidence recorded.	2011, 2013	Occasional small setts and foraging signs.	No signs recorded.

	Construction: 2020-2021	Pre-construction: no evidence recorded. Construction: badger snuffle holes recorded.		Part B: sett recorded. Part C: no evidence recorded		undertake n. WSIII: Footprint recorded during survey. Incidental records of feeding signs.							
Great-crested Newt (GCN)	EIA: 2012	EIA: waterbodies inspected during Phase 1 survey and found to be unsuitable for GCN. Ecological value of survey area for GCN is low.	April - mid June 2008	Part A: 12 waterbodies assessed using Habitat Suitability Indices ⁵⁰ (HSI), six considered to offer suitable habitat. Located in northern section of Part A with five between Belston Loch and Barlosh bridge and a further located 200 m north-east of Barlosh Bridge. No GCN or GCN eggs recorded. Part B: No suitable waterbodies identified within 500 m of Part B. Part C: No suitable waterbodies identified within 500 m of Part C.		WS/WSII: no specific protected species surveys undertaken. WSIII: no surveys undertaken.	EIA: 2003-2004	Not considered.	No suitable habitats	No suitable habitats	No suitable habitats	No suitable habitats	No suitable habitats
Fish & Macro-invertebrates	EIA: 2006, 2011	EIA: electrofishing and habitat assessment		No surveys undertaken as no in-stream		WS/WSII: no specific protected	EIA: 2003-2004	No surveys undertaken, but EIA	2014	Surveys identified juvenile	2014	Surveys identified juvenile	No surveys undertaken.

⁵⁰ Oldham, R.S, Keeble, J., Swan, M.J.S. and Jeffcote, M.2000. Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). Herpetological Journal 10: pp 143-155.

	<p>Pre-construction: 2018</p> <p>undertaken by fisheries organisations. 27 sampling sites used. Salmon, trout and invertebrates found in waterbodies across the site. From macro-invertebrate levels the waterbodies on site are moderate to high quality.</p> <p>Pre-construction: electrofishing surveys undertaken in 2018 in three fisheries trust areas. Good fish habitat recorded across the site with salmon and trout recorded on Muck Water, Mossdale and Cummock Burns.</p> <p>Construction: Electrofishing surveys, macro-invert and fish habitat surveys were undertaken in 2020 and 2021. These results are currently being used to monitor the water quality as a result of construction, but the results can also be used as a baseline and will be presented as such in the assessment.</p>		operations planned.		<p>species surveys undertaken.</p> <p>WSIII: watercourses within development area considered largely unsuitable for fish and macro-invertebrates. Good practice and mitigation to be followed to preserve suitable habitat downstream.</p>		assessment included migratory salmonid fish, brown trout and grayling. No impact identified but mitigation to prevent pollution required.		trout/salmon in lower reaches of tributaries.		trout/salmon in lower reaches of tributaries.	
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Freshwater pearl mussel	EIA: 2013	EIA: freshwater pearl mussels known to be found in the River Doon downstream of the site. Survey conducted in 2013 concluded given known distribution of remnant population in the River Doon, South Kyle would not exert any effects.	9 – 11 May 2008	<p>Part A: none recorded. Habitat mostly unsuitable with short suitable sections.</p> <p>Part B: no surveys undertaken.</p> <p>Part C: none recorded. Habitat entirely unsuitable in Afton Water, Montraw Burn and Euchan Water.</p>		<p>WS/WSII: No specific protected species surveys undertaken.</p> <p>WSIII: no surveys undertaken.</p>	Not considered.	2014	No evidence recorded.	No surveys undertaken	No surveys undertaken
Reptiles	EIA: 2009, 2010, 2012 Pre-construction: 2019	EIA: live sightings of common lizard recorded onsite. Pre-construction: no evidence recorded.	Suitable habitat noted during mammal and habitat surveys: July – September 2007.	<p>Part A: common lizard recorded at Mid Hill and Overhil.</p> <p>Part B: No incidental sightings recorded. Suitable habitat present along Part B.</p> <p>Part C: No incidental sightings recorded. Suitable habitat present along Part C.</p>	WS/WSII: 1993 - 2001	<p>WS/WSII: No specific protected species surveys undertaken. Common lizard incidental records, very scarce onsite.</p> <p>WSIII: no surveys undertaken. Incidental sightings of common lizard onsite. Suitable habitat noted in Phase 1.</p>	Not considered.	No surveys undertaken.	No surveys undertaken.	No surveys undertaken.	
Other	EIA: 2009, 2010, 2012	EIA: brown hare recorded onsite. Common frogs and toads recorded onsite.	July -August 2007	Part B: mink recorded 4 km west of Part B.	WS/WSII: 1993 - 2001	WS: No specific protected species surveys	EIA: 2003-2004	Invertebrates – habitat assessed for UKBAP butterflies.	Not Applicable.	Not Applicable..	Not Applicable

		<p>Lepidoptera and Odonata noted on an <i>ad hoc</i> basis. Orange tip butterfly, four-spotted chaser dragonfly, common hawker dragonfly and mountain bumblebee recorded.</p>				<p>undertaken. Incidental records of mountain hare, very scarce onsite.</p> <p>WSIII: common frog and toad frequently recorded onsite incidentally.</p>		<p>Suitable for pearl-bordered fritillary and Northern brown argus butterflies. Amphibians – Common frog recorded.</p>			
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Source: South Kyle Wind Farm EIA, Natural Power; SWS Interconnector Project EIA, Scottish Power; Windy Standard EIA, Natural Power; Windy Standard II EIA, Natural Power, Windy Standard III EIA, Natural Power; Afton Wind Farm EIA, Eon; South Kyle Pre-construction, Natural Power; South Kyle ECoW Reports, Natural Power.

*Windy Standard II data from pre-construction surveys as reported in WSIII EIA

Table 9.2: Bat activity levels recorded at developments immediately adjacent to and surrounding the proposed South Kyle II (blank boxes indicate no surveys undertaken).

Bat Species	Bat activity level						
	South Kyle I	SWS	Windy Standard Complex	Afton Wind Farm	Benbrack Wind Farm	Enoch Hill Wind Farm	Pencloe Wind Farm
Common pipistrelle	EIA: Identified during transect surveys and with static detectors. Activity concentrated around waterbodies.		WSIII: Very low levels of activity during transects, only one contact. Static detectors indicated low levels of activity.		Low activity in summer and autumn only.		Recorded during transects in low numbers summer and autumn only. Recorded on static detectors; low activity but 45.2% of all calls.
Soprano pipistrelle	EIA: Identified during transect surveys and with static detectors. Most commonly recorded species. Activity concentrated around waterbodies.	Part A: male soprano pipistrelle recorded roosting, assumed to be near a larger female maternity roost. Bat foraging activity level in area assumed to be high.	WSIII: Very low levels of activity during transects, six contacts. Static detectors indicated low levels of activity.		Low activity in summer and autumn only.		Recorded during transects in low numbers summer and autumn only. Recorded on static detectors; low activity but 51.5% of all calls.
<i>Pipistrelle</i> species				Considered to be likely to be present in the general area and may use the adjacent forested habitat in low densities. No evidence bats present in survey area.		Two roosts located at buildings within 2 km from the proposed development. Low activity levels during transects. Low activity levels during static surveys.	
Noctule	EIA: Identified during transect surveys. Activity concentrated around waterbodies.	Part A: male noctule recorded roosting, assumed to be near a larger female maternity roost. Bat foraging activity level in area assumed to be high.			Two passes on static detectors only.		
Leisler's bat	EIA: Identified during transect surveys and with static detectors.				Six passes on static detectors only.		Two passes on static detectors only.

	Activity concentrated around waterbodies.						
<i>Nyctalus</i> species						Low activity levels during transects. High activity levels during static surveys.	
Long-eared bats			WSIII: Static detectors indicated low levels of activity.			Low activity levels during static surveys.	
<i>Myotis</i> species (Either Daubenton's or Natterer's)	EIA: Identified during transect surveys and with static detectors. Activity concentrated around waterbodies.		WSIII: Very low levels of activity during transects, two contacts.		Low activity in summer and autumn only.	Low activity levels during static surveys.	Daubentons recorded on static detectors only.
Daubenton's Bat	EIA: Identified with static detectors. Activity concentrated around waterbodies.		WSIII: Static detectors indicated low levels of activity.				
Natterer's bat	EIA: Identified with static detectors. Activity concentrated around waterbodies.						

Source: South Kyle Wind Farm EIA, Natural Power; SWS Interconnector Project EIA, Scottish Power; Windy Standard EIA, Natural Power; Windy Standard II EIA, Natural Power, Windy Standard III EIA, Natural Power; Afton Wind Farm EIA, Eon; Enoch Hill Wind Farm EIA Eon September 2015; Benbrack Wind Farm Eon November 2014; Pencloe Wind Farm Pencloe Wind Energy Limited March 2015.

Table 9.3: Statutory Designated Sites within 5 km with Ecological Interest

Name	Designation	Distance from Site	Summary of Species Interest / Condition
Bogton Loch	SSSI	1.3 km	This SSSI comprises a freshwater loch with an extensive range of associated wetland communities and is one of only two open water transition fens in Ayrshire.
Dalmellington Moss	SSSI	1.7 km	This SSSI comprises of an area of raised bog with a lagg fen developed in the valley of the River Doon. Although modified by burning, the raised bog section remains one of the best examples of its type in East Ayrshire, with areas of gentle hummock-hollow topography which support a number of locally rare or uncommon bog plant species, notably great sundew <i>Drosera anglica</i> , bog rosemary <i>Andromeda polifolia</i> , and white beak-sedge <i>Rhynchospora alba</i> .
Ness Glen	SSSI	2.2 km	This SSSI comprises an area of upland mixed ash woodland within a narrow and steep-sided ravine, which has cut through greywackes and shales that are locally calcareous. A range of moist, shaded habitats supports a nationally-important assemblage of oceanic woodland mosses and liverworts, exhibiting a range and diversity of species that are more typical of woodlands in the West Highlands. Among the notable oceanic woodland bryophytes are the nationally scarce mosses, Irish crisp-moss <i>Trichostomum hibernicum</i> , Wulfsberg's tamarisk-moss <i>Heterocladium wulfsbergii</i> and Portuguese feather-moss <i>Platyhypnidium lusitanicum</i> . Two liverworts that occur on the site, hooked veilwort <i>Metzgeria leptoneura</i> and pale pincerwort <i>Cephalozia leucantha</i> , are provisionally classed in the GB Red List as vulnerable to extinction due to apparent declines at a national scale.
Loch Doon	SSSI	2.7 km	This SSSI supports the last 'naturally occurring' population of Arctic charr <i>Salvelinus alpinus</i> in south-west Scotland. In addition, the Loch Doon fish are now thought to be genetically distinct from other naturally occurring populations, the nearest of which are in Argyll and Cumbria.

Source: MAGIC Online GIS Tool; Sitelink.

9.4. Embedded mitigation

This section outlines any embedded mitigation and good practice measures assumed to be in place prior to undertaking the assessment.

To ensure compliance with legislation, and to follow good practice guidance and consultation recommendations, a number of standard measures will be implemented should the application be consented. The standard measures which are relevant to avoiding and reducing effects on IEFs include:

- A maximum of eight months prior to commencement of works, pre-construction ecology walkover surveys will be carried out and will include surveys for:
 - Potential bat roosts;
 - Pine marten dens;
 - Squirrel dreys;
 - Badger setts;
 - A check of all riparian habitat for signs of otter and water vole; and
 - Potential reptile and amphibian hibernacula.
- All watercourses and waterbodies will have a minimum 50 m wide protection buffer that will be avoided for wind turbine (and other structure) placement. The access track layout will be optimised to ensure the minimum number of necessary watercourse crossings.
- Refinements to mitigation, micro-siting and/or the construction programme will be made, if necessary, to take account of any updated distribution or presence of protected species, with a suitable mitigation plan adopted on a case-by-case basis.
- No development shall take place (including demolition, ground works, vegetation clearance) until a CEMP, incorporating a Construction Method Statement (CMS), has been submitted to and approved in writing by the local planning authority. The CEMP shall include the following:

- Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts during construction (may be provided as a set of method statements), including a Pollution Prevention Plan outlining measures to control pollution and a Drainage Management Plan outlining measures for management of surface and groundwater;
- The location and timing of sensitive works to avoid harm to ecological features;
- The times during construction when specialist ecologists need to be present on site to oversee works;
- Species Protection Plans (SPPs) outlining specific measures to avoid and reduce impacts on protected species, including disturbance buffers;
- Responsible persons and lines of communication; and
- The role and responsibilities on site of an ECoW or similarly competent person.

No development shall commence until the role and responsibilities and operations to be overseen by an appropriately competent ECoW have been submitted to and approved in writing, by the LPA. The ECoW will monitor and advise on potential effects on ecological features during construction in order that these effects are avoided or minimised through best practice. This includes maintaining water quality and minimising the potential for disturbance or risk of injury or death for protected species which may be using the site.

The approved CEMP shall be adhered to and implemented throughout the construction period strictly in accordance with the approved details, unless otherwise agreed in writing by the LPA.

9.5. Scope of Assessment

The assessment of the effects associated with construction, operation and decommissioning of the Proposed Development will be undertaken, including habitat loss and gain calculations associated with the development, following the completion of ecological baseline surveys in 2022.

9.5.1. Likely Significant Effects

Having regard to the characteristics of the Site and the Proposed Development, key baseline characteristics and proposed embedded mitigation measures, it is considered that the following effects require further consideration through the EIA process:

- a) Likely, adverse effects during construction, which will be considered in detail in the EIA, are as follows:
 - Disturbance and displacement to key receptors (breeding and non-breeding) caused by the presence of construction workers, noise, vibration and artificial lighting during construction;
 - Loss of degradation of important supporting habitats for key receptors during construction; and
 - The potential for cumulative construction related effects with other proposed developments.
- b) Likely adverse effects during the operational phase that will be considered in detail the EIA are as follows:
 - Mortality from collision with wind turbines for bat species;
 - Operational displacement from and disturbance to important habitats supporting key receptor populations (e.g. displacement from foraging, shelters, roosting habitats due to the presence of the wind farm); and
 - The potential for cumulative operational effects with other existing and Proposed Developments.

9.5.2. Assessment Methodology

An assessment of the likely significant effects and impacts associated with the Proposed Development will be carried out in accordance with relevant and applicable legislation, policies and technical standards.

The assessment will follow a standard, systematic approach, which will be informed by the best available scientific evidence and experienced professional judgement. Where there are uncertainties, reasonable

greatest extent assumptions are made to minimise the risk of effects being under-estimated. The assessment methods will follow guidance produced by CIEEM³³.

Presently, no baseline ecology surveys have been undertaken at the Proposed Development. As such the following lists the ecological features that shall be assessed in the EIAR:

- Habitats;
- Otter;
- Water vole;
- Bats;
- Badger;
- Pine marten;
- Red squirrel; and
- Fish/ macro-invertebrates.

During the Phase 1 survey any ponds located will be assessed for great-crested newt suitability. However, at this stage, due to the lack of ponds within the site boundary and absence of great-crested newt within the area as illustrated from the contextual data (see Section 9.3) it is proposed that more detailed great-crested newt surveys are scoped out of this assessment. Should any suitable ponds be found then additional surveys will be conducted.

The freshwater pearl mussel survey conducted in 2013 for South Kyle Wind Farm concluded that, given the known distribution of a remnant population in the River Doon, South Kyle would not exert any effects on this species. Due to the close proximity of the Proposed Development to South Kyle, it is assumed that, following initial surveys, freshwater pearl mussel will be scoped out of this assessment. Should any suitable habitat be identified then additional surveys will be conducted.

The ecological assessment will be supported by a Technical Appendix, which will provide further detail on the baseline survey results and background to some aspects of the assessment. Data from the baseline surveys, along with information from other sources (e.g. SWSEIC) will be used to inform the evaluations of the relative importance of the Proposed Development site for key receptor species.

A confidential annex will be produced (if required) which will provide details of the locations of species at risk of persecution. These details will not be included in the publicly available EIA documents.

9.6. Consultee Questions

A collaborative design process is being adopted and comments are therefore sought at this stage from consultees regarding both the proposed scope of assessment and the optimum design of the Proposed Development within the maximum development parameters. Specifically, in responding to this Scoping Report, consultees are asked to consider the following key questions:

- *Is the proposed scope and extent of the available and proposed baseline data considered to be sufficient to inform a reliable assessment of the potential effects of the Proposed Development?*
- *Are there any other key ecological features that consultees believe should be considered that have not been discussed above?*
- *Do consultees consider any Natura 2000 not discussed above as requiring consideration as part of screening for Appropriate Assessment?*
- *Do consultees see value to any particular mitigation and/or enhancement measures for any local or regional species, whether referred to above or otherwise?*

Chapter 10

Hydrology, Geology and Hydrogeology

South Kyle II Wind Farm



10. Hydrology, Geology and Hydrogeology

10.1. Introduction

As part of the EIAR, a Hydrological, Geological and Hydrogeological Impact Assessment will be undertaken on those receptors that are likely to experience a significant impact from the construction, operation, and decommissioning of the Proposed Development.

10.2. Embedded Mitigation and Layout Iterations

The design of the Proposed Development to date has avoided known impacts on hydrological receptors as far as possible, through embedded mitigation. Throughout the remainder of the EIAR process and following further survey work and feedback from the consultation process, it may be that the layout presented here in the Scoping Report evolves. Should the layout change from now to submission, it should be noted that the layout presented within this Scoping Report represents a 'greatest extent scenario' and generally any amendments to the design will not increase the likelihood of a significant impact. Should any changes that are likely to have a significant impact on the receptor occur then these will be included within the EIAR. If the changes are not likely to have a significant impact, where possible, these changes will be discussed with the relevant consultees to ensure that they too are in agreement with the Applicant's understanding before excluding them from the EIAR.

Chapter 6 contains further general information about embedded mitigation.

10.2.1. Mitigation by Design

A series of buffer distances have been adopted to help reduce effects of the Proposed Development on the hydrological environment. As the design process evolves, a 50 m buffer will be ensured for all identified natural mapped hydrological features. Infrastructure will be located out with this buffer except where access necessitates.

Watercourse crossings associated with the new access track required as part of the Proposed Development will be minimised as far as practicable.

10.2.2. Good Practice Mitigation

Mitigation will follow the well-established principles of industry good practice so as to prevent or minimise effects on the surface and groundwater environment. The following principles will be included as part of the good practice mitigation:

- Drainage – all runoff derived from works associated with the Proposed Development will not be allowed to directly enter the natural drainage network. All runoff will be adequately treated via a suitably designed drainage scheme with appropriate sediment and pollution management measures. The Proposed Development is situated in an upland hydrological area, and it is imperative that the drainage infrastructure is designed to accommodate storm flows based on a 1-in-200 year event plus climate change to help maintain the existing hydrological regime.
- Storage – all soil/peat stockpiles as well as equipment, materials and chemicals will be stored well away from any watercourses. Chemical, fuel, and oil stores will be sited on impervious bases with a secured bund.
- Vehicles and refuelling – standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable, refuelling of vehicles and machinery will be carried out in designated areas, on an impermeable surface, and well away from any watercourse.
- Maintenance – only emergency maintenance to construction plant will be carried out within the Planning Application Boundary, in designated areas, on an impermeable surface well away from any watercourse or drainage, unless vehicles have broken down necessitating maintenance at the point of breakdown, where special precautions will be taken.
- Welfare facilities – on-site welfare facilities will be adequately designed and maintained to ensure all sewage is disposed of appropriately. This may take the form of a soakaway or tankering and off-site disposal depending on the suitability of the site for a soakaway and only with prior agreement with the Scottish Environment Protection Agency (SEPA).
- Cement and concrete – fresh concrete and cement are alkaline and corrosive and can be lethal to aquatic life. The use of wet concrete in and around watercourses will be avoided and elsewhere carefully controlled.
- Monitoring Plan – all activities undertaken as part of the Proposed Development will be

monitored throughout the construction phase. Such monitoring will be to ensure environmental compliance.

- Contingency plans – plans will ensure that emergency equipment is available on site i.e., spill kits and absorbent materials, advice on action to be taken and who should be informed in the event of a pollution incident.
- Training – All relevant staff personnel will be trained in both normal operating and emergency procedures and will be made aware of highly sensitive areas on site.

Further details on specific mitigation requirements will be provided as part of the EIAR. This is likely to include the preparation of a site-specific CEMP as well as associated appendices, including but not limited to, a peat slide risk assessment, a peat management plan, a watercourse crossing assessment and hydrological monitoring plan. Under the Water Environment (Miscellaneous) (Scotland) Regulations 2017, amendments were made to the Controlled Activities Regulations (CAR) and the Proposed Development will require a construction runoff permit for water management across the entirety of the wind farm site prior to any construction works taking place, including enabling works. No work will be able to commence on site until a permit has been obtained.

10.3. Legislation and Guidance

10.3.1. International Legislation and Policy

The assessment takes into account the requirements of the Water Framework Directive (2000/60/EC) (WFD). The WFD aims to protect and enhance the quality of surface freshwater (including lakes, rivers, and streams), groundwater, GWDTE, estuaries and coastal waters. The key objectives of the WFD relevant to this assessment are:

- To prevent deterioration and enhance aquatic ecosystems; and
- To establish a framework of protection of surface freshwater and groundwater.

The WFD resulted in The Water Environment and Water Services (Scotland) Act 2003, which gave Scottish Ministers powers to introduce regulatory controls over water activities to protect, improve and promote sustainable use of Scotland's water environment. These regulatory controls, in the form of The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) or CAR, made it an

offence to undertake the following activities without a CAR authorisation:

- Discharges to all wetlands, surface waters and groundwaters;
- Disposal to land;
- Abstractions from all wetlands, surface waters and groundwaters;
- Impoundments (dams and weirs) of rivers, lochs, wetlands; and
- Engineering works in inland waters and wetlands.

10.3.2. National & Regional Legislation and Policy

The assessment takes into account the following legislation and policy:

- The Water Environment and Water Services (Scotland) Act 2003;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended);
- Flood Risk Management (Scotland) Act 2009;
- The Water Supply (Water Quality) (Scotland) Regulations 2001;
- Private Water Supplies (Scotland) Regulations 2006;
- Part IIa of the Environment Protection Act 1990;
- Waste Management Licensing (Scotland) amendment Regulations 2016;
- Pollution Prevention and Control Regulations (Scotland 2012);
- Electricity Works, EIA Regulations;
- Scottish Planning Policy (2014);
- Land Use Planning System (LUPS) Guidance Note 4: Planning Guidance on Onshore Windfarm Developments;
- LUPS Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems; and
- SEPA Policies:
 - No. 19 Groundwater Protection Policy for Scotland;
 - No. 22 Flood Risk Assessment Strategy;
 - No. 41 Development at Risk of Flooding: Advice and Consultation;
 - No. 54 Land Protection Policy; and
 - No. 61 Control of Priority & Dangerous Substances & Specific Pollutants in the Water Environment.

10.3.3. Other Guidance and Good Practice

Table 10.1 lists other key guidance and best practice documentation relevant to assessment.

TOPIC	SOURCE OF INFORMATION
Scottish Government Planning Advice Notes (PAN's)	PAN 50: Controlling the Environmental Effects of Surface Mineral Workings PAN 51: Planning, Environmental Protection and Regulation PAN 1/2013: Environmental Impact Assessment PAN 61: Planning and Sustainable Urban Drainage Systems PAN 79: Water and Drainage
SEPA Guidance for Pollution Prevention (GPP's) and Pollution Prevention Guidelines (PPG's)	GPP 1: Understanding your environmental responsibilities – good environmental practices GPP 2: Above ground oil storage tanks GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer GPP 5: Works and maintenance in or near water PPG 6: Working at construction and demolition sites PPG 7: Safe storage - The safe operation of refuelling facilities GPP 8: Safe storage and disposal of used oils. GPP 13: Vehicle washing and cleaning GPP 21: Pollution incident response planning GPP 22: Dealing with spills GPP 26: Safe storage - drums and intermediate bulk containers
SEPA Position Statements (Published)	WAT-PS-06-02: Culverting of Watercourses WAT-PS-07-02: Bank Protection WAT-SG-78: Sediment Management Authorisation
Construction Industry Research and Information Association (CIRIA)	CIRIA C692 Environmental good practice on site (third edition) CIRIA C753 The SuDS Manual CIRIA C532 Control of water pollution from construction sites CIRIA C648 Control of water pollution from linear construction projects CIRIA C786 Culvert, screen and outfall manual

Other Guidelines	Scottish Renewables Joint Publication, (2019) Good Practice During Wind Farm Construction Version 4 FCE, SNH, (2010), Floating Roads on Peat Scottish Renewables, Joint Publication (2012), Development of Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste SEPA, The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended), A Practical Guide, Version 8.5, July 2021 River Crossings and Migratory Fish: Design Guidance, A Consultation Paper, The Scottish Executive WAT-SG-23: SEPA (2008), Engineering in the Water Environment, Good Practice Guide - Bank Protection Rivers and Lochs, First Edition WAT-SG-25: SEPA (2010), Engineering in the Water Environment: Good Practice Guide, River Crossings, Second Edition WAT-SG-26: SEPA (2010), Engineering in the Water Environment, Good Practice Guide, Sediment Management, First Edition WAT-SG-31: SEPA, (2006) Special Requirements for Civil Engineering Contracts for the Prevention of Pollution, Version 2
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Table 10.1: Guidance and Best Practice

10.4. Desk Based Studies

The following sections summarises the work that has been undertaken to inform the details presented in this Scoping Report.

10.4.1. Surface Water Hydrology

The general position of the Proposed Development means that the Site is situated across the upper reaches of three hydrological networks: the Muck Water, the Water of Deugh and the River Nith. The Muck Water is part of the main River Doon catchment, the Water of Deugh is part of the main Water of Ken and River Dee catchments and the River Nith is its own main catchment. There are nine named burns which supply these networks situated in and around the Proposed Development area (Benbrack Burn, Knockenlee Burn, Linn Water, Mossdale Burn, Peddinnan Burn, Pochriegavin Burn, Polmath Burn, Powkelly Burn and Prickeny Burn).

According to the National River Flow Archive⁵¹ the nearest river gauging station to the Proposed Development is situated in the River Nith at Halls Bridge (NS684129). A review of the long-term flow archive for this gauging station (1959-2019) indicates a mean annual flow of 5.72 m³ s and a Q10 flow of 15.7 m³ s. Flow is generally highest during the winter months between November and February. Flow within the watercourses on the Proposed Development would be considered in more detail within the EIAR to ensure the appropriate design of drainage and watercourse crossings.

Catchment descriptions were also obtained for this catchment from the River Flow Archive and includes the Proposed Development. The Standard Annual Average Rainfall (SAAR) is the average rainfall and for the Proposed Development ranges from 1641 mm per year to 1765 mm per year. The base flow index (BFI) is a measure of the proportion of a catchment's long-term runoff that derives from stored sources, with the BFI ranging from 0.10 in relatively impermeable clay catchments to 0.99 in highly permeable catchments. The BFI for the site catchments indicates that around a third of the catchments long-term runoff is derived from stored sources. The standard percentage runoff (SPR) values represent the percentage of rainfall that is likely to contribute to runoff. The SPR for the site catchments indicates that around a half of the rainfall during an event contributes to runoff.

10.4.2. River Doon Catchments

The main Clawfin Hill catchments of the Linn Water (downstream named the Cummock Burn/Water) and the Mossdale Burn drain predominantly eastwards to the Muck Water and then into the River Doon. The Benbrack Burn, which drains the west side of Benbrack also flows into the Mossdale Burn on its route to the River Doon. The River Doon flows north-west eventually reaching the coast at Ayr.

10.4.3. River Dee Catchments

The catchment of Pochriegavin Burn is located to the south of Benbrack and Prickeny Hill. The Prickeny Burn drains the east side of Prickeny Hill southwards down the Water of Deugh and through Kendoon Loch becoming the Water of Ken. The Water of Ken flows through Carsfad Loch and Earlstoun Loch before entering Loch Ken and into the River Dee which reaches the coast at Kirkcudbright.

10.4.4. River Nith Catchments

The Source of the Nith is situated within the Proposed Development site, with the River Nith draining north within the site boundary and encompassing the Knockenlee Burn, Peddinnan Burn, Polmath Burn and Powkelly Burn catchments. These catchments drain the north of Prickeny Hill, north-east of Benbrack, Barbeys Hill, Meikle Hill and Maneight Hill. The River Nith flows east to Sanquhar before turning south and reaching the coast at Dumfries.

10.4.5. Water Quality

Several watercourses within the vicinity of the Proposed Development have been classified under SEPA's River Basin Management Plans (RBMP) (SEPA 2011). The RBMPs are one of the requirements of the Water Framework Directive (WFD) (2000/60/EC) and are the plans designed for protecting and improving the water environment. The details of the overall condition of watercourses within and around the Proposed Development that are classified under the RBMP classification scheme are provided in Table 10.3.

⁵¹ National River Flow Archive. Nith – Halls Bridge. Available at

<https://nrfa.ceh.ac.uk/data/station/meanflow/79003> (accessed 03/12/2021)

Designation	Watercourse name	Qualifying features	Distance to site boundary
Good	Cummock Water	N/A	Within Site Boundary
Poor	Muck Water	Barrier to fish migration	0 m
Poor	Pochriegavin Burn	Barrier to fish migration – Hydro-electric	0 m
Moderate	River Nith (u/s New Cumnock)	Modification to bed, banks and shores	0 m
Poor	Water of Deugh (u/s Carsphairn Lane)	Heavily modified – Hydro-electric	1.5 km
Good	River Doon (d/s Muck Water)	N/A	3 km

Table 10.3: RBMP classification of watercourses in the vicinity of the Proposed Development

10.4.6. Designated Areas

There are six designated SSSI within 5 km (Benbeoch, Bogton Loch, Dalmellington Moss, Dunaskin Glen, Loch Doon and Ness Glen) and a further one SSSI within 7 km of the Proposed Development’s site boundary (Nith Bridge).

There are no other designated sites within 10 km of the site.

10.4.7. Flood Risk

The Flood Risk Management (Scotland) Act 2009 sets in place a statutory framework for delivering a sustainable and risk-based approach to managing flooding.

Flood information provided by SEPA indicates that within the Proposed Development area there is a risk from flooding in the Cummock Burn/Linn Water, Mossdale Burn, Pochriegavin Burn and River Nith catchments (less than 1:10 chance of flooding each year). This risk is mainly associated with fluvial flooding and appears to be most significant on areas of level ground in the riparian zones. There is also a risk of surface water flooding in some localised channels and level areas of bog across the Proposed Development site.

A flood risk assessment will be undertaken as part of the planning application. The assessment will be carried out

in accordance with SPP. The document states that *“Planning authorities must take the probability of flooding from all sources – (coastal, fluvial (watercourse), pluvial (surface water), groundwater, sewers and blocked culverts) and the risks involved into account when preparing development plans and determining planning applications.”*

10.4.8. Soils and Peat

Peat is a soft to very soft, highly compressible, highly porous organic material that can consist of up to 90 – 95% water, with 5 – 10% solid material. Unmodified peat consists of two layers; a surface acrotelm which is usually 10 cm – 30 cm thick, highly permeable and receptive to rainfall. Decomposition of organic matter within the acrotelm occurs aerobically and rapidly. The acrotelm generally has a high proportion of fibrous material and often forms a crust in dry conditions.

A second layer, or catotelm, lies beneath the acrotelm and forms a stable colloidal substance which is generally impermeable. As a result, the catotelm usually remains saturated with little groundwater flow. Peat is thixotropic, meaning that the viscosity of the material decreases when stress is applied. The thixotropic nature of peat may be considered less important where the peat has been modified through artificial drainage or natural erosion and is drier but will be significant when the peat body is saturated.

The distribution of soils across the site is dependent upon land use, geology, topography and hydrological regime of the area. Information on site soils has been provided by the James Hutton Institute, specifically from its online Soil Information for Scottish Soils (SIFSS) portal.

Soil Association	Parent Material	Component Soils
BLAIR	Drift derived from greywackes, Old Red Sandstone lavas, sandstones and felsites	Noncalcareous gleys
CRAIGDALE	Drifts derived from greywackes, shales and basic lavas	Noncalcareous gleys with peaty gleys
DARLEITH	Drifts derived from basaltic rocks	Noncalcareous gleys
ETTRICK	Drifts derived from Lower Palaeozoic	Noncalcareous gleys

	greywackes and shales	
HINDSWARD	Drifts derived from Carboniferous sediments and basic igneous rocks	Peaty gleys with dystrophic blanket peat
KNOCKSKAE	Drifts derived from felsites and allied igneous rocks	Humus-iron podzols
ORGANIC SOILS	Organic deposits	Dystrophic blanket peat

Table 10.5: Summary of Soil Types

The above soils information indicates that peat is present in the area occupied by the Proposed Development. Some peat probing has been undertaken on site to date however, further site survey work would be needed to confirm the presence and depth of peat on site. The completion of such works will support the completion of the EIAR and associated technical appendices, including a peat management plan and peat side risk assessment.

10.4.9. Bedrock Geology

According to the 1:50,000 scale British Geological Survey (BGS) Solid Bedrock Geology Sheet the Proposed Development site is split in two from south-west to north-east by the Southern Upland Fault, a major fault which transects from the west coast to the east coast of Scotland. To the south-east of the fault the Site is underlain by the Marchburn Formation (approximately 1300 m thick wacke unit), and a small section of the Tappins Group (mudstone and chert). To the north-west of the fault the Site is predominantly underlain by the Carrick Volcanic Formation (approximately 600 m thick basalt and basaltic andesite unit), which is associated with the Old Red Sandstone. To the west of Clawfin Hill, the bedrock comprises the Lanark Group (sandstones and conglomerates, also known as the Old Red Sandstone). The Dalmellington Fault, a more localised fault, runs south-west to north-east just inside the northern boundary of the proposed site, separating the Carrick Volcanic Formation and Lanark Group from the Carboniferous Coal Measures which lie just within the site boundary. A number of intrusive igneous rocks can be found across the Site, the most significant of which are the Southern Midland Valley Felsite Sills, again associated with the Old Red Sandstone, as well as Carboniferous – Permian dolerites, and Siluro-Devonian and Paleogene dykes.

There are no apparent registered geologically derived SSSI within the site boundary or within a 500 m buffer.

10.4.10. Superficial Geology

According to the 1:50,000 scale BGS Superficial Drift Sheet a substantial proportion of the solid bedrock is likely to be overlain by an assemblage of Quaternary glacial till deposits. Peat is the other dominant superficial deposit overlying the proposed site, mostly encompassing the areas of relatively level high ground. There are also areas of alluvium deposits within some of the valleys, as well as the occasional glaciofluvial deposit. It is anticipated the general succession of facies is likely to be a layer of peat underlain by glacially derived sands and gravels, which may also have a clay matrix.

10.1. Hydrogeology

According to the 1:625,000 scale BGS Hydrogeology Sheet the Site is predominantly underlain by the low productivity aquifers with limited resource potential of the Tappins Group (south-east of the Southern Upland Fault) and the extrusive and intrusive volcanic rocks described above (north-west of the Southern Upland Fault), however the extrusive volcanic rocks do host the occasional spring that produces a yield of up to 2 litres per second (l/s). There are two relatively small areas within the proposed site boundary which are classified as moderately productive aquifers: the Lanark Group and the Coal Measures. The Lanark group produces up to 12 l/s locally and lies within the South Ayrshire Hills aquifer which is designated to be in ‘good’ condition. The coal measures can produce high yields, however they are of poor quality due to historic mining activity, and as such are designated within the Cumnock aquifer by SEPA as being in ‘poor’ condition, although still lie within a groundwater Drinking Water Protected Area (DWPA). Scottish Water will be asked to confirm the presence of any public water supplies within the site boundary or with potential hydrological connectivity to the site

Where there is low porosity of the underlying bedrock, it is possible that groundwater may exist within the weathered zone in fractures, or in superficial sands and gravel deposits. The volume of water corresponding to the aquifer transmissivity will be a primary function of the effective porosity derived from the content of clays and silts. Since most of these deposits are mapped around watercourses it is likely these locations may well support perched aquifers, supplying baseflow to some of the catchments. These may also support species and be considered as GWDTE, which again will require further assessment during the completion of the EIAR.

Chapter 11

Noise

South Kyle II Wind Farm



11.1. Noise

11.1.1. Introduction

Noise will be emitted as a result of the Proposed Development during the construction, operation and decommissioning phases. This section provides a summary of the noise effects anticipated at each stage of the development and, where appropriate, details of the proposed assessment work.

11.1.2. Study Area

The Site is located within a rural location. There are a number of scattered residential properties around the Site with the closest property located approximately 2 km from the proposed turbines (based on the current draft layout).

There are a number of operational or consented wind farm developments surrounding the Proposed Development and they lie to the east and north of the Proposed Development.

11.1.3. Assessment Methodology

Construction Noise

A construction noise assessment will be undertaken in accordance with BS5228-1: 2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Noise'.

Operational Noise

The Scottish Government's Planning Advice Note PAN1/2011 'Planning and Noise'⁵² refers to the 'Onshore Wind Turbines' web-based document which in turn states that ETSU-R-97 'The Assessment and Rating of Noise from Windfarms'⁵³ should be used by Planning Authorities 'to assess and rate noise from wind energy developments until such time that an update is available.' The web-based document also refers to the Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise'⁵⁴ Institute of Accountics Good Practice Guide (IOA GPG) as a source, which provides:

'Significant support on technical issues to all users of the ETSU-R-97 method for rating and assessing wind turbine noise, and should be used by all IOA members and those undertaking assessments to ETSU-R-97. The Scottish Government accepts that the guide represents current industry good practice.'

⁵² Scottish Government, Planning Advice Note PAN 1/2011: 'Planning and Noise'

⁵³ ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms' (ETSU-R-97)

ETSU-R-97 details a methodology for establishing noise limits for proposed wind farm developments and these limits should not be exceeded. ETSU-R-97 states that noise limits should be set relative to existing background noise levels at the nearest receptors and that these limits should reflect the variation in both turbine source noise and background noise with wind speed. Separate noise limits apply for quiet daytime and for night-time periods. Quiet daytime limits are chosen to protect a property's external amenity, and night-time limits are chosen to prevent sleep disturbance indoors, with windows open.

ETSU-R-97 recommends that wind farm noise for the quiet daytime periods should be limited to 5 dB(A) above the prevailing background or a fixed minimum level within the range 35 - 40 dB $L_{A90,10min}$, whichever is the higher. The precise choice of criterion level within the range 35 - 40 dB(A) depends on a number of factors, including the number of dwellings in the neighbourhood of the wind farm (relatively few dwellings suggest a figure towards the upper end), the effect of noise limits on the number of kWh generated (larger sites tend to suggest a higher figure) and the duration and level of exposure to any noise. These factors will be taken into account with justification for deriving suitable noise limits included in the noise assessment.

An exception to the setting of both the quiet daytime and night-time fixed minimum limit occurs where a property occupier has a financial involvement with the Proposed Development. In that case the fixed minimum limit can be increased to 45 dB $L_{A90,10min}$ or the prevailing background noise L_{A90} plus 5 dB, whichever is the greater for both the quiet daytime and night-time periods.

A background noise survey may not be required for situations where predicted wind turbine noise levels at the nearest noise sensitive properties is limited to an $L_{A90,10min}$ of 35dB(A) up to wind speeds of 10 m/s at 10 m, as the protection of the amenity of those properties can be controlled through a simplified noise condition as detailed in ETSU-R-97. ETSU-R-97 states that:

'For single turbines or wind farms with very large separation distances between the turbines and the nearest properties, a simplified noise condition may be suitable. If the noise is limited to an $L_{A90,10min}$ of 35dB(A) up to wind speeds of 10m/s at 10m height, then this condition alone would offer sufficient protection of

⁵⁴ Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (2013)

amenity, and background noise surveys would be unnecessary.'

The noise assessment for the Proposed Development will be undertaken in three stages:

- Determine the 'Total ETSU-R-97 Noise Limits' which are applicable to the operation of all schemes in the area;
- Undertake a cumulative assessment to determine whether predictions from all cumulative schemes meet the 'Total ETSU-R-97 Noise Limits'; and
- Derive a set of Site Specific Noise Limits (for the Proposed Development) and undertake predictions to determine whether the Proposed Development can operate within the Site Specific Noise Limits.

Given the proximity of other consented schemes in the area and the fact that background noise monitoring has already been undertaken at a number of the closest properties, a review will be undertaken of the previously collected datasets to determine whether additional noise monitoring will be required.

Given the existing noise limits allocated to other schemes in the area, it is proposed that the 'Total ETSU-R-97 Noise Limits' for the assessment will be based on a 40 dB noise limit during the daytime period and a 43 dB noise limit during the night-time period.

The guidance contained in the IOA GPG will be used to establish suitable Site Specific Noise Limits which fully take account of the proportion of the Total ETSU-R-97 Noise Limits which has been allocated too, and can realistically be used by, existing operational and consented wind farms in the area.

Detailed consultation will be undertaken with the Council's Environmental Health Department to agree the overall assessment methodology.

The noise assessment will include predictions of likely wind turbine noise levels across a range of wind speeds to demonstrate compliance with the Total ETSU-R-97 and Site Specific Noise Limits. A cumulative noise

⁵⁵ Hayes McKenzie (2006). 'The measurement of low frequency noise at three UK windfarms', Hayes Mckenzie, The Department for Trade and Industry, URN 06/1412, 2006.

⁵⁶ Environment Protection Authority (2013). 'Infrasound levels near windfarms and in other environments'. Available Online At:

assessment will also be undertaken in order to consider the consented, operational and proposed wind farms within the vicinity of the Proposed Development. The assessment will be undertaken in accordance with ETSU-R-97 and the IOA GPG.

11.1.4. Discussion

Matters to be Scoped Out

Vibration

Given the nature of construction activities proposed and the relative distances from residential receptors, the risk of ground borne vibration impacting on residential receptors is considered very low, as such it is not proposed that a vibration assessment be undertaken and that a vibration assessment is thus scoped out.

Low-Frequency Noise

A study⁵⁵, published in 2006 by acoustic consultants Hayes McKenzie on the behalf of the Department of Trade and Industry (DTI), investigated low frequency noise from wind farms. This study concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines.

In February 2013, the Environmental Protection Authority of South Australia published the results of a study into infrasound levels near wind farms⁵⁶. This study measured infrasound levels at urban locations and rural locations with wind turbines close by, and rural locations with no wind turbines in the vicinity. It found that infrasound levels near wind farms are comparable to levels away from wind farms in both urban and rural locations. Infrasound levels were also measured during organised shutdowns of the windfarms; the results showed that there was no noticeable difference in infrasound levels whether the turbines were active or inactive.

Bowdler et al., (2009)⁵⁷ concluded that:

"...there is no robust evidence that low frequency noise (including 'infrasound') or ground-borne vibration from wind farms generally has adverse effects on wind farm neighbours".

http://www.epa.sa.gov.au/xstd_files/Noise/Report/infrasond.pdf

⁵⁷ Bowdler et al (2009). 'Prediction and Assessment of Wind Turbine Noise: Agreement about relevant factors for noise assessment from wind energy projects'. Acoustics Bulletin, Vol 34 No2 March/April 2009, Institute of Acoustics.

More recently during a planning Appeal (PPA-310-2028, Clydeport Hunterston Terminal Facility, approximately 2.5 km south-west of Fairlie, 9 January 2018), the health impacts related to low frequency noise associated with wind turbines were considered at length by the appointed Reporter (Mr M. Croft). The Reporter considered evidence from Health Protection Scotland and the National Health Service. In addition, he also considered low frequency noise surveys undertaken by the Appellant and the local authority both of which demonstrated compliance with planning conditions and did not identify any problems attributable to the turbine operations; some periods with highest levels of low frequency noise were recorded when the turbines were not operating.

The Reporter concluded that:

- The literature reviews by bodies with very significant responsibilities for the health of local people found insufficient evidence to confirm a causal relationship between wind turbine noise and the type of health complaints cited by some local residents.
- The NHS's assessment is that concerns about health impact are not supported by good quality research.
- Although given the opportunity, the Community Council failed to provide evidence that can properly be set against the general tenor of the scientific evidence.

It is therefore not considered necessary to carry out specific assessments of low frequency noise and that it should be scoped out.

Amplitude Modulation

In its simplest form, Amplitude Modulation (AM), by definition, is the regular variation in noise level of a given noise source. This variation (the modulation) occurs at a specific frequency, which, in the case of wind turbines, is defined by the rotational speed of the blades, i.e., it occurs at the rate at which the blades pass a fixed point (e.g. the tower), known as the Blade Passing Frequency.

A study⁵⁸ was carried out in 2007 on behalf of the Department for Business, Enterprise and Regulatory Reform (BERR) by the University of Salford, which investigated the incidence of noise complaints associated with wind farms and whether these were associated with AM. The study defined AM as aerodynamic noise from wind turbines with a greater degree of fluctuation than normal at Blade Passing Frequency. Its aims were to ascertain the prevalence of AM on UK wind farm sites, to try to gain a better understanding of the likely causes, and to establish whether further research into AM is required.

The study concluded that AM had occurred at only a small number (4 of 133) of wind farms in the UK, and only for between 7% and 15% of the time. It also stated that, the causes of AM are not well understood, and that prediction of the effect was not currently possible.

This research was updated in 2013 by an in-depth study undertaken by Renewable UK⁵⁹, which identified that many of the previously suggested causes of AM have little or no association to the occurrence of AM in practice. The generation of AM is based upon the interaction of a number of factors, the combination and contributions of which are unique to each site. With the current state of knowledge, it is not possible to predict whether any particular site is more or less likely to give rise to AM, and the incidence of AM occurring at any particular site remains low, as identified in the University of Salford study. The report includes a sample planning condition to address AM, however that has not yet been validated or endorsed by UK Government.

In 2016, the IOA proposed a measurement technique to quantify the level of AM present in any particular sample of windfarm noise⁶⁰. In August 2016 a report written by WSP/Parsons Brinkerhoff was published by the Department of Business, Energy & Industrial Strategy (BEIS, formerly The Department of Energy & Climate Change)⁶¹. The report sought to build on the conclusions of the IOA study to define a suitable assessment method for AM, including a penalty scheme and an outline planning condition.

In November 2017, an article entitled 'A planning condition for wind farms' was published in Vol 42 No 6 of

⁵⁸ University of Salford (2007). 'Research into aerodynamic modulation of wind turbine noise'. Report by University of Salford, The Department for Business, Enterprise and Regulatory Reform, URN 07/1235, July 2007.

⁵⁹ Renewable UK (2013). 'Wind Turbine Amplitude Modulation: Research to improve understanding as to its Cause and effects', Renewable UK, 2013.

⁶⁰ Institute of Acoustics, (2016) A Method for Rating Amplitude Modulation in Wind Turbine Noise

⁶¹ BEIS, (2016), Review of the evidence on the response to amplitude modulation from wind turbines

the Acoustics Bulletin magazine. The article was written collaboratively by a number of noise consultants and suggested a noise planning condition, which included consideration of AM. The authors noted in the article that:

‘Whilst local authorities and developers have waited for a planning condition that could be applied to newly consented wind farms, or to those already consented but with a suspensive condition, the report Wind Turbine AM Review (WTAMR) by WSP/Parsons Brinckerhoff for DECC arguably did not provide that. In addition, there have been a number of comments on WTAMR that we consider should be addressed.’

The article then went on to propose a draft condition but noted that:

‘This approach is proposed based on the current state of understanding but may be subject to modification in light of new research and further robust information.’ And *‘As various people before us have discovered, the derivation of a penalty is not easy. There is not sufficient reliable research to be confident that a penalty system would always provide a fair indication of the impact of AM.’*

At the time of writing there has been no official response to those recommendations from the IOA Noise Working Group and, as yet, no endorsement from any Scottish Government Minister or Department. The recommendation to impose a planning condition and the associated penalty scheme is at odds with the advice from the IOA GPG which currently states (paragraph 7.2.10):

‘7.2.1 The evidence in relation to “Excess” or “Other” Amplitude Modulation (AM) is still developing. At the time of writing, current practice is not to assign a planning condition to deal with AM.’

At time of writing there is no agreed methodology which can be used to predict the occurrence of AM or an agreed methodology which can be used to determine whether the effects of AM, should it occur, are likely to be significant. On that basis it is considered therefore that AM should be scoped out.

11.2. Consultee Questions

- *Can the consultees confirm that they agree with the proposed assessment methodologies, specifically the user of ETSU-R-97 and the IOA GPG to assess operational noise and BS5228 to assess construction noise?*

- *Can the consultees agree that assessment of vibration, low frequency noise and amplitude modulation be scoped out of the EIA?*

Chapter 12

Population and Human Health

South Kyle II Wind Farm



12. Population and Human Health

A requirement of the EIA Regulations is to consider potential effects upon population and human health. These have typically been assessed separately in the past under different headings and are now brought together under the same umbrella. Issues considered under this topic include:

- Noise;
- Shadow flicker;
- Ice throw;
- Lightning;
- Private water supplies (PWS); and
- Socio-economics

12.1. Noise

The potential noise impacts on the human population are considered within this chapter and reflects the findings of Chapter 11.

12.2. Shadow Flicker

It is proposed that shadow flicker can be scoped out if the final layout for proposed turbines is further than 10 rotor diameters from potential receptors. If this situation cannot be avoided, shadow flicker will be calculated using WindFarmer software for a single given turbine layout and set turbine dimensions. Shadow flicker will be calculated assuming:

- There are clear skies every day of the year;
- The turbines are always rotating;
- The sun can be represented as a single point; and
- The blades of the turbines are always perpendicular to the direction of the line of sight from the specified location to the sun.

12.3. Ice Throw

Ice throw is the process of ice falling or being launched from the blades of a turbine. As embedded mitigation, the turbines will have sensors on them to detect the build-up of ice and automatically prevent the turbines spinning when ice has developed on them, thus preventing the ice being thrown. Scottish Government's Onshore Wind Farm Advice Sheet states that danger to human or animal life from falling parts or ice is rare. Ice

throw will not be assessed in the EIA and is thus scoped out of the assessment.

12.4. Lightning

As stated in Scottish Government's Onshore Wind Farm Advice Sheet, the danger to human or animal life from lightning strike via a turbine is rare since lightning is directed down the turbine to the earth; the turbine itself being earthed. Maintenance of the turbines would not be undertaken during high lightning risk weather conditions. Lightning will therefore not be assessed in the EIA and is thus scoped out of the assessment.

12.5. Water Supply

The Hydrology chapter of the EIAR will present the relevant hydrological assessment. It will inform a brief assessment of water supplies in relation to human health in the Population and Human Health chapter of the EIAR.

12.5.1. Private Water Supplies (PWS)

Increased sediment erosion as a result of wind farm construction and decommissioning can have significant impacts on the quality, quantity and continuity of water supply to residential properties. East Ayrshire Council is requested to provide a fresh list of PWS to allow a gap analysis of the potential effects on PWS by the Proposed Development. Potential effects will be assessed in the EIAR and appropriate mitigation would be proposed.

12.5.2. Public Water Supplies

Scottish Water will be asked to confirm the presence of any public water supplies within the site boundary or with potential hydrological connectivity to the Site.

12.6. Socio-Economic and Tourism Assessment

12.6.1. Introduction

The socio-economics and tourism assessment will include consideration of local tourism and recreation activity, employment generation and any indirect or induced effects from the Proposed Development.

12.6.2. Proposed Scope of the Assessment

It is anticipated that the contents of the assessment chapter will include:

- Introduction, including scope of assessment and methodology;

- Economic development and tourism strategic context;
- Baseline socio-economic and tourism context;
- Socio-economic assessment;
- Tourism impact assessment;
- Proposed measures and actions to maximise local economic and community impacts;
- Proposed measures and actions to mitigate any harmful effects (if required); and
- Summary of findings and conclusions.

12.6.3. Methodology

Relevant Guidance and Legislation

There is no relevant legislation or guidance available on the methods that should be used to assess the socio-economic effects of a proposed onshore wind farm development for the purposes of an EIA. The proposed method has however been based on established best practice, including that which is used in UK Government and industry reports. In addition, the socio-economic assessment shall follow the general guidance provided in:

- Scottish Government (2016) Draft Advice on Net Economic Benefit and Planning

In particular, this assessment draws on two studies by BiGGAR Economics on the UK onshore wind energy sector, a report published by RenewableUK, and then the Department for Energy and Climate Change (DECC) in 2012 on the direct and wider economic benefits of the onshore wind sector to the UK economy and a subsequent update to this report published by RenewableUK in 2015.

Similarly, there is no formal guidance on the methods that should be used to assess the effects that wind farm developments may have on tourism assets.

For recreational assets, guidance has been provided by NatureScot on how to assess effects on recreational amenity and the approach outlined has been used. This takes into consideration a number of potential effects, including direct effect on facilities, such as limitation or restrictions on access, and effects on the intrinsic quality of the resources enjoyed by people.

The socio-economic and tourism chapter will also consider relevant local and national policy objectives. The most relevant are expected to include national and local economic and tourism strategies, including:

- Scotland's National Performance Framework;
- Scotland's National Strategy for Economic Transformation (to be published); and
- The East Ayrshire Economic Development Strategy.

Further strategies will be identified at the time of writing the assessment.

Study Areas

The study areas of the assessment will be selected to meet the interests of key stakeholders. The assessment of economic impacts shall focus on the following study areas:

- East Ayrshire;
- South West Scotland – as defined by the local authority areas of Dumfries and Galloway, East Ayrshire, North Ayrshire, and South Ayrshire;
- Scotland; and
- the UK.

12.6.4. Analysis

Baseline Description

The assessment will include a description of the current socio-economic baseline within the local area. This will include a summary of economic performance data for each study area and a description of any relevance. In particular the socio-economic baseline will cover:

- The demographic and economic profile of the local area within the context of the regional and national demographic trends, including employment and economic activity;
- The industrial structure of the local area within the context of regional and national economies;
- Wage levels within the regional economy compared to the national level; and
- The role of the tourism sector in the local and regional economy.

The baseline assessment will focus on factors most relevant to the development of an onshore wind farm.

Potential Impacts

The issues that will be considered in this assessment will include the potential socio-economic, tourism and recreation effects associated with the development.

An economic impact analysis will be undertaken using the methodology developed by BiGGAR Economics; which has been used to assess over 100 onshore wind farms across the UK. The potential socio-economic effects 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 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 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 development.

The assessment will also build on the ongoing analysis that BiGGAR Economics is doing on the supply chain impact of the South Kyle Wind Farm. This analysis has examined the spending associated with the development and its impact on the economies of South West Scotland and Scotland as a whole.

The assessment will also consider any economic impacts associated with the construction and operation of any additional energy storage facilities that will be located on the site. This may include battery storage or the production of hydrogen.

The link between onshore wind energy developments and the tourism sector has been a subject of debate. However, the most recent research has not found a link between tourism employment, visitor numbers and onshore wind development. For example, in 2017 BiGGAR Economic published an updated study that considered 28 wind farms constructed between 2009 and 2015 and the trends in tourism employment in the areas local to these developments. The analysis found that there was no relationship between the development of onshore wind farms and tourism employment at a national level (Scotland), at the local authority level nor in the areas immediately surrounding wind farm developments.

Nevertheless, the tourism sector is an important contributor to the Scottish economy and so there is merit in considering whether the development will have any effect on the tourism sector. This assessment will consider the potential effects that the development could have on tourism attractions, routes, trail and local accommodation provider. This will consider the implications of any effects identified for the tourism sector in the local area and wider region.

- *Can Scottish Water confirm the presence of any public water supplies within the site boundary or with potential hydrological connectivity to the Site?*
- *Do the consultees agree to scope out Lightning and Ice Throw from the EIA?*

12.7. Consultee Questions

- *Do consultees agree with the proposed scope for shadow flicker?*

Chapter 13

Cultural Heritage

South Kyle II Wind Farm



13. Cultural Heritage

13.1. Introduction

This chapter sets out the proposed approach to the assessment of potential effects on cultural heritage within the local area during construction and operation of the Proposed Development.

Cultural heritage resources include designated and non-designated sites, as defined in Historic Environment Scotland's *Designation Policy and Selection Guidance*. Designated sites are World Heritage sites, Scheduled Monuments, Listed Buildings, Conservation Areas, Inventory Gardens and Designed Landscapes, Inventory Battlefields and Marine Protected Areas. Other cultural heritage sites, not subject to the above designations, are recorded within the National Record of the Historic Environment and the local Historic Environment Record. There are also many sites that have not yet been identified or recorded.

The Proposed Development area lies to the east of Dalmellington in East Ayrshire. Initial research indicates that there are 13 known cultural heritage sites within the proposed wind farm development area. A further two are recorded within 100 m of the Proposed Development.

There are 330 designated cultural heritage sites within 15 km of the proposed wind farm development area. These consist of eight Conservation Areas, four Inventory Gardens and Designed Landscapes, 292 Listed Buildings and 26 Scheduled Monuments.

13.2. Key Planning Policy and Guidance

The statutory framework for heritage in Scotland is outlined in the Town and Country Planning (Scotland) Act 1997, as amended by the Planning (Listed Buildings and Conservation Areas) (Scotland) Act, and The Ancient Monuments and Archaeological Areas Act 1979, both of which are modified by the Historic Environment (Amendment) (Scotland) Act (2011).

The implications of the acts noted above regarding local government planning policy are described within SPP the Historic Environment Policy for Scotland (HEPS) (2019) and its supporting guidance, and Planning Advice Note 2/2011 (2011). SPP and HEPS deal specifically with

planning policy in relation to heritage. NPF4 and East Ayrshire Local Development Plan will also be complied with and utilised as necessary.

13.3. Scope of Works

For this assessment, the study area will include the Proposed Development area, a 100 m buffer zone and a 15 km assessment area beyond the development area's red line boundary. All known archaeological remains within the development area and within the 100 m buffer zone will be recorded and assessed. Beyond the 100 m buffer zone and up to 15 km from the development area boundary, all designated sites will be recorded and assessed. Study of the surrounding landscape will be undertaken to establish the local archaeological and historical context, to provide a broader understanding of the historical development of the area proposed for development and the potential for as-yet-unidentified archaeological remains within that area. Study of all designated sites will also be undertaken to assess any potential indirect impacts upon the setting of these sites.

13.4. Proposed Methodology

13.4.1. Baseline Methodology

Baseline studies will comprise a desk-based assessment and a walkover survey. The desk-based assessment of the study area will include the following:

- GIS information on designated cultural heritage sites around the Proposed Development area will be obtained from Historic Environment Scotland;
- GIS information on cultural heritage sites will be collated from the National Record of the Historic Environment;
- GIS information will be collated from the local Historic Environment Record;
- Relevant Local and Strategic Development Plans will be obtained from the local authority website;
- Relevant aerial photographs will be viewed online in order to identify any unknown sites or features of archaeological interest;
- Digital versions of the Pre-Ordnance Survey maps and the first, second and subsequent editions of the Ordnance Survey maps of the area of interest, held by the National Library of Scotland, will be identified online and examined; and

- Relevant published primary and secondary historical sources will be consulted.

13.4.2. Assessment Methodology

The methodology for the assessment of potential effects has two strands – a methodology for assessing the potential direct effects of the Proposed Development, where the effects relate to the physical impact of the development on cultural heritage features; – and a methodology for assessing the potential indirect effects of the development on the settings of cultural heritage assets. In both cases, effects can be adverse or beneficial. The area over which effects may occur on the settings of cultural heritage assets relates closely to the area over which the development will be visible. Inter-visibility will therefore be established by ZTV prior to the setting impact assessment survey and further assessed during a setting impact assessment survey, to quantify the potential impact on settings of surrounding designated sites.

that could potentially be directly impacted by the proposal. Initial assessment indicates that up to 330 designated sites within the wider study area could be indirectly impacted by the Proposed Development. Upon initial assessment, this site does not appear to be archaeologically sensitive but, subject to the full assessment, there may be a potential for unknown buried archaeology within relatively undisturbed parts of the development area which could be significantly directly affected by development works.

13.5. Mitigation

Where possible, any archaeological remains should be preserved *in-situ* through avoidance of direct impacts. Where this is not possible, preservation through record should be achieved following consultation with the West of Scotland Archaeology Service, in accordance with SPP, PAN 2/2011 and local development plan policies. Where possible, the settings of any designated cultural heritage sites should be preserved through avoidance or mitigation of indirect impacts. Mitigation of indirect impacts should be achieved following consultation with Historic Environment Scotland and the West of Scotland Archaeology Service, in accordance with SPP and local planning policies.

13.5.1. Potential Impacts

Potential adverse direct impacts on known cultural heritage features can occur within the boundary of the Proposed Development area, where avoidance of such features is not possible. There is also the potential for direct impacts upon as-yet-undiscovered archaeological remains, which may occur where, for example, sub-surface remains are present but have not yet been identified because they have no visible, above-ground elements. Potential adverse indirect impacts comprise potential visual effects on the settings of cultural heritage sites that have statutory and non-statutory designation.

13.5.2. Likely Significant Effects

Initial assessment indicates that there are 13 cultural heritage sites within the Proposed Development area

Chapter 14

Traffic and Transport

South Kyle II Wind Farm



14. Traffic and Transport

14.1. Introduction

The objective of the Traffic and Transport assessment is to assess the impact of the Proposed Development, South Kyle II Wind Farm, on the public road network, by means of a Traffic Impact Assessment (TIA). This will be supplemented by an Access Route Assessment for delivery of the wind turbine Abnormal Invisibile Loads (AILs) and a preliminary Traffic Management Plan (TMP).

Due to the nature of a wind farm project where operational traffic is limited weekly to only a very small number of Light Goods Vehicle's undertaking maintenance, and because future decommissioning activities are likely to generate smaller volumes of traffic compared to the construction phase, the assessment will focus on impacts during the construction phase of the Proposed Development only, excluding the operational and decommissioning phases from the assessment. It is currently proposed that the assessment will provide an expected 'worst case' example of impacts on the local road network, however if required, the assessment can present the most likely scenario for traffic impacts as an alternative.

14.2. EIA - Traffic and Transport Chapter

Following completion of the Traffic and Transport assessment, a Traffic and Transport EIA chapter will be produced as part of the EIA and will include the following information:

- Description of the proposed construction and AIL traffic routes;
- Description of the baseline traffic movements on identified delivery routes;
- Description of the predicted construction and AIL traffic movements, along with their predicted durations;
- Assessment of the resulting temporary increase to traffic movements on the road network (magnitude);
- Assessment of the sensitivity of receptors identified along the proposed traffic route(s);
- Assessment of the temporary environmental impacts on receptors due to the temporary increase in traffic (significance);

- Identification of required mitigation measures for any resultant significant effects;
- AIL Route Survey Report (appended); and
- Preliminary TMP (appended).

14.3. Consultation

In order to agree the scope of the Traffic and Transport assessment it is intended to consult with the following stakeholders:

- East Ayrshire Council;
- Dumfries and Galloway Council;
- Transport Scotland; and
- Police Scotland.

The discussions will identify the extent of the study area, the methodology and the data sources proposed for use in the assessment.

14.4. Geographical Context

The Proposed Development is situated in East Ayrshire, immediately adjacent to South Kyle Wind Farm, to the north-east of Dalmellington. The location of the access is still being developed but will likely be either from the all-purpose road A713 or the B741.

It is anticipated that the AIL will travel from the selected port to the A77, onto the A713, prior to entering site.

Given the road network arrangement and location of the Site, it is considered that there are several route options from identified material supply centres (e.g., quarries) which would eventually converge onto the A713 at various locations, depending on their origin. Beyond these points the traffic would be dispersed via multiple routes, resulting in the overall increases in traffic volumes on each route being minimised.

It is therefore proposed that the geographical extent of the assessment include:

- The A713 between Patna and the Proposed Development entrance;
- The A713 between Carsphairn to the south and the Proposed Development entrance; and
- The B741 between Dalleagles and the Proposed Development entrance.

For the AIL assessment it is proposed that the geographical extent will be from the A77/A713 junction to the Proposed Development.

14.5. Traffic Impact Assessment

The TIA will focus on impacts during the construction phase as any impact to the road network will cease once the relevant construction activities are completed. The following outlines the anticipated impacts associated with the Proposed Development:

- Temporary increase in movements of Heavy Goods Vehicles (HGVs) and LGVs associated with the construction of the Proposed Development;
- Transport impacts due to the delivery of AILs) associated with the wind turbine generator components, during the construction phase;
- Effects on sensitive receptors, principally residents and communities in the surrounding area; and
- Road widening/improvements to accommodate AILs.

During the operational phase these impacts will no longer occur and therefore longer-term mitigation is not required.

At this stage, turbine component deliveries are anticipated to come from the Port of Glasgow King George, however a number of options are currently being investigated for final site access.

14.6. Assessment Exclusions

The volume of traffic generated during the operational phase of the wind farm is considered to be negligible as this would be limited to operational staff in light goods or 4x4 vehicles inspecting the site and undertaking ad-hoc maintenance and servicing. It is assumed that traffic movement associated with inspection and maintenance will be occasional and limited in number. As such it is proposed to scope out operational and maintenance impacts from this assessment.

Decommissioning will include the removal of the wind turbines and associated infrastructure. Typically, buried infrastructure such as cabling, and turbine foundations (less the top 1 m) would remain in-situ following decommissioning. Similarly, access tracks may be left in-situ in whole or in part depending on planning conditions and any landowner arrangements. Hence, the vehicle movements associated with the decommissioning phase

is considered to be significantly less than that during the construction phase.

Furthermore, decommissioning of the Proposed Development is unlikely to take place before the end of its life and as such a minimum period of 30 years is assumed before decommissioning takes place. Due to the changes in the baseline situation which may have occurred by the time that the Proposed Development is decommissioned it is considered impractical to assess the likely environmental effects. Given the uncertainty of baseline conditions around 30 years in the future and the expected reduction in traffic volumes associated with decommissioning, it is proposed to scope out decommissioning impacts from this assessment. However decommissioning impacts will be considered within the decommissioning plan which will be submitted six months prior to decommissioning.

14.7. Baseline Traffic

Published traffic data will be reviewed, or traffic surveys undertaken, to inform the assessment within a defined study area, set out in 14.4 above and to be agreed with consultees. The traffic data will be used to determine the baseline traffic volumes for use within the Traffic and Transport assessment. The assessment will consider the most up to date traffic data readily available, and/or utilise traffic survey data gathered, which will be used as a baseline.

Acquisition of traffic count data will be obtained either by use of the Department for Transport Traffic Count Database, consultation with the local roads authority or commissioning of traffic counts, depending on the level of existing information available.

Assessment of baseline sensitivity of receptors will account for 'embedded mitigation'. With respect to this assessment, the 'embedded mitigation' includes best practice processes which are implemented during construction, regardless of the outcome of the traffic impact assessment. These measures will be defined within the assessment and delivered through the TMP.

14.8. Assessment Methodology

The Traffic and Transport assessment will be carried out in accordance with the following guidance documents:

- Transport Assessment Guidance (Transport Scotland); and
- IEMA Guidelines for the Environmental Assessment of Road Traffic (“the IEMA Guidelines”) to assess impact upon environmental receptors.

The Traffic and Transport assessment developed for the Proposed Development will provide the forecasts of vehicle movements. The assessment will seek to provide a robust (expected worst case or most likely case) assessment of impacts and effects associated with the Proposed Development. The assessment will identify the potential traffic increase and associated environmental effects on sensitive receptors and mitigation will be proposed where necessary.

With regards to Transport Scotland’s Transport Assessment Guidance, the guidance is aimed at appraising the operational implications of a development and as such has limited relevance to the development of a wind farm project given the temporary nature of traffic increase during construction and the low numbers of additional permanent traffic generated by its operation. However, paragraph 5.54 states that *“Transport Assessment must cover traffic and road issues, parking and any particular impacts caused by abnormal loads”*. These elements will be assessed through a TIA and TMP respectively, focussing on the construction phase of the Proposed Development. The adopted AIL assessment methodology is set out in further detail below.

Transport Scotland’s Transport Assessment Form has been included as Appendix 3 to aid with establishing the assessment requirements, in line with Transport Scotland’s scoping process.

In terms of the environmental impact on receptors, the IEMA guidelines suggests that two rules can be used as a screening process to delimit the scale and extent of the assessment:

- Rule 1 – Include highway links where traffic flows would increase by more than 30% (or the number of HGVs would increase by more than 30%); and
- Rule 2 – Include any other specifically sensitive areas where traffic flows would increase by 10% or more. (IEMA Guidelines Paragraph 3.20 defines sensitive area as including “accident blackspots, conservation areas, hospitals, links with pedestrian flows etc.”).

Where the predicted increase in traffic flow is lower than these thresholds, the significance of the effects will be stated to be low or insignificant, and further detailed assessments will not be warranted. Where the predicted

increase in traffic flow exceeds these thresholds, the effects of the additional traffic generated will be assessed. The sensitivity of receptors will be assessed and synthesised with the magnitude of effect to determine its significance. Further mitigation may be required to minimise the potential effect.

The criteria used for the identification and assessment of potentially significant impacts will be clearly presented in the EIA chapter. The magnitude of each impact and its significance will be assessed by a variety of mechanisms, including published guidance and professional judgement.

14.9. Cumulative assessment

Consideration will be given to possible cumulative effects of the Proposed Development with regards to other developments, occurring as result of concurrent construction programmes within the same study area. It is important to note that a cumulative assessment in respect of traffic and transport effects is dependent on the likelihood of more than one wind farm being under construction at the same time as the Proposed Development. This is especially pertinent to the peak construction periods associated with the importation of stone which would be dependent on the outputs of local quarries.

AIL Route Survey Report is an assessment of potential delivery routes for AILs, associated with the wind turbine component deliveries. This assessment will be undertaken to identify the preferred route to the Proposed Development, from the nearest suitable port, and to assess what mitigating measures may be required on the public road network.

Swept path drawings for key points of interest, undertaken on Ordnance Survey base mapping will be prepared as deemed appropriate. These will be carried out on the expected wind turbine component dimensions. The swept path assessments will identify areas of over-sail and over-run, street furniture modifications and indicative mitigation works.

A full Electronic Service Delivery for Abnormal Loads (ESDAL) consultation with the trunk and local roads officers relating to structure issues with the proposed access routes would also be undertaken to identify any structural issues that may arise.

14.10. Preliminary Traffic Management Plan

As part of the Transport Assessment, and in line with any pre-application requirements, a preliminary construction TMP will be produced for transport associated with site traffic (HGV's, LGV's etc). The TMP will generally outline the detail of the works and the associated traffic. It will include aspects such as the standard industry mitigation measures considered for impacts associated with the works and typical traffic management measures employed for control of traffic on the public road to ensure there are no safety issues or impediments on the public highway.

14.11. Consultee Questions

- *Do consultees agree with the proposed geographical extent of the assessment?*
- *Do consultees agree that operational and decommissioning phases can be scoped out and the assessment will consider the effects during the construction phase only?*
- *Can consultees provide traffic count data?*
- *Do consultees agree that 'embedded mitigation' can be assumed in baseline assessment of receptors?*
- *Do the consultees agree with the approach to consider the environmental impacts in line with IEMA thresholds of 30% and 10%?*
- *Do the consultees agree with the traffic assessment approach set out in the above section?*
- *Do consultees agree that the 'worst case scenario' be modelled or would a realistic 'most likely scenario' approach be more appropriate?*
- *Do Transport Scotland agree that in relation to their Transport Assessment Guidance, no 'Transport Statement' or 'Transport Assessment' is required?*

Chapter 15

Existing Infrastructure and Aviation

South Kyle II Wind Farm



15. Existing Infrastructure and Aviation

This section of the EIAR will assess the potential impact on any existing infrastructure in the vicinity of the Proposed Development. The approach to the assessment will be to consult with statutory undertakers and other relevant organisations to ascertain if the Proposed Development will have an impact on their services and if so, what mitigation if any will be necessary. In this respect, the EIA will consider:

- Public access;
- Defence interests;
- Civil aviation;
- Telecoms and radio communications;
- Water, gas and power; and
- Existing footpaths including Public Rights of Way and Southern Upland Way.

15.1. Public access

The locations of all footpaths will be considered during the iterative design process. Scoping responses from the local planning authorities and ScotWays will be considered during the final design work to ensure balance between wind optimisation and potential effects on access are addressed. This section of the chapter will be cross referenced with the Population and Human Health assessment.

15.2. Defence interests

Comment from the Ministry of Defence will be sought on the Proposed Development. It should be noted that there was no objection to the neighbouring South Kyle development from the Ministry of Defence subject to conditions such as sharing coordinates of turbines to Defence Geographic Centre for inclusion in national files, fitting infra-red lighting to 16 of the total 50 turbines and providing full details of the construction proposals.

15.3. Civil aviation

All potential aviation effects occurring as a direct result of the development will be addressed in the EIA with potential mitigations set out. Mitigation measures installed for the neighbouring South Kyle Wind Farm include radar mitigation works to satisfy Glasgow Prestwick Airport and NATS En Route Ltd (NERL). It is likely that the positions of all turbines will require to be provided to the CAA for inclusion in national files. Due to the height of the turbines proposed being over 150m, it is understood that fixed aviation lighting will have to be installed on the turbines as standard. This will be agreed with the CAA in due course.

15.4. Telecommunications and radiocommunications

A relevant assessment will be included in the EIAR. Fixed microwave and scanning telemetry link radio facilities with the potential to be affected by the Proposed Development will be identified through consultation with Ofcom.

Determination of the impact of the proposed wind turbines on any potentially affected telecommunications facilities will be conducted principally through consultation with the operators of the services.

15.5. Utilities

Potential utilities including gas and electricity will be investigated and assessed during the EIA, with the final layout designed to avoid potential direct effects.

Chapter 16

Forestry

South Kyle II Wind Farm



16. Forestry

16.1. Introduction

This chapter sets out the proposed approach to the assessment of potential effects on the forestry during construction and operation of the Proposed Development.

In the UK there is a strong presumption against permanent deforestation unless it addresses other environmental concerns. In Scotland, such deforestation is dealt with under the Scottish Government's Control of Woodland Removal Policy (Forestry Commission Scotland, 2009)⁶². The purpose of the policy is to provide direction for decisions on woodland removal in Scotland. It will be essential that the Proposed Development addresses and satisfies the requirements of the Policy.

The Proposed Development is located within an area of extensive commercial forestry. The land is part of Scotland's National Forest Estate, owned by Scottish Ministers on behalf of the nation, and managed by FLS.

16.2. Legislation, Policy and Guidance

The Proposed Development forestry proposals will be prepared in accordance with current policies, guidance and best practice, including, but not limited to:

- Ayrshire Joint Planning Unit (2014): The Ayrshire and Arran Forestry and Woodland Strategy;
- Forestry Commission (2017): The UK Forestry Standard: The Government's Approach to Sustainable Forestry, Forestry Commission, Edinburgh;
- Forestry Commission Scotland (2009): The Scottish Government's Policy on Control of Woodland Removal, Edinburgh;
- Forestry Commission Scotland (2013): The Native Woodland survey of Scotland;
- Forestry Commission Scotland (2018) The National Forest Inventory Woodland Scotland;
- Forestry Commission Scotland (2019): Guidance to Forestry Commission Scotland

⁶² Forestry Commission Scotland (2009). The Scottish Government's Policy on the Control of Woodland Removal. Forestry Commission, Edinburgh.

staff on implementing the Scottish Government's Policy on Control of Woodland Removal;

- SEPA (2013): SEPA Guidance Notes WST-G-027 "Management of Forestry Waste";
- SEPA (2014): LUPS-GU27 "Use of Trees Cleared to Facilitate Development of Afforested Land";
- The Scottish Government (2016): A Land Use Strategy for Scotland, Edinburgh;
- The Scottish Government (2018): The Forestry and Land Management (Scotland) Act 2018, Edinburgh;
- The Scottish Government (2019: Scotland's Forestry Strategy 2019 -2029, Edinburgh; and
- UKWAS (2018): The UK Woodland Assurance Standard 4th Edition, UKWAS, Edinburgh.

16.3. Proposed Scope of Assessment

The Forestry Study Area will be limited to the forestry within the Proposed Development site boundary or the extent of the current Land Management Plan. A Proposed Development Forest Plan will be prepared. This will include a felling plan to show the location and timeframe of felling on the Site during the construction and operation of the Proposed Development. It will further include a restocking plan showing any areas which are to be replanted.

A key issue will be the integration of the Proposed Development into the forest structure to minimise the loss of woodland area and to prevent fragmentation of the remaining forestry. Forest design and the effect of the Proposed Development is an important part of the overall design process.

The changes to the woodland structure will be analysed and described including changes to woodland composition, timber production, traffic movements and the felling and restocking plans. The resulting changes to the woodland structure will be assessed for compliance against the UK Forestry Standard (UKFS) and the requirement for compensation planting to mitigate against any woodland loss. The Proposed Development Forest Plan will be assessed against the baseline data in line with the methodology outlined in the Control of

Woodland Removal Policy Implementation Guidance (Forestry Commission Scotland, 2019)⁶³.

There is potential for changes to the forest structure resulting from the Proposed Development, with consequential implications for the wider felling and restocking plans across the remaining parts of the forestry. It is anticipated that areas of woodland will be felled for the construction and operation of the Proposed Development to accommodate access tracks, wind turbine locations and other infrastructure.

Changes to the forestry for a particular development are regarded as site specific and it is considered there are no cumulative on-site forestry issues to be addressed, therefore cumulative forestry effects are scoped out of the EIAR.

Commercial forests are dynamic and constantly changing through for example landowner activities; market forces; natural events, such as windblow or pest and diseases; or developments. The forestry assessment will be a factual assessment describing the changes to the physical forest structure resulting from the incorporation of the Proposed Development into the forest, in particular the loss of woodland area. Other chapters within the EIAR will identify the sensitive receptors relevant to their disciplines and report on the effects of the Proposed Development due to the forestry proposals.

16.4. Baseline Conditions

The forestry baseline will describe the crops existing at time of preparation of the EIAR. This will include current species; planting year; any felling and replanting plans; and other relevant woodland information. The baseline will be compiled from a desk-based assessment and field surveys. The desk-based assessment will include landowner crop databases; the Native Woodland Survey of Scotland (NWSS)⁶⁴; the National Forest Inventory (Forestry Commission Scotland, 2018)⁶⁵; aerial photography; publicly available databases; and current policy, legislation and guidance.

⁶³ Forestry Commission Scotland (2019). Guidance to Forestry Commission Scotland staff on implementing the Scottish Government's Policy on Control of Woodland Removal. Available at <https://forestry.gov.scot/publications/349-scottish-government-s-policy-on-control-of-woodland-removal-implementation-guidance/viewdocument> (accessed on 30 June 2021).

⁶⁴ Forestry Commission Scotland (2013): The Native Woodland survey of Scotland. Available at

The field survey will consist of:

- A site walkover to verify and update baseline data as necessary;
- Map out areas of peat and condition of peat;
- An assessment of the crops, with respect to integration of the development infrastructure; and
- Identification of any opportunities within the forestry for on-site compensatory planting if any is required.

The forestry consists of a single block of forest under the ownership of the Scottish Ministers. The South Kyle Forest is in the production phase with ongoing felling and replanting as part of an approved Land Management Plan (LMP).

An initial desk-based assessment identifies there are no woodlands recorded in the Ancient Woodland Inventory (AWI) Scotland within the South Kyle commercial forests. The desk-based assessment further identified small areas of native woodland were recorded in the NWSS within the commercial forests, though none of these were recorded as ancient woodland in the AWI. There are no woodland designations over the Forestry Study Area.

16.5. Potential Mitigation

Measures to avoid or mitigate potential impacts upon the forestry will, as far as practicable, be sought to be embedded in the design of the Proposed Development through consideration of the siting of the Proposed Development infrastructure; and by using existing access tracks and forest roads where possible. Woodland loss will be minimised wherever possible.

Potential forms of mitigation may include a redesign of the existing forest structures including, for example, changes to the felling programme; the use of designed open space; alternative species and woodland types; changing the management intensity; or the provision of compensation planting on or off-site.

<https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18> (accessed on 30 June 2021).

⁶⁵ Forestry Commission Scotland (2018). The National Forest Inventory Woodland Scotland. Available at https://data-forestry.opendata.arcgis.com/datasets/b71da2b45dde4d0595b6270a87f67ea9_0 (accessed on 30 June 2021).

16.6. Consultee Questions

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- *Are consultees content with the proposed methodology and scope for the forestry assessment?*
- *Do the consultees have any information, particularly with reference to new guidance, which should be taken into account?*

Chapter 17

Synergistic Effects and Summary of Mitigation and Residual Effects

South Kyle II Wind Farm



17. Synergistic Effects and Summary of Mitigation and Residual Effects

A concluding chapter will present the key findings from each EIA chapter and any required mitigation. In line with the EIA Regulations it will then assess the potential synergistic effects that may occur in combination. This will include an assessment of potential effects on human health caused by the Proposed Development and will be covered by assessments provided throughout the chapters in the EIA (e.g., Noise, Access, Traffic and Transport, Shadow Flicker, Residential Amenity).

The chapter will identify all mitigation, including the mitigation by design that will be undertaken to reduce any adverse effects and summarise the residual effects regarding all the proposed work in relation to the construction, operation and decommissioning of the Proposed Development.

Chapter 18

EIAR Accompanying Documents

South Kyle II Wind Farm



18. EIAR Accompanying Documents

18.1 Non-Technical Summary (NTS)

The NTS details the main components of the Proposed Development and summarises the main findings of the environmental studies carried out to build and operate the Proposed Development. It is designed to be an easily accessible document that will communicate the main elements of the EIA to any interested party without the need for the reader to have specialist background knowledge. It will also contain maps and figures that show the extent and geographical location of the development.

18.2 Planning Statement and Design & Access Statement

A Planning Statement and Design & Access Statement will be produced and seek to highlight the design principles and concepts behind the Proposed Development. It will detail how the developer has applied these principles to the Proposed Development in tandem with input from consultation activities

The Statements will also provide a commentary of the EIA findings and assess the Proposed Development accounting for residual effects (both positive and negative) against national policy and legislation, the Development Plan and other material planning considerations relevant to the Proposed Development.

18.3 Pre-Application Consultation (PAC) Report

Although not a statutory requirement for applications submitted under Section 36 of the Electricity Act 1989, the Applicant intends to submit a PAC Report to accompany the application.

It is proposed that the legislation and best practice guidance in relation to public consultation for Major Developments will be broadly followed as contained in PAN 3/2010 - Community Engagement - Planning with People.

The PAC Report would:

- Outline the scope of the consultation programme including when and who has been consulted;
- Confirm how the consultation programme meets the best practice standards;
- Set out how the Applicant has responded to the comments made, including whether and the extent to which the proposals have changed as a result of the PAC;
- Provide documentary evidence that the planned consultation programme has taken place e.g., copies of advertisements of the public events and reference to display materials and records of response from such events;
- Demonstrate that steps were taken to explain the nature of the PAC i.e., that it does not replace the application process whereby representations can be made to the planning authority; and
- Make an assessment of the success of the Pre-application Consultation activities.

Chapter 19

Responding to this Scoping Report

South Kyle II Wind Farm



19. Responding to this Scoping Report

Consultee responses to this report should be directed to the Energy Consents Unit (ECU) which will form a Scoping Opinion. The ECU can be contacted via email:

Econsents_Admin@gov.scot

The Applicant will welcome such responses to inform the scope of EIA to be undertaken for the Proposed Development and further consultation to be undertaken with each consultee as the EIA progresses.

19.1. Consultee Questions

A summary of consultation questions as proposed throughout this scoping report is below. Please see previous chapters where relevant for further context.

1. *Do consultees have any comments in relation to public consultation?*
2. *Do consultees have any comments in relation to the approach to the Environmental Impact Assessment?*
3. *Do consultees have any comments in relation to the proposed chapters to be included in the EIAR?*
4. *Do the consultees agree with the LVIA and CLVIA methodologies proposed?*
5. *Do the consultees agree with the suggested viewpoint locations and visualisations detailed in Appendix 2?*
6. *Do consultees agree with the approach suggested for aviation lighting?*
7. *Do the consultees agree with the approach to the sequential assessment?*
8. *Are consultees satisfied with the coverage provided by the vantage point locations?*
9. *Is the proposed scope and extent of the available and proposed baseline data considered to be sufficient to inform a reliable assessment of the potential effects of the Proposed Development?*
10. *Are there any other key ornithological features that consultees believe should be considered that have not been discussed above?*
11. *Do consultees consider any Natura 2000 not discussed above as requiring consideration as part of screening for Appropriate Assessment?*
12. *Do consultees see value to any particular mitigation and/or enhancement measures for any local or regional species, whether referred to above or otherwise?*
13. *Is the proposed scope and extent of the available and proposed baseline data considered to be sufficient to inform a reliable assessment of the potential effects of the Proposed Development?*
14. *Are there any other key ecological features that consultees believe should be considered that have not been discussed above?*
15. *Do consultees consider any Natura 2000 not discussed above as requiring consideration as part of screening for Appropriate Assessment?*
16. *Do consultees see value to any particular mitigation and/or enhancement measures for any local or regional species, whether referred to above or otherwise?*
17. *Can the consultees confirm that they agree with the proposed assessment methodologies, specifically the user of ETSU-R-97 and the IOA GPG to assess operational noise and BS5228 to assess construction noise?*
18. *Can the consultees agree that assessment of vibration, low frequency noise and amplitude modulation be scoped out of the EIA?*
19. *Do consultees agree with the proposed scope for shadow flicker?*
20. *Can Scottish Water confirm the presence of any public water supplies within the site boundary or with potential hydrological connectivity to the Site?*
21. *Do the consultees agree to scope out Lightning and Ice Throw from the EIA?*
22. *Do consultees agree with the proposed geographical extent of the assessment?*
23. *Do consultees agree that operational and decommissioning phases can be scoped out and the assessment will consider the effects during the construction phase only?*
24. *Can consultees provide traffic count data?*
25. *Do consultees agree that 'embedded mitigation' can be assumed in baseline assessment of receptors?*
26. *Do the consultees agree with the approach to consider the environmental impacts in line with IEMA thresholds of 30% and 10%?*
27. *Do the consultees agree with the traffic assessment approach set out in the above section?*
28. *Do consultees agree that the 'worst case scenario' be modelled or would a realistic 'most likely scenario' approach be more appropriate?*
29. *Do Transport Scotland agree that in relation to their Transport Assessment Guidance, no 'Transport Statement' or 'Transport Assessment' is required?*
30. *Are consultees content with the proposed methodology and scope for the forestry assessment?*

31. *Do the consultees have any information, particularly with reference to new guidance, which should be taken into account?*

Appendices

South Kyle II Wind Farm

Appendix 1 – Figure List

- Figure 1 – Site Location
- Figure 2 – Regional Context
- Figure 3 – Site Layout and Constraints
- Figure 4 – Designated Sites
- Figure 5 – Viewsheds and Vantage Point Locations
- Figure 6 – Existing Fish Monitoring Locations for South Kyle Wind Farm
- Figure 7 – Habitat Results
- Figure 8a – ZTV to Tip Height (A0 size)
- Figure 8b – ZTV to Tip Height (A3 size)

Appendix 2 – Viewpoint Locations

Table A7.1: Viewpoint Locations

VP No.	Location	Grid Coordinates	Receptor
1	A77 West of Maybole	228894, 609487	Road users
2	Carrick Hills	229957, 616260	Walkers
3	B743 South of Tarbolton	243203, 625666	Residents
4	A76 South of Mauchline	250046, 626832	Road users
5	B743 Muirkirk to Sorn	260453, 627158	Road users
6	Southern Upland Way at Sanquhar	282096, 612064	Walkers
7	St. Johns Town of Dalry	263140, 580656	Residents
8	Corserine Summit	249788, 587067	Walkers
9	Merrick Summit	242764, 585551	Walkers
10	A70 at Cumnock	257742, 620318	Road users
11	New Cumnock	261940, 614175	Residents
12	B741 at Bankglen	259695, 612147	Road users
13	B741 at Dalleagles	258076, 610832	Road users
14	Blackcraig Hill	264713, 606576	Walkers
15	Black Hill, Southern Upland Way	268858, 598715	Walkers
16	Cairnmore of Cairnsphairn	259348, 598165	Walkers
17	A713 at Carsphairn	255962, 593407	Road users
18	North of Loch Doon Castle	248770, 595293	Visitors
19	South of Beoch House Loch Doon	249195, 597869	Visitors
20	Footpath East of Ness Glen	247835, 602530	Walkers
21	Craigengillan Estate (The Dark Sky Observatory)	247359, 602263	Visitors
22	Craigengillan Estate (The Fort)	247542, 602345	Visitors
23	Craigengillan House (The Stables)	247404, 602797	Visitors
24	Craigengillan House (The Front Door)	247364, 602811	Visitors
25	Craigengillan House (The former summerhouse)	247452, 602801	Visitors
26	Berbeth	246781, 603933	Visitors
27	Dalcairnie Glen	246667, 604037	Visitors
28	Auchenroy Hill	245007, 605051	Walkers

VP No.	Location	Grid Coordinates	Receptor
29	Dalnean Hill	246151, 605332	Walkers
30	B741 West of Dalmellington	244410, 606057	Road users
31	Bogton Loch	246441, 605705	Visitors
32	A713 West of Dalmellington	246693, 606512	Road users
33	Dalmellington Church	248027, 606171	Visitors
34	Bellsbank	247906, 605211	Residents
35	Picnic Area off the A713	249380, 604082	Road users

Appendix 3 – Transport Assessment Form

Transport Scotland Transport Assessment Form



Contact Details		
	Applicant	Consultant
Contact name		Mhairi Bowley
Company	Vattenfall Wind Power Ltd.	Natural Power Consultants Ltd
Address		Ochil House, Stirling, FK7 7XE
Telephone		
E-mail		mhairib@naturalpower.com

Development Details	South Kyle II Wind Farm
Brief description	The following are being considered for the Proposed Development: Up to 17 wind turbines with associated infrastructure; Temporary borrow pits; Anemometry mast(s); Temporary construction and storage compounds, laydown areas and ancillary infrastructure; Substation, compound, and control building Battery/energy storage; and Green Hydrogen generation and storage.
Existing/ historical site use	There is currently forestry, the land is owned by the Scottish Government and managed by Forestry & Land Scotland (FLS). Within the Proposed Development area is the recently constructed SPEN Overhead Line Replacement.
Location: Street/Road Town/City/Plan Area (Map to be included)	The Proposed Development is situated south-east of the B741, south of Dalmellington and south-west of New Cumnock, located in East Ayrshire.
Size (e.g. GFA, no. of dwellings, etc.) Indicate if any thresholds in Table 3.1 from Transport Scotland Transport Assessment Guidance are exceeded.	The Proposed Development covers an area of approximately 21.8 hectares and exceeds the thresholds noted in Table 3.1.
Opening year(s)	2028

Appendix 4 – Scoping Report Non-Technical Summary

Scoping Report Non-Technical Summary