



Shepherds' Rig Wind Farm

INFINERGY

harnessing the power of nature

Updated Scoping Report

March 2018



Cover image for illustrative purpose only

Applicant

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BiGGAR Economics

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INTRODUCTION

Purpose of the Updated Scoping Report

- 1.1. This report constitutes the request for a Revised Environmental Impact Assessment (EIA) Scoping Opinion for a proposed wind farm (the Development) on land at Shepherds' Rig (the Site) approximately 5 kilometres (km) east of Carsphairn, Dumfries and Galloway. The Site encompasses an area of approximately 810 hectares (ha) within an upland rural area which includes forestry plantations. The Site location is shown in Figure 1, Appendix A. This Updated Scoping Report has been prepared by Arcus Consultancy Services Ltd (Arcus) on behalf of Infinergy Ltd (the Applicant).

Project History

- 1.2. The original Scoping Report for the Development was prepared in April 2013. This included a layout of up to 45 turbines with a tip height of 149.5 metres (m). A Scoping Opinion was received from the Energy Consents Unit in July 2013 (included as Appendix B). A range of initial baseline surveys were undertaken during and after the original scoping exercise as part of the EIA. These included:
- Ornithological surveys between October 2012 and August 2013;
 - Ecological surveys involving an extended phase 1 habitat survey and protected species surveys in September 2013;
 - Cultural heritage desk based assessment and supplementary site visit;
 - Peat depth surveys across the Site undertaken in October 2013;
 - Hydrological site visits and baseline work;
 - Baseline noise surveys between November 2013 and January 2014;
 - Strategic access and transport baseline studies in November 2013; and
 - Aviation baseline analysis and modelling in December 2013.
- 1.3. As part of the application process, a series of community open days were held in July 2013 allowing the community to find out more about the Development and provide comment on the proposals. Constraint analysis and layout design work also continued during 2014 to ensure that a scheme that was both environmentally sensitive and economically viable could be designed for the Site.
- 1.4. In 2015, assessment and design work on the project was put on hold due to the uncertainty associated with the United Kingdom (UK) Government's proposed changes to the funding arrangements for onshore wind.
- 1.5. In April 2017, following consideration of the economic viability of the Development in a post-subsidy environment, further ornithological

survey work commenced and is due to continue until the end of March 2018.

Progression of the Application

- 1.6. Now that the Applicant has confirmed the viability of the Development they can confirm their intention to apply to the Scottish Government for consent under Section 36 of the Electricity Act 1989¹ for the construction and operation of a wind farm on the Site. In the interests of being a responsible developer, this Updated Scoping Report has been prepared to reflect the current situation, taking account of previous surveys and consultation efforts.
- 1.7. The aim of the scoping process is to confirm the key environmental issues following the pause in the EIA process, to help determine which elements of the Development are likely to cause significant environmental effects and identify issues that can be scoped out of the assessment. This Updated Scoping Report has been prepared with a view to providing structure for re-consultation on the approach to EIA and the further work required for preparation of the EIA Report. Comments are therefore welcomed from consultees on the relevance of work undertaken to date, the topics to be scoped into the EIA and the proposed assessment methodologies.
- 1.8. This report forms the Applicant's written request to the Scottish Government, under Regulation 12 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017² as amended (the EIA Regulations), for its opinion as to the information to be provided in the EIA Report (a Scoping Opinion) for the development of the Site.

The Applicant

- 1.9. Infinergy is a renewable energy developer with a strong focus on onshore wind development. Infinergy possesses in-house expertise along with the experience needed to design, develop, build and operate wind energy schemes.
- 1.10. Infinergy believes wind energy has an important role to play in reducing the combined threats of decreasing energy security, climate change and energy poverty, all of which have been identified by successive governments as key issues facing the energy supply of the UK. The Scottish Government has set a target of 50% of the energy for Scotland's heat, transport and electricity consumption to be supplied from renewable sources by 2030³.

¹ The Electricity Act 1989. Available at:

https://www.legislation.gov.uk/ukpga/1989/29/pdfs/ukpga_19890029_en.pdf [Accessed 25/01/2018]

² The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at: <http://www.legislation.gov.uk/ssi/2017/101/contents/made> [Accessed 25/01/2018]

³ Scottish Government (2017). Scottish Energy Strategy: The future of energy in Scotland. Available at: <http://www.gov.scot/Resource/0052/00529523.pdf> [Accessed 01/03/2018]

- 1.11. When developing a wind energy scheme, Infinergy aims to put the right sized wind farm in the right place, whilst in close consultation with statutory consultees and local communities. This approach allows Infinergy to consistently design wind developments that are sympathetic to local landscapes, while maximising operational efficiency and hence energy output. Infinergy currently have a wind farm project portfolio of over 500 megawatts (MW).
- 1.12. Infinergy is a member of the trade organisations Scottish Renewables and Renewable UK. For more information please visit <http://www.infinergy.co.uk>.

ENVIRONMENTAL IMPACT ASSESSMENT

- 2.1. EIA is a legal requirement for certain types of development. In assessing the EIA requirement for wind turbine developments over 50 MW, the decision on whether or not an EIA is required is delegated to Scottish Ministers. Given that prior to the Development being put on hold, it was considered that it was an EIA development, it is assumed that this remains the case and a screening request has not been obtained.

EIA Process

- 2.2. The EIA is an iterative process of assessment and design, whereby prediction and assessment of effects will inform the eventual design of the Development. The Development can then be refined in order to avoid or reduce potential environmental effects where necessary.
- 2.3. The EIA Report, which reports the findings of the EIA as set out in the EIA Regulations, is required to "*describe the likely significant effects*" of a development; effects that are not considered significant do not need to be described to meet the requirements of the EIA Regulations.
- 2.4. The EIA Regulations implement European Union (EU) Directive 2014/52/EU⁴ which amended Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, insofar as it relates to applications for consent to construct, extend or operate a power station or install or keep installed overhead electricity lines under Sections 36 and 37 of the Electricity Act 1989¹. EIA is a process which identifies the potential environmental effects of a development and then seeks to avoid, reduce or offset any adverse effects through 'mitigation measures'. EIA follows a series of stages:
- Site selection and feasibility;
 - Screening - is an EIA required;
 - Pre-application consultation and scoping;
 - Baseline studies to establish the current environmental conditions at the Site;
 - Identification of potential environmental effects;
 - Mitigation to avoid or reduce the effects through iterative design process;
 - Assessment of residual effects;
 - Preparation of an EIA Report;
 - Submission of the EIA Report;
 - Consideration of application and environmental information by the Scottish Government, Dumfries and Galloway Council (the Council) and other consultees;

⁴ DIRECTIVE 2014/52/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN> [Accessed 01/03/2018]

- Determination of application (with or without conditions); and, if approved
 - Implementation and monitoring.
- 2.5. EIA is an iterative process of assessment and design, during which prediction and assessment of potential effects will inform the evolving design of the Development. Consultation, a vital component of the EIA process, continues throughout each stage and contributes both to the identification of potential effects and mitigation measures.

Assessment Methodology

- 2.6. In order to assess the potential effects arising from the Development, the significance of such effects will be determined. The determination of significance relates to the sensitivity of the resource or receptor being affected and the magnitude of change as a result of the impact. The assessment of effects will combine professional judgement together with consideration of the following.
- The sensitivity of the resource or receptor under construction;
 - The magnitude of potential impact in relation to the degree of change which occurs as a result of the Development;
 - The type of effect, i.e. adverse, beneficial, neutral or uncertain;
 - The probability of the effect occurring, i.e. certain, likely or unlikely; and
 - Whether the effect is temporary, permanent and/or reversible.
- 2.7. A generalised methodology for assessing significant effects is detailed below; however, each individual technical area will have a specific assessment methodology which may vary from that detailed in the following subsections.

Sensitivity of Receptors

- 2.8. The sensitivity of the receptors, including the importance of environmental features on or near to the Site of the sensitivity of potentially affected receptors, will be assessed in line with the best practice, legislation or statutory designations and/or judgement.
- 2.9. Table 2.1 details a framework for determining the sensitivity of receptors. Each technical assessment will specify their own criteria that will be applied during the EIA and details will be provided in the relevant EIA Report chapter.

Table 2.1: Framework for Determining Sensitivity of Receptors

Sensitivity of Receptor	Definition
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value.

Magnitude of Impact

- 2.10. The magnitude of potential impacts will be identified through consideration of the Development, the degree of change to baseline conditions predicted as a result of the Development, the duration and reversibility of an impact and professional judgement, best practice guidance and legislation.
- 2.11. General criteria for assessing the magnitude of an impact are presented in Table 2.2. Each technical assessment will apply their own appropriate criteria during the EIA, with the details provided in the relevant EIA Report chapter.

Table 2.2: Framework for Determining Magnitude of Effects

Magnitude of Effects	Definition
High	A fundamental change to the baseline condition of the asset, leading to total loss or major alteration of character.
Medium	A material, partial loss or alteration of character.
Low	A slight, detectable, alteration of the baseline condition of the asset.
Negligible	A barely distinguishable change from baseline conditions.

- 2.12. If impacts of zero magnitude (i.e. none / no change) are identified, this will be made clear in the assessment.

Significance of Effect

- 2.13. The sensitivity of the asset and magnitude of the predicted impacts will be used as a guide, in addition to professional judgement, to predict the significance of the likely effects. Table 2.3 summarises guideline criteria for assessing the significance of effects.

Table 2.3: Framework for Assessment of the Significance of Effects

Magnitude of Impact	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

- 2.14. Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations, and are shaded in light grey in the above table.
- 2.15. Zero magnitude impacts upon a receptor will result in no effect, regardless of sensitivity.

Mitigation & Enhancement

- 2.16. Where the EIA identifies likely significant adverse effects, mitigation measures will be proposed in order to avoid, reduce, offset or compensate those effects. These mitigation measures may be embedded in the design or compensatory. Such embedded mitigation measures will likely include the movement or loss of turbines, access tracks and other infrastructure; and management and operational measures.
- 2.17. In line with the mitigation hierarchy identified in Planning Advice Note (PAN) 1/2013, Revision 1.0 (2017)⁵, the strategy of avoidance, reduction, offsetting and compensation seeks:
- First to avoid significant adverse effects;
 - Then to minimise those which remain; and
 - Lastly, where no other remediation measures are possible, to propose appropriate compensation.
- 2.18. In addition, enhancement measures may be incorporated into design of the Development to maximise environmental benefits.

⁵ The Scottish Government (2017). PAN 1/2013 Revision 1.0 Environmental Impact Assessment. Available at: <http://www.gov.scot/Resource/0052/00521028.pdf> [Accessed 01/03/2018]

Residual Effects

- 2.19. Taking a cognisance of the suggested mitigation (and enhancement) measures, the predicted effects will be re-assessed to determine the residual effects.

Cumulative Effects

- 2.20. At the time of writing it is known that there are other operational wind farms and a number of wind energy proposals located in the vicinity of the Site. Known wind farm developments are shown on Figure 2, Appendix A. The methodology adopted for assessing the cumulative effects of wind energy developments will be in accordance with advice from SNH^{6,7}. Cumulative effects will be considered for each technical area assessed within the EIA and include two forms:
- Combined effects of two or more similar developments; and
 - Combined effects within the Development.
- 2.21. The cumulative assessment will include descriptions of the effects in relation to proposed and upgraded transmission lines in the vicinity of the Development.
- 2.22. The extent of the cumulative assessment relative to each technical assessment will be agreed during the consultation process. For example, the potential landscape and visual effects, which relate to the visibility of the Development, will be much more wide ranging than noise effects, which will be limited to receptors in the more immediate vicinity of the Development. Specific guidance and policy exist for certain technical areas which advise how effects should be considered cumulatively and these will be used where relevant.

Alternatives

- 2.23. Schedule 4, Part 2 of the EIA Regulations 2017 requires a description of the reasonable alternatives (such as project design, technology, location, size and scale) studied by the developer, which are relevant to the Development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of environmental effects. Consideration of alternative designs has already begun. The final layout of the Development will be based on a range of technical criteria, such as separation distances between turbines, wind speed, prevailing wind direction, existing infrastructure, topography, ground conditions, local environmental issues and landscape and visual considerations. The identification of these criteria is an iterative process: as they are identified the layout of the Development, including ancillary infrastructure, will undergo a series of modifications to avoid or reduce

⁶ SNH, 2005, *Cumulative effect of Windfarms (Version 2)* [Online] Available at:

<http://www.snh.org.uk/pdfs/strategy/cumulativeeffectsonwindfarms.pdf> [Accessed 02/02/2018]

⁷ SNH, 2012, *Assessing the Cumulative Impact of Onshore Renewable Energy Developments* Available at: <http://www.snh.gov.uk/docs/A675503.pdf> [Accessed 02/02/2018]

potential effects through careful design. This process will be set out in the EIA Report.

Structure and Content of the EIA Report

- 2.24. The content of the EIA Report will broadly follow the specifications detailed within Schedule 4 of the EIA Regulations. The EIA Report will consist of three volumes and a Non-Technical Summary (NTS).
- Volume 1 – Main EIA Report text;
 - Volume 2 – Figures; and
 - Volume 3 – Technical Appendices.
- 2.25. The front end of the main EIA Report text will include:
- An introduction;
 - Description of the site and its surroundings;
 - Details of alternative considered and scheme evolution;
 - Description of the Development;
 - Details of the EIA process and methodology, including a summary of consultation; and
 - Policy context.
- 2.26. The technical chapters of the EIA Report will present details of the assessments undertaken, including any cumulative effects, required mitigation and residual effects.

PROJECT DESCRIPTION

- 3.1. The Development will consist of:
- Wind turbines and turbine foundations;
 - Access tracks and crane pads;
 - On site power collection system (transformers and underground cables);
 - Substation compound including a battery energy storage array;
 - Construction compound;
 - Borrow Pit workings; and
 - Permanent meteorological mast.

Turbines

- 3.2. The proposed details are as follows:
- Number of turbines – up to 30;
 - Maximum height to blade tip – 149.5 m;
 - Maximum generating capacity (per turbine) – 3 - 4 MW; and
 - Total generation capacity – over 50 MW.
- 3.3. An indicative turbine layout is shown in Figure 3, Appendix A. This layout has been developed with due consideration to known constraints e.g. topography, watercourses, cultural heritage features, peat depth, and proximity to dwellings.
- 3.4. For the purposes of the EIA, a precautionary approach will be taken and the largest prospective turbine will be assessed as the selected option. The worst case scenario will be evaluated for each topic, for example the maximum tip height and rotor diameter for landscape and visual and the maximum rotor diameter and a lower feasible hub height for ornithology.

Access Tracks

- 3.5. The turbine components would be delivered to the Site using the existing road network. The use of public roads will require further consultation with the appropriate bodies.
- 3.6. Previous site visits and route modelling and inspection suggests that turbine components could be delivered to site from the Port of Ayr via the A77, A713 and then via the western end of the B729 where access would be taken from. However, a detailed further abnormal loads assessment will be undertaken to determine the most suitable route of turbine delivery to the site. The traffic assessment would determine any requirements for upgrading of junctions or minor roads and would include swept path analysis.

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- 3.7. Existing forestry access tracks on Site will be used as far as possible to provide access to the turbines, construction compound, substation and meteorological mast. Where required, tracks will be upgraded and new tracks will be constructed of a graded stone and be up to 6 m in width.
- 3.8. An access and traffic assessment will be conducted as outlined in Chapter 14 of this scoping report.

Construction of the Development

- 3.9. The construction phase of the Development will comprise on-site site preparation and construction activities, supported by deliveries of materials, components and staff to the Site.
- 3.10. Construction is expected to take approximately 18 to 24 months, depending on weather and ground conditions, as well as other technical and environmental factors and is likely to consist of the following principal operations:
- Forestry activities;
 - Extraction of stone from onsite borrow pits;
 - Construction and upgrading of site tracks including water crossings/culverts;
 - Construction of a temporary construction compound and office facilities;
 - Construction of the substation buildings/compounds;
 - Construction of turbine foundations;
 - Construction of crane hardstanding areas;
 - Excavation of cable trenches and cable laying adjacent to the site tracks;
 - Installation of temporary and permanent drainage;
 - Erection and commissioning of wind turbines; and
 - Reinstatement of borrow pits and temporary construction compounds.

Grid Connection

- 3.11. Underground cabling, laid where possible alongside the access tracks, will link the turbine transformers to a single storey control building. Each turbine transformer will be located either within the turbine nacelle, within the base of the tower or in a small enclosure at the base of the turbine.
- 3.12. The connection to the grid falls under a separate consent process and will be subject to a separate application. As such it will not be considered as part of this EIA. However, a high level desk based environmental review of the likely connection route will be included as an appendix to the EIA Report.

Decommissioning

- 3.13. The Development will be designed to operate for a period of 25 years. Provision will be made for the Development to be decommissioned and the site restored at the expiry of consent. Typically all above ground infrastructure will be dismantled and removed from the site, cables and turbine foundations will be cut 1 m below ground level and covered with topsoil. Alternatively, the Applicant may apply for consent to extend the operational life of the Development in accordance with the relevant legislation at the time of any such application.

SITE SELECTION AND DESIGN EVOLUTION

- 4.1. The Applicant has identified the Site through an iterative site selection process seeking to avoid areas of high environmental sensitivity whilst choosing sites which are technically and economically viable. In doing so the following criteria have been used:
- No international or national landscape designations within the Site;
 - No European Protected Species listed on Annex 1 of European Council Directive 2009/147/EC⁸ on the conservation of wild birds or species listed in Schedule 1 to the Wildlife and Countryside Act 1981⁹, as amended, located within the turbine envelope area;
 - An assessment of known ecological/ ornithological constraints within the vicinity of the Site;
 - Located more than 2 km from densely populated settlements;
 - Exposed location with good wind speeds;
 - Close proximity to a potential grid connection point;
 - Land area available to accommodate sufficient and viable generating capacity;
 - Availability of a good access route options to the site involving minimal environmental disruption; and
 - No, or potentially resolvable, civil and military radar issues.
- 4.2. The purpose of a wind farm is to harness energy from the wind. It is important that wind turbines are sited in the optimum position to maximise the wind yield whilst minimising environmental effects.
- 4.3. The optimum layout of a wind farm depends on a range of criteria. These vary depending on the type and size of turbine as well as the local topography and the turbulence created by the ground conditions within and around the Site. Turbine manufacturers recommend that the turbines be spaced between four and five rotor diameters apart depending on the prevailing wind direction, turbine type and site characteristics. The available capacity of the electricity grid into which a wind farm will connect can also limit its size.
- 4.4. Throughout the remainder of the EIA process, the layout will further evolve to take into consideration the results of additional surveys and data gathered through the assessment process. This iterative design process ensures that the final layout of the wind farm submitted responds to the constraints identified onsite. The iterative design process and the reasoning behind the key changes will be reported in the EIA Report.

⁸ DIRECTIVE 2009/147/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 November 2009. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0147&from=EN> [Accessed 01/03/2018]

⁹ The Wildlife and Countryside Act 1981. Available at: https://www.legislation.gov.uk/ukpga/1981/69/pdfs/ukpga_19810069_en.pdf [Accessed 01/03/2018]

PLANNING AND ENERGY POLICY

- 5.1. The Planning and Energy Policy Chapter of the EIA Report will consider the Development in the context of adopted and emerging planning and energy related documents. The EIA Report Chapter will not undertake a detailed assessment of the Development against relevant planning policies and other material considerations, rather it will identify those documents considered to be material to determination of the application, identifying and briefly discussing individual plans, policies, aims and objectives considered to be particularly pertinent to the Development.
- 5.2. The application will be accompanied by a Planning Statement in support of the Development. The Planning Statement will draw upon the contents of the Planning and Energy Policy Chapter and consider the Development against identified planning and other policy objectives, concluding with substantiated comments about the extent to which the Development complies with the aims and objectives of identified plans and policies.
- 5.3. For clarity, the Planning Statement will draw upon the residual effects, post mitigation, of the Development identified in the various technical chapters of the EIA Report, in discussing the extent to which it complies with the aims and objectives of identified planning, energy and other relevant policy objectives. The purpose of this Chapter of the Scoping Report is to establish agreement on the planning and energy related documents that should be considered by the Applicant in the EIA.

National Planning Policy

National Planning Framework 3¹⁰

- 5.4. The Third National Planning Framework (NPF3) for Scotland sets the overall context for development planning across the country and provides a framework for the spatial development of Scotland as a whole. NPF3 was introduced in June 2014 and represents an up to date expression of Scottish Government policy on land use matters. NPF3 sets out the Scottish Government's development priorities over the next 20 to 30 years and identifies national developments which support the development strategy. NPF3 is a material consideration in the determination of applications submitted under Section 36 of the Electricity Act 1989¹ (Section 36 applications).
- 5.5. The Planning and Energy Policy Chapter will identify those elements of NPF3 considered relevant to determination of the Development. While Section 3 of NPF3 'A low carbon place' is likely to contain material of most relevance to the Development, other sections of NPF3, notably Section 2 'A successful, sustainable place' and Section 4 'A natural, resilient place' will also contain relevant commentary and the Planning and Energy Policy Chapter will identify and discuss these matters.

¹⁰ National Planning Framework 3 (2014). Available at:
<http://www.gov.scot/Resource/0045/00453683.pdf> [Accessed 01/03/2018]

Scottish Planning Policy¹¹

- 5.6. The most up to date version of Scottish Planning Policy (SPP) was introduced by the Scottish Government in June 2014 alongside NPF3. SPP states that its purpose *"is to set out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land"*. As a statement of Scottish Ministers' priorities, the content of SPP is a material consideration that carries significant weight in the assessment of Section 36 applications, although SPP makes it clear that it is for the decision maker to determine the appropriate weight in each case.
- 5.7. The subject policies contained in SPP mirrors the structure of the NPF3 and are set out under the following headings:
- A Successful, Sustainable Place;
 - A Low Carbon Place;
 - A Natural, Resilient Place; and
 - A Connected Place.
- 5.8. The narrative and policies under the 'Low Carbon Place' heading are likely to be of most relevance to the Development, as this section contains commentary relating to renewable energy matters in general and in relation to onshore wind in particular. Table 1 of SPP 'Spatial Frameworks' shows areas where wind farms will not be acceptable (Group 1), areas of significant protection (Group 2) and areas with potential for wind farm development (Group 3). As far as it is possible to tell from the scale of the Wind Energy Interim Spatial Framework Maps (2014) on the Council's website, the Site is located partly within a Group 3 area.
- 5.9. The Planning and Energy Policy Chapter will consider the Development in the context of the Spatial Framework and other relevant commentary in SPP, including aims and objectives regarding the creation of a low carbon economy, the presumption in favour of development that creates sustainable development and other relevant matters relating to rural and island development.

Onshore Wind Turbines, Online Renewables Planning Advice (May 2014)¹²

- 5.10. The Scottish Government introduced online renewables advice in February 2011, which has been regularly updated since then. The most recent specific advice note regarding onshore wind turbines was published in May 2014. The advice note identifies the typical planning considerations in determining applications for onshore wind turbines, including landscape impact, impacts on wildlife and ecology, shadow

¹¹ Scottish Planning Policy (2014). Available at: <http://www.gov.scot/Resource/0045/00453827.pdf> [Accessed 01/03/2018]

¹² Scottish Government (2014). Onshore Wind Turbines, Online Renewables Planning Advice. Available at: <http://www.gov.scot/Resource/0045/00451413.pdf> [Accessed 01/03/2017]

flicker, noise, ice throw, aviation, road traffic impacts, cumulative impacts and decommissioning.

- 5.11. The Planning and Energy Policy Chapter will consider the most up to date version of the advice note in place at the time of preparation.

*Planning Advice Notes*¹³

- 5.12. Alongside NPF3 and SPP, the Scottish Government provides technical advice on specific land use planning matters through a series of Planning Advice Notes (PANs). A number of PANs are potentially relevant to the Development and these would be briefly discussed in the Planning and Energy Policy Chapter, with more detailed commentary reserved for the relevant technical chapters. At this stage, it is envisaged that the following PANs may be of relevance:

- PAN 1/2011: Planning and Noise (2011);
- PAN 1/2013: Environmental Impact Assessment, Revision 1.0 (2017);
- PAN 2/2011: Planning and Archaeology (2011);
- PAN 3/2010: Planning Advice on Community Engagement (2010);
- PAN 51: Planning, Environmental Protection and Regulation (2006);
- PAN 60: Planning for Natural Heritage (2000);
- PAN 61: Planning and Sustainable Urban Drainage Systems (2001);
- PAN 68: Design Statements (2003);
- PAN 69: Planning and Building Standards Advice on Flooding (2004);
- PAN 75: Planning for Transport (2005); and
- PAN 79: Water and Drainage (2006).

*Historic Environment Scotland Policy Statement (June 2016)*¹⁴

- 5.13. The Historic Environment Scotland (HES) Policy Statement sets out Scottish Ministers' policies for the historic environment, provides greater policy direction for HES and provides a policy framework to inform the work of organisations that have a role and interest in managing the historic environment. This statement complements and has the same authority as the SPP. In paragraph 1.6 of the introductory section it notes that the historic environment faces many challenges, including the needs of renewable energy generation.

- 5.14. The Planning and Energy Policy Chapter will consider the Development against this statement, notably the 'key principles' which include conservation and management for the benefit of present and future generations and an understanding that the people of Scotland should be

¹³ Scottish Government (various). Planning Advice Notes. Available at: <https://beta.gov.scot/publications/planning-advice-notes-index/> [Accessed 01/03/2017]

¹⁴ HES (2016). Historic Environment Scotland Policy Statement. Available at: <https://pub-prod-sdk.azurewebsites.net/api/file/d60d93c4-90ad-41af-ba52-a67a00c7b383> [Accessed 01/03/2017]

able to enjoy, appreciate, learn from and understand Scotland's historic environment.

Strategic and Local Planning Policy

Dumfries and Galloway Local Development Plan¹⁵

- 5.15. The Development Plan for Dumfries and Galloway comprises the Dumfries and Galloway Local Development Plan (LDP) which was adopted in September 2014 and is the established planning policy for the area.
- 5.16. A review of the LDP is currently underway, the most recent stage being the approval by members at a Full Council meeting on 18 January 2018 to publish a Proposed LDP2¹⁶ for consultation. It is therefore expected that the currently adopted LDP will provide the established planning policy throughout the anticipated EIA Report preparation stage and determination period for the Development. Progress of the Proposed LDP2 will be monitored throughout the EIA and it is proposed that the Planning and Energy Policy Chapter will contain a section that discusses the Proposed LDP2, noting its status at the time of the EIA Report publication.
- 5.17. The LDP will be a significant material consideration in shaping the Council's consultation response to the Section 36 Application, and the Planning and Energy Policy Chapter will identify those aims, objectives and planning policies of the LDP considered to be of relevance to the Development. Policies IN1 Renewable Energy and IN2 Wind Energy are the key LDP policies, however other LDP policies of relevance will also be discussed as appropriate in the context of the EIA.

Dumfries and Galloway Supplementary Planning Guidance

- 5.18. The Council adopted their Supplementary Guidance (SG) relating to onshore wind development in June 2017. The SG comprises two parts; Wind Energy Development: Development Management Considerations¹⁷ and Dumfries and Galloway Wind Farm Land Capacity Study¹⁸. As adopted SG, this forms part of the LDP and is afforded the same weight as the LDP for decision making purposes.

¹⁵ Dumfries and Galloway Council (2014). Local Development Plan. Available at: [https://www.dumgal.gov.uk/media/17412/Local-Development-Plan-Section-1/pdf/Section1_LDP_\(policy\).pdf](https://www.dumgal.gov.uk/media/17412/Local-Development-Plan-Section-1/pdf/Section1_LDP_(policy).pdf) [Accessed 01/03/2018]

¹⁶ Dumfries and Galloway Council (2018). Local Development Plan 2, Proposed Plan. Available at: https://www.dumgal.gov.uk/media/19739/LDP2-Proposed-Plan/pdf/PROPOSED_PLAN_JAN_2018.pdf [Accessed 01/03/2018]

¹⁷ Dumfries and Galloway Council (2017). Wind Energy Development: Development Management Considerations. Available at: https://www.dumgal.gov.uk/media/17607/Part-1-Wind-Energy-Development-Development-Management-Considerations-Screening-Determination/pdf/0892-16_Wind_Energy_Guidance_Part_1.pdf [Accessed 01/03/2018]

¹⁸ Dumfries and Galloway Council (2017) Dumfries and Galloway Wind Farm Land Capacity Study. Available at: https://www.dumgal.gov.uk/media/18596/Dumfries-and-Galloway-Wind-Farm-Land-Capacity-Study-Appendix-C/pdf/Wind_Energy_Appendix_C_Landscape_June_2017.pdf [Accessed 01/03/2018]

- 5.19. As part of the production of the Proposed LDP2, the SG is also being reviewed. The Draft SG documents are also subject to consultation, following approval of such by members at the Full Council meeting in January 2018. Progress of the Draft SG will be monitored throughout the EIA Report preparation process and it is proposed that the Planning and Energy Policy Chapter will contain a section that discusses the Draft SG, noting its status at the time of EIA Report publication.

Energy Policy

- 5.20. According to the United Nations Intergovernmental Panel on Climate Change's fifth assessment report¹⁹, fossil fuel power generation should be phased out almost entirely by the end of the century to limit global warming to 2 degrees Celsius (°C) above pre-industrial levels. The report states that low carbon electricity supply will have to increase from 30% currently to more than 80% by 2050.
- 5.21. Most of the energy policy documents of relevance to the Development are concerned with reducing the amount of greenhouse gases (GHG) that are emitted as a result of energy production and a related objective of increasing the proportion of energy derived from renewable sources. The Planning and Energy Policy Chapter will identify and discuss the key aims and objectives of the most pertinent energy policy documents to the Development, at the time of EIA Report preparation. The discussion will include relevant European, UK and Scottish energy related legislation and policy. It is anticipated that the commentary on energy policy will identify and discuss the following publications:
- 2009 Copenhagen Accord²⁰ - As a party to the Copenhagen Accord, the UK has agreed a range of proclamations and objectives, including that climate change is 'one of the greatest challenges of our time', which must be combated 'urgently'.
 - 2009 European Renewable Energy Directive²¹ - The Directive encourages energy efficiency, energy consumption from renewable sources and the improvement of energy supply.
 - The Climate Change (Scotland) Act 2009²² - Sets out the statutory framework for GHG emission reductions in Scotland. The Scottish Government is in the process of finalising its third Climate Change Plan, setting out proposals to drive emissions down by 66% by 2032.

¹⁹ IPCC (2014) Fifth Assessment Report. Available at: <http://www.ipcc.ch/report/ar5/index.shtml> [Accessed 01/03/2018]

²⁰ UN (2009). Copenhagen Accord. Available at: <http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf> [Accessed 01/03/2017]

²¹ DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0028&from=EN> [Accessed 01/03/2018]

²² Climate Change (Scotland) Act 2009. Available at: https://www.legislation.gov.uk/asp/2009/12/pdfs/asp_20090012_en.pdf [Accessed 01/03/2018]

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- Renewables Action Plan (2009)²³ including associated updates – The overall aim is to support and accelerate the implementation of renewable energy in line with EU targets.
 - Onshore Wind Policy Statement (December 2017)²⁴ - This newly published statement by the Scottish Government examines a number of issues relating to the maintenance and continued support of onshore wind as a more mature technology for renewable energy generation. The statement covers a range of topics including route to market, strategic approach to development, protection for residents and the environment and community benefits.
 - Scottish Energy Strategy: The future of energy in Scotland (December 2017)³ - This strategy document aims to guide Scottish Government decisions and priorities in the context of a 'whole system' approach to energy production and consumption. Two new 2030 targets are set by the strategy. Firstly, that the equivalent of 50% of the energy for Scotland's heat, transport and electricity consumption to be supplied from renewable sources. Secondly, an increase in 30% in the productivity of energy use across the Scottish economy.
 - Electricity Generation Policy Statement, 2013²⁵ - This Scottish Government publication examines the way in which Scotland generates electricity and is underpinned by four key principles, one of which includes a largely decarbonised electricity generation sector by 2030.
- 5.22. These documents comprise the main energy related publications that will be considered in the Planning and Energy Policy Chapter, with any other publications and/or updates to these documents considered on a case by case basis.

²³ Scottish Government (2009). Renewables Action Plan. Available at: <http://www.gov.scot/Resource/Doc/278424/0083663.pdf> [Accessed 01/03/2018]

²⁴ Scottish Government (2017). Onshore Wind Policy Statement. Available at: <http://www.gov.scot/Resource/0052/00529536.pdf> [Accessed 01/03/2018]

²⁵ Scottish Government (2013). Electricity Generation Policy Statement. Available at: <http://www.gov.scot/Resource/0042/00427293.pdf> [Accessed 01/03/2018]

FORESTRY

- 6.1. This Chapter of the Scoping Report sets out the approach which would be used to integrate the Development into the existing woodland structure. A Wind Farm Forest Plan would be prepared, which would detail felling and replanting proposals, illustrating the forestry requirements associated with the construction and operation of the Development.
- 6.2. The Site is located in an area with extensive commercial woodlands, both private and publicly owned. The land available for the Development is largely forested, with the remainder comprising open ground for management boundaries, roads, unplantable land and margins beyond the woodland edge. The forests within the Site are privately owned and managed. They consist primarily of commercial conifers with areas of native broadleaves, open ground habitats and water bodies.
- 6.3. A desk based assessment reveals there are no woodland designations affecting the Site. Areas are identified as Primary and Secondary Zones under the Native Woodland Integrated Habitat Network, as potential areas for native woodland expansion. The associated core areas of the Native Woodland Integrated Habitat Network and Primary Zones for native woodland expansion are located outwith the Site. The commercial conifer crops are now moving into the second rotation, with ongoing felling and replanting of mature woodlands.
- 6.4. Timber from the Site will be despatched via the B729. The B729 is a consultation route for timber traffic and is subject to an agreed usage protocol with the Council and forestry users. Development related timber traffic would need to be integrated into all other timber traffic using this route, in agreement with the forestry industry and the Council.

2013 Scoping Opinion

- 6.5. In 2013, the only response in relation to forestry was received from the Scottish Environment Protection Agency (SEPA); the Forestry Commission Scotland provided no comment to the scoping request. SEPA noted that the Applicant should consider waste from forestry and how this could be managed. The use of waste materials on site for ecological benefits, must be proven to be beneficial onsite and result in no harm, otherwise it would be classed as a waste under the waste regulations. The release of nutrients during felling processes is also a key consideration in terms of water quality. SEPA also welcomed the approach of key holing the turbines and noted that clear felling would be acceptable on areas of deep peat enabling their restoration as guided by a Habitat Management Plan (HMP).

Assessment Methodology

Guidance and Legislation

- 6.6. In the UK there is a strong presumption against permanent woodland removal, unless it addresses other environmental concerns or where it would achieve significant and clearly defined additional public benefits. In Scotland, such woodland removal is dealt with under the Scottish Government's Control of Woodland Removal Policy²⁶ (2009). The purpose of the policy is to provide direction for decisions on woodland removal in Scotland. It is essential that the requirements of the Policy are addressed within the EIA. The integration of the Development into the Forest Plan will be a key part of the development process.
- 6.7. The forestry proposals would be prepared in accordance with the current industry best practice and guidance including, but not limited to:
- Dumfries and Galloway Council (2014): The Dumfries and Galloway Forestry and Woodland Strategy. Dumfries.
 - 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 (2015): Guidance to Forestry Commission Scotland staff on implementing the Scottish Government's Policy on Control of Woodland Removal.
 - The Scottish Government (2006). The Scottish Forestry Strategy. Edinburgh.
 - The Scottish Government (2011). Scottish Land Use Strategy. Edinburgh.
 - The Scottish Government (2012): Waste (Scotland) Regulations 2012.
 - The Scottish Government (2014a). Scotland's Third National Planning Framework (NPF3). Edinburgh.
 - The Scottish Government (2014b). Scottish Planning Policy. Edinburgh
 - 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.
 - UKWAS (2018). The UK Woodland Assurance Standard 4th Edition, UKWAS, Edinburgh.

²⁶ FCS (2009). Control of Woodland Removal Policy. Available at: Control of Woodland Removal Policy [Accessed 01/03/2018]

Consultation

- 6.8. The main forestry consultee is FCS, South Scotland Conservancy. FCS would be consulted throughout the design of the Development to ensure that the proposed changes to the woodlands are appropriate and address the requirements of the Control of Woodland Removal Policy and other guidance. In addition there may be interrelated issues raised by other consultees which would be addressed within the forestry assessment, for example from SEPA on forestry residues and the Council on timber transport.

Assessment

- 6.9. Forestry does not fit well into the standard EIA methodology. Commercial forests are dynamic and constantly changing through landowner activities, market forces and natural events such as windblow or pest and diseases. The forestry assessment would therefore not be a formal EIA assessment, rather it would be an assessment which describes the changes to the forest structure resulting from the incorporation of the Development into the forest. This would include the changes to, for example, the woodland composition and felling programmes. The forestry assessment would be presented in an individual EIA Report Chapter. The effects of the Development relating to forest felling and restocking would be assessed in the relevant chapters of the EIA Report, including Ecology; Landscape and Visual; Hydrology, Hydrogeology, Geology and Peat; Ornithology; and Traffic and Transport.

Baseline Conditions

- 6.10. The forestry baseline will describe the crops existing at the time of preparation of the EIA Report. This would include current species; planting year; felling and restocking plans contained within the existing Forest Plan; and other relevant woodland information. It would be prepared from existing forest records; desk based assessments; site visits; and aerial photographs.

Potential Effects and Assessment

- 6.11. There is potential for changes to the forest structure resulting from the Development, with consequential implications for the wider felling and restocking plans across the forest area. Areas of woodland may need to be felled for the construction and operation of the Development including for access tracks, turbine locations and other infrastructure. The potential effects would be changes to the structure of the woodlands, which may result in a loss of woodland area. This would be addressed through a redesign of the existing forest including, for example, the use of designed open space; alternative woodland types; changing the management intensity; or the provision of compensation planting on an alternative site. The changes to the forests for a particular development are regarded as site specific and it is considered that there are no cumulative forestry issues to be addressed.

- 6.12. The principal output would be the preparation of the Wind Farm Forest Plan. This would include a felling plan to show which woodlands are to be felled and when they are to be felled during the life of the Development. It would further include a restocking plan showing which woodlands are to be replanted and when during the life of the Development. The changes to the woodland structure would be analysed and described including changes to species composition, age class structure, timber production, traffic movements and the felling and restocking plans.
- 6.13. The resulting changes to the woodland structure and any requirement for compensation planting to mitigate against any woodland loss would be considered in the context of the Control of Woodland Removal Policy and in consultation with FCS.

Key Questions for Consultees

- 6.14. 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:
- Do the consultees agree with the proposed methodology and scope of the forestry assessment?
 - Do the consultees have any information, particularly with reference to any new guidance, which should be taken into account within the assessment?

LANDSCAPE AND VISUAL

- 7.1. It is acknowledged from the outset that, in common with almost all commercial wind energy developments, some landscape and visual effects would occur as a result of the proposals.
- 7.2. A key principle of the European Landscape Convention is that all landscapes matter and should be managed appropriately. It is also acknowledged that landscapes provide the surroundings for people's daily lives and often contribute positively to the quality of life and economic performance of an area.
- 7.3. It is therefore proposed that a Landscape and Visual Impact Assessment (LVIA) is undertaken as part of the EIA and a Landscape and Visual Chapter be included in the EIA Report. The LVIA will be undertaken by Chartered Landscape Architects, who are experienced in the assessment of large scale, onshore wind energy projects and are familiar with the landscapes in and around Dumfries and Galloway.
- 7.4. It is proposed that the LVIA will consider the potential effects of the Development upon:
- Individual landscape features and elements;
 - Landscape character; and
 - Visual amenity and the people who view the landscape.

2013 Scoping Opinion

- 7.5. In the 2013 Scoping Opinion, SNH made a number of points:
- The Applicant should consider a number of layout and turbine height iterations during the EIA process to ensure that the Development is well designed to work with the landscape.
 - It was noted that the Site is located within the Galloway Hills Regional Scenic Area (RSA) and therefore the effects on the key characteristics of this area (i.e. Glenkens and Rhinns of Kells) must be investigated.
 - The apparent saturation of the area with wind energy developments was a key consideration.
 - Photomontages were requested for all viewpoints up to 17 km from the Development.
 - The suggested viewpoints were acceptable, although it was requested that a viewpoint from Corserine was included.
- 7.6. These points have all been considered through the Updated Scoping Report to development a methodology which satisfies SNH's concerns.

Baseline Landscape Conditions

Landscape Character

- 7.7. The Dumfries and Galloway landscape assessment was undertaken by Land Use Consultants in 1998²⁷ and formed part of the national programme of landscape character assessment (LCA) commissioned by Scottish Natural Heritage (SNH) in partnership with local authorities.
- 7.8. The study defines 27 landscape character types across Dumfries and Galloway. Each character type is further sub-divided into landscape units which comprise discrete geographical areas. A total of 104 of these smaller landscape units occur across Dumfries and Galloway.
- 7.9. The larger proportion of the Site and its immediate surroundings lie within the '19a: Southern Uplands with Forest' landscape character type and the 'Ken' landscape character unit. A small proportion of the Site is also located within landscape character type '4: Narrow Wooded River Valley'.
- 7.10. The key characteristics of the Southern Uplands with Forest were identified in the landscape assessment to be its "large, smooth dome-shaped hills with large scale dark green plantations on slopes and over lower summits". It was also identified that the area was a "changing landscape with large scale felling, ploughing and replanting".
- 7.11. The key characteristics of the Narrow Wooded River Valley include "narrow incised valleys with wooded slopes enclosing pasture floors, small pasture and arable fields enclosed by hedges/fences, dominant broadleaf woodland character with conifers on the higher slopes, lush tough shaped river valleys with pasture/arable floors enclosed by deciduous wooded slopes, intimate unspoilt landscape focusing on river views with some adjacent policy landscape". The key landscape issues identified for this character type include increase in coniferous forests and hedgerow loss.
- 7.12. It is considered that the landscape in the vicinity of the Site does not share the characteristics of the Narrow Wooded River Valley character type as set out within the Dumfries and Galloway LCA. Large scale coniferous forestry encloses the valley road to both sides, limiting intervisibility to the wider landscape. There are also active areas of plantation felling and forestry management within the 'Ken' landscape character area of the Narrow Wooded River Valley type, that have a strong influence upon the perception of the landscape.
- 7.13. It is known, as stated within the Guidelines for Landscape Character Assessment²⁸, that "In Scotland, the Landscape Character Assessment programme was carried out typically at 1:50,000 scale, working with

²⁷ Land Use Consultants (1998). Dumfries and Galloway Landscape Assessment. Available at: <http://www.snh.org.uk/pdfs/publications/review/094.pdf> [Accessed 01/03/2018]

²⁸ Land Use Consultants (2002). Landscape Character Assessment: Guidance for England and Scotland. Available at: <http://www.snh.org.uk/pdfs/publications/LCA/LCA.pdf> [Accessed 01/03/2018]

local authorities across the country". The scale of assessment at which the Dumfries and Galloway landscape assessment was undertaken therefore presents a broader brush analysis of the landscape, rather than a detailed local level assessment, carried out at the 1:10,000 scale. It is therefore not unusual to find that when the published character area boundaries are reviewed in the field, they do not always correspond to the characteristics of the landscape as they appear on the ground. The LVIA will include an assessment of local landscape character and how this might differ from the published landscape character assessment; some of this analysis has already taken place as part of the preparation of this Scoping Report.

- 7.14. Having undertaken initial analysis of the character of the landscape in and around the Site, it is considered, for the purposes of the LVIA, that the landscape of the Narrow Wooded River Valley in the vicinity of the Site is more characteristic of the adjacent Southern Uplands with Forest and thus the assessment will consider that the Development is located within the Southern Uplands with Forest character type.
- 7.15. The Dumfries and Galloway Wind Farm Landscape Capacity Study¹⁸ (DGWLCS) forms Appendix C to the Wind Energy Development: Development Management Considerations¹⁷ Supplementary Guidance Document. The study assesses the sensitivity of landscape character types, and more locally defined character areas, to different sizes of wind turbine development. The study was revised and updated to reflect the current position in relation to wind farm development in Dumfries and Galloway and the emergence of larger turbines.
- 7.16. The study considers landscape sensitivity to a wide range of turbines, based primarily on turbine height. It focusses on the remaining capacity for large turbines and a consideration of potential cumulative effects.
- 7.17. With regard to the sensitivity of the Southern Uplands with Forest landscape the Capacity Study sets out that this would be "*Medium for the large typology (turbines 80-150m)*".
- 7.18. It is set out in the Executive Summary to the Capacity Study that it "*identifies the greatest scope for additional [wind energy] development in parts of the Southern Uplands with Forest*". However, with regard to the 'Ken' landscape, it is set out that "*Capacity for additional development is likely to be very limited within the Ken unit, although some scope for repowering and/or small extensions to operational wind farms may be possible provided that effects on promoted recreational routes and on more sensitive glens are minimised. Limiting turbines within repowering schemes to around 150m high would fit better with the scale of the Ken unit*". From the site work undertaken as part of the preparation of this Scoping Report, it is considered that the part of the 'Ken' landscape in which the Development would be located does have the capacity to accommodate the Development. This matter will be considered in further detail through the assessment of landscape character to be set out within the LVIA.

- 7.19. With regard to the Narrow Wooded River Valley the Capacity Study states that *"There is no scope for turbines >50m high to be accommodated within this character type without significant adverse impacts occurring on key landscape and visual sensitivities"*. As discussed above, it is considered that the tract of the Narrow Wooded River Valley landscape that falls within the Shepherd's Rig site does not share the characteristics of the character type as a whole, rather it appears more characteristic of the adjacent Southern Uplands with Forest character type. Again, this matter will be considered in further detail through the assessment of landscape character and capacity to be set out within the LVIA.

Landscape Designations

- 7.20. The Site lies outwith any national landscape designation, including, National Parks or National Scenic Areas. It also lies outwith Wild Land, Inventoried Gardens and Designed Landscapes and the Galloway Forest Park (including the Dark Skies Park). A part of the site, at its north western edge, lies within the Galloway Hills Regional Scenic Area. Landscape designations in the wider area are illustrated on Figure 4, Appendix A.

Visual Receptors

- 7.21. There are a relatively limited number of potential visual receptors in the area surrounding the Site, with few settlements and towns in the nearby locality. There would be the potential for some views from the local road network, including the A713; B729; and B7000 as well as from the Southern Upland Way as it passes to the east of the Site. A detailed consideration of the potential for impacts to the visual amenity of receptors in the landscape surrounding the Site will be set out in the LVIA. This visual assessment will be informed by a selection of representative assessment viewpoints, which are discussed further in the methodology section, each of which will be illustrated with visualisations prepared in line with SNH best practice guidance.

Residential Visual Amenity

- 7.22. Detailed consideration with regard to residential visual amenity will also be given within in the LVIA. The Residential Visual Amenity Study (RVAS) will consider views from all properties located within 2 km of the Development.

Methodology

- 7.23. It is proposed that the main objectives of the LVIA will be as follows:
- To identify, evaluate and describe the current landscape character of the Site and its surroundings, and also any notable individual or groups of landscape features within the Site;
 - To determine the sensitivity of the landscape to the type of development proposed;

- To identify potential visual receptors (i.e. people that would be able to see the Development) and evaluate their sensitivity to the type of changes proposed;
- To identify and describe any impacts of the Development in so far as they affect the landscape and/or views of it and evaluate the magnitude of change due to these impacts;
- To identify and describe any mitigation measures (including mitigation which is embedded in the design and layout of the Development) that have been adopted to avoid, reduce and compensate for landscape and visual effects;
- To identify and assess any cumulative landscape and visual effects;
- To evaluate the level of residual landscape and visual effects; and
- To make a professional judgement about which effects, if any, are significant.

Published LVIA Guidance

7.24. The LVIA shall be undertaken in accordance with the principles of best practice, as outlined in published guidance documents, notably the third edition of the Guidelines for Landscape and Visual Assessment²⁹ (GLVIA3)

7.25. The methodology and assessment criteria proposed for the assessment has been developed in accordance with the principles established in this best practice document. It should be acknowledged that GLVIA3 establishes guidelines, not a specific methodology. The preface to GLVIA3 states:

"This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand."

7.26. The approach has therefore been developed specifically for this assessment to ensure that the methodology is fit for purpose.

7.27. As part of the development of the proposed methodology, consideration has also been given to the following documents:

- Guidelines for Landscape Character Assessment, (2002) Countryside Agency and SNH;
- Landscape Character Assessment Guidance for England and Scotland: Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity, (2002) The Countryside Agency and SNH;
- Assessing the Cumulative Impact of Onshore Wind Energy Developments (March 2012) SNH;
- Siting and Design of Wind farms in the Landscape, Version 3 (February 2017) SNH;

²⁹ LI & IEMA (2013). Guidelines for Landscape and Visual Impact Assessment, Third Edition.

- Visual Representation of Wind farms – Version 2.2 (February 2017), SNH;
- Landscape Institute (LI) Advice Note 02/17 Visual representation of development proposals (March 2017) Landscape Institute; and
- LI Advice Note 01/11 Photography and Photomontage in Landscape and Visual Impact Assessment, (2011) Landscape Institute.

7.28. Full details of the methodology will be provided within the LVIA chapter. The following provides an outline of the key aspects of the assessment.

Distinction between Landscape and Visual Effects

7.29. In accordance with the published guidance, landscape and visual effects shall be assessed separately, although the procedure for assessing each of these is closely linked. A clear distinction has been drawn between landscape and visual effects as described below:

- Landscape effects relate to the effects of the Development on the physical and perceptual characteristics of the landscape and its resulting character and quality; and
- Visual effects relate to the effects on specific views experienced by visual receptors and on visual amenity more generally.

Types of Landscape and Visual Effects Considered

7.30. The LVIA will address all phases of the Development and effects will be considered during the construction phase, when the Development is being built (temporary effects), following completion of the Development (permanent effects) and during decommissioning of the Development (temporary effects).

7.31. The LVIA will not only assess the effects associated with the turbines, but also any related effects resulting from the anemometer mast, control building/substation, underground cabling, borrow pit workings and site tracks and access road.

7.32. Consideration shall be given to seasonal variations in the visibility of the Development and these will be described where necessary.

7.33. The LVIA will also consider the potential for any cumulative effects to arise. The requirement for consideration of cumulative effects under the EIA Regulations is set out in Schedule 4, as follows:

*"5. A description of the likely significant effects of the development on the environment resulting from, inter alia: (e) the cumulation of effects with other **existing and/or approved development**, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources"*

7.34. This represents a change to the wording of the previous Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2010 which stated: "A description of the likely significant effects of the development

on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development".

- 7.35. There is therefore apparently no longer any minimum requirement under the current EIA Regulations to consider the potential for cumulative impacts in relation to other developments which are yet to be awarded consent.
- 7.36. Notwithstanding this, it is acknowledged that current best practice guidance for cumulative impact assessment (Assessing the Cumulative Impact of Onshore Wind Energy Developments, SNH, 2012) still refers to a consideration of proposals which are "*awaiting determination within the planning process with design information in the public domain*" and states that "*The decision as to which proposals in the planning / consenting system should be included in an assessment is the responsibility of the determining authority.*"
- 7.37. As such, it is proposed in this LVIA to consider cumulative effects caused by the development of the Site in conjunction with other sites which are either operational, under construction, consented or the subject of a full planning application. The SNH best practice guidelines identify two principle types of cumulative visual impact:
- Combined visibility – where the observer is able to see two or more developments from one viewpoint; and
 - Sequential visibility – where two or more sites are not visible at one location but would be seen as the observer moves along a linear route, for example, a road or public right of way.
- 7.38. The guidelines state that combined visibility may either be in combination (where two or more sites are visible from a fixed viewpoint in the same arc of view) or in succession (where two or more sites are visible from a fixed viewpoint, but the observer is required to turn to see the different sites). Each of the above types of cumulative effect will be considered in the LVIA.

Study Areas

- 7.39. In order to assist with defining the study area, a digital Zone of Theoretical Visibility (ZTV) model was created as a starting point to illustrate the geographical area within which views of development on the Site are theoretically possible. This was based on a 'bare-earth' scenario, whereby the screening effect of areas of existing vegetation or built features in the landscape are not taken into account. The ZTV was modelled to blade tip height using the currently proposed turbine height of 149.5 m and is presented at Figure 5, Appendix A.
- 7.40. The ZTV is a useful tool used to provide a focus on the area and receptors that are most likely to be affected by a proposed development, but should always be subject to verification in the field. In this regard,

initial site visits have been conducted during January 2018 to understand the actual likely visibility of development at the Site.

- 7.41. Having reviewed the ZTV and with regard to best practice guidance, it is proposed that the LVIA will consider an initial 35 km radius study area. Detailed assessment will then be provided for a 15 km section of this study area, which it is considered represents a proportionate extent of the study area and the limit within which any potential significant effects might occur.
- 7.42. For the cumulative assessment, consideration was initially given to a 60 km radius from the Site, as recommended by SNH best practice guidance. Following this review, it is proposed that a 20 km study area be adopted to consider cumulative effects, which is considered to represent a proportionate extent of the study area and the limit within which any potential significant cumulative effects might occur. Cumulative sites within 35 km of the site are illustrated on Figure 2, Appendix A and listed in Appendix C.
- 7.43. It is also proposed to carry out a separate Residential Visual Amenity Study covering all properties located within 2 km of all proposed turbines. This additional assessment will be presented in an appendix to the LVIA Chapter and will complement the assessment of visual receptors within the LVIA, providing further detail in relation to the effect on the views and amenity from different parts of each property and its curtilage.

Proposed LVIA Viewpoint Locations

- 7.44. It is proposed that the 21 locations set out in Table 7.1 are included as viewpoints in the LVIA. The locations which are illustrated on Figure 5, Appendix A represent visual receptors and character types at a range of distances and directions from the Site.
- 7.45. It is acknowledged that the Development is located in relative close proximity to the proposed Longburn Wind Farm. This scheme of 10 no. turbines, 134 m to blade tip, is located on land to the west of the Site and is understood to be visible from similar locations to the Development. A planning application for Longburn Wind Farm was submitted to the Council in June 2016 (application reference 16/P/2/0187), and a series of viewpoints were agreed with SNH and the Council. The application was refused consent in September 2017 and is currently subject to an appeal (reference PPA-170-2129) which was lodged in October 2017. At the time of preparing this Scoping Report it remains undetermined.
- 7.46. A comparative exercise of ZTV coverage between the Development and the Longburn Wind Farm has been undertaken to understand the potential cumulative effects of the two schemes. This in turn has influenced the choice of viewpoint locations, which have been purposefully chosen to replicate those that were included in the Longburn LVIA to allow for a comprehensive understanding of potential effects.

7.47. Although there are minor differences in ZTV coverage between the Development and Longburn Wind Farm; the following list of 21 viewpoints remains relevant for the Development.

Table 7.1: Proposed Assessment Viewpoints

No	Location	OS Grid Ref	Direction	Receptor Type
1	Stroanfreggan Bridge (B729)	264564, 591794	South east	Minor Road
2	Stroanfreggan Craig Fort	263710, 592069	South east	Heritage Asset
3	Guttery Glen (B729)	265951, 591540	South east	Minor Road
4	Smittons Bridge	263301, 591879	South	Minor Road
5	Stroanfreggan Cairn	264101, 591433	South south east	Heritage Asset
6	Carroch Hill	267389, 592210	East	Hill summit
7	Culmark Hill	264448, 589670	South south east	Southern Upland Way
8	National Byway Cycle Route (minor road south of B729)	268635, 590766	South east	Recreational Route
9	High Bridge of Ken	261972, 590163	South	Minor Road
10	Southern Upland Way west of Benbrack	267950, 597005	North east	Long distance footpath. Limited view from summit of Benbrack
11	B7000	261856, 589322	South	Minor road
12	Dundeugh Hill	260976, 589724	South south west	Hill summit
13	Beninner	260584, 597157	North west	Hill summit
14	Cairnsmore of Carsphairn	259472, 597985	North west	Hill summit
15	Craig of Knockgray	257042, 594364	West	Hill summit
16	Alhang	264229, 601026	North	Hill summit
17	Mullwhanny	271668, 597343	North east	Hill summit near to Cairnhead and Striding Arch Sculptures
18	Straongassel (A713)	260313, 586825	South south west	Tourist Route
19	Bardennoch Hill	256679, 591479	West	Hill summit

No	Location	OS Grid Ref	Direction	Receptor Type
20	Woodhead Mines	252988, 593806	West	Minor Road
21	Corserine	250365, 587143	South west	Hill summit

- 7.48. Each of the representative viewpoints will be visited to evaluate the sensitivity of views. In addition, the study area will also be extensively visited to consider visibility of the Development as receptors move through the landscape.
- 7.49. The viewpoints will be used as the basis for determining the effects on visual receptors within the study area. The sensitivity of different receptor groups will be set out in the LVIA methodology.
- 7.50. The level of effect experienced by different visual receptor groups will be determined by considering in tandem the sensitivity and view with the magnitude of impact.

Visualisations

- 7.51. For each of the viewpoints, photography will be undertaken and visualisations will be prepared in line with SNH best practice guidance³⁰.
- 7.52. A digital model will be generated to enable the production of wirelines of the Development from locations throughout the study area to help identify the scale, arrangement and visibility of the proposed turbines. These images will be reviewed on site to assess how natural and built screening would affect visibility of the Development.
- 7.53. Each of the wireframe models will then be developed further into photomontages to help illustrate the predicted impact of the Development.
- 7.54. For each viewpoint where it is possible to view a long distance 360 degree (°) panorama, a series of four 90° baseline photography panoramas will be produced, illustrating the full panorama as seen from the viewpoint locations. Each panorama will be accompanied with an associated wireline illustrating cumulative schemes. These will be presented so that each 90° angle of view is read in a clockwise direction, starting with the section which includes the Development. For those viewpoints where a wide panorama is not available, a 90° baseline panorama in the direction of the Site will be produced, along with any other 90° angles of view to illustrate the wider panorama as appropriate.
- 7.55. Ancillary elements such as the permanent anemometer mast, access tracks and the substation will be shown in photomontages for viewpoints within 5 km when they would be visible. Beyond 5 km it is considered

³⁰ SNH (2017). Visual Representation of Wind Farms, Version 2.2. Available at: <https://www.nature.scot/sites/default/files/2017-07/A2203860%20-%20Visual%20representation%20of%20wind%20farms%20-%20Guidance%20-%20Feb%202017.pdf> [Accessed 01/03/2018]

unlikely that the ancillary elements would form more than a limited element of the entire Development when compared to the turbines.

Key Questions

- 7.56. 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 there any comments with regard to the position taken that the 'Ken' landscape of the 'Narrow Wooded River Valley' character type, does not share the characteristics of the overall character type in the area local to the Site, and thus will be considered as being part of the adjacent 'Southern Uplands with Forest' character type for the purposes of the character assessment?
 - Are there any comments on the proposed list of viewpoint locations?
 - Are there any further wind farm sites, to those listed in Appendix C, to consider as part of the cumulative assessment?

ECOLOGY

- 8.1. This section of the Updated Scoping Report describes the proposed methods that will be followed to confirm and further establish the ecological baseline relevant to the Development. The methods and approach that will be followed to evaluate and assess the potential effects of the Development on the ecological baseline (Important Ecological Features (IEFs)) will also be identified. A discussion of ornithological methods and assessment is provided separately in Chapter 9.
- 8.2. Initial baseline surveys were carried out between May and September 2013. The survey areas were defined with reference to the Site and encompassed a series of buffers. The buffer size is dependent on the sensitivity of key species to potential effects associated with the Development. Survey methods followed contemporaneous best practice guidance at the time.
- 8.3. As outlined in SNH's document 'General advice, sources of guidance and information for onshore wind farms'³¹, after 18 months, the non-avian protected species baseline data may be considered out of date. This may therefore need updating to provide a sufficiently robust baseline to inform the Ecological Impact Assessment (EcIA) for accurate determination of the potential impacts from the Development. As a result, it is proposed that baseline surveys will be undertaken in 2018 to provide an updated baseline.

2013 Scoping Opinion

- 8.4. In 2013, SNH confirmed they were satisfied with the breadth of surveys being undertaken for the ecological assessment; the only request they made was that any Annex 1 habitats or UK Biodiversity Action Plan (BAP) Priority Habitats should be covered by a National Vegetation Classification (NVC) survey. Cognisance has been taken on this when developing the current update survey and assessment methodology.

Desk Study

Statutory Designated Sites

- 8.5. A search was undertaken for statutory designated sites within 5 km, with this search area extended to 10 km for Special Areas of Conservation (SAC). A review of the SNH Information service (SNHi³²) identified only one site of (non-avian) nature conservation value within the search area (Table 8.1).

³¹ SNH (2016) General advice, sources of guidance and information for onshore wind farms. Available at: <https://www.snh.scot/sites/default/files/2017-07/A1150291%20-%20SNH%20General%20pre-application%20and%20scoping%20advice%20to%20to%20developers%20of%20onshore%20wind%20farms.pdf> [Accessed Feb 2018]

³² SNHi – Available at: <http://www.snh.gov.uk/publications-data-and-research/snhi-information-service/> [Accessed Feb 2018]

Table 8.1: Summary of Statutory Designated Sites within the Search Area

Site	Designation	Distance and Direction	Description/Principal Interest
Cleugh	SSSI	3.5 km S	Best example of unimproved lowland neutral grassland in the region.

- 8.6. Dundeugh Wood, to the south of the Development, is listed in the Ancient Woodland Inventory (AWI).
- 8.7. Designated sites within the wider area are shown on Figure 6, Appendix A.

Previous Baseline Survey Results Summary

Habitats & Vegetation Surveys

- 8.8. An Extended Phase 1 Habitat Survey and National Vegetation Classification (NVC) Survey were carried out in September 2013 within the Site. Habitats recorded were dominated by Sitka spruce (*Picea sitchensis*) plantation, some of which was planted on poorly drained blanket bog peatland. Further habitats included areas of felled plantation, some of which had been recently replanted with native broadleaf trees (to the north of the Site) and Sitka spruce, and others which had become established with bracken and scattered scrub. Woodland rides were predominately purple moor-grass (*Molinia caerulea*) dominated marshy grassland. Dry heath was recorded on the edges of forest roads and tracks which interspersed the Site.

Protected Species Surveys

- 8.9. Protected species surveys were carried out between May and September 2013, and included surveys for otter (*Lutra lutra*), water vole (*Arvicola amphibius*), pine marten (*Martes martes*), badger (*Meles meles*) and red squirrel (*Sciurus vulgaris*). The results of these surveys are summarised below.

Red Squirrel

- 8.10. Surveys recorded potential evidence of red squirrel presence; however this could not be distinguished from grey squirrel evidence, as both species were known to be present in the area. It was considered possible that red squirrel were present within the Site but in low numbers.

Pine Marten

- 8.11. No evidence of pine marten was recorded during surveys, however due to the geography of the Site and limited habitat suitability, the species was considered likely to exist within the areas of coniferous woodland within the Site.

Badger

- 8.12. No evidence of badger was recorded and the majority of the habitats present within the Site, such as dense coniferous woodland, offer limited foraging opportunities and were considered unsuitable for establishing setts. Badger were considered unlikely to reside on the Site however, transient badger use was considered possible.

Bat Surveys

- 8.13. Bat surveys were carried out monthly between May and September 2013. Surveys included transects, remote monitoring and roost suitability. The results of these surveys are presented below.
- 8.14. Transect surveys were undertaken on three occasions seasonally, in May, July and September 2013, in accordance with Bat Conservation Trust (BCT) survey guidelines³³. The survey recorded very low levels of bat activity, and was dominated by common and widespread species of low to moderate risk from wind farm development³⁴ including common and soprano pipistrelle (*Pipistrellus pipistrellus/pygmaeus*). A single pass from a possible Nathusius pipistrelle (*Pipistrellus nathusius*) represented the only potential activity from high risk species³⁴.
- 8.15. Remote monitoring surveys were undertaken on three occasions seasonally, in May, July and September 2013, in accordance with BCT survey guidelines³³. The survey recorded low levels of bat activity, dominated by common and widespread species of low to moderate risk from wind farm development³⁴ including common and soprano pipistrelle, as well as *Myotis* species. Survey also recorded very infrequent activity from potential high risk species³⁴ (approximately 1% of activity) such as Nathusius' pipistrelle and *Nyctalus* species.
- 8.16. No evidence of, or suitability for, roosting bats were recorded during 2013 surveys.

Fisheries Surveys

- 8.17. Fisheries surveys were carried out between April and September 2013 across nine sampling sites within close proximity to the Site.
- 8.18. The habitat quality and utilisation potential of the survey sites was generally good with a small number of sites recorded as moderate. The majority of assessed sites generally consisted of moderate/good combinations of flow types, depths and variable substrates providing good habitat for juvenile salmonids. Within the selected survey reaches, there were few areas of suitable habitat for juvenile lamprey (*Lampetra sp.*), however none were recorded at the time of survey.
- 8.19. The fish fauna surveys predominantly recorded brown/sea trout (*Salmo trutta*) which were recorded as being widespread across the survey area.

³³ Hundt, L. (ed.) (2012) Bat Surveys: Good Practice Guidelines (2nd Edition). Bat Conservation Trust.

³⁴ Natural England (2014) Bats and onshore wind turbines (Interim guidance) (TIN051)- Third edition

Trout were recorded within a range of age-classes, suggesting spawning activity in the previous four years, an overall low-moderate trout population. There are many suitable habitat for Atlantic salmon (*Salmo salar*), however the species was not recorded during surveys. This was considered to be as a result of the presence of the Galloway Hydro Scheme, which may create barriers to fish migration. These obstacles were considered to possibly have contributed to the absence of lamprey species and European eel (*Anguilla anguilla*), and suggest that brown trout population are resident and not migratory.

Baseline Update Methodology

Desk Study

- 8.20. In order to augment baseline survey data collected and, if necessary, refine the survey scope, recent records (within 20 years) of protected and/or notable species and details of sites of ecological interest will be sought. Data consultation will aim to collect up-to-date records of the following: non-statutory designated sites located within 2 km of the Site, (extended to 5 km for those designated for bats); rare, notable or protected flora and fauna within 5 km of the Site (extended to 10km for bats); and records of invasive, non-native species within 2 km of the Site.
- 8.21. In the first instance, records will be sought from publically available data resources, as well as the following organisations:
- SNH;
 - Dumfries and Galloway Environmental Resources Centre (DGERC);
 - Dumfries and Galloway Bat Group;
 - Red Squirrels in South Scotland;
 - Scottish Wildlife Trust;
 - Galloway Fisheries Trust;
 - Nith District Salmon Fisheries Board;
 - Dumfries and Galloway Biodiversity Action Plan; and
 - National Biodiversity Network.

Field Surveys

- 8.22. Ecological surveys are necessary to provide an up-to-date baseline against which the potential effects of the Development can be assessed. The limit of baseline surveys has been defined by the Site boundary and thus, encompasses all areas in which development may take place. Where necessary and accessible, some surveys will extended beyond this Site boundary to provide the required baseline information.

Habitats and Vegetation

- 8.23. Due to extensive clear-felling, there are likely to be significant changes in the baseline habitats. As such, it is recommended that the Extended Phase 1 habitat survey is ground truthed and updated in areas where the existing baseline appears to differ from the previous 2013 conditions outlined above.
- 8.24. The survey will be carried out during the optimum period (April to September 2018) following standard methods³⁵. The survey will cover the relevant areas of the Site and immediately adjacent areas (up to 200 m), with additional effort targeted at identifying the locations of any rare or scarce plants or invasive species. The survey will allow features of ecological constraint to influence design, an assessment of the potential impact of habitat loss due to the construction of the Development and will also help to guide the scope of other ecological surveys by assessing the potential of habitats to support notable fauna.
- 8.25. Should the presence of notable or sensitive habitats be recorded during the survey, such as peatlands or Ground Water Dependant Terrestrial Ecosystems (GWDTE), an NVC³⁶ survey will be carried out up to 200 m of the Site.

Protected Species

Bat Surveys

- 8.26. Bat activity at the Site will be surveyed according to BCT³³, SNH and Natural England (NE)^{37, 34} guidance and as follows:
- Transect surveys - Habitats within the survey area will be walked and/or driven, where accessible, to provide a transect route with five-minute point counts at regular intervals. Transect surveys will be carried out seasonally (Spring, summer & autumn) on three separate occasions between May and September 2018.
 - Automated Surveys - AnaBat detectors will be deployed to automatically record bat activity on three occasions seasonally between May and September 2018. On each occasion the AnaBat detectors will be deployed for a minimum of five consecutive nights. The AnaBats will be located within the potential turbine layout, as well as in a range of representative habitats and control sites.
 - Roost Suitability surveys – Data searches will be conducted to identify any known roost sites in the vicinity of the Site. Potential bat roosts onsite will be identified and, if necessary, emergence/re-entry surveys will be conducted at potential roost sites considered to be at risk.

³⁵ Joint Nature Conservation Committee (JNCC) (2004) Handbook for Phase 1 habitat survey: a technique for environmental audit. JNCC.

³⁶ Rodwell, J. S. et seq. (1992) British Plant Communities Vols 1–5, Cambridge University Press: Cambridge.

³⁷ SNH has adopted NE TIN051 guidelines in relation to bats and wind farm developments.

- 8.27. As habitats with the Site are likely to be sub-optimal for high risk bat species and very low levels of these species were recorded during 2013 baseline surveys, a precautionary low risk seasonal approach will be taken to bat activity surveys. Data will be analysed immediately after being collected, and should bat activity, or high-risk species such as noctule (*Nyctalus noctula*) or Leisler's bats (*Nyctalus leisleri*) be recorded at notably higher levels of activity than previously recorded, then the survey scope will be increased appropriately, for example to a moderate risk monthly survey approach.

Otter and Water Vole

- 8.28. Surveys for evidence of otter and water vole will be carried out in accordance with SNH survey guidelines^{38, 39}, across suitable habitats including up to 200 m upstream and downstream of riparian features, as well as waterbodies and wetland areas within the Site during spring to autumn 2018.

Red Squirrel

- 8.29. Suitable habitats (particularly mature coniferous plantation) within 50 m of the Site will be surveyed in accordance with SNH guidance⁴⁰, for evidence of red squirrel such as dreys and feeding cones. If deemed necessary, camera trapping will be deployed to confirm the presence of red squirrel dreys.

Pine marten

- 8.30. Suitable habitats within 250 m of the Site will be surveyed in accordance with SNH guidance⁴¹, to assess their potential to support pine marten and to identify field signs including dens. If deemed necessary, camera trapping and DNA analysis of scats will be undertaken to confirm the presence of pine marten.

Fisheries Surveys

- 8.31. Due to habitat suitability and presence of salmonids such as brown trout, recorded during previous baseline surveys, update fish fauna surveys will be carried out in Spring–Autumn 2018. Fish populations will be surveyed by electrofishing and will be carried out to Scottish Fisheries Co-ordination Centre protocols⁴², and under licence from the Nith District Salmon Fisheries Board or the Scottish Government. Surveys will include both fully quantitative and semi-quantitative assessments where possible.

³⁸ SNH (2016) Protected Species Advice for Developers: Otter

³⁹ SNH (2016) Protected Species Advice for Developers: Water Vole

⁴⁰ SNH (2016) Protected Species Advice for Developers: Red Squirrel

⁴¹ SNH (2016) Protected Species Advice for Developers: Pine Marten

⁴² Scottish Fisheries Co-ordination Centre (2007) *Electrofishing Team Leader Training Manual*. Fisheries Management SVQ Level 3: Manage Electrofishing Operations. Inverness College.

Other species

- 8.32. Habitats will be assessed for their potential to support other notable species and a watching brief will be maintained during ecological surveys to record observations. Additional species-specific surveys will be undertaken as dependent on the results of consultation, desk study and field observations.

Ecological Impact Assessment Methodology

- 8.33. The Site is dominated by commercial forestry plantation, much of which has been recently felled. It is interspersed by tributaries of the Water of Ken. The remainder of the Site is surrounded by open moorland and other areas of existing and felled forestry plantation. The scale and location of the Development will limit potential ecological effects, since the turbines and the majority of associated infrastructure will be located within commercial forestry, which is a habitat generally considered to be of limited ecological value.
- 8.34. The assessment of ecological impacts will follow the guidance document produced by the Chartered Institute of Ecology and Environmental Management (CIEEM) ensuring a transparent and scientifically rigorous approach to EcIA⁴³. These guidelines set out the process for assessment through the following:
- Collation of baseline ecological information through desk study and field surveys;
 - Identification and characterisation of ecological impacts from all phases of the Development;
 - Incorporation of measures to mitigate identified effects;
 - Assessment of significance of residual effects following mitigation;
 - Identification of appropriate compensation to offset significant residual impacts; and
 - Identification of opportunities for ecological enhancement.
- 8.35. The assessment will include proposals for the avoidance and mitigation of potentially adverse effects and will consider enhancement measures to increase biodiversity in the area. Potential cumulative ecological effects with other nearby developments will also be addressed. Mitigation will be identified where the assessment indicates that there is a potential significant impact on important habitats and species as a consequence of the Development.

Important Ecological Features (IEFs)

- 8.36. Although some baseline surveys require updating, the known baseline at the time of writing suggests that a number of ecological sensitivities may

⁴³ CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. 2nd edition, Chartered Institute of Ecology and Environmental Management, Winchester

exist. In the context of EcIA these features are defined as IEFs, and for the Development may include:

- Sensitive habitats (such as Annex I, Scottish Biodiversity List (SBL), and potential GWDTEs (SEPA, 2014));
- Riparian mammals – a number of watercourses and waterbodies located within and in close proximity to the Site have potential to support water vole and likely support otter;
- Woodland mammals – standing and recently felled coniferous plantation woodland as well as marginal and connecting habitats have the potential to support pine marten & red squirrel;
- Aquatic species – aquatic habitats within and in close proximity to the Site have the potential to support salmonid species; and
- Bats – habitats within the Site support commuting and foraging bats of low risk from wind farm development.

Determining Significance

- 8.37. The approach to assessment outlined in Chapter 2 will generally be followed in the EIA Report. Definitions of sensitivity and magnitude specific to ecology receptors will be used and defined in detail.

Potential Effects

- 8.38. The ecological assessment will focus on the potential effects of indirect and direct impacts upon IEFs during construction, operation and decommissioning of the Development. This will be assessed in terms of, but not limited to, the effects of the following;
- Direct impacts on nearby designated sites and their qualifying interests;
 - Direct and indirect habitat loss and disturbance - temporary or permanent loss to terrestrial or aquatic habitats;
 - Turbine-related bat mortality - death or injury by collision with the turbine blades; and
 - Indirect and direct effects on protected fauna including, but not limited to, otter, pine marten, water vole, red squirrel, and Salmonid fish.

Key Questions for Consultees

- 8.39. 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:
- Is the list of potential effects and key sensitive receptors comprehensive?
 - Are the baseline survey methods and level of proposed survey effort appropriate taking into consideration current guidance; the proposed scale and location of the Development; survey work

completed to date; and the key findings and identified sensitive receptors?

- Are the proposed receptor evaluation and impact assessment methods considered appropriate and comprehensive?

ORNITHOLOGY

- 9.1. This chapter of the Updated Scoping Report describes the proposed approach to the assessment of potential effects from the Development on bird populations and their supporting habitats (i.e. key ornithological receptors). It includes the methods for the desk study, baseline survey, receptor evaluation and the assessment of the significance of any identified effects.

2013 Scoping Opinion

- 9.2. SNH provided the below comments in regard to ornithology for the 2013 scoping opinion:
- It was advised that autumn and spring migratory surveys were not required for the Site.
 - Following review of the supporting figures it was noted that the vantage point surveys did not cover the entire Site and of most concern was the fact that Turbine 44 was not covered by the surveys.
 - It was noted that a 'flexible approach' was to be taken for the survey methods and advised against this, as this was not the norm.
- 9.3. RSPB also provided comment in 2013, stating:
- The Site is located in an area of medium sensitivity for breeding and wintering birds, and is located in an area for wildfowl migratory birds. Further it was noted that black grouse leks are known within 1 to 2 km of the Site and breeding raptors are within the area.
 - They were generally satisfied with the level of survey work which had been undertaken and agreed with the target species, but recommended that whooper swans were included.
 - Concerns were also raised about the vantage point survey coverage of the full Site.
- 9.4. The Applicant can confirm that the points raised in 2013 by the consultees have been considered throughout the survey effort and in developing the assessment methodology.

Survey Effort

- 9.5. SNH guidance⁴⁴ (2005, revised 2014) recommends that a minimum of two years' of bird survey are required. Furthermore, it recommends that a minimum of 72 hours of Vantage Point (VP) observations are gathered per VP, split by season (36 hours breeding and 36 hours non-breeding), per year.

⁴⁴ SNH (2014). Recommended bird survey methods to inform impact assessment of onshore wind farms. Available at: <https://www.nature.scot/sites/default/files/2017-09/Guidance%20note%20-%20Recommended%20bird%20survey%20methods%20to%20inform%20impact%20assessment%20of%20onshore%20windfarms.pdf> [Accessed 01/03/2018]

- 9.6. To comply with SNH guidance baseline surveys commenced in October 2012 and continued until end of August 2013 (providing Year 1 of data). The second round of surveys commenced in April 2017 and will continue until end of March 2018 (providing Year 2 of data). In Year 1, a total of 302 hours of VP observations were undertaken across four VPs, providing a minimum of 75 hours per VP (38 hours breeding and 37 hours non-breeding). In Year 2, a total of 144 hours of VP observations were undertaken across four VPs during the breeding season, meeting the minimum requirement. VP observations are still ongoing and it is fully expected that by the end of March 2018 the required survey effort will be met for the non-breeding season.
- 9.7. The survey area was defined with reference to the Site and encompassed a series of buffers of up to 2 km radius from the Site Boundary, with buffer size dependent on the sensitivity of key species to potential effects associated with the Development (Figure 7, Appendix A).
- 9.8. Survey methods followed contemporaneous best practice guidance; further details of the survey methods and survey effort are provided in Appendix D.
- 9.9. Baseline ornithological surveys included flight activity surveys covering all seasons from strategically located vantage points, breeding bird surveys and winter transects. Vantage point locations and viewsheds are illustrated in Figure 8, Appendix A.

Baseline

Designated sites

- 9.10. The Site is not located within or adjacent to any statutory sites designated for ornithological interest and there are no such sites within 10 km of the Site.
- 9.11. The only statutory designated site for ornithological interest within 20 km of the Site is the Loch Ken and River Dee Marshes Special Protection Area (SPA) which is situated c.13 km to the south and supports wintering populations of Greenland white-fronted goose (*Anser albifrons flavirostris*) and greylag goose (*Anser anser*).
- 9.12. Following current SNH guidance⁴⁵ on the connectivity of SPA populations with supporting habitats in the wider environment, the distances to all SPAs in the surrounding area are greater than the reported range/connectivity distance for the qualifying species listed for the individual SPAs or despite being within 20 km of a goose SPA have no connectivity with the qualifying interests of the SPA (Mitchell, 2012⁴⁶).

⁴⁵ SNH (2016). Assessing Connectivity with Special Protection Areas (SPAs). Available at: SNH guidance (SNH, 2012) on the connectivity of SPA [Accessed 01/03/2018]

⁴⁶ Mitchell, C. 2012. *Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland*. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge. 108pp

Desk Study and Consultations

- 9.13. Having conducted baseline wind farm surveys across Dumfries and Galloway over many years, NRP has familiarity with the general area and its birds. In addition, the NRP principal surveyor lives locally to the Site and has a sound knowledge of the area. He is also an active member of the Dumfries and Galloway Raptor Study Group.
- 9.14. The Applicant consulted with SNH in 2012 regarding the need for migration watches and SNH commented, via John Gibson (Operations Officer, South of Scotland)⁴⁷, that there was not felt to be a need for migration watches. It is considered that this remains the case.

Summary of Baseline Surveys

- **Geese and swans** – no regular local or passage movements of geese or swans over the Site.
- **Raptors** – two active nests of red kites were recorded within 2 km of the Site in 2017. Breeding, within 2 km of the Site, was suspected for osprey in 2013 and goshawk in 2017; however, despite searches, no nest locations were found.

Low levels of flight activity, gathered from over 530 hours of observation, were recorded for red kite, goshawk, osprey and hen harrier within 500 m of the Site.

- **Black grouse** – there was no evidence of lekking black grouse within the Site or survey area.
 - **Waders** – breeding wader species, typical of the habitats present within 500 m of the Development, were present in very low numbers.
 - **Barn owl** – one barn owl breeding site was confirmed during 2017, however this was at a distance greater than 2 km from the Site.
 - **Other species** – the survey area supports a suite of breeding songbirds typically associated with upland moorland habitats and commercial conifer plantation in south-west Scotland.
- 9.15. Further detail on baseline survey results is provided in Appendix D.

Potential Significant Effects

- 9.16. Particular consideration will be given in the assessment to potential effects on bird species whose populations are of moderate to high conservation concern and that belong to taxonomic groups that are considered to be particularly susceptible to impacts from the Development. These include:

⁴⁷ Email from J Gibson (SNH) to Infinergy 13/09/12.

- Species listed on Annex1 of European Council Directive 2009/147/EC⁸ on the conservation of wild birds (i.e. 'Annex 1' species), in particular those that may be associated with populations of species that are qualifying interests of SPAs in the wider area;
 - Species listed in Schedule 1 to the Wildlife and Countryside Act 1981⁹, as amended (i.e. 'Schedule 1' species); and
 - Species of national conservation concern, not included within the above categories, but that are present within the study area in nationally or regionally important numbers (e.g. species on the UK Red List of birds of conservation concern⁴⁸).
- 9.17. The key potentially significant effects on ornithology receptors arising from the Development can be broadly summarised as follows:
- Disturbance and / or displacement from supporting habitats during construction works;
 - Loss / degradation of habitats through construction works, permanent structures and access tracks;
 - Displacement from and disturbance to foraging, nesting, roosting habitat from the operational Development; and
 - Mortality from collision with wind turbine blades; and
 - The potential for cumulative effects arising from the combined effects of other existing and proposed developments within the wider area affecting the same bird populations.

Evaluation and Impact Assessment

- 9.18. The assessment will follow the process set out in the EIA Regulations and guidance on the implementation of the Birds and Habitats Directives (SERAD 2000). The process of evaluating the effects of the Development on birds will seek to ensure that the Scottish Ministers have sufficient information to determine whether the Development (either alone or in combination with other developments) is likely to have a significant effect on bird interests.
- 9.19. Effects will be assessed against the existing baseline conditions, i.e. without the Development present. This assessment will be carried out assuming that there would be no significant adverse effects on the existing population, range or distribution of a species (i.e., no significant effect on the species' conservation status); and no significant interference with the flight paths of migratory birds.
- 9.20. The assessment will therefore first identify the possible effects of the Development and will then consider the likelihood of their occurrence. A judgement will then be made as to whether or not these effects are significant with respect to the EIA Regulations. In judging whether a

⁴⁸ Eaton, M.A., Brown, A.F., Noble, D.G., Musgrove A.J., Hearn, R., Aebischer, N.J., Gibbons, D.W., Evans, A. and Gregory, R.D. 2009. *Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and Isle of Man*. British Birds 102: pp. 296-341

possible effect is significant or not, two principal factors will be taken into account:

- The nature conservation importance of the bird populations present; and
- The magnitude of the likely effect.

- 9.21. In assessing the effects, emphasis will be given to the national and regional populations of the species. Inconsequential effects will be excluded.
- 9.22. The EIA Report chapter will include proposals for measures to mitigate any identified adverse effects of the Development on bird species. Potential measures including micro-siting, the review of construction timing and land management regimes will be considered, as appropriate, in consultation with the appropriate statutory consultees. The need for, and scope of, further post consent monitoring of bird activity in relation to the Development will also be defined as part of the assessment process.
- 9.23. Impacts will be assessed in relation to species' population, range and distribution. Key considerations will include territory occupancy, breeding success, foraging success and ranging behaviour. The assessment will:
- Evaluate the nature conservation importance of the bird interest in a systematic manner; and
 - Estimate the magnitude of likely impacts on each species as a result of the proposals.
- 9.24. The significance of each potential effect will be judged by integrating scales relating to ecological value, behavioural sensitivity and effects magnitude in a reasoned way, in the context of the status of, and trends within, species' regional populations (as defined by SNH Natural Heritage Zones [NHZ]). Measures will be presented to mitigate any effects deemed to be significant in terms of the EIA Regulations.
- 9.25. The effects of the Development will be assessed in isolation and in combination with predicted effects of other wind farm developments in the same NHZ. As part of this process, data for other wind farm developments will be sought.

Key Sensitive Receptors

- 9.26. Given the habitat within the Site and within a 2 km buffer, potential sensitive receptors include **red kite, goshawk, osprey** and **hen harrier**. Surveys to assess the status of these species during the breeding season are described in Appendix D. The status of these species during the non-breeding season will be ascertained following completion of the winter surveys which are due to be completed in March 2018.

Key Questions for Consultees

- 9.27. 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:
- Do the consultees agree that SPAs can be scoped out of the EIA given the lack of connectivity?
 - Are the consultees content with and / or have any comments on the list of effects and key sensitive receptors?
 - Are the consultees content with and / or have any comments on the baseline survey methods and level of survey effort, taking into consideration current guidance, the proposed scale and location of the Development, survey work completed to date and the key findings and identified sensitive receptors?
 - Are the consultees content with and / or have any comments on the proposed receptor evaluation and impact assessment methods?

CULTURAL HERITAGE

- 10.1. For the purposes of the assessment, cultural heritage interests are deemed to include both above ground (built heritage) and below ground remains. The assessment will consider both direct and indirect (largely visual) effects as well as cumulative effects upon the following cultural heritage receptors:
- Archaeology – above and below ground, designated or not. Consideration will be given to the potential for unknown (buried) archaeological remains to exist within the Site;
 - Cultural Heritage - World Heritage Sites, Scheduled Monuments, Listed Buildings, Inventoried Gardens and Designed Landscapes (GDL), Inventoried Battlefields, Protected Wrecks and Conservation Areas;
 - Archaeological Areas as shown on the relevant Local Development Plan; and
 - Heritage assets marked or publicised (for example archaeological/heritage trails).
- 10.2. The assessment will be conducted with reference to the relevant statutory and planning frameworks for cultural heritage and in particular cognisance will be taken of HES Policy Statement June 2016 (HESPS)¹⁴. The assessment will be undertaken in accordance with current best practice and guidelines, which includes the Chartered Institute for Archaeologists (CIfA) Standards and Guidance⁴⁹ and HES's Managing Change in the Historic Environment Series, specifically 'Managing Change in the Historic Environment: Setting' (2016)⁵⁰.
- 10.3. Initial analysis was undertaken in 2013 of the Site and cultural heritage receptors with the potential to be affected by the Development. Whilst this was not published, it forms the basis upon which the assessment will be built, with additional data searches and site visits undertaken to confirm effects.

2013 Scoping Opinion

- 10.4. Comments were received from both the Council Archaeologist and Historic Scotland (now Historic Environment Scotland). The Council Archaeologist noted the potential for effects to be direct, indirect and had a particular interest in the cumulative effects. They noted key receptors included
- Stroanfreggan Craig fort;
 - Stroanfreggan cairn;

⁴⁹ Chartered Institute for Archaeologists (2017) Standard and Guidance for Historic Environment Desk-Based Assessment, Published December 2014, Updated January 2017 Available at: http://www.archaeologists.net/sites/default/files/CifAS%26GDBA_3.pdf [Accessed 01/05/2017]

⁵⁰ HES (2016). Managing Change in the Historic Environment: Setting. Available at: <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=80b7c0a0-584b-4625-b1fd-a60b009c2549> [Accessed 01/05/2017]

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- Woodhead Mines;
 - Smittons Bridge; and
- 10.5. Stroanfreggan Bardenoch to Garryhorn Archaeological Sensitive Areas (ASAs). Historic Scotland considered that there was the potential for wind development at this location, however they had concerns of the effects on the setting of a number of scheduled monuments and made the following points:
- Stroanfreggan Craig fort – turbines should be no closer to this scheduled monument from the south;
 - Stroanfreggan Bridge, cairn – concerns from the effects of turbines in the north-west and the cumulative effects with Longburn Wind Farm;
 - Craigengillan, cairn – it was proposed within the forestry management plan a 20 m buffer would be in place around this scheduled monument and that views would be opened to and from the south east which may result in significant effects from a number of turbines and cumulative effects from Longburn Wind Farm.
- 10.6. It was also considered that effects may be experienced on the setting of Dundeugh Castle, Braidenoch Hill and Polmaddy.
- 10.7. The above points have been considered when developing the below detailed assessment methodology, taking into account the concerns of the consultees.

Methodology

- 10.8. A desk-based assessment (DBA) of cultural heritage records will be compiled to establish the baseline against which the impact assessment will be carried out. Data will be gathered from the following sources:
- Dumfries and Galloway Historic Environment Record (HER);
 - Aerial photographs and other cartographic information on pre-recent land uses;
 - The National Monuments Record of Scotland Canmore datasets;
 - HES's databases of nationally designated sites; and
 - Local Studies Libraries and other archives as appropriate.
- 10.9. A study area of 1 km around the Site will be used to collect data to inform on the archaeological potential of the Site. For purposes of indirect impact assessment, data on nationally designated cultural heritage features will be collected to a maximum of 15 km from the Site centre.
- 10.10. Initial information relating to cultural heritage and archaeology will be gathered through a preliminary desk top search to identify potential features of interest.

- 10.11. The DBA will be augmented by a walkover survey to provide information on the archaeological potential of the area and to validate the documentary evidence. This fieldwork will be conducted to:
- Assess and validate documentary data collected;
 - Identify the extent and condition of any visible monuments;
 - Determine whether previously unrecorded historic features are visible; and
 - Subject to the findings of the DBA the requirement for and extent of any additional surveys will be agreed in consultation with the Council's Historic Environment Team.
- 10.12. An assessment will be made of the potential indirect effects upon the setting of cultural heritage features including historic landscapes. This assessment will be made against the ZTV produced as part of the LVIA. This may also include visual representations such as photomontages and / or wirelines.
- 10.13. The assessment will proceed from a consideration of the sensitivity of a cultural heritage feature against the magnitude of any potential change, to arrive at the significance of the effect. The assessment of sensitivity of archaeological and historical assets reflects the relative weight which statute and policy attach to them, principally as published in HESPS, with regard for professional judgement.
- 10.14. The assessment will be supported by presentation of the data in assessment tables, with a gazetteer and location plan. The Cultural Heritage Chapter will also include proposals for mitigation of any identified effects, where necessary.
- 10.15. Consultation will be undertaken with the Dumfries and Galloway Archaeologist, HES and other stakeholders, as appropriate.

Current Baseline Knowledge

- 10.16. Preliminary DBA indicate that there are no Inventoried Battlefields, Inventoried Gardens and Designed Landscapes or World Heritage Sites within 15 km of the Site; however, Loch Doon Castle, Property in Care is situated approximately 12.8 km west of the Site.
- 10.17. There are six Scheduled Monuments within 5 km of the Site, which are considered to have the potential to receive a significant effect. These are detailed in Table 10.1.

Table 10.1: Scheduled Monuments within 5 km of the Site

Scheduled Monument Number	Scheduled Monument Name	Approximate Distance and Direction
223	Craigengillan, cairn	Situated within the site boundary
1095	Stroanfreggan Craig, fort, Smittens Bridge	200 m east

Scheduled Monument Number	Scheduled Monument Name	Approximate Distance and Direction
1043	Stroanfreggan Bridge, cairn	700 m east
2476	Dundeugh Castle	3.8 km south-west
5391	Polmaddy, medieval and post-medieval settlement	4.5 km south-west
1105	Braidenoch Hill, cross slabs	4.5 km west

10.18. There are nine Listed Buildings (of varying grades) situated within 5 km of the Site. There are no Category A Listed Buildings within 5 km of the Site; however, as Table 10.2 shows there are five Category B Listed Buildings.

Table 10.2: Category B Listed Buildings with 5 km of the Site

Historic Building Number	Listed Building name	Category	Approximate Distance/ Direction
3628	Smittons Bridge	B	10 m south
3627	High Bridge of Ken	B	900 m south-west
51691	Galloway hydroelectric Power Scheme, Kendoon North Dam	B	1.4 km south-west
51694	Kendoon Power Station	B	3.7 km south-west
51694	Kendoon Valve House	B	3.7 km south-west

10.19. Figure 9, Appendix A shows the location of these Listed Buildings and Scheduled Monuments.

Key Questions for Consultees

10.20. 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:

- Do the Consultees agree with the proposed methodology and scope of assessment?
- Is there any current or recent archaeological work or projects being undertaken within or in the vicinity of the Site, that the results of which may not yet be recorded in the HER or National Monuments Record for Scotland?
- Are the Consultees aware of any further sites with statutory protection within the wider landscape whose settings may be affected by the Development?
- Do the Consultees have details of any cultural heritage sites in the vicinity of the Site which it considers may raise significant issues within the EIA process for this Development?

GEOLOGY AND PEAT

- 11.1. An assessment of the impact of the Development on geology and peat will be undertaken. This will establish the baseline conditions, inform the assessments and designs whilst determining any suitable mitigation measures required.

2013 Scoping Opinion

- 11.2. Minor comments were received in relation to geology and peat in the 2013 Scoping Opinion:
- SNH requested that the peat is surveyed and analysed.
 - SEPA requested that a borrow pit assessment was undertaken demonstrating the need and impact of any onsite borrow pit. The borrow pit assessment should include details of the location size and nature of the borrow pit; the depth to which it will be excavated; and associated drainage and storage to minimise effects.
- 11.3. These points have been considered in the methodology below.

Baseline Conditions

- 11.4. The Site occupies an undulating upland location with available British Geological Survey (BGS) mapping⁵¹ indicating that a part of the north-western area of the Site is underlain by peat with the remainder dominated by either glacial till or shallow rock.
- 11.5. Consistent with the BGS mapping, peat investigations comprising 100 m centre spaced probing was undertaken as part of the initial EIA survey works in October 2013. During the survey works a total of 368 probes were sunk. The probing was undertaken in accessible areas, within forestry rides and along existing access tracks.
- 11.6. Peat deposits varied across the Site however, typically shallow peat was recorded within steep topography. Peat deposits were recorded up to 3.0 m thick within flatter areas, mainly in the north-western part of the Site and localised pockets of peat were also recorded across the south of the Site. As a large proportion of the southern area of the Site was not accessible during the 2013 survey works, these areas will be revisited as part of the survey works for the EIA.
- 11.7. BGS mapping information on solid geology indicates that the Site is underlain by Wacke of the Portpatrick Formation. Minor dykes were noted in the north of the Site described as North Britain Siluro-Devonian Calc-Alkaline Dyke Suite comprising Microdiorite Porphyritic rocks.

⁵¹ British Geological Survey (BGS) Geindex Onshore. Available at: <http://mapapps2.bgs.ac.uk/geindex/home.html> [Accessed on 08/02/2018]

Potential Effects

- 11.8. It is unlikely that the Development will have significant adverse effects on the geology of the Site, with the exception of effects on peat; therefore it is proposed that this Chapter will solely focus on effects on peat as a result of the Development.
- 11.9. Development of wind farms on peatlands can lead to potential peat slide risk. An assessment of the likely effects on peatlands and the potential for peat slide risk will be undertaken as part of the EIA.
- 11.10. Excavation of peat during construction of site infrastructure, including access tracks, crane hardstandings, turbine foundations and cable trenches may lead to potential effects on peat habitat. In addition, natural surface drainage systems may change which could lead to drying and oxidation of in-situ peat.
- 11.11. Disturbance of organic rich peat soils could result in carbon loss and is further considered within Chapter 19.

Potential Mitigation

- 11.12. Measures will be taken during the design phase of the Development to ensure that infrastructure is located appropriately to reduce the potential risk of peat slide. This includes siting turbines and other infrastructure within areas of shallow topography which contain limited or no peat. Peat greater than 1 m is classified as 'deep peat' and should be avoided where possible during the design phase.
- 11.13. The excavation of peat will be minimised or avoided where possible. Where peat excavation cannot be avoided, an approach will be developed for peat restoration and reinstatement in accordance with best practice. Monitoring of peat re-instatement or restoration will be carried out throughout the lifetime of the Development.
- 11.14. A detailed Peat Management Plan (PMP) would be prepared post-consent and would take account of information produced in the Peat Chapter to specify management techniques. The PMP would include details of expected peat excavation and re-use volumes based on recorded peat thickness, the infrastructure dimensions and anticipated re-use streams.

Assessment Methodology

- 11.15. The purpose of this assessment will be to:
- Define the peat extent, depth and properties across the Site;
 - Identify any areas susceptible to peat slide, using peat thickness and digital terrain model (DTM) data to analyse slopes;
 - Advise on the micrositing of turbines and tracks to areas of shallow or no peat;

- Assess potential effects on soils, peat and geology, and sensitive habitats; and
- Develop an acceptable code for construction that will adopt best practice procedures, effective management and control of onsite activities to reduce or offset any detrimental effects on the geology and soils including peat.

Stage 1 Peat Probing

- 11.16. Initial phase 1 peat probing from 2013 will be supplemented by additional Phase 1 probing survey works. This will be carried out in accordance with Energy Consents Unit (ECU) Scottish Government guidance Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Second Edition)⁵², focussing of areas where it was previously not possible to collect peat data. The information gathered will be utilised in preparation of Peat Landslide Hazard and Risk Assessment.

Stage 2 Peat Probing

- 11.17. Following design freeze, the Stage 2 peat probing survey will be undertaken at 50 m centres from site infrastructure. Peat probing will also be undertaken at 10 m centres from each turbine location.

Peat Condition Assessment

- 11.18. During Stage 2 peat probing, a selection of core sample locations will be selected to provide a full peat depth profile. This will be achieved by taking 50 cm cores from the surface layer through to the basal layer. A record of each core will be kept and will include, but not be limited to the following information:
- Photograph of each core;
 - Depth of acrotelm layer;
 - Degree of humification;
 - Course and fine fibre content;
 - Water content; and
 - Information on the water table and the average soil pH level.
- 11.19. This approach is consistent with the document Good Practice During Windfarm Construction⁵³ produced by Scottish Renewables, SNH, SEPA, FCS and HES.

⁵² Scottish Government (2017) Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments. Available at: <http://www.gov.scot/Publications/2017/04/8868/0> [Accessed 08/02/2018]

⁵³ Scottish Renewables, SNH, SEPA, FCS and HES (2015), Good Practice During Windfarm Construction. Available at: <http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/good-practice-during-windfarm-const/> [Accessed on 08/02/2018]

Peat Slide Risk Assessment

- 11.20. Should significant quantities of peat be present within the Site, a Peat Slide Risk Assessment will be undertaken in accordance with Scottish Government guidance and Guidance on Developments on Peatland - Site Surveys⁵⁴ along with full consultation with the relevant consultees.
- 11.21. The Peat Slide Risk Assessment will comprise of detailed analysis and reporting on the design freeze and will include a hazard and slope stability assessment and preliminary peat management recommendations.
- 11.22. In accordance with the Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments⁵⁵, , hazards existing on Site will be ranked based on factors that influence stability; namely peat depth and slope gradient. In addition, the exposure of potential receptors to risk will be established and hazard rankings applied across the Site, with management and mitigation measures recommended for an acceptable construction.

Borrow Pit Assessment

- 11.23. Given the limitations on traffic movements to and from the Site, an onsite borrow pit to support the construction works is essential. The presence of historical quarries on site indicate that this is a viable option. In order to confirm this, a Borrow Pit Assessment will be undertaken to understand the nature of the underlying rock geology and identify borrow pit areas for purposes of construction purposes.

⁵⁴ Scottish Government (2014) Guidance on Developments on Peatland - Site Surveys. Available at: <http://www.gov.scot/Topics/Business-Industry/Energy/Energy-sources/19185/17852-1/CSavings/PSG2011> [Accessed on 08/02/2018]

⁵⁵ Scottish Government (2017) Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments. Available at: <http://www.gov.scot/Publications/2017/04/8868/0> [Accessed 08/02/2018]

HYDROLOGY AND HYDROGEOLOGY

- 12.1. The Site comprises a forestry plantation, with an undulating topography and there are isolated areas of peat in the north western part of the Site. The Site rises from approximately 200 m above ordnance datum (AOD, approximately equivalent to sea level) along Dry Burn (in the southern section of the Site) to 380 m at Marscalloch Hill in the south western part of the Site and 400m at Craigenjillan Hill in the northern part of the Site.
- 12.2. A site walkover was undertaken during 2013 to assess the hydrological receptors on site. An assessment of Private Water Supplies (PWS), including a site visit, was also undertaken in 2013 which identified a number of properties with the potential to be affected by the Development.
- 12.3. A hydrogeological assessment will be undertaken in order to establish the baseline conditions and assess the potential effects of the Development, significance and the potential for mitigation.

2013 Scoping Opinion

- 12.4. Comments were received from SEPA in relation to the hydrological assessment in 2013 as summarised below:
- Watercourse crossing must be detailed with supporting photographs.
 - Details of any water abstraction required as part of the Development must be given.
 - The flood risk must be identified.
- 12.5. Concerns were also raised by SEPA, Scottish Water and Marine Scotland Science about nutrients and acidification which may occur as a result of felling associated with the Development and advised that method statements and monitoring would be essential.
- 12.6. Consideration of these points has been given in development of the assessment methodology.

Methodology

- 12.7. Further consultation, desk studies and data requests will be undertaken to inform the updated baseline for the assessment.
- 12.8. Hydrology and hydrogeology data will be obtained including, (but not limited to), the following aspects:
- Review of published data and maps;
 - Consultation with the SEPA, the Council and the British Geology Survey;
 - Identification of solid and surface geologies;

- Review of Pollution Prevention Guidelines;
 - Identification of surface water features, catchments and GWDTEs;
 - Collation of flood plain information, water quality data and groundwater vulnerability information; and
 - Preparation of a catchment plan;
 - Confirmation of data on public and private abstractions and supplies, and risk assessment of these; and
 - Identification of other similar developments within 10 km to identify potential cumulative effects.
- 12.9. The EIA Report Chapter will present the assessment of potential effects on hydrology and hydrogeology resources, including:
- Details of consultation undertaken;
 - Assessment methodologies;
 - Hydrological walkover survey details and results;
 - Assessment of the different phases of the Development to establish the effect on the hydrological resource;
 - Identify mitigation measures, where necessary;
 - Identify any residual effects following mitigation;
 - Cumulative assessment with other developments within 10 km of the Development; and
 - Statement of significance in accordance with the Environmental Impact Assessment Regulations 2017⁵⁶.
- 12.10. A draft Water and Construction Management Plan (WCMP) will be included as an appendix to the Hydrology and Hydrogeology Chapter. The WCMP will detail recognised best practice methods to control effects on hydrology and hydrogeology and will form part of the overarching Construction Environmental Management Plan (CEMP).

Baseline Conditions

- 12.11. An initial review of the hydrological and ground conditions of the site has been undertaken. This section outlines the potential hydrological receptors which have been identified within the Site and its wider area.

Surface Water

- 12.12. The receptors which have been identified on the Site include several named and unnamed tributaries of the Water of Ken, namely Black Burn, Dry Burn, and Craigengillan Burn. Polifferie Burn is located outwith, but adjacent to, the north eastern boundary of the Site. The Water of Ken is classified by SEPA as having a 'Moderate' ecological status under the

⁵⁶ The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.
<http://www.legislation.gov.uk/ssi/2017/101/contents/made> (Accessed 25/01/2018)

Water Framework Directive. The Water of Ken discharges into Kendoon Loch, approximately 1.4 km from the Site, which is noted as a trout fisheries resource.

Statutory Designated Sites

- 12.13. There are no statutory designated sites in the area surrounding the Site which are potentially hydrologically connected.

GWDTEs

- 12.14. Should potential GWDTEs be identified through the ecological surveys, further consideration would be given to the hydrological function of these habitats to determine their actual dependency on groundwater.

Private and Public Water Supplies

- 12.15. A request will be made to the relevant statutory consultees for information pertaining to the location, type and source of public and PWSs to ensure that the information obtained in 2013 remains accurate.

Groundwater

- 12.16. The groundwater unit underlying the Site is identified as the 'New Galloway bedrock and localised sand and gravel aquifers', which is classified as having a 'Good' SEPA River Basin Management Plan (RBMP) quantitative and qualitative status.

Flood Risk

- 12.17. The Indicative River and Coastal Flood Map (Scotland) produced by SEPA shows the areas of Scotland with a 0.5 % (1:200) or greater chance of flooding. These areas are known as medium to high risk areas for flooding. Whilst every effort will be made to avoid locate Development infrastructure outwith areas of flooding, consideration will be given to ensuring the Development does not increase the risk of flooding elsewhere.

Key Sensitivities

- 12.18. At this stage, the main key sensitivities are considered to be named and unnamed tributaries of the Water of Ken and Kendoon Loch, groundwater, the hydrological function of GWDTEs and PWSs.

Key Questions for Consultees

- 12.19. 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:
- Do the consultees agree with the proposed methodology and scope of the hydrology and hydrogeology assessment?

- Do the consultees have any information that would be useful in the preparation of the hydrology and hydrogeology assessment?

NOISE

- 13.1. Sources of noise during operation of a wind turbine are mechanical (from machinery housed within the turbine nacelle) and aerodynamic (from the movement of the blades through the air). Modern turbines are designed to minimise mechanical noise emissions from the nacelle through isolation of mechanical components and acoustic insulation of the nacelle. Aerodynamic noise is controlled through the design of the blade tips and edges. In most modern wind turbines, aerodynamic noise is also restricted by control systems which actively regulate the pitch of the blades.
- 13.2. While noise from the wind turbines does increase with wind speed, at the same time ambient background noise (for example wind in trees) usually increases at a greater rate. Planning conditions are used to enforce compliance with specified limits.

2013 Scoping Opinion

- 13.3. Comments were provided by the Environmental Health Officer (EHO) at the Council on the proposed assessment; these included:
- The assessment should be undertaken in line with ETSU-R-97;
 - The Development should consider whether the lower limits in ETSU-R-97 can be met; and
 - A method statement should be produced for construction.
- 13.4. These points have been considered through subsequent consultation with the EHO and in refining the assessment methodology below.

Operational Noise

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

- 13.5. The assessment methodology for operational noise is described in ETSU-R-97 'The Assessment and Rating of Noise from Windfarms'. The basic aim of ETSU-R-97 is to provide:
- "Indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development or adding unduly to the costs and administrative burdens on wind farm developers or local authorities".*
- 13.6. The report makes it clear from the outset that any noise restrictions placed on a development must balance the environmental impacts of the development against the national and global benefits which would arise through the development of renewable energy sources.
- 13.7. The specific methodologies involved in applying ETSU-R-97 to the Development will be detailed in full in the EIA Report however, in summary, these provide recommendations for noise limits relating to the

existing levels of background noise for quiet day-time and night-time periods.

- 13.8. To carry out a noise assessment in accordance with ETSU-R-97, the following steps are required:
- Specify the number and locations of the wind turbines;
 - Identify the locations of the nearest, or most noise sensitive, neighbours;
 - Determine the background noise levels as a function of site wind speed at the nearest neighbours, or at least at a representative sample of the nearest neighbours;
 - Determine the quiet day time and night time criterion curves from the background noise levels identified at the nearest neighbours;
 - Specify the type and noise emission characteristics of the wind turbines proposed for the Development;
 - Calculate the noise immission⁵⁷ levels due to the operation of the wind turbines as a function of site wind speed at the nearest neighbours; and
 - Compare the calculated noise immission levels with the derived criterion curves and assess in the light of relevant planning requirements.

Good Practice Guide to the Application of ETSU-R-97 for Wind Turbine Noise Assessment

- 13.9. The Good Practice Guide (GPG)⁵⁸ was published by the Institute of Acoustics (IOA) in May 2013 (IOA, 2013). It presents current good practice in the application of the ETSU-R-97 assessment methodology for wind turbine developments at the various stages of the assessment, and has been endorsed by the Scottish Government as current industry good practice. It is accompanied by six Supplementary Guidance Notes (SGNs), which provide greater detail and examples of good practice in various aspects of the assessment process. The GPS and SGNs will be followed throughout the assessment.

Local Development Plan Supplementary Guidance: Part 1 Wind Energy Development: Development Management Considerations 2017¹⁷

- 13.10. Reference will also be made to the requirements in terms of noise contained within Dumfries and Galloway Council's ('the Council's') Supplementary Guidance Part 1 Wind Energy Development: Development Management Considerations adopted in 2017.

⁵⁷ 'Immission' refers to the noise at a receiver location, whereas 'emission' relates to noise produced by a source.

⁵⁸ Institute of Acoustics (IOA) (2013), A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise.

Baseline

- 13.11. A baseline noise survey was carried out at seven properties in the vicinity of the Development in November 2013 to January 2014. The methodology for this survey was in accordance with the requirements of the GPG. The resulting data will be re-analysed to ensure that this aspect of the assessment is in accordance with SGN 2, which relates to data processing⁵⁹.

Cumulative Assessment

- 13.12. ETSU-R-97 and the GPG state that the noise limits that ETSU-R-97 recommends apply to the cumulative effect of noise from all wind turbines that may affect a particular location. A search will be undertaken in consultation with the Council to identify any wind energy developments either operational, consented or in planning which may also require consideration in the assessment process.
- 13.13. Cumulative noise levels will be established in line with the requirements of the GPG, and assessed against the ETSU-R-97 noise limits to determine the level of headroom present (i.e. the level of noise which may be generated by the Development, after taking all relevant cumulative developments into account).
- 13.14. Noise due to the Development will then be assessed against the remaining headroom to determine compliance with ETSU-R-97.

Low Frequency Noise and Infrasound

- 13.15. A study⁶⁰, published in 2006, by Hayes McKenzie on behalf of the DTI investigated low frequency noise from wind turbines. This study concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines. It also noted, however, that a phenomenon known as Aerodynamic Modulation was in some isolated circumstances occurring in ways not anticipated by ETSU-R-97.
- 13.16. In addition, Bowdler *et al.* (2009) concludes:
- "...there is no robust evidence that low frequency noise (including 'infrasound') or ground-borne vibration from wind farms, generally has adverse effects on neighbours".*
- 13.17. It is therefore not considered necessary to carry out specific assessments of low frequency noise or infrasound.

⁵⁹ Institute of Acoustics (IOA) (2014) Supplementary Guidance Note 2: Data Processing & Derivation of ETSU-R-97 Background Curves

⁶⁰ The Department for Trade and Industry, (2006). The measurement of low frequency noise at three UK windfarms. Hayes Mckenzie.

Amplitude Modulation

- 13.18. In its simplest form, Amplitude Modulation, 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.
- 13.19. There is a distinction between 'normal' AM of wind turbine noise, characterised as blade swish and increased AM, typically referred to as Enhanced AM (EAM) or Other AM (OAM). It should be noted that ETSU-R-97 describes and makes allowance for normal AM or blade swish.
- 13.20. A study⁶¹ 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. This report 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.
- 13.21. 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 OAM are not well understood and that prediction of the effect was not currently possible.
- 13.22. This research was updated in 2013 by an in-depth study undertaken by Renewable UK⁶² which has identified that the generation of OAM 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 OAM, and the incidence of OAM 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 Government.
- 13.23. In 2016, the IOA proposed a measurement technique⁶³ to quantify the level of AM present in any particular sample of wind farm noise. This technique is supported by the Department of Business, Energy & Industrial Strategy (BEIS, formerly The Department of Energy & Climate Change) who have published guidance⁶⁴, which follows on from the conclusions of the IOA study in order to define an appropriate assessment method for AM, including a penalty scheme and an outline planning condition. Notwithstanding this, the suggested outline planning

⁶¹ 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.

⁶² Renewable UK (2013). 'Wind Turbine Amplitude Modulation: Research to improve understanding as to its Cause and effects', Renewable UK, 2013

⁶³ Institute of Acoustics, (2016) A Method for Rating Amplitude Modulation in Wind Turbine Noise,

⁶⁴ BEIS, (2016), Review of the evidence on the response to amplitude modulation from wind turbines

condition remains in a draft form and would require site-specific legal advice on its appropriateness to a specific development. Section 7.2.1 of the GPG therefore remains current, stating: "*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*"

- 13.24. It is therefore not considered necessary to carry out specific assessments of amplitude modulation.

Construction Noise

- 13.25. The following legislation and standards are of particular relevance to construction noise:

- The Control of Pollution Act 1974 (CoPA 1974);
- The Environmental Protection Act 1990 (EPA 1990); and
- BS 5228: 2009+a1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites.

- 13.26. CoPA 1974 provides local authorities in Scotland, England and Wales with powers to control noise and vibration from construction sites. Section 60 of CoPA 1974 enables a Local Authority to serve a notice to persons carrying out construction work of its requirements for the control of site noise. Section 61 of CoPA 1974 allows for those carrying out construction work to apply to the Local Authority in advance for consent to carry out the works.

- 13.27. The EPA 1990 specifies mandatory powers available to Local Authorities in respect of any noise that either constitutes or is likely to cause a statutory nuisance, which is also defined in the EPA 1990. A duty is imposed on Local Authorities to carry out inspection to identify statutory nuisances, and to serve abatement notices against these. Procedures are also specified with regards to complaints from persons affected by a statutory nuisance.

- 13.28. BS 5228 provides guidance on controlling noise and vibration from construction sites. It:

- Refers to the need for the protection against noise and vibration of persons living and working in the vicinity of and those working on construction sites;
- Recommends procedures for noise and vibration control in respect of construction operations; and
- Stresses the importance of community relations, stating that early establishment and maintenance of these relations throughout the carrying out of site operations will go some way towards allaying people's fears.

- 13.29. The acceptability of construction noise is likely to be affected by the location of the Site, relative to the noise sensitive premises; existing ambient noise levels; the duration and working hours of site operations;

the characteristics of the noise produced and the attitude of local residents to the site operator.

Key Questions for Consultees

- 13.30. 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:
- Do the Consultees agree with the proposed method of assessment?
 - Are the Consultees aware of any additional potential noise-sensitive receptors, such as new housing developments?
 - Which other wind energy developments should be taken into consideration in the cumulative noise assessment?
 - What are the Council's requirements for information on noise during construction?

TRAFFIC AND TRANSPORT

Introduction

- 14.1. The Traffic and Transportation Chapter will consider the effects of vehicle movements to and from the Site associated with construction, operation and decommissioning phases of the Development. Vehicle movements to the Site will likely consist of abnormal load vehicles (for the delivery of turbine components), heavy goods vehicles (HGVs), light goods vehicles and cars.
- 14.2. This Updated Scoping Report will outline the proposed methodology to be employed in the EIA for assessment of Traffic and Transportation effects on the chosen delivery routes and on the wider road network as required.

2013 Scoping Opinion

- 14.3. Whilst no comments were received from Transport Scotland in 2013, the following comments were received from the Council's traffic department:
- A swept path analysis should be undertaken;
 - The number and type of construction vehicles must be detailed;
 - Details must be given of mitigation, including any widening and management; and
 - A Traffic Management Plan (TMP) and condition survey would be required prior to commencement of the works.
- 14.4. Consideration of these points has been given when refining the methodology below.

Methodology

- 14.5. Assessment methodology will follow the 'Guidelines for the Environmental Impact of Road Traffic'. A screening process using two broad rules outlined in the aforementioned guidelines is used to identify the appropriate extent of the assessment area. These include:
- Highway links where traffic will increase by more than 30% (or where the number of HGVs will increase more than 30%); and
 - Any other specifically sensitive areas where traffic flows have increased by 10% or more.
- 14.6. Where the predicted increase in traffic flows is lower than the thresholds, the guidelines suggest the significance of effects can be stated to be low or not significant and further detailed assessments are not warranted. Peak traffic flows will be identified to assess a worst case scenario. Assessment of driver distraction will be undertaken as appropriate.
- 14.7. Traffic movements on the public roads resulting from construction, operation and decommissioning will be based on the Development

design. Traffic generation will take into account the import of construction materials and the export of surplus materials; and the movement of equipment, construction plant and labour required during each phase of the Development.

- 14.8. Predicted traffic generation associated with any forestry clearance required to accommodate the Development will be included in the assessment. Only forestry clearance that deviates from ongoing forestry management activities will be considered (i.e. forestry traffic attributable to the Development).
- 14.9. Peak traffic flows will be identified to assess a worst case scenario. An assessment of effects on road safety, driver delay, pedestrian amenity, severance, noise and vibration will be undertaken as appropriate.
- 14.10. In addition to the aforementioned guidance, the Traffic and Transport Chapter will take into account the following statutory guidance documents published by the Scottish Government:
- SPP;
 - PAN 75 – Planning for Transport; and
 - Scottish Government Planning Specific Advice Sheet for Onshore Wind Turbines (last updated December 2013).
- 14.11. It should be noted that the above list may be subject to change in the case that various policies and guidance are replaced or updated during the delivery of the project.
- 14.12. As Transport Assessments (TA's) principally relate to developments that generate a significant permanent increase in traffic as a direct consequence of function, it is not proposed a formal TA will accompany the application, as wind farms are temporary in nature and the function will not result in a permanent increase.

Baseline Conditions

- 14.13. An initial study of the access route has been undertaken and has identified that the preferred strategic access route is likely to be from the Port of Ayr via A77, A713 and then the western end of the B729 from where access to the Site would be taken. The access route is shown on Figure 10, Appendix A. Further Abnormal Load Assessment work will be undertaken as part of the remaining EIA studies.
- 14.14. Baseline traffic flow conditions on routes within the vicinity of the Site will be established and detailed in the EIA. The geographic scope of baseline assessment will be confirmed in consultation with the Council and Transport Scotland as appropriate. This scope is expected to extend to all approach routes to the Site, except where justification for their omission can be demonstrated.
- 14.15. It is proposed that where publically available traffic count information is available (for example, that provided by the Department for Transport

(DfT)), this shall be used for the baseline assessment. Where no such information is available, traffic surveys shall be conducted in accordance with best practice. It is anticipated that a combined research approach will be required (i.e. use of DfT information and primary traffic surveys).

Assessment of Effects

- 14.16. The findings of the access route study will be used to identify physical constraints and measures required for appropriate access to the Site.
- 14.17. The study would consider effects on:
- Road Users (delay and safety);
 - Road Infrastructure (dilapidation); and
 - Adjacent community/properties (safety and congestion).
- 14.18. Numerical analyses of delay through network or junction modelling is not to be required. The study would consider effects during construction, operation and decommissioning.
- 14.19. Assessing the sensitivity of receptors and magnitude of impacts is based on professional judgement. In terms of road networks, the sensitivity to change in traffic levels of any given road segment or junction is generally assessed by considering the residual capacity of the network under existing conditions. Where there is a high degree of residual capacity, the network may readily accept and absorb an increase in traffic and therefore, the sensitivity is considered low. Conversely, where existing traffic levels are high in comparison to the road capacity, there will be little spare capacity, and the sensitivity to any change in traffic levels would be considered as high.
- 14.20. The magnitude of the impacts will be determined through a review of the outline proposals for the Development; establishing the parameters of the road traffic that may cause an impact; and quantifying these effects.
- 14.21. To summarise, the study would involve:
- Consultation with the relevant roads authorities and emergency services (the Council, Transport Scotland, Police and FCS, etc.);
 - Procurement of existing traffic data, and arranging additional surveys where necessary;
 - Route inspections including detailed observations of communities potentially affected by the Development within the identified study area. The detailed and numeric assessment would be limited to the roads in close proximity to the Site, i.e. between the exit from the A77 and the Site entrance on the B729;
 - Following a route inspections, sensitive receptors would be identified;
 - In consultation with the Applicant and the relevant roads authorities, alternative route options would be identified;

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- An initial assessment of traffic generation as a result of the Development would be undertaken. An initial assessment of effects will be based on professional judgement rather than transportation network modelling;
 - Obtain refined project needs, refine traffic generation, and re-assess effects, using obtained baseline traffic data;
 - Assessment of residual effects following the primary mitigation built in by virtue of the above-mentioned iteration, and any required residual mitigation needs; and
 - Identify and assess the potential for cumulative effects based on other known developments in construction or in the planning process.

Key Questions

- 14.22. 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:
- Do the Consultees agree with the proposed method of assessment?
 - Are the Consultees aware of any specific access restrictions or limitations on the proposed abnormal loads route?

AVIATION

2013 Scoping Opinion

- 15.1. No specific comments were received from the Civil Aviation Authority, NATS or Defence Infrastructure Organisation (DIO) in the 2013 Scoping Opinion. Prestwick Airport provided comment stating that initial analysis indicated that their radar was well shielded by the terrain.

Assessment Criteria

- 15.2. Wind turbines have the potential to affect civil and military aviation operations. The assessment of effects of the Development will be based upon the guidance laid down in CAA Publication CAP 764 Policy and Guidelines on Wind Turbines, Version 6 dated February 2016. Consultation criteria for aviation stakeholders is defined in Chapter 4 of that document and the recommended distances include:
- Airfield with a surveillance radar – 30 km;
 - Non radar licensed aerodrome with a runway of more than 1,100 m – 17 km;
 - Non radar licensed aerodrome with a runway of less than 1,100 m – 5 km;
 - Licensed aerodromes where the turbines would lie within airspace coincidental with any published Instrument Flight Procedure (IFP);
 - Unlicensed aerodromes with runways of more than 800 m – 4 km;
 - Unlicensed aerodromes with runways of less than 800 m – 3 km;
 - Gliding sites – 10 km; and
 - Other aviation activity such as parachute sites and microlight sites within 3 km – in such instances developers are referred to appropriate organisations.
- 15.3. CAP 764 goes on to state that these distances are for guidance purposes only and do not represent ranges beyond which all wind turbine developments will be approved, or within which they will always be objected to. These ranges are intended as a prompt for further discussion between developers and aviation stakeholders and will be reported upon in the EIA Report.
- 15.4. It is necessary to take into account the aviation and air defence activities of the Ministry of Defence (MOD) as safeguarded by the DIO. The types of issues that will be addressed in the EIA Report include:
- MOD Airfields, both radar and non-radar equipped;
 - MOD Air Defence Radars;
 - MOD Meteorological Radars; and
 - Military Low Flying.

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- 15.5. It is necessary to take into account the possible effects of wind turbines upon the National Air Traffic Services En Route Ltd (NERL) communications, navigation and surveillance systems – a network of primary and secondary radars and navigation facilities around the country.
- 15.6. As well as examining the technical impact of wind turbines on Air Traffic Control (ATC) facilities, it is also necessary to consider the physical safeguarding of ATC operations using the criteria laid down in CAP 168 Licensing of Aerodromes to determine whether a proposed development will breach obstacle clearance criteria. This will also be reported on in the EIA Report, however initial surveys show there are no physical safeguarding issues associated with the Development.
- 15.7. Licenced Aerodromes - An initial review undertaken using the above criteria shows that there are no radar equipped aerodromes within 30 km of the site; Prestwick Airport is the nearest, approximately 40 km north-west of the northern section of the Site. Initial radar modelling indicates, that neither the existing Primary Surveillance Radar (PSR), nor the newly installed Terma Scanter 4000 radar, will be affected by the turbines as there is sufficient terrain screening. This will be confirmed in an assessment to be included in the EIA Report.
- 15.8. ATC Radars - the closest MOD ATC radar is at West Freugh, approximately 62 km to the south-west of the Site. Initial radar modelling indicates that the radar will be unaffected and in any case there is no operational requirement for the use of this radar in or near the location of the Development. The next closest ATC radars are those associated with the RAF Spadeadam range, over 100 km to the east of the Site. Initial radar modelling again indicates that the radars will be unaffected by the Development. This will be confirmed and reported in the EIA Report.
- 15.9. MOD Low Flying – The Site is located around 10 km north of St John's Town of Dalry and 2 km to the east of the Glenkens (A713) valley. The Glenkens valley is an important MOD/RAF tactical low flying route by day and night. Fortunately, the Site sits on high ground and is set back from the immediate area of the valley where the Water-of-Ken/Water-of-Deugh split around Dundough Hill to significantly widen the valley floor, meaning that low flying is unlikely to be undertaken over the Site.
- 15.10. Tactical Training Area 20 - The Site is located within MOD Tactical Training Area 20 (TTA20). Tactical Training Areas are highly valuable parts of the UK Low Flying System and are carefully monitored, managed and safeguarded by the MOD Low Flying Operations Squadron (LFOS) through DIO. To aid wind energy developers, LFOS publish a Low Flying/Wind Farm Safeguarding Map on the DECC Restats web-site (Moving to the RUK site). The Map is colour coded Red, Amber, Blue and Green in descending order of Low Flying importance. TTA20 is mostly coded Red and the Site is in a Red area, meaning it is an area of high importance.

- 15.11. Local Area Low Flying Congestion - The Site is near the St John's Town of Dalry complex of villages and small towns. This is a MOD priority noise avoidance area and wind farm sites that increase the risk of military aircraft flying closer to the complex may raise concerns. In addition, the presence of existing sites (Wether Hill) and proposed sites (Longburn & Quantans) will be a factor when LFOS assesses the site.
- 15.12. The Development has been known to DIO and LFOS for some years now. Initial concerns and possible objections must be expected when MOD DIO are consulted; nonetheless, experience indicates that the Site has the potential to be successful dependent upon final turbine numbers and locations. MOD DIO consultation discussions will be reported in the EIA Report.
- 15.13. NATS En Route Ltd (NERL) – Initial radar modelling indicates that there are two NERL radars with low level coverage in this area, located at Lowther Hill and Great Dun Fell. In the case of Lowther Hill it is possible that there would be marginal visibility of northerly turbines and this may require negotiation with NERL to resolve. In the case of Great Dun Fell, there is theoretical radar line of sight across the Site, however at a distance of over 125 km it is possible that the radar signal will have been sufficiently attenuated by the terrain so as to remove any technical or operational impact from the surveillance system. This will be addressed initially through the provision of a Technical and Operational Assessment (TOPA) provided by NERL and subsequent technical discussions, if required. The outcome of any assessments and discussions will be reported in the EIA Report. NERL have not previously objected to other sites in the vicinity that have a similar exposure to the Great Dun Fell radar.
- 15.14. NERL navigation infrastructure – Examination of aviation charts indicates that there is a non-directional beacon (NDB) (a radio navigation aid) located 2.8 km to the south of the Site; a technical safeguarding assessment will be undertaken and reported in the EIA Report in accordance with the requirements laid down in CAP 670 ATS Safety Requirements. NERL will comment upon this in any case in the TOPA if it is likely to be an issue of concern.
- 15.15. Met Office Radars – The Met Office safeguards its network of radars using a European methodology known as OPERA. In general they will object to any turbine within 5 km in line of sight and will examine the impact of any turbines within 20 km. Where a site is within 20 km, the Met Office will undertake an operational assessment based on three main criteria, having determined that there is a technical impact on the radar. The factors they will consider include the following:
- Proximity to Airports;
 - River catchment response times; and
 - Population density.
- 15.16. In this case the closest Met Office radar is well beyond 20 km. It is expected that there will be no Met Office radar objection to this

Development; this will be confirmed through consultation and reported in the EIA Report.

- 15.17. Consultation with relevant aviation providers is a routine part of wind farm development and in accordance with CAP 764 consultees will include:
- Civil Aviation Authority (CAA) as the Development is expected to be greater than 50 MW;
 - MOD DIO; and
 - NERL.
- 15.18. A search for private airfields has been conducted and none were identified within consultation distance; however, not all private strips are listed in publications or marked on charts. Operators of any such private airstrips that are identified during EIA Report preparation will be consulted in accordance with CAP 764 CAP and CAP 793 Safe Operating Practices at Unlicensed Aerodromes.

EXISTING INFRASTRUCTURE

- 16.1. Wind farms have the potential to interfere with electro-magnetic signals passing above ground and physically with existing infrastructure below ground. This can therefore potentially affect television reception, fixed telecommunication links and other utilities. To identify any existing infrastructure constraints, a desk based study as well as consultation will be conducted. Consultation with relevant telecommunication and utilities providers is a routine part of wind farm development and consultees will include:
- Spectrum licensing/ OFCOM;
 - Television and telecommunications providers as appropriate; and
 - Water, gas and electricity utilities providers.
- 16.2. Other additional information obtained from consultation will be used to inform the future layout iterations.

2013 Scoping Opinion

- 16.3. No issues were highlight in the 2013 Scoping Opinion and the Applicant seeks confirmation that this remains the case.

SOCIO-ECONOMICS AND TOURISM

- 17.1. This chapter will consider the potential socio-economic and tourism effects from the Development. This includes a consideration of existing land uses within the site, local tourism activity, employment generation and any indirect economic effects from the Development.

2013 Scoping Opinion

- 17.2. Receptors were highlighted in the 2013 Scoping Opinion by Visit Scotland and ScotWays and included:
- 7 Stanes Biking Trail;
 - Galloway Forest Park, including the Dark Sky aspect;
 - Paths DS15, DS16 (both Rights of Way) and DS21 with the potential to be affected by the Site boundary;
 - Southern Upland Way; and
 - Path DS17 which forms part of a route which was promoted for its historic interest by the Heritage Paths project.
- 17.3. The Applicant can confirm that these receptors will be considered in the EIA.

Relevant Guidance and Advice

- 17.4. There is no specific legislation or guidance available on the methods that should be used to assess the socio-economic impacts of a proposed onshore wind farm development. The proposed method has however been based on established best practice, including that used in UK Government and industry reports on the sector. In particular this assessment will draw from two studies by BiGGAR Economics on the UK onshore wind energy sector, a report published by RenewableUK and DECC in 2012 on the direct and wider economic benefits of the onshore wind sector to the UK economy (BiGGAR Economics, 2012) and a subsequent update to this report published by Renewable UK in 2015 (BiGGAR Economics, 2015). These reports will provide the input assumptions if the data for the Development is not available.
- 17.5. There is also no formal legislation or guidance on the methods that should be used to assess the effects that wind farm developments may have on tourism and leisure interests. The proposed method would consider individual attractions and tourism facilities to assess if there could be any effects from the Development.
- 17.6. It is also important that the socio-economic and tourism chapter takes account of the relevant local and national policy objectives. The most relevant objectives for this are expected to be included in the following strategies:
- Scotland's Economic Strategy;

- Dumfries and Galloway Regional Economic Strategy;
- Tourism Scotland 2020; and
- Dumfries and Galloway Regional Tourism Strategy 2016 - 2020.

Summary of Baseline Environment

- 17.7. 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 the relevant tourism assets that will be considered in the assessment.
- 17.8. The baseline environment will cover and compare three study areas, namely:
- Local Area, comprising of electoral wards that cover the location of the Development and nearest settlements;
 - Dumfries and Galloway Council Area; and
 - Scotland.
- 17.9. The economic impacts will be quantified for Dumfries and Galloway Council Area and Scotland.
- 17.10. The socio-economic baseline will cover:
- The demographic profile of the local area within the context of the regional and national demographic trends;
 - Employment and economic activity in the local area, within the context of the regional and national economic trends;
 - The industrial structure of the local area within the context of the regional and national economies;
 - The role of the tourism sector in the local and regional economy; and
 - Wage levels within the local economy compared to regional and national levels.

Key Issues for Consideration in the EIA Report

- 17.11. The issues that will be considered in this assessment will include the potential socio-economic and tourism effects associated with the Development.
- 17.12. 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;

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- Permanent effects on the regional and/or national economy due to expenditure associated with the on-going operation and maintenance of the Development;
 - Permanent effects on the local economy 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;
 - Permanent effects on the local economy that could be supported by any community benefit funding that might be provided by the Applicant during the operational phase; and
 - Temporary effects on the regional and/or national economy due to expenditure during the decommissioning phase.
- 17.13. The link between onshore wind energy developments and the tourism sector is a subject of debate; however the most recent research has not found a link between tourism employment, visitor numbers and onshore wind developments. For example, in 2017 BiGGAR Economics 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. This analysis found that there was no relationship between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at local authority level nor in the areas immediately surrounding wind farm developments.
- 17.14. Nevertheless, the tourism sector is an important contributor to the local and Scottish economies; therefore there is merit in considering whether the Development will have any effect on the tourism sector. This assessment will consider the potential effect that the Development could have on tourism attractions, routes, trails and local accommodation providers, such as:
- Galloway Forest Park; and
 - the Southern Upland Way.
- 17.15. This will consider the implications of any effects identified for the tourism sector in the local area and wider region.
- 17.16. Other issues, such as implications for the agricultural sector, may emerge during the assessment that will require consideration.
- 17.17. Effects will be considered based on the guidance from Guidelines for Environmental Impact Assessment and a Handbook for EIA.
- 17.18. 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 context;
 - Baseline tourism context;
 - Socio-economic assessment;

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- 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.

17.19. This will be a desk-based study and therefore there will be no stakeholder consultations undertaken as part of this study.

Key Issues for Consultees

17.20. 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:

- Do the Consultees agree with the proposed method of assessment?
- What additional wind energy developments are under consideration in the area that have a similar development timeframe?
- Are the Consultees aware of any additional sensitive economic activities in the area that would not be covered in the proposed method of assessment?

SHADOW FLICKER AND REFLECTIVITY

Introduction

- 18.1. Reflectivity is the potential for the sun to 'glint' off structures which, in the case of wind turbines, can be an intermittent glint when the turbines are rotating. This effect can be minimised by selecting a matt coating for the wind turbines, designed to reduce the potential for reflection and is therefore scoped out of further assessment.
- 18.2. Under certain combinations of geographical position and time of day, the sun may pass behind the rotors of a wind turbine and cast a shadow over neighbouring properties. Shadow flicker is an effect that can occur when the shadow of a blade passes over a small opening (such as window), briefly reducing the intensity of light within the room, and causing a flickering to be perceived. Shadow flicker effects only occur inside buildings where the blade casts a shadow across an entire window opening.

Methodology

- 18.3. Due to the lack of explicit guidance in Scotland, guidance within England is considered to be material for assessing shadow flicker effects. Guidance produced by the UK Government, Planning Practice Guidance for Renewable and Low Carbon Energy⁶⁵ states that "*only properties within 130 degrees either side of north, relative to the turbines can be affected at these latitudes in the UK- turbines do not cast long shadows on their southern side*". In addition, the Scottish Government Online Planning Guidance note on onshore wind¹² provides information on shadow flicker. It states: "*Where separation is provided between turbines and nearby dwellings (as a general rule 10 rotor diameters), "shadow flicker" should not be a problem*".
- 18.4. An assessment will be undertaken to determine whether or not there will be any shadow flicker effects properties surrounding the Site. This assessment will examine all properties which lie within 10 rotor diameters and 130° either side of north from each turbine. Effects will be quantified using a computer model during the EIA process and mitigation, if required, will be outlined.

⁶⁵ DCLG (2013). Planning Practice Guidance for Renewable and Low Carbon Energy. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/225689/Planning_Practice_Guidance_for_Renewable_and_Low_Carbon_Energy.pdf [Accessed 01/03/2018]

CLIMATE CHANGE AND CARBON BALANCE

Introduction

- 19.1. The aim of the Climate Change Impact Assessment (CCIA) is to determine how the Development is likely to interact with a changing climate and whether any significant effects could arise. CCIA one of the new assessment topics which must be given consideration as specified within the EIA Regulations.
- 19.2. The purpose of the Development will be to produce electricity from a renewable source, the wind, thereby displacing carbon dioxide (CO₂) and other GHG emissions that would occur through the production of the equivalent amount of electricity from fossil fuel sources. The EIA will consider the current electricity generation mix and assess the level of CO₂ savings that could potentially be made depending on the source of electricity generation the wind farm is displacing at any given time.
- 19.3. CO₂ emissions can also be generated from the degradation of peatland should a wind farm be constructed in peatland habitat, as peat based soils can act as carbon sinks or carbon sources depending on how they are managed. Given that peat is present on the Site, the potential effects associated with construction on peatland would be considered as part of this chapter.

Methodology

- 19.4. As CCIA is a new category of assessment currently only provisional guidelines exist to standardise the process in the UK. IEMA published Environmental Impact Assessment Guide to Climate Change Resilience and Adaption⁶⁶ in November 2015 with the intention of providing an update once the directive was transposed. As of early 2018, this guidance has not yet been published. Accordingly, the proposed CCIA methodology is developed in line with the 2015 IEMA guidance and the text of the EU Directive and EC guidance in order to establish a comprehensive assessment methodology.
- 19.5. The proposed methodology focuses on the following elements:
- Assessment of the Development's effects on climate change (calculation of carbon footprint based on best practice guidelines, e.g. Scottish Government Carbon Calculator Tool⁶⁷) to include calculation of GHG emissions relating to construction, operation, decommissioning and the production of electricity;

⁶⁶ IEMA (2015) Environmental Impact Assessment Guide to Climate Change Resilience and Adaption. Available at:

[https://www.iema.net/assets/templates/documents/iema_guidance_documents_eia_climate_change_resilience_and_adaptation%20\(1\).pdf](https://www.iema.net/assets/templates/documents/iema_guidance_documents_eia_climate_change_resilience_and_adaptation%20(1).pdf) [Accessed 01/03/2018]

⁶⁷ Scottish Government (2018) Carbon Calculator Toll v1.4.0. Available at:

<https://informatics.sepa.org.uk/CarbonCalculator/index.jsp> [Accessed 06/02/18]

- Assessment of the Development's vulnerabilities and resilience in the context of climate change by identifying appropriate climate change projections and climate change effects; and
- Assessment of the Development's effects upon identified environmental receptors in the context of the emerging baseline.

Baseline and Potential Effects

- 19.6. The most recent climate change projection iteration, UKCP09, has identified the following trends as a result of climate change:
- Increased temperature;
 - Changes in the frequency, intensity and distribution of rainfall events (e.g. an increase in the contribution to winter rainfall from heavy precipitation events and decreases in summer rainfall);
 - Increased windstorms; and
 - Sea level rise.
- 19.7. The UK Climate Projections 18 (UKCP18) project will build upon the UKCP09 projections. Due to be released in May 2018, academics and other researchers will use the core set of UKCP18 data to support the next Climate Change Risk Assessment.
- 19.8. The Development will be inherently designed to reduce adverse climate change effects by offsetting the production of carbon dioxide through use of renewable sources for generating electricity. The current baseline with respect to GHG emissions from existing methods of electricity generation will be identified using existing data from the Government, operational sites, and experience of other similar developments. This information will provide the baseline information against which to assess the contribution of the Development to reducing greenhouse gas emissions and potential for significant effects.
- 19.9. It is proposed that the assessment of the Development's effects on climate change will be scoped into the EIA, given the associated carbon reduction properties of wind farms and the need for felling and potential for peat disturbance.

MAJOR ACCIDENTS AND DISASTERS

Introduction

- 20.1. The EIA Regulations state that an EIA must identify, describe and assess in an appropriate manner, the expected effects deriving from the vulnerability of the development to risks, so far as relevant to the development, of major accidents and natural disasters.

Assessment

- 20.2. Relevant information available and obtained through risk assessments pursuant to legislation of the European Union such as Directive 2012/18/EU of the European Parliament⁶⁸ on the control of major-accident hazards involve dangerous substances. The Directive lays down rules for the prevention of major accidents which might result from certain industrial activities and the limitation of their consequences for human health and the environment. Directive 2012/18/EU requires the preparation of emergency plans and response measures which will be covered under equivalent documents relevant to the nature of the Development. Throughout all phases of the Development, cognisance should be made of the following guidance documents produced by Renewable UK:
- Wind Turbine Safety Rules Third Edition⁶⁹;
 - Guidance & Supporting Procedures on the Application of Wind Turbine Safety Rules Third Edition⁷⁰; and
 - Onshore Wind Health & Safety Guidelines⁷¹.
- 20.3. Health and Safety during the construction and decommissioning phases of the Development will be subject to relevant legislation and best practice. This will involve site inductions, risk assessment and method statements as implemented by the Construction Management Plan (CMP). Therefore there is no further requirement for Health and Safety to be assessed within the EIA and is scoped out of further assessment.
- 20.4. The risk of a major accident could be increased by the probability of natural disasters associated with the location of the Development. This should be considered during the preparation of major-accident scenarios.

⁶⁸ European Union (2012) Directive 2012/18/EU. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012L0018&from=en> [Accessed 06/02/18]

⁶⁹ Renewable UK (2015) Wind Turbine Safety Rules, Third Edition. Available at: [https://c.ymcdn.com/sites/www.renewableuk.com/resource/resmgr/Docs/Health & Safety/WindTurbine SafetyRulesIssue3.pdf](https://c.ymcdn.com/sites/www.renewableuk.com/resource/resmgr/Docs/Health%20&%20Safety/WindTurbineSafetyRulesIssue3.pdf) [Accessed 06/02/2018]

⁷⁰ Renewable UK (2015) Guidance & Supporting Procedures on the Application of Wind Turbine Safety Rules, Third Edition. Available at: <https://c.ymcdn.com/sites/www.renewableuk.com/resource/collection/AE19ECA8-5B2B-4AB5-96C7-ECF3F0462F75/Wind-turbine-safety-rules-guidance.pdf> [Accessed 06/02/2018]

⁷¹ Renewable UK (2015) Onshore Wind Health & Safety Guidelines. Available at: http://c.ymcdn.com/sites/www.renewableuk.com/resource/collection/AE19ECA8-5B2B-4AB5-96C7-ECF3F0462F75/OnshoreWind_HealthSafety_Guidelines.pdf [Accessed 06/02/2018]

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- 20.5. The Development is not located within an area known for natural disasters such as floods, hurricanes, tornadoes, volcanic eruptions, earthquakes or tsunamis. At 200 m Above Ordnance Datum (AOD, approximately equivalent to sea level) and 30 km east of the Firth of Clyde, the Development is not at risk from tsunamis and there are no known volcanoes nearby. As the most probable of natural disasters to affect the Development, flood risk will be assessed within the hydrological assessment in the ER. It is noted that the Development is not located in an area of flood risk.
- 20.6. As stated in the CCIA Chapter, none of the identified climate change trends listed will affect the Development with the exception of increased windstorms. Brake mechanisms installed on turbines allow them to be operated only under specific wind speeds and should severe windstorms be experienced then the turbines would be shut down. Although an unlikely event in the area, the brake mechanism could also apply to a hurricane scenario.
- 20.7. Whilst unlikely to occur in Scotland, ice throw is a phenomenon which can occur when ice, which builds up on the blades, is dislodged when the blades begin to turn. Modern turbines are fitted with sensors which can shut the turbine down during icy conditions to prevent ice throw, thereby negating the need for concern.
- 20.8. Appropriate health and safety protocol will be implemented to minimise the occurrence of any major accidents. Infrastructure will be placed outwith flood zones to mitigate likelihood of flooding and braking mechanisms installed to allow shut down of the turbines during severe windstorms. Although it is difficult to plan for natural disasters such as earthquakes or tornados, the Development is not located in an area prone to such disasters and the likelihood of such an event is extremely rare. Therefore, it is concluded that no significant effects will arise due to major accidents and natural disasters as a result of the Development, and this topic can be scoped out of the EIA.

CUMULATIVE EFFECTS

- 21.1. At the time of writing it is known that there are other operational wind farms and a number of wind energy proposals in the region. The methodology adopted for assessing the cumulative effects of wind energy developments will be in accordance with advice from SNH and the Scottish Government. Cumulative effects, which are the combined effects of two or more wind energy developments, will be considered for each technical area assessed within the EIA Report.
- 21.2. The extent of any cumulative assessment relative to each technical assessment will be agreed during the consultation process and can include both existing and proposed wind farm developments and other forms of development. The potential landscape and visual effects, for example, which relate to the indivisibility of an individual wind farm development scheme, will be much more wide ranging than noise effects which will be limited to receptors in the more immediate vicinity of the Development.
- 21.3. In relation to some of the technical assessments, specific guidance and policy exists advising that effects associated with existing wind farm developments should be considered cumulatively.
- 21.4. An initial list of cumulative sites located within 35 km of the Site is located in Appendix C.

CONSULTATION

- 22.1. The process of identifying environmental effects is both iterative and cyclical, running in tandem with the iterative design process. Consultation forms an integral role throughout the EIA process.

Scoping Consultation

- 22.2. Infinergy is fully committed to a thorough engagement process aiming to ensure that communities are consulted and informed of developments during, and beyond, the EIA process on all projects. This is achieved by a variety of methods as appropriate including public exhibitions, meetings and circulars. Public consultation will be incorporated into the iterative design process and recorded in appropriate sections of the EIA Report. Planning Advice Note (PAN) 81 on Community Engagement provides advice on how communities should be properly engaged in the planning process and forms a basis for potential activities.
- 22.3. Comments are specifically invited on:
- The proposed content of the EIA Report;
 - Assessment methods;
 - Additional data sources; and
 - Additional consultees.
- 22.4. In terms of the proposed content of the EIA Report it should be emphasised that one of the aims of this scoping report is to scope out any issues which are known not to be significant from further consideration and to highlight and focus on the main issues which should be assessed within the EIA Report.

Public Consultation

- 22.5. It is hoped that a positive relationship can be maintained with local community members. Initial community open days were held in July 2013.
- 22.6. As part of the consultation process, the Applicant will engage with the local community in order to inform local people about the proposals, to explain the development and its likely effects and to take on board any concerns or issues.
- 22.7. The following further pre-application community involvement activity is proposed:
- Information, such as a development brief to be included on Infinergy's website (<http://www.infinergy.co.uk>) in relation to the project;
 - Written consultation to Councillors and the Chair of the relevant committee to include information about the project along with a summary of public consultation to be carried out;

- Placement of an advert in local paper(s) announcing the project with reference to Infinergy's website for further information and including information on public exhibitions; and
- Public exhibitions – Infinergy will closely assess the consultation zone and will then decide on the location and timing of a public exhibition.

22.8. The EIA Report will include a summary of all pre-application public consultation carried out.

APPENDIX A – FIGURES

- Figure 1 Site Location
- Figure 2 Cumulative Developments
- Figure 3 Indicative Layout
- Figure 4 Landscape Designations
- Figure 5 Zone of Theoretical Visibility with Viewpoints
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- Figure 7 Ornithology Study Areas
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- Figure 9 Cultural Heritage Designations
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APPENDIX B – 2013 SCOPING OPINION



**SCOTTISH GOVERNMENT
ENERGY CONSENTS AND DEPLOYMENT UNIT
SHEPHERDS RIG SCOPING OPINION**

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Annex 1

All Consultee comments relating specifically to Shepherd's Rig Wind Farm

THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2000

SCOPING OPINION FOR THE PROPOSED SHEPHERD RIG WIND FARM EAST OF CARSPHAIRN, DUMFRIES & GALLOWAY

1. Introduction

Any proposal to construct or operate a power generation scheme with a capacity in **excess of 50 megawatts** requires Scottish Ministers' consent under Section 36 of the Electricity Act 1989.

Schedule 9 of the Act places on the applicant a duty to "have regard to the desirability of preserving the natural beauty of the countryside, of conserving flora, fauna and geological and physiological features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest". In addition, the applicant is required to give consideration to National Planning Framework 2, Scottish Planning Policy, Planning Advice Notes, the relevant planning authority's Development Plans and any relevant supplementary guidance.

Under the Electricity Works (Environmental Impact Assessment) (Scotland)(EIA) Regulations 2000, the Scottish Ministers are required to consider whether any proposal for a wind farm is likely to have a significant effect on the environment. In terms of these Regulations, we must consult the planning authority, Scottish Natural Heritage and the Scottish Environment Protection Agency and other relevant consultees.

2. Aim Of This Scoping Opinion

Scottish Ministers are obliged under the EIA regulations to respond to requests from applicants for a scoping opinion on outline design proposals.

The purpose of this document is to provide advice and guidance to applicants which has been collated from expert consultees whom the Scottish Government has consulted. It should provide clear advice from consultees and enable applicants to address the issues they have identified and address these in the EIA process and the Environmental Statement associated with the application for Section 36 consent.

3. Land Use Planning

The Scottish Government's planning policies are set out in the National Planning Framework, Scottish Planning Policy, Designing Places and Circulars.

The National Planning Framework is the Scottish Government's Strategy for Scotland's long term spatial development.

Scottish Planning Policy (SPP) is a statement of Scottish Government policy on land use planning and contains:

- The Scottish Government's view of the purpose of planning,
- The core principles for the operation of the system and the objectives for key parts of the system,
- Statutory guidance on sustainable development and planning under Section 3E of the Planning etc. (Scotland) Act 2006,
- Concise subject planning policies, including the implications for development planning and development management, and
- The Scottish Government's expectations of the intended outcomes of the planning system.

Online renewables planning advice for onshore wind, preparing spatial frameworks and wind farm developments on peat land is available at <http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables>, including advice on spatial planning, typical planning considerations, detailed siting matters and useful references. This is regularly updated to reflect emerging best practice.

Other land use planning documents which may be relevant to this proposal can be found at <http://www.scotland.gov.uk/Topics/Built-Environment/planning>

The ES should also include full reference to the relevant development plan.

4. Natural Heritage

Scottish Natural Heritage (SNH) has produced a service level statement (SLS) for renewable energy consultation. This statement provides information regarding the level of input that can be expected from SNH at various stages of the EIA process. Annex A of the SLS details a list of references, which should be fully considered as part of the EIA process. A copy of the SLS and other vital information can be found on the renewable energy section of their website – <http://www.snh.org.uk>.

5. General Issues

5.1 Aviation

In the wake of recent consultation with the aviation organisations such as NATS, BAA, CAA, MOD etc, it is clear that large scale wind farm proposals can impact significantly on primary, secondary or weather radar stations and thus affect operational safety. Applicants are encouraged to engage with these organisations and airport operators at an early stage in the design process, to establish the potential impacts and agree acceptable technical solutions. Where actual or potential conflicts exist, it is important that a solution is identified and that the relevant consultee agrees to that solution being realised within a suitable timescale.

A link to relevant aviation guidance is available at the following website <http://www.caa.co.uk/docs/33/Cap764.pdf>

NATS En Route Plc (“NERL”) is responsible for the safe and expeditious movement in the en-route phase of flight for aircraft operating in controlled airspace in the UK. To undertake this responsibility NERL has a comprehensive infrastructure of radars, communication systems and navigational aids throughout the UK, all of which could be compromised by the establishment of a wind farm. In this respect NERL is responsible for safeguarding this infrastructure to ensure its integrity to provide the required services to Air Traffic Control (ATC). In order to discharge this responsibility NERL assess the potential impact of every wind farm development in the UK which have applied for planning approval.

NERL offer services to assist in pre-planning for wind farm developments. Details of these services are available at <http://www.nats.co.uk/services/information/wind-farms/self-assessment-maps/> or by contacting NERL directly on NATSSafeguarding@nats.co.uk or writing to:

NERL Safeguarding – Mailbox 27
NATS - CTC
4000 Parkway
Solent Business Park
Whiteley
Hampshire
PO15 7FL

NATS are unable to evaluate the proposal until the ground to blade tip height and OS Grid Reference for each individual wind turbine (eastings and northings) is received.

The Wind Energy Team at the Defence Infrastructure Organisation (DIO) is the focal point for all wind farm proposals in the Ministry Of Defence (MOD). The team seeks to work with industry at the earliest stages of proposed development to minimise the impact on Defence, to ensure public safety is not compromised, and maximise the likelihood of planning success. Some of the main concerns the MOD have are interference with Air Defence Radar and Air Traffic Control Radar, plus the creation of obstacles in Low Flying Areas, which negate the usefulness of the training undertaken there. Aviation safety lighting should also be considered through consultation with the aviation authorities and the relevant planning authority.

The pre-planning consultation form found at <http://www.bwea.com/aviation/proforma.html> should be completed and e-mailed to DIO at DIO-Safeguarding-Wind@mod.uk.

Civil Aviation Authority Directorate of Airspace Policy (DAP) is the civil aviation regulatory focal point for all wind farm proposals. DAP seeks to work with industry at the earliest stages of proposed development to establish potential civil aviation issues associated with any particular wind turbine proposal. The best means by which to initiate the aviation related consultation

process is via the **completion and submission of an associated aviation pre-planning proforma** in line with the process described within the DTI/BERR guidance document 'Wind Energy and Aviation Interests – Interim Guidelines'. Generic CAA policy and guidance on wind turbines is set out within Civil Air Publication 764, available at <http://www.caa.co.uk/docs/33/Cap764.pdf>.

Furthermore, applicants should demonstrate that a solution to potential aviation issues is either agreed or well advanced, **prior to** submission of the application.

5.2 Economic Benefit

The Government Economic Strategy (2011) establishes a new Strategic Priority – Transition to a Low Carbon Economy – to reflect the excellent opportunity we have to secure investment and jobs from this growing sector and ensure that the benefits of this transformational change are shared across the economy and our communities. The concept of economic benefit as a material consideration is explicitly confirmed in the SPP. Further details of the Government's approach to realising its ambitions for renewables are set out in the "2020 Routemap for Renewable Energy in Scotland", which highlights the manufacturing potential of the renewables sector and opportunities for communities to share in the rewards of our next energy revolution.

The application should include relevant economic information connected with the project, including the potential number of jobs, and economic activity associated with the procurement, construction operation and decommissioning of the development.

5.3 Local Planning Agreements

There are two main tests in determining whether a consideration is material and relevant. These are:

- it should serve or be related to the purpose of planning – it should therefore relate to the development and use of land; and
- it should fairly and reasonably relate to the particular application.

Only those issues that meet the above tests can be taken into account when considering applications. Where relevant, applicants should identify such issues in their application, including evidence to support compliance with these tests.

6. **Contents Of The Environmental Statement (ES)**

We recommend the contents of the ES should be structured as follows below:

6.1 Format

High resolution and low resolution PDF versions should be provided. A description of the methodology used in assessing all impacts should be included.

It is considered good practice to set out within the ES the qualifications and experience of all those involved in collating, assessing or presenting technical Information.

6.2 Non Technical Summary

This should be written in simple non-technical terms to describe the various options for the proposed development and the mitigation measures against the potential adverse impacts which could result.

6.3 Site Selection And Alternatives

The applicant should set out the alternatives sites considered and the rationale and methods used to select the chosen site. The applicant should demonstrate that a fairly wide set of environmental and economic parameters have been used to narrow down choice of sites and how this choice takes account of the spatial framework set out in the SPP. Secondly, there should be a detailed examination on these parameters to minimise the impact of the proposal by sensitive design and layout.

Wind potential and access to the grid are key to initial sieve-mapping exercises for site selection, but environmental constraints other than landscape character should also be included in this initial site selection process. For example, areas of deep peat, watercourse crossings, wetlands and locations of protected species would be other examples of additional environmental constraints to be considered both from the outset and in the detailed design and layout.

Architecture+Design Scotland (A+DS) suggest that a planning and design strategy should first look at the proposed location and address whether this is a sensible location in relation to wind, access to the grid and to the character of the landscape.

6.4 Description Of The Development

The description of the proposed development in the Environmental Statement should comprise information on the site boundary, design layout, and scale of the development.

Where it is required to assess environmental effects of the development (see EIA regulation 4 (1)(b), the Environmental Statement should include;

- (a) a description of the physical characteristics of the whole development and the land use requirements during the construction, operation, decommissioning and restoration phases;
- (b) a description of the main characteristics of the production processes and nature and quality of the materials used; and

- (c) an estimate by type and quantity of expected residues and emissions resulting from the operation of the proposed development.

6.5 Track Construction

The applicant should set out the alternative access routes considered and the rationale and methods used to select the chosen access routes. Applicants should set out the intended use of access routes i.e.: for transportation of turbine components, delivery of construction materials, every day operational use etc. Applicants should specify which access routes/ roads are temporary and which are required for the operational duration of the development. Considered design details will be required for all aspects of site work that might have an impact upon the environment, containing further preventative action and mitigation to limit impacts.

The applicant should be aware of useful guidance on, among other things, minimising the impact from construction of the type of access roads used in wind farms. Such guidance can be found in “Forests and Water Guidelines” Fifth Edition (2011) which can be obtained from the Forestry Commission via <http://www.forestry.gov.uk/forestry/infd-8bvgx9> and “Control of water pollution from linear construction projects” (CIRIA C648, 2006) which can be obtained from CIRIA. However, given that tracks in some cases will be located on peat and will carry very heavy loads, evidence will be necessary of additional consideration of specific measures required in similar schemes elsewhere to deliver best practice. Additional guidance is also available in ‘Constructed tracks in the Scottish Uplands’ (2006) published by SNH and available at <http://www.snh.org.uk/pdfs/publications/heritagemanagement/constructedtracks.pdf>

6.6 Decommissioning

The subsequent application and supporting environmental statement should include a programme of work complete with outline plans and specifications for the decommissioning and reinstatement of the site. Information should be provided on the anticipated working life of the development and after use site reinstatement.

6.7 Grid Connection Details

The impacts of constructing, installing and operating the following infrastructure components should be considered and assessed by applicants, if known;

- Substation.
- Cabling (Underground).
- Cabling (Overhead).
- Monitoring and control centre.

7. Baseline Assessment And Mitigation

Under each section below applicants are asked to consider:

- Aspects of the environment likely to be affected by the proposals.
- Environmental impacts of the proposals.
- Methods to offset adverse environmental effects.
- Effects of the phases of the development; Construction, Operation, Decommissioning and Restoration.

This section should clearly set out a description of the environmental features of the proposed wind farm site, the likely impacts of the wind farm on these features, and the measures envisaged to prevent, mitigate and where possible remedy or offset any significant effects on the environment. It should incorporate details of the arrangements and the methodologies to be used in monitoring such potential impacts, including arrangements for parallel monitoring of control sites, timing and arrangements for reporting the monitoring results. It should be noted that there is a danger that these measures could themselves have secondary or indirect impacts on the environment.

7.1 Air And Climate Emissions

The Environmental Statement should fully describe the likely significant effects of the development on the environment, including direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary e.g. construction related impacts, positive and negative effects of the development which result from:

- (a) the existence of the development.
- (b) the use of natural resources.
- (c) the emission of pollutants, the creation of nuisances and the elimination of waste.

7.2 Carbon Emissions

To assist Scottish Ministers in making a determination on the application, applicants must produce a statement of expected carbon savings over the lifetime of the wind farm. The statement should include an assessment of the carbon emissions associated with track preparation, foundations, steel, and transport; any carbon losses from tree felling (and offsetting from tree planting); and any carbon losses from loss or degradation of peaty soils. Reference can be made to the technical note "Calculating Potential Carbon Losses and Savings from Wind Farms on Scottish Peatlands" (Scottish Government, 2011). The spreadsheet tool it refers to should be used for developments on peat but can also be used for sites that will be drained, are located on carbon rich soils or require a significant amount of deforestation.

It is important to ensure that the carbon balance of renewable energy projects is not adversely affected by management of peat resource. There need to be measures in place to ensure that the development does not lead to significant

drying or oxidation of peat through, for example, development of access tracks and other infrastructure, drainage channels, or “landscaping” of excavated peat. The basis for these measures should be set out within the ES, on which a detailed peat management scheme, required through planning condition, can subsequently be designed to ensure that the carbon balance benefits of the scheme are maximised.

Applicants are required to submit full details of the potential carbon losses and savings of the wind farm, and demonstrate how the scheme has been designed to minimise the payback figure.

The ES should include a dedicated chapter on carbon assessment which has printed copies of all worksheets along with an explanation of how the data entered is derived, referring to the relevant section of the ES as appropriate. An electronic version of the spreadsheet should be emailed to econsentsadmin@scotland.gsi.gov.uk and SEPA.

References must be given to the data sources used as inputs to the tool and the rationale behind their use must be made clear, especially where sources outside the data presented elsewhere in the ES are used. Where assumptions or estimates have been made these should be explained and justified.

Guidance on the above technical note, planning policy, site surveys and assessments for developments on peatland, re-use of peat and minimisation of waste, as well as the supporting research and spreadsheet tools are all available from the Scottish Government “Wind Farms and Carbon” website at www.scotland.gov.uk/WindFarmsAndCarbon. Prior to submission of the application, applicants should make a final check that they have used the most up to date version of the tool. This will always be available from the link above.

7.3 Design, Landscape And The Built Environment

Scottish Ministers place particular importance on the layout design of wind farms and considers there is a need for a coherent, structured and quality driven approach to wind farm development. The appearance of wind farms is of particular interest and the need for a coherent design strategy to be considered at scoping stage and to be prepared before submission of the Environmental Statement. The strategy should explain the design principles behind the layout plan in a rational way that can be easily understood. The design strategy for the wind farm should be expressed through a design statement. The Design Statement should describe a clear strategy for meeting these objectives, a justification for the resulting layout and evidence that the design ideas have been tested against the objectives.

Wind farms are prominent features in the landscape and hence a full assessment of the effects on landscape and visual amenity is important. The assessment methodology should follow the approach promoted by the Landscape Institute and Institute of Environmental Management and Assessment (‘Guidelines for Landscape and Visual Impact Assessment’, second edition, Spon 2002). General guidance on the range of issues to be considered in assessment of wind farms is set out, in the form of a scoping

checklist, at Appendix 1 of 'Hydroelectric schemes and the natural heritage (SNH 2010)

As regards the portrayal of visual and landscape impacts within Environmental Statements, guidance has also been developed, jointly by SNH and the Scottish Renewables Forum, on 'Visual Representation of Wind Farms – Good Practice Guidance' (SNH 2007), published at:

<http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind>.

Visual information should be presented in a way which communicates as realistically as possible the actual visual impact of the proposal. The format of the images and the focal length of the lens will have to be taken into consideration.

All visualisation images should be accompanied by a description of how to view the image so that it best replicates what will be seen if the proposal is constructed. This should include the required viewing distance between the eye and the image, and whether it is a single frame image or a composite panoramic image. If a composite image, it is desirable either to curve the edges of panoramic images so that peripheral parts of the image are viewed at the same intended viewing distance, or to 'pan' across the image with the eye remaining at the recommended viewing distance. This is not required for single frame images.

The viewpoints from which the photographs are taken should be agreed with the planning authority and SNH. The horizontal field of view should be shown on a map so that the images can be used accurately on site.

The ES should include a description of the landscape character of the area and how that character will be affected by the impact on any landscapes designated for their landscape or scenic value, including National Parks, National Scenic Areas, or local landscape designations such as Area of Great Landscape Value or Regional Scenic Area (the terminology is varied) and the impact on any area which is a recognised focus for recreational enjoyment of the countryside, eg a Regional Park or Country Park.

7.4 Construction And Operation

The ES should contain site-specific information on all aspects of site work that might have an impact upon the environment, containing further preventative action and mitigation to limit impacts. Elements should include: fuel transport and storage management; concrete production (including if batching plants are proposed and measures to prevent discharges to watercourses); stockpile storage; storage of weather sensitive materials at lay-down areas; haul routes and access roads (and if temporary or permanent); earthworks to provide landscaping; mechanical digging of new or existing drainage channels; vehicle access over watercourses; construction of watercourse crossings and digging of excavations (particularly regarding management of water ingress); temporary and long-term welfare arrangements for workers during construction ; maintenance of vehicles and plant; pollution control measures during turbine gearbox oil changes; bunding or roofing of transformer areas;

use of oil-cooled power cables and related contingency measures; and dewatering of turbine base excavations. With regards to oil, it is imperative that there is a detailed contingency plan to deal with large oil spills that cannot be dealt with at a local level. The ES should identify if there are particularly sensitive receptors of pollution (e.g. salmonid rivers, rivers with freshwater pearl mussels etc.).

Such information is necessary in order to assess the environmental impact of the proposals prior to determination and provide the basis for more detailed construction method statements which may be requested as planning conditions (it is recommended that the relevant Planning Authorities, SNH and SEPA are provided with the opportunity to view these method statements in draft form, prior to them being finalised should development take place).

The applicant should be aware of information provided by SEPA that may be of use such as rainfall and hydrological data. The need to plan the works in order to avoid construction of roads, dewatering of pits and other potentially polluting activities during periods of high rainfall is important. The ES needs to demonstrate which periods of the year would be best practice for construction for the site, taking into account the need to avoid pollution risks and other environmental sensitivities affecting operational timing, such as fish spawning and bird nesting.

The impact of the proposed development on public footpaths and rights of way should be clearly indicated. If any re-routing of paths under a Right of Way is required alternative routes should be highlighted for consideration. Further guidance can also be found within the Scottish Outdoor Access Code at <http://www.outdooraccess-scotland.com>.

The ES should set out mechanisms to ensure that workers on site, including sub-contractors, are aware of environmental risks, and are well controlled in this context. The ES should state whether or not appropriately qualified environmental scientists or ecologists are to be used as Clerk of Works or in other roles during construction to provide specialist advice. Details of emergency procedures to be provided should be identified in the ES.

The process whereby a method statement is consulted upon before commencement of work is satisfactory at many sites where sensitivities are non-critical. However for environmentally sensitive sites it is recommend that, following consultation, method statements be approved by the planning authority in consultation with SNH, prior to the commencement of construction work.

Scottish Natural Heritage would normally only wish to comment on Construction Method Statements where there are relevant and significant natural heritage interests involved. Applicants should avoid submitting multiple versions of the Construction Method Statement to SNH.

8. Ecology, Biodiversity And Nature Conservation

Scottish Government suggests that all ecological survey methods conform to the best available standard methods for each habitat and species, and follow guidance published by SNH where this is available. Where standard methodologies do not exist, applicants should propose and agree an appropriate methodology with SNH specialist advisers. SG also requires that all ecological survey data collected during ES survey work should be made available by the applicant to SG and SNH, in a form which would enable them to make future analysis of the effects of wind farms if appropriate.

8.1 Designated Sites

The ES should address the likely impacts on the nature conservation interests of all the designated sites in the vicinity of the proposed development. It should provide proposals for any mitigation that is required to avoid these impacts or to reduce them to a level where they are not significant. Information on designated sites and the law protecting them can be found on the SNH website. Maps of the boundaries of all natural heritage designated sites and information on what they are designated for are also publicly available via SiteLink in the SNHi section of the SNH website <http://www.snh.org.uk/snhi/>. The applicant is referred to this resource to ensure that they have the correct information on designated sites within the locality that may be affected by the proposed development. The potential impact of the development proposals on other designated areas such as NSA, LSA, SSI or Regional/National Parks etc should be carefully and thoroughly considered and appropriate mitigation measures outlined in the ES. Early consultation and agreement with SNH, the relevant planning authority and other stakeholders is imperative in these circumstances.

For developments with a potential to affect Natura sites, applicants must provide in the ES sufficient information to make clear how the tests in the Habitats Regulations will be met, as described in the June 2000 Scottish Government guidance. The information in the ES should enable the assessments required by the legislation to be completed by the Scottish Government. Specific guidance on the Habitats and Birds Directive regarding the appropriate impact assessments and associated alternative solution and IROPI tests is available on the following website link <http://www.scotland.gov.uk/library3/nature/habd-00.asp>

Within the Regulations, the first test is whether the proposal is necessary for the management of the site: this will not be the case for wind farm applications. The next step is to ask whether the proposal (alone or in combination with other proposals) is likely to have a significant effect on the site. If so, the Scottish Government as the Competent Authority under the Habitats Directive will draw up an 'appropriate assessment' as to the implications of the development for the site, in view of that site's conservation objectives.

The scoping report should aim to present sufficient information to enable a conclusion to be drawn on this test, i.e. as to whether there is likely to be a significant effect on the site. If that information is provided, SNH will be able to

advise, when consulted upon the scoping request, whether an appropriate assessment will be necessary. In the event that detailed survey or analysis is required in order to reach a view, the survey and analysis should be regarded as information contributing to that assessment. Note that such information should be provided for the wind farm itself together with any ancillary works such as grid connections and vehicle tracks, and cumulatively in combination with any other wind farm consented or formally proposed in the vicinity.

8.2 Habitats

Surveys should be carried out at appropriate times or periods of the year by appropriately qualified and experienced personnel, and suitability of the timing needs to be considered within the ES.

The ES should provide a comprehensive account of the habitats present on the proposed development site. It should identify rare and threatened habitats, and those protected by European or UK legislation, or identified in national or local Biodiversity Action Plans. Habitat enhancement and mitigation measures should be detailed, particularly in respect to blanket bog, in the contexts of both biodiversity conservation and the inherent risk of peat slide. Details of any habitat enhancement programme (such as native- tree planting, stock exclusion, etc) for the proposed wind farm site should be provided. It is expected that the ES will address whether or not the development could assist or impede delivery of elements of relevant Biodiversity Action Plans.

Particular attention should be paid to the effects of the proposals on any priority habitats, as listed in Annex 1 of the EU Habitats Directive, on the site. SEPA emphasises that the ES should demonstrate that turbine locations have been determined on the basis of habitats on the site, especially with regard to any areas of deep peat and intact hydrological units of mire vegetation. Turbines therefore need to be located in the light of vegetation survey work. Similarly, the ES needs to demonstrate that roads have been located to minimise impact on vegetation communities, peat habitats and peat depth. Measures to avoid pH impact on peatland from use of cement/concrete (e.g. use of blinding cement on roadways, wash-out during construction, integrity of shuttering) should be set out.

8.3 Habitat Management

SNH and RSPB may wish to see a Habitat Management Plan for the area of the wind farm and any area managed in mitigation or compensation for the potential impacts of the wind farm. A commitment to maintain and/or enhance the biodiversity of the overall area is expected. Monitoring of any specific potential impacts of the development, and of the outcome of any habitat management measures, should form part of the ES proposals. Applicants may also want to consult other interested parties in preparation of the HMP information or relevant studies/surveys.

The ES should also outline provisions made regarding public access, having regard for the requirements of the Land Reform (Scotland) Act 2003 and the Scottish Outdoor Access Code at <http://www.outdooraccess-scotland.com>,

clarifying the extent of any access restrictions proposed, if any, during construction or operation, and indicating any new facilities for access to be provided on or off site.

8.4 Species: Plants And Animals

The ES needs to show that the applicants have taken account of the relevant wildlife legislation and guidance, for example but not limited to, Council Directives on The Conservation of Natural Habitats and of Wild Flora and Fauna, and on Conservation of Wild Birds (commonly known as the Habitats and Birds Directives), the Wildlife & Countryside Act 1981, the Nature Conservation (Scotland) Act 2004, the Protection of Badgers Act 1992, the 1994 Conservation Regulations, Scottish Government Interim Guidance on European Protected Species, Development Sites and the Planning System and the Scottish Biodiversity Strategy and associated Implementation Plans. In terms of the SG Interim Guidance, applicants must give serious consideration to/recognition of meeting the three fundamental tests set out in this Guidance. **It may be worthwhile for applicants to give consideration to this immediately after the completion of the scoping exercise.**

It needs to be categorically established which species are present on the site, and where, before the application is considered for consent. The presence of legally protected species and habitats, for example bird species listed in Annex 1 of the EU Birds Directive, Schedules 5 (animals) and 8 (plants) of the Wildlife & Countryside Act 1981, (as amended in Scotland), must be included and considered as part of the application process, not as an issue which can be considered at a later stage. Any consent given without due consideration to these species may breach European Directives with the possibility of consequential delays or the project being halted by the EC. Likewise the presence of species on Schedules 5 (animals) and 8 (plants) of the Wildlife & Countryside Act 1981 should be considered where there is a potential need for a licence under Section 16 of that Act.

Plants

A baseline survey of the plants present on the site should be undertaken, and field and existing data on the location of plants should be used to determine the presence of any rare or threatened species of vascular and no-vascular plants and fungi.

Birds

The ES should provide an assessment of the impact of the wind farm on birds. The assessment should follow the available guidance on the SNH website at <http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/>. A baseline survey of the species and number of birds present on the site throughout the year should be undertaken. Particular attention should be paid to specially protected and/or vulnerable species. All ornithological survey work should conform to the SNH guidance at the above link..

Survey work should include assessments of the flight lines of breeding birds and birds whose migrations or other seasonal distributions traverse or are in

close proximity to the site. Collision risk analyses will be necessary for species which regularly pass through the site at any time of year. The analysis should follow the principles set out in the SNH guidance at the above link.

In the interests of all stakeholders involved in the consultation exercise, the presence of protected species must be included and considered as part of the Section 36 application process. Submitting this information as an addendum at a later date will require further publicity and consultation which will delay the overall determination.

An Annex of Environmentally Sensitive Information may be required to provide information on nest locations or other environmentally sensitive information related to specially protected species, the information should follow the principles set out in the SNH guidance "Environmental Statements and Annexes of Environmentally Sensitive Bird Information" (September 2009) at <http://www.snh.gov.uk/docs/A285693.pdf>. However, the annex should not include any information that is not confidential, or if it does this information should be contained elsewhere within the text of the environmental statement.

Mammals

A baseline survey of the species and number of mammals present on the site should be undertaken. Particular attention should be paid to specially protected and/or vulnerable species, especially European Protected Mammals. Consideration should also be given to indirect impacts on species outwith the site.

Reptiles And Amphibians

A baseline survey of the species and number of reptiles and amphibians present on the site should be undertaken. Particular attention should be paid to specially protected and/or vulnerable species, especially European Protected species, and those potentially affected by the development.

Fish And Other Freshwater Aquatic Species

Fish populations and other freshwater aquatic species can be impacted by subtle changes in water quality and quantity and changes in channel morphology that influence suitability of habitat and consequently performance and production. Further impacts can occur if issues of habitat continuity are not adequately considered when planning site drainage and river crossings. A baseline survey should be undertaken to demonstrate the species and abundance of fish present in the still and running water bodies on and around the site throughout the year. This should extend to watercourses which may be affected by run-off from the site during construction, operation or decommissioning.

Particular attention should be paid to specially protected and/or vulnerable species, especially European Protected species, and those potentially

affected by the development. However, fish and fisheries should be given due consideration regardless of conservation designation.

Applicants should be aware that wind farm developments have considerable construction implications which should not be conducted without proper regard or understanding of their potential impacts on watercourses and water quality, and on fish and aquatic invertebrate populations.

The applicant should ensure that the implications of changing water quality, quantity, channel morphology and habitat continuity are addressed specifically with reference to potential impacts on fish and that mitigation addresses these issues. Where this information is provided elsewhere in the document, it should be specifically highlighted.

Where a development has the potential to impact on local fish populations the applicant will be asked to develop an integrated fish and water quality monitoring programme with baseline, development and post-development sampling. Details of any proposed monitoring should be detailed.

Applicants are encouraged to submit fish information in a collective document or with the relevant cross references to other areas of the ES. (i.e. hydrology, hydro-geology, water quality and hydro-morphology)

Terrestrial And Aquatic Invertebrates

A baseline survey of invertebrates present on the site and in the water bodies and watercourses on and around the site throughout the year should be undertaken. This should be guided by existing information on the presence, distribution and abundance of notable invertebrates. Sampling of aquatic invertebrates should extend to watercourses which may be affected by run-off from the site during construction, operation or decommissioning. Particular attention should be paid to specially protected and/or vulnerable species, especially European Protected species, and those potentially affected by the development.

8.5 Archaeology And Cultural Heritage

General Principles

The ES should address the predicted impacts on the historic environment and describe the mitigation proposed to avoid or reduce impacts to a level where they are not significant. Historic environment issues should be taken into consideration from the start of the site selection process and as part of the alternatives considered.

National policy for the historic environment is set out in:

- Scottish Planning Policy *Planning and the Historic Environment at:* <http://www.scotland.gov.uk/topics/built-environment/planning/National-planning-policy/themes/historic>
- The Scottish Historic Environment Policy (SHEP) sets out Scottish Ministers strategic policies for the historic environment and can be found at:

<http://www.historic-scotland.gov.uk/index/heritage/policy/shep.htm>

Amongst other things, SPP paragraph 110–112, Historic Environment, stresses that scheduled monuments should be preserved *in situ* and within an appropriate setting and confirms that developments must be managed carefully to preserve listed buildings and their settings to retain and enhance any features of special architectural or historic interest which they possess. Consequently, both direct impacts on the resource itself and indirect impact on its setting must be addressed in any Environmental Impact Assessment (EIA) undertaken for this proposed development. Further information on setting can be found in the following document: Managing Change in the Historic Environment <http://www.historic-scotland.gov.uk/managing-change-consultation-setting.pdf>.

Historic Scotland recommend that the applicant engages a suitably qualified archaeological/historic environment consultants to advise on, and undertake the detailed assessment of impacts on the historic environment and advise on appropriate mitigation strategies.

Baseline Information

Information on the location of all archaeological/historic sites held in the National Monuments Record of Scotland, including the locations and, where appropriate, the extent of scheduled monuments, listed buildings and gardens and designed landscapes can be obtained from <http://www.pastmap.org.uk>.

Data on scheduled monuments, listed buildings and properties in the care of Scottish Ministers can also be downloaded from Historic Scotland's Spatial Data Warehouse at <http://data.historic-scotland.gov.uk>. For any further information on those data sets and for spatial information on gardens and designed landscapes and World Heritage Sites which are not currently included in Historic Scotland's Spatial Data Warehouse please contact hsgimanager@scotland.gsi.gov.uk. Historic Scotland would also be happy to provide any further information on all such sites.

9. Water Environment

Applicants are strongly advised at an early stage to consult Scottish Environment Protection Agency (SEPA) as the regulatory body responsible for the implementation of the Controlled Activities (Scotland) Regulations 2005 (CAR), to identify 1) if a CAR license is necessary and 2) clarify the extent of the information required by SEPA to fully assess any license application. Energy Consents will identify a requirement for flood prevention comments from SEPA.

All applications (including those made prior to 1 April 2006) made to Scottish Ministers for consent under Section 36 of the Electricity Act 1989 to construct and operate a electricity generating scheme will require to comply with CAR . In this regard, we will be advised by SEPA concerning the requirements of these Regulations on the proposed development and will have regard to this

advice in considering any consent under Section 36 of the Electricity Act 1989.

SEPA produces a series of Pollution Prevention Guidelines, several of which should be usefully utilised in preparation of an ES and during development. These include SEPA's guidance note PPG6: Working at Construction and Demolition Sites, PPG5: Works in, near or liable to affect Watercourses, PPG2 Above ground storage tanks, and others, all of which are available on SEPA's website at:

http://www.sepa.org.uk/about_us/publications/guidance/ppgs.aspx

SEPA would look to see specific principles contained within PPG notes to be incorporated within mitigation measures identified within the ES rather than general reference to adherence to the notes.

Prevention and clean-up measures should also be considered for each of the following stages of the development;

- Construction.
- Operational.
- Decommissioning.

Construction contractors are often unaware of the potential for impacts such as these but, when proper consultation with the local District Salmon Fishery Board (who have a statutory responsibility to protect salmon stocks) and Fishery Trust is encouraged at an early stage, many of these problems can be averted or overcome.

- Increases in silt and sediment loads resulting from construction works.
- Point source pollution incidents during construction.
- Obstruction to upstream and downstream migration both during and after construction.
- Disturbance of spawning beds during construction – timing of works is critical.
- Drainage issues.
- Alteration to hydrological regime and water quality
- Impacts on stream morphology

The ES should identify location of and protective/mitigation measures in relation to all private water supplies within the catchments impacted by the scheme, including modifications to site design and layout.

Applicants should also be aware of available CIRIA guidance on the control of water pollution from construction sites and environmental good practice (<http://www.ciria.org>). Design guidance is also available on river crossings and migratory fish (SE consultation paper, 2000) at <http://www.scotland.gov.uk/consultations/transport/rcmf-00.asp>.

9.1 Hydrology And Hydrogeology

The ES should contain detailed statements of the nature of the hydrology and hydrogeology of the site, and of the potential effects the development on these. Applicants should be aware that wind farm developments will have considerable construction implications and these should not be conducted without proper regard or understanding of the potential impacts on hydrology, water courses, water quality, water quantity and on aquatic flora and fauna. The assessment should include statements on the effects of the proposed development at all stages on;

- Hydrology
- Water Quality and quantity
- Flood Risk

The high rainfall often experienced at proposed wind farm sites means that run-off, high flow in watercourses, and other hydrological and hydrogeological matters require proper consideration within the ES.

Hydrological and hydrogeological issues should be addressed within the ES, and the following hydrological baseline information should be included.

- Long term average monthly rainfall figures.

Where the project includes significant watercourse engineering works, then SEPA would expect the following information to be included within the ES for at least a typical watercourse within the development area:

- Flood flow statistics - the flows for the Mean Annual Flood, 1:100 and 1:200 year return period.
- From a flow duration curve, the mean daily flow and Q95 flow.
- Methods used to calculate these must be identified; if non-standard methods are used, these should be described in detail with rationale for use.

Impacts on watercourses, lochs, groundwater, other water features and sensitive receptors, such as water supplies, need to be assessed. Measures to prevent erosion, sedimentation or discolouration will be required, along with monitoring proposals and contingency plans.

The applicant should refer to SEPA policy on groundwater which can be found at: <http://www.sepa.org.uk/planning/groundwater.aspx> which will assist in identifying potential risks. It should also be noted that 1:625000 groundwater vulnerability map of Scotland often referred to in Environmental Statements has been superseded by the digital groundwater vulnerability map of Scotland (2003) and the digital aquifer map of Scotland (2004) and it is the information used on these newer maps, available on request from SEPA, that should be used in any assessment.

If culverting should be proposed, either in relation to new or upgraded tracks, then it should be noted that SEPA has a policy against unnecessary culverting

of watercourses. **Schemes should be designed to avoid by preference crossing watercourses, and to bridge watercourses which cannot be avoided. Culverting is the least desirable option.**

The ES must identify all water crossings and include a systematic table of watercourse crossings or channelising, with detailed justification for any such elements and design to minimise impact. The table should be accompanied by photography of each watercourse affected and include dimensions of the watercourse. It may be useful for the applicant to demonstrate choice of watercourse crossing by means of a decision tree, taking into account factors including catchment size (resultant flows), natural habitat and environmental concerns.

Culverts are a frequent cause of local flooding, particularly if the design or maintenance is inadequate. The size of culverts needs to be large enough to cope with sustained heavy precipitation, and allow for the impact of climate change. This must be taken into account by applicants and planning authorities. SPP and PAN69 provide more information on this aspect.

Measures to avoid erosion of the hillside associated with discharge from road culverting need to be set out in the ES.

All culverts must be designed with full regard to natural habitat and environmental concerns. Where migratory fish may be present (such as trout, salmon or eels) the river crossing should be designed in accordance with the Scottish Government guidance on River Crossings and Migratory Fish. This guidance can be found on the Scottish Government website at: <http://www.scotland.gov.uk/consultations/transport/rcmf-06.asp>.

Where the watercourse is used as a pathway by otters and other small mammals, the design of culverts will need to be modified to accommodate this.

The need for, and information on, abstractions of water supplies for concrete works or other operations should also be identified in the ES.

SEPA requests that evidence should also be provided to demonstrate that the proposals have been designed to minimise engineering works within the water environment, including crossing watercourses. Further to this, SEPA wishes to highlight the following Scottish National Policy, and legislative aims.

Environment, including crossing watercourses. Further to this, SEPA wishes to highlight the following Scottish Planning Policy and legislative aims.

Scottish Planning Policy (paragraph 130) states 'Lochs, ponds, watercourses and wetlands also form valuable landscape features, recreational resources and wildlife habitats and should be protected and enhanced wherever possible both as part of developments and green networks.'

In addition, where water abstraction is proposed, SEPA requests that the ES assesses whether a public or private source is to be utilised. If a private

source is to be utilised, the following information should be included within the ES to determine the environmental acceptability of the proposals.

- Source i.e. ground water or surface water;
- Location i.e. grid ref and description of site;
- Volume i.e. quantity of water to be extracted;
- Timing of abstraction i.e. will there be a continuous abstraction?;
- Nature of abstraction i.e. sump or impoundment?;
- Proposed operating regime i.e. details of abstraction limits and hands off flow;
- Survey of existing water environment including any existing water features;
- Impacts of proposed abstraction upon the surrounding water environment.

Although it is appreciated that many of the issues highlighted above will be scoped out during the EIA process they are important to consider. Equally, the applicant should be aware that the drilling activity does not fall under Water Environment (Controlled Activities) Regulations (CAR) and therefore would not require authorisation from SEPA as the proposal is within coastal waters.

9.2 Geology And Soils

The Environmental Statement should fully describe the likely significant effects of the development on the environment including direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary e.g. construction related impacts, positive and negative effects of the development which result from:

- The existence of the development.
- The use of natural resources (including borrow pits, the need for which and impact of which, including dust, blasting and pollution of the water environment, should be appraised as part of the overall impact of the scheme)
- The emission of pollutants, the creation of nuisances and the elimination of waste.

The ES should identify the intended source of any rock or fill material to be used for tracks or foundations, and should describe the environmental impacts associated with any new quarries or borrow pits or road or track cuttings.

SEPA seeks in relation to substantial new development, that applicants demonstrate that the development includes construction practices to minimise the use of raw materials and maximise the use of secondary aggregates and recycled or renewable materials. Further information is available from AggRegain (<http://www.aggregain.org.uk>);

Where borrow pits are proposed, the ES should include information regarding the location, size and nature of these borrow pits including information on the depth of the borrow pit floor and the borrow pit final reinstated profile.

The impact of such facilities (including dust, blasting and impact on water) should be appraised as part of the overall impact of the scheme. Information should cover, in relation to water, at least the information set out within Planning Advice Note 50: Controlling the Environmental Effects of Surface Mineral Workings in relation to surface water (pages 24-25) and, where relevant, in relation to groundwater (pages 22-23). Information on the proposed depth of the excavation compared to the actual topography, the proposed restoration profile, proposed drainage and settlement traps, turf and overburden removal and storage for reinstatement should be submitted.

9.3 Assessment Of Peat Slide Risk

If the proposed development is to take place on peatland habitats, the Environmental Statement should incorporate a comprehensive peat slide risk assessment in accordance with the Scottish Government Best Practice Guide for Developers, published at:

<http://www.scotland.gov.uk/Publications/2006/12/21162303/0>

Particular attention should be paid to the risks of engineering instability relating to presence to peat on the site. Turbines locations should be identified in the light of survey work on peat depth and nature, and roads will need to be carefully aligned and designed with regard to peat habitats and depth. It is recommended that both engineers and ecologists are involved in the assessment and management of the risk of peat slide.

The peat slide risk assessment should also address pollution risks to and environmental sensitivities of the water environment. It should include a detailed map of peat depth and evidence that the scheme minimises impact on areas of deep peat. The ES should include outline construction method statements or the site-specific principles on which such construction method statements would be based for engineering works in peat land areas, including access roads, turbine bases and hard standing areas, and these should include particular reference to drainage impacts, dewatering and disposal of excavated peat.

9.4 Forestry / Woodlands

Internationally there is now a strong presumption against deforestation (which accounts for 18% of the world's greenhouse gas emissions). Reflecting this, Scottish Ministers have now approved a policy on Control of Woodland Removal published at <http://www.forestry.gov.uk/forestry/infid-7hyhwe> (refer Scottish Planning Policy paragraph 148) which seeks to protect the existing forest resource in Scotland, and supports woodland removal only where it would achieve significant and clearly defined additional public benefits. In some cases, including those associated with development, a proposal for compensatory planting may form part of this balance.

The criteria for determining the acceptability of woodland removal and further information on the implementation of the policy is explained in the Control of Woodland Removal Policy. These should be taken into account when preparing the development plans for this wind farm proposal. The applicant should also be aware of the *National Planning Framework 2* (published at

<http://www.scotland.gov.uk/Publications/2008/12/12093953/0>) and specifically paragraph 93 which reiterates Scottish Government determination to decrease the loss of existing woodland and aspiration for further expansion.

The ES should indicate proposed areas of woodland for felling to accommodate new turbines and other infrastructure such as roads. Details of the area to be cleared around those structures should also be provided, along with evidence to support the proposed scale and sequence of felling. The ES should also detail any trees or woodland areas likely to be indirectly affected by the proposed development (e.g. through changes in hydrology, loss of neighbouring plantation causing instability, etc) and provide full details of alternatives and/or protection and mitigation measures in the ES.

The applicant should consider the wildlife implications of any tree felling in the relevant sections of the ES. The ES should also consider any impacts of forestry activities on the water environment, with particular attention paid to acidification and nutrient leaching. The applicant should make full use of the *Forests and Water Guidelines* in proposing forestry activity and mitigation procedures.

If timber is to be disposed of on site, details of the methodology for this should be submitted. Areas of retained forestry or tree groups should be clearly indicated and methods for their protection during construction clearly described.

If areas of woodland are to be temporarily removed but then replanted shortly afterwards (typically within 1-5 years) this should be indicated in the ES, and details of the replanting plan provided.

Where there is a change in land use (e.g. to non-woodland habitats) the woodland should be described in sufficient detail (e.g. including details of the age of the trees; the species type and mix; the soil types; any particular natural heritage designations or protected species present in the woodland; and the landscape and historical environment context) to enable its intrinsic public benefit value to be assessed. This will facilitate decisions on whether woodland removal is acceptable and if so, whether compensatory planting will be required.

The applicant should refer to guidance documents¹ issued by the Forestry Commission in relation to good forestry practice and associated environmental issues.

In summary, the applicant should consider their response to the Control of Woodland Removal Policy, including the consequences of such removal on carbon sequestration and mitigating the potential effects of climate change.

Forestry Commission Scotland can advise on all aspects of woodlands and forestry associated with developments and early consultation with them to

¹ The UK Forestry Standard and its suite of associated guidelines are available at: <http://www.forestry.gov.uk/forestry/INFD-6J2JBS>. Further guidance is available at: <http://www.forestry.gov.uk/forestry/INFD-5XFLS7>.

clarify proposals and any particular restrictions or conditions on woodland removal that may apply to the area is recommended. Contact details of the nearest Forestry Commission Conservancy office can be accessed at: <http://www.forestry.gov.uk> or from fcscotland@forestry.gsi.gov.uk.

Forest and woodland ecology

The *Scottish Forestry Strategy* (SFS) (2006) and *Scottish Biodiversity Strategy* (both of which have Ministerial endorsement) and *Nature Conservation (Scotland) Act 2004* should be essential documents that the applicant should be aware of.

The SFS recognises the importance of native woodlands, especially those that are of ancient and semi-natural origin. It also incorporates targets for priority habitats and species, sets priorities for action in terms of improving the management of semi-natural woodlands, and extending and enhancing native woodlands by developing forest habitat networks (page 48).

The SFS also recognises the potential for well designed productive forests to contribute environmental benefits through the restructuring process and future management systems, such as habitat and landscape value from increased open space (page 48).

The SFS also identifies and promotes the importance of sustainable forest management as an essential contributor to the conservation of soils, the quality of water and air (page 44), and the general contribution that forests and woodlands can make to tackle climate change.

The *Scottish Biodiversity Strategy* contains delivery of targets for priority habitats and species as key aims as well as enhanced management of whole landscapes for biodiversity, including reducing fragmentation of habitats. This strategy has been designated by Ministers under the terms of the *Nature Conservation (Scotland) Act 2004*, to confirm that all public bodies have a duty to further biodiversity where consistent with their functions, in ways which are guided by the strategy.

This would suggest that the applicant should be obliged to carry out an assessment of the implications of the wind farm proposals on biodiversity. This should be in both general terms of effects on the biodiversity strategy aims, and specifically the impacts on priority habitats and species; i.e. those with national targets (*HAPs* and *SAPs* identified in the *Biodiversity Action Plan*).

It would also suggest that the applicant should be obliged to carry out an assessment of the implications of the wind farm proposals on water, soil and air resources, and an appreciation of the potential consequences of the loss of woodland cover with regards climate change, specifically carbon sequestration.

Consultation with the local Forestry Commission Scotland Conservancy should also be undertaken during the development of proposals for the

planned restructuring and/or woodland removal to accommodate the wind farm proposals.

Regards the FC *Forest and Water Guidelines* please note that this publication is now in its 4th Edition, published 2004.

Landscape and visual assessment

The *UK Forestry Standard*, *FC Forest Landscape Guidelines* and *Lowland Design Guidelines*, *FC Forestry Practice Guide: Forest Design Planning – A Guide to Good Practice*, *The Scottish Forestry Strategy 2006* and SNH suite of *Landscape Character Assessments* should all be on the list of documents that the applicant should be aware of.

The *Scottish Forestry Strategy* identifies that forests and woodlands contribute to Scotland's diverse and attractive landscape. It promotes the benefits of well designed and managed woodlands that reflect local landscape character, and that their contribution to the wider landscape should help Scotland meet the undertakings of the *European Landscape Convention* (page 44).

The Scoping Report should promote a full assessment by the applicant of all the landscape and visual issues. This should include a full description of the general landscape character within which the applicant proposes to introduce the wind farm, and a statement of the landscape and visual sensitivities that may be potentially affected by that development.

It should also include an assessment of the cumulative landscape and visual impacts affecting the wind farm proposal, and identify relevant criteria that may have a bearing on that assessment.

The *UK Forestry Standard* sets out the criteria and standards for the sustainable management of all forests and woodlands in the UK. Landscape is a specific *Criteria for Sustainable Forest Management* (page 18) and the two *Forest Management Unit Indicators* as evidence that landscape quality is enhanced are:

- Landscape principles of forest design are used;
- Cultural and historical character of countryside is taken into account when...making changes to existing woods.

The first point refers to the *FC Forest Landscape Guidelines* and *Lowland Design Guidelines* (both extracted from the FC book *The Design of Forest Landscapes* (Oliver W.R. Lucas; pub. Oxford University Press 1991)).

The second point on the appraisal of the landscape with regard to appreciating its local character is similarly covered in the aforementioned Guidelines and *The Design of Forest Landscapes*. Further, the *Scottish Forestry Strategy* specifically advocates the use of Scottish Natural Heritage's suite of *Landscape Character Assessments*, which provide valuable descriptive information about the landscape of Scotland. The potential removal of the existing woodlands within the wind farm proposal area may

create significant areas of open ground (that is, ground without woodland cover).

The principles and process of restructuring an existing forest are described in the aforementioned FC Forestry Practice Guide: *Forest Design Planning – A Guide to Good Practice*. Not only should such a plan consider how best to clear fell the forest for the wind farm development, but also describe how the remaining woodland elements beyond the scheme boundary can be best integrated with the development site. Such integration could be achieved, for example, by the selective restocking of strategic areas within the wind farm site area.

We would advise that when forest landscape design is being considered as part of the forest management associated with such a development, a chartered Landscape Architect with a comprehensive knowledge of forestry should be commissioned.

Historic environment of forests and woodlands

The applicant should recognise the wider aspects of the wind farm proposals on historic environment policies. In terms of forests and woodlands, besides the legacy of the past to be found within woodlands, the cultural heritage of ancient woodlands and veteran trees are particularly important. The value of the historic environment in woodlands is recognised in the *UK Forestry Standard* the *Scottish Forestry Strategy* (SFS) (page 45) and FCS Policy Statement *Scotland's Woodlands and the Historic Environment*.

The SFS not only identifies the duty to safeguard evidence of the historic environment but also encourages their active management, enhancement and interpretation. Reference should also be made to the FC *Forests & Archaeology Guidelines*.

Management Plan

With regards both ecological and landscape considerations for the site and immediate environs, we would advocate the preparation of a long-term management plan.

This should be carried out in consultation with FCS, Local Authority, SNH, landowners and other interested parties. Essentially what is required is an integrated land-use and management plan that fosters optimising the ecological and landscape benefits of both the wind farm site and neighbouring land uses.

10. Other Material Issues

10.1 Waste

Potential requirement for waste management licences or licensing exemptions in relation to waste disposed to or from borrow pits should be discussed at an

early stage with SEPA as decisions on waste management are likely to affect site design and layout.

The ES should identify all of the waste streams (such as peat and other materials excavated in relation to infrastructure) associated with the works. It should demonstrate a) how the development can include construction practices to minimise the use of raw materials and maximise the use of secondary aggregates and recycled or renewable materials and b) how waste material generated by the proposal is to be reduced and re-used or recycled where appropriate on site (for example in landscaping not resulting in excessive earth moulding and mounding).

Further to the above advice, SEPA would like to highlight the use of site waste management plans which SEPA are now seeking on all large scale construction projects and which the applicant should consider during the formulation of the ES. In SEPA's experience, waste management is becoming an increasing issue on large scale projects.

Coherent consideration should be given to the handling, use, short term storage and final disposal of surplus material, including peat and soils, and to waste minimisation and management. Should it be proposed that peat should be used at depth to restore excavations such as borrow pits, the applicant would need to demonstrate that this could be done without the release of carbon through oxidisation, and without risk to people and the environment. Please note that waste peat or soil from excavations spread on this land would not necessarily be to ecological benefit; if excavated peat or soil is to be used in landscaping the site, then this should be included in the plans, and not dealt with in an ad-hoc fashion as it arises.

SEPA therefore requests that the ES gives consideration to a full site specific Site Waste Management Plan (SWMP). The SWMP should detail the measures for managing and minimising waste produced during construction. Further information on the preparation of these plans can be obtained from the Zero Waste Scotland web site which may be found at <http://www.zerowastescotland.org.uk/category/service/business-support>.

The SWMP should also include a soils balance carried out to demonstrate need for importation/export of materials including any backfill of excavations. Given experience on other sites, clarification is sought specifically on whether or not waste materials are to be imported. Clarification of the amount of surplus materials to be permanently deposited on mounds and scale of these mounds should also be included.

SEPA encourages the recovery and reuse of controlled waste, provided that it is in accordance with the Waste Management Licensing Regulations 1994. The applicant should note the regulatory advice below. The applicant should note that SEPA has produced guidance to assist in the consideration as to whether any particular material is waste, which is available on SEPA's website at http://www.sepa.org.uk/waste/waste_regulation/is_it_waste.aspx.

10.2 Telecommunications

British Telecom will offer advice in respect of EMC and related problems, BT point to point microwave links and satellite. Any information on the likely interference to BT's current and presently planned radio networks should be enclosed.

Ofcom only comment in respect of microwave fixed links and does not include broadcast transmissions or scanning telemetry links that may be affected by the proposals. Ofcom will have sent a copy of the scoping request to:

CSS Spectrum Management Services Ltd. David Tripp 01458 273 789
david.tripp@css.gb.com (for Scanning Telemetry)

Joint Radio Company (JRC). David Priestley 020 7953 7015
david.priestley@jrc.co.uk (for Scanning Telemetry)

With regard to assessing the affects to TV reception, the BBC now have an online tool available on their website, at http://www.bbc.co.uk/reception/info/windfarm_tool.shtml. Ofcom will no longer be forwarding enquiries received to the BBC or carrying out assessments. Applicants are advised to access the online tool.

Ofcom only comment in respect of fixed microwave links managed by Ofcom, in addition the applicant is obliged to do further checks of the proposals with the CAA, NATS, and the MOD. Further details may be obtained on the British Wind Energy Association (BWEA) website at <http://www.bwea.com>.

10.3 Noise

Wind farms have the potential to create noise through aerodynamic noise and mechanically generated noise. Noise predictions should be carried out to evaluate the likely impacts of airborne noise from the wind turbines and associated construction activities including noise from blasting or piling activities which may affect local residents, during construction, operational and decommissioning stages of the project. Advice should be sought from the relevant Council planning and/or environmental health departments in respect to the potential impacts on the local community.

The applicant should be aware of the guidance produced by ETSU on behalf of the DTI titled "The Assessment and Rating of Noise from Wind Farms". This publication provides applicants with best practice noise monitoring and reporting techniques. Cumulative noise effects should also be considered in assessing the specific circumstances prevailing at the development site. Applicants may also want refer to PAN 1/2011 in this respect.

10.4 Shadow Flicker

Information on the impact of shadow flicker on the local community should be enclosed within the ES. Information on this can be found at:

10.5 Traffic Management

The Environmental Statement should provide information relating to the preferred route options for delivering the turbines etc. via the trunk road network. The Environmental Impact Assessment should also address access issues, particularly those impacting upon the trunk road network, in particular, potential stress points at junctions, approach roads, borrow pits, bridges, site compound and batching areas etc.

Where potential environmental impacts have been fully investigated but found to be of little or no significance, it is sufficient to validate that part of the assessment by stating in the report:

- the work has been undertaken, e.g. transport assessment;
- what this has shown i.e. what impact if any has been identified, and
- why it is not significant.

10.6 Cumulative Impacts

Where a wind farm development might have cumulative impacts with other existing, approved or current wind farm applications, then the assessment of environmental impacts should include consideration of these cumulative effects. Visual or landscape cumulative effects may arise where more than one wind farm is visible from certain viewpoints, or along a journey by road or other route. Ecological cumulative effects may arise where more than one wind farm impacts upon a bird population, or on the hydrology of a wetland or peatland habitat.

SPP introduces new requirements in relation to considering cumulative impacts through the development plan process. Where relevant, proposals should identify how they comply with development plans. We also refer to the SNH guidance note 'Cumulative Effect of Wind Farms' (version 2 revised 13.4.05) for further guidance. A cumulative assessment should include other existing wind farms in the vicinity of the proposal, any wind farms which have been consented but are still to be constructed, and any which are the subject of undetermined consent applications. Inclusion within a cumulative assessment of other proposed wind farms which have not yet reached application stage is not required, unless in exceptional circumstances we advise otherwise.

<http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/>

10.7 Other Planning Or Environmental Impact Issues Unique To The Application

The ES should include information on any other potential impacts connected with the project.

11. **General ES Issues**

In the application for consent the applicant should confirm whether any proposals made within the Environmental Statement, eg for construction methods, mitigation, or decommissioning, form part of the application for consent.

11.1 Consultation

Applicants should be aware that the ES should be submitted in a user-friendly PDF format. Applicants are asked to issue ESs directly to all consultees. An up to date consultee list can be obtained from the Energy Consents and Deployment Unit. The Energy Consents and Deployment Unit also requires **1 hard copy and 2 CDs**.

Where the applicant has provided Scottish Ministers with an environmental statement, the applicant must publish their proposals in accordance with part 4 of the Environmental Impact Assessment (Scotland) Regulations 2000. Energy consents information and guidance, including the specific details of the adverts to be placed in the press can be obtained from the Energy Consents website; <http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-Consents>

11.2 Gaelic Language

Where Section 36 applications are located in areas where Gaelic is spoken, applicants are encouraged to adopt best practice by publicising the project details in both English and Gaelic (see also Energy consents website above).

11.3 OS Mapping Records

Applicants are requested at application stage to submit a detailed Ordinance Survey plan showing the site boundary and all turbines, anemometer masts, access tracks and supporting infrastructure in a format compatible with the Scottish Government's Spatial Data Management Environment (SDME), along with appropriate metadata. The SDME is based around Oracle RDBMS and ESRI ArcSDE and all incoming data should be supplied in ESRI shapefile format. The SDME also contains a metadata recording system based on the ISO template within ESRI ArcCatalog (agreed standard used by the Scottish Government), all metadata should be provided in this format.

11.4 Difficulties In Compiling Additional Information

Applicants are encouraged to outline their experiences or practical difficulties encountered when collating/recording additional information supporting the application. An explanation of any necessary information not included in the Environmental Statement should be provided, complete with an indication of when an addendum will be submitted.

11.5 Application And Environmental Statement

A checklist is enclosed with this report to help applicants fully consider and collate the relevant ES information to support their application. In advance of publicising the application, applicants should be aware this checklist will be

used by government officials when considering acceptance of formal applications.

11.6 Consent Timescale And Application Quality

In December 2007, Scottish Ministers announced an aspirational target to process new Section 36 applications within a 9 month period, provided a Public Local Inquiry (PLI) is not held. This scoping opinion is specifically designed to improve the quality of advice provided to applicants and thus reduce the risk of additional information being requested and subject to further publicity and consultation cycles.

Applicants are advised to consider all aspects of the scoping opinion when preparing a formal application, to reduce the need to submit information in support of the application. The consultee comments presented in the scoping opinion are designed to offer an opportunity to considered all material issues relating to the development proposals.

In assessing the quality and suitability of applications, Government officials will use the enclosed checklist and scoping opinion to scrutinise the application. Applicants are encouraged to seek advice on the contents of ESs prior to applications being submitted, although this process does not involve a full analysis of the proposals. In the event of an application being void of essential information, officials reserve the right not to accept the application. Applicants are advised not to publicise applications in the local or national press, until their application has been checked and accepted by SG officials.

Applicants are advised to refer to the Energy Consents website at <http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-Consents>

11.7 Judicial Review

All cases may be subject to judicial review. A judicial review statement should be made available to the public.

Authorised by the Scottish Ministers to sign in that behalf.

Annex 1

Consultee Comments relating specifically to Shepherds Rig Wind Farm

Statutory Consultees

1. Dumfries and Galloway Council
2. SEPA
3. SNH

Scottish Government Internal Consultees

4. Forestry Commission Scotland
5. Historic Scotland
6. Marine Scotland
7. Transport Scotland

Non Statutory External Consultees

8. Association of Salmon Fishery Boards
9. Civil Aviation Authority - Airspace
10. The Crown Estate
11. Defence Infrastructure Organisation
12. NATS Safeguarding
13. RSPB Scotland
14. Mountaineering Council of Scotland
15. Scottish Water
16. Visit Scotland
17. John Muir Trust
18. Scottish Wildlife Trust
19. British Horse Society
20. Scottish Rights of Way and Access Society (ScotWays)
21. Prestwick Airport
22. BT

Any Additional Non Statutory External Consultees

23. Carsphairn Community Council
24. Carsphairn Heritage Group
25. Carsphairn Renewable Energy Fund Ltd

CONSULTEE COMMENTS

Statutory Consultees

1. Dumfries and Galloway Council

The scoping request from Scottish Government on behalf of Infinergy relates to a development site of approximately 810ha. The site is approximately 5km east of Carsphairn, in an upland rural landscape dominated by forestry plantation. The proposed development would consist of up to 45 turbines with maximum height to blade tip of 146.5m and all associated infrastructure.

The council consulted the following Departments of Dumfries and Galloway Council:

Archaeology, Roads, Environmental Standards and the Landscape Architect.

No response has been received from the Council's Landscape Architect to date. Should comments be received in due course then these will be forwarded.

Archaeologist

Council Archaeologist has expressed concerns about a proposal of this scale at this location.

Section 9 of the submitted document sets out a methodology for assessing effects on 'Cultural Heritage'. It is confirmed that there is potential for a proposal of this nature to have significant impact on cultural heritage assets and therefore potential effects will need to be assessed in the environmental impact assessment. Careful note should be taken of the following comments in respect of this assessment.

Interim Planning Policy: Wind Energy Development

The applicant should be aware of the Interim Planning Policy: Wind Energy Development, adopted February 2012. This is supported by a technical study; the

Dumfries and Galloway Wind Farm Landscape Capacity Study (DGWLCS). It is

advised that the landscape capacity study considered 'Settlement and Archaeology' as one of the landscape sensitivities informing the landscape capacity study and the resulting spatial framework.

The following is an extract from Appendix B: assessment methodology that describes how this has been applied to inform the overall sensitivity category of the landscape character area:

Settlement and Archaeology

Large/medium wind farms, turbines greater than 50m to blade tip

Consideration of the pattern, scale and character of settlement and its relationship to the landscape. Assessment of how development might impinge on these characteristics; where there may be scope to attain some visual separation to avoid adverse scale contrasts and minimise effects on settlement setting. Where larger scale industrial buildings are present, the scale relationships between turbines and these is also considered. Archaeological features are considered in respect of their contribution to landscape character and any potential effects on setting.

In this case, the proposal falls within Character Type 19a: Southern Uplands with Forest, Ken. Although the sensitivity rating in relation to settlement and Archaeology is Low in Unit 19a, as the area is sparsely settled overall, the guidance advises that there is a range of archaeological sites and the setting of these sites is sensitive. This is confirmed to be the case and is indeed highlighted by the designation of 2 Archaeologically Sensitive Areas within 5 km that fall within the ZTV. It is also noted that Character Type 4 : Narrow Wooded Valley lies to the east of the proposal. The overall sensitivity rating is High for turbines over 50m m in height. Section 7 of Interim Planning Policy: Wind Energy Development contains guidance on Historic Environment and Cultural Heritage for all proposals, that must be considered.

Direct effects

These effects may occur within or around the proposal site where development activity will take place. Assessment of these effects should be informed by a thorough desk based study and, where appropriate, targeted field survey in order that Council Historic Environment Record identifies designated and undesignated features within and around the proposal area. To inform the assessment this should be consulted, see below.

The results of the survey should be submitted to the Council in a format suitable for importation to the Council Records. (Contact Historic Environment Record Officer, see below).

Indirect Effects

Generally, impacts on the setting of significant historic environment assets, should be lead by the Zone of Theoretical Visibility, with the greatest effects likely to be

experienced by sites of national, (note not all are designated), or greater significance closest to the site.

Preliminary examination of the ZTV at the scale provided indicates that the effects on the following assets should be assessed :

- Designated sites at Stroanfreggan Craig Fort, Stroanfreggan Cairn, Woodhead mines and Smittons Bridge
- Stroanfreggan Archaeologically Sensitive Areas, (ASA) from a number of viewpoints/specific assets within and around
- Bardennoch to Garryhorn ASA from a number of viewpoints/specific assets within and around.

This list is not exhaustive and further analysis of the historic environment features in relation to the ZTV should be undertaken, before a finalised list of wirelines/photomontages illustrating the effects on the setting of features is agreed with Council Archaeologist. Cumulative effects should also be considered. The planning case officer will provide advice on which proposals and approved schemes to include.

Key Policy

Key policy statements that have been issued by the Scottish Government in relation to the historic environment are:

- Scottish Historic Environment Policy
- Scottish Planning Policy, paragraphs 110 -124 on Historic Environment
- Managing Change in the Historic Environment: Setting, Historic Scotland October 2010.

• Planning Advice Note 2/2011 Planning and Archaeology

In addition to national policy the relevant Council policies covering the historic environment in this case are:

- Structure Plan Policy E9: Listed Buildings
- Structure Plan Policy E11: Historic Gardens and designed Landscapes
- Structure Plan Policy E12: Development Affecting Archaeological Sites
- Structure Plan Policy E13 and General Policy 55 on Archaeologically Sensitive Areas, (ASA).

Structure Plan Policy E13 and General Policy 55 on Archaeologically Sensitive Areas is considered to be a very significant constraint for the proposal to address. The justification in the background paper advises that in defining ASAs consideration has been given to:

- 1 Particularly good group survival/and importance
- 2 Landscape setting where this is a significant dimension of the archaeological remains
- 3 Areas where there is a existing or potential recreational aspect
- 4 High density of archaeological remains worthy of preservation
- 5 Rare group survival in an otherwise improved or already generally afforested area

Technical Guidance on all ASA's is available on line on the Local Development Plan pages on the Council web site :

<http://www.dumgal.gov.uk/index.aspx?articleid=11943> . Note: This relates to current as well as proposed policy.

It is strongly recommended that at an early stage the developer give full consideration to this policy that flags up the sensitivity of this area to change.

Policy

Key policy statements that have been issued by Scottish Government in relation to the historic environment are:

- Scottish Historic Environment Policy.
- Scottish Planning Policy, paragraphs 110 -124 on Historic Environment, and 182-191 on Renewable Energy, February 2010.
- Managing Change in the Historic Environment: Setting, Historic Scotland October 2010.

- Planning Advice Note 2/2011 Planning and Archaeology

In addition to national policy the relevant Council policies covering the historic environment in this case are:

- Structure Plan policy E8: Conservation Areas
- Structure Plan Policy E9: Listed Buildings
- Structure Plan Policy E11: Historic Gardens and designed Landscapes
- Structure Plan Policy E12: Development Affecting Archaeological Site
- Structure Plan Policy E13: Archaeologically Sensitive Areas

Historic Environment Record

Information on features recorded in the Council Historic Environmental Record, including listed buildings and designed landscapes, can be obtained from the Historic

Environmental Record Officer (Andrew Nicholson), Planning and Environment,
Newall Terrace, Dumfries, DG1 1LW. Tel: 01387 260154. In line with Council Policy

there will be a charge to cover the costs of the time taken. This can be supplied in GIS and database format to facilitate integration with other data, particularly the ZTV.

Principal Roads Services Officer (Stewartry)

A Scoping Report was submitted as part of this planning application and Sections 12, Traffic and Transport provide details which are to be included in an Environmental Impact Assessment (EIA) that will form part of a future detailed planning application.

In the interests of road safety, the applicant shall carry out swept path analysis of the proposed access route to ensure that vehicles can navigate the route. Furthermore, an assessment of the number and type of construction vehicles used during construction, operational and decommissioning stage is to be provided and any mitigation measures, carriageway widening and traffic management procedures are to be agreed in advance with the Development Team Leader (Stewartry).

A traffic management plan is to be developed in consultation with all relevant bodies and the exact details of the Traffic Management Plan are to be agreed in writing with the Development Team Leader (Stewartry) prior to any works being carried out on site.

A full road condition survey of the component delivery route is to be undertaken prior to any construction works taking place to record the condition of the public roads thereby ensuring that any damage caused by the windfarm construction traffic can be repaired by the applicant.

Any improvements or construction of new access off the public road shall be constructed to the specification

Environmental Standards

The Council's Environmental Standard Section have no objections in principal. However, until a site specific noise impact assessment has been carried out following

the principles detailed in the Assessment & Rating of Noise from Wind Farms ETSU

Report ETSU-R-97, 1996 they are unable to comment fully as to the expected impacts. The site specific assessment should be carried out following the principles

detailed in the Assessment & Rating of Noise from Wind Farms ETSU Report ETSU-R-97, 1996

It is also suggested that the proposal should be designed to meet the lower noise

limits as specified in the ETSU-R-97 document, but where lower limits cannot be achieved the detailed reasons as to why this cannot be accomplished should be detailed in the ETSU-R-97 report within the Environmental Impact Assessment.

It is additionally suggested that a method statement for the construction project should be provided within the ETA for approval by Dumfries & Galloway Council. This should include an assessment of potentially noisy operations and outline the noise mitigation measures proposed. This will also include a programme and phases for each stage of work. Guidance as to construction noise prediction methodology may be found within BS5228: 2009

2. SEPA

Thank you for consulting SEPA on the scoping opinion for the above development proposal by way of your letter which we received on 25 April 2013. We would welcome meeting with the applicant at an early stage to discuss any of the issues raised in this letter. We consider that the following key issues should be addressed in the EIA process:

Environmental impact from all aspects of site development, carbon balance, impact on peatlands and associated wetland habitats, deforestation activities, site waste management (including forestry waste), impact on site hydrology (inclusive of flood risk and private water supplies), baseline monitoring works including habitat assessments and evidence on how all of the above factors will be used to influence the proposed design of the site.

Windfarm developments can make a valuable contribution to achieving Scotland's renewable targets and help fulfil public sector duties under the Climate Change (Scotland) Act 2009. However, even small windfarms can potentially have an adverse environmental impact. While all of the issues below should be addressed in the Environmental Statement (ES), there may be opportunities for several of these to be scoped out of detailed consideration. The justification for this approach in relation to specific issues should be set out within the ES.

Carbon balance

[Scottish Planning Policy](#) (SPP) recognises that "the disturbance of some soils, particularly peat, may lead to the release of stored carbon, contributing to carbon emissions" (Paragraph 133). In line with SPP and government guidance, we recommend that the ES or planning submission contains a section systematically assessing carbon balance. This assessment should quantify the gains over the life of the project against the release of carbon dioxide during construction. It should include all elements of the proposal, including borrow pits, construction of roads/tracks and other infrastructure and loss of peat bog. Please refer to the Scottish Government guidance [Calculating carbon savings from windfarms on Scottish peat lands - A New Approach](#), which provides a revised methodology for estimating the impacts of this type of development on carbon dynamics of peat lands. We will validate carbon balance assessments for Section 36 windfarm applications that use this revised version of the tool. In order to validate such assessments, all input data, assumptions and workings need to be provided within one dedicated section of the ES. In addition we will provide comment on drainage and waste management aspects of the peat management scheme to ensure that the carbon balance benefits of the scheme are maximised.

Disruption to wetlands including peatlands

If there are wetlands or peatland systems present, the ES or planning submission should demonstrate how the layout and design of the proposal, including any associated borrow pits, hard standing and roads, avoid impact on such areas.

A Phase 1 habitat survey should be carried out for the whole site and the guidance A Functional Wetland Typology for Scotland should be used to help identify all wetland areas. National Vegetation Classification should be completed for any wetlands identified. Results of these findings should be submitted, including a map with all the proposed infrastructure overlain on the vegetation maps to clearly show which areas will be impacted and avoided.

Groundwater dependent terrestrial ecosystems, which are types of wetland, are specifically protected under the Water Framework Directive. The results of the National Vegetation Classification survey and Appendix 2 (which is also applicable to other types of developments) of our Planning guidance on windfarm developments should be used to identify if wetlands are groundwater dependent terrestrial ecosystems.

The route of roads, tracks or trenches within 100 m of groundwater dependent terrestrial ecosystems (identified in Appendix 2) should be reconsidered. Similarly, the locations of borrow pits or foundations within 250 m of such ecosystems should be reconsidered. If infrastructure cannot be relocated outwith the buffer zones of these ecosystems then the likely impact on them will require further assessment. This assessment should be carried out if these ecosystems occur within or outwith the site boundary so that the full impacts on the proposals are assessed. The results of this assessment and necessary mitigation measures should be included in the ES.

For areas where avoidance is impossible, details of how impacts upon wetlands including peatlands are minimised and mitigated should be provided within the ES or planning submission. In particular impacts that should be considered include those from drainage, pollution and waste management. This should include preventative/mitigation measures to avoid significant drying or oxidation of peat through, for example, the construction of access tracks, dewatering, excavations, drainage channels, cable trenches, or the storage and re-use of excavated peat. Detailed information on waste management is required as detailed below. Any mitigation proposals should also be detailed within the Construction Environmental Management Document, as detailed below.

Disturbance and re-use of excavated peat

Where the proposed infrastructure will impact upon peatlands, a detailed map of peat depths (this must be to full depth) should be submitted. The peat depth survey should include details of the basic peatland characteristics.

By adopting an approach of minimising disruption to peatland, the volume of excavated peat can be minimised and the commonly experienced difficulties in dealing with surplus peat reduced. The generation of surplus peat is a difficult area which needs to be addressed from the outset given the limited scope for re-use.

The ES or planning submission should detail the likely volumes of surplus peat that will be generated, including quantification of catotelmic and acrotelmic peat, and the principles of how the surplus peat will be reused or disposed of.

There are important waste management implications of measures to deal with surplus peat as set out within our Regulatory Position Statement - Developments on Peat. Landscaping with surplus peat (or soil) may not be of ecological benefit and consequently a waste management exemption may not apply. In addition we consider disposal of significant depth of peat as being landfilled waste, and this again may not be consentable under our regulatory regimes. Experience has shown that peat used as cover can suffer from significant drying and oxidation, and that peat redeposited at depth can lose structure and create a hazard when the stability of the material deteriorates. This creates a risk to people who may enter such areas or through the possibility of peat slide and we are aware that barbed-wire fencing has been erected around some sites in response to such risks.

It is therefore essential that the scope for minimising the extraction of peat is explored and alternative options identified that minimise risk in terms of carbon release, human health and environmental impact. Early discussion of proposals with us is essential, and an overall approach of minimisation of peatland disruption should be adopted. If it is proposed to use some excavated peat within borrow pits or bunding then details of the proposals, including depth of peat and how the hydrology of the peat will be maintained, should be outlined in the ES or planning submission.

Our Planning and Energy webpage provides links to current best practice guidance on peat survey, excavation and management.

Forest removal and forest waste

We would support the approach of key-holing wherever possible as large scale felling can result in a peak release of nutrients which can affect local water quality. We may, however, be supportive of clear felling in cases where planting took place on deep peat and it is proposed through a Habitat Management Plan to reinstate peat-forming habitats. This should be specifically referenced in the ES.

We would be especially interested in and are likely to have significant concerns relating to any proposals to fell to waste where the waste generated by the process will be managed by techniques such as chipping, mulching or spreading. This is because where material is classed as waste then appropriate waste management options require consideration and, where appropriate, adoption. In such cases we would wish the ES to include information which explains how the waste hierarchy has been applied in a way which delivers the best overall environmental outcome and if this is not demonstrated we are likely to be object to the application.

It has previously been argued that using waste on the site could yield an ecological improvement and so has been considered as an exemption under waste management licensing. However, this approach is now being questioned as the results of early research show there is a lack of clarity and evidence to support the claim that this practice delivers overall ecological improvement for the main target vegetation types (blanket bog or wet heath).

This restoration practice is currently being tested and researched at a number of sites across Scotland. This research will provide greater clarity on the benefits and risks associated with the practice. If ecological benefit from use of waste is to be claimed, then reliable site-specific evidence must be provided. For avoidance of doubt, where it is sought to claim ecological benefit from deposition of forestry waste a) the ecological benefit must relate to the land to which the waste is applied rather than off-site benefits and b) there must not be an ecological harm also associated with the deposition of the waste. Note that if there are likely to be significant amounts of surplus forestry material without a clear use, and if scope for an exemption under waste management is unclear, then unfortunately we may need to object to an application due to our inability to advise on consentability under our regulatory regime and hence it is essential that these issues are addressed at an early stage.

Nationally we are working with our SEARS partners to agree common principles for considering the use of forest material / waste wood on peatland sites for restoration projects. This work is currently being agreed and will soon be published on our website as Principles for Use of Forest Residue for Peatland Restoration. The draft principles within it which should be applied are as follows:

- Full justification for using the material on-site must be provided. Evidence must be provided to show that all options for use of the material off-site have been considered;
- The proposed use of the material must be beneficial in reaching the objectives of the Habitat Management Plan (HMP) as agreed by the local authority in consultation with statutory agencies (SNH and SEPA). Detailed monitoring proposals should be included in the HMP;
- Material used on site should not have any negative impact on the water environment or other sensitive receptors (e.g. protected species);
- Details of the size, volume, and depth of material to be used on site must be provided. A detailed map showing areas where the material will be used and extent of cover should also be provided;
- A clear specification for contractors is required to ensure the correct machinery is used, and that any material left on site is used in line with the HMP. The quality of the material is an important factor; maximum chip size (or other criteria) should be defined and agreed with the contractor. A maximum depth of material should also be agreed with the contractor.

We ask that where the ecological benefit proposed by the fell to waste activity does not relate to improvement of peatland habitats that the expected environmental benefit is outlined and fully justified in the ES.

Existing groundwater abstractions

Roads, foundations and other construction works associated with large scale developments can disrupt groundwater flow and impact on groundwater abstractions. To address this risk a list of groundwater abstractions both within and outwith the site boundary, within a radius of i) 100 m from roads, tracks and trenches and ii) 250 m from borrow pits and foundations) should be provided.

If groundwater abstractions are identified within the 100 m radius of roads, tracks and trenches or 250 m radius from borrow pits and foundations, then either the applicant should ensure that the route or location of engineering operations avoid this buffer area or further information and investigations will be required to show that impacts on abstractions are acceptable. Further details can be found in Appendix 2 (which is also applicable to other types of developments) of our [Planning guidance on windfarm developments](#).

Engineering activities in the water environment

In order to meet the objectives of the [Water Framework Directive](#) of preventing any deterioration and improving the water environment, developments should be designed to avoid engineering activities in the water environment wherever possible. The water environment includes burns, rivers, lochs, wetlands, groundwater and reservoirs. We require it to be demonstrated that every effort has been made to leave the water environment in its natural state. Engineering activities such as culverts, bridges,

watercourse diversions, bank modifications or dams should be avoided unless there is no practicable alternative. Paragraph 211 of SPP deters unnecessary culverting. Where a watercourse crossing cannot be avoided, bridging solutions or bottomless or arched culverts which do not affect the bed and banks of the watercourse should be used. Further guidance on the design and implementation of crossings can be found in our [Construction of River Crossings Good Practice Guide](#). Other best practice guidance is also available within the water [engineering](#) section of our website.

If the engineering works proposed are likely to result in increased flood risk to people or property then a flood risk assessment should be submitted in support of the planning application and we should be consulted as detailed below.

A site survey of existing water features and a map of the location of all proposed engineering activities in the water environment should be included in the ES or planning submission. A systematic table detailing the justification for the activity and how any adverse impact will be mitigated should also be included. The table should be accompanied by a photograph of each affected water body along with its dimensions. Justification for the location of any proposed activity is a key issue for us to assess at the planning stage.

Where developments cover a large area, there will usually be opportunities to incorporate improvements in the water environment required by the Water Framework Directive within and/or immediately adjacent to the site either as part of mitigation measures for proposed works or as compensation for environmental impact. We encourage applicants to seek such opportunities to avoid or offset environmental impacts. Improvements which might be considered could include the removal of redundant weirs, the creation of buffer strips and provision of fencing along watercourses. Fencing off watercourses and creating buffer strips both helps reduce the risk of diffuse water pollution and affords protection to the riparian habitat.

We are pleased to note that the applicant intends to undertake baseline water monitoring sampling, macroinvertebrate and fishery surveys at various locations throughout the site and that these surveys will be carried out in accordance with the relevant best practice standards. We will be pleased to offer further comments on these matters in due course.

Water abstraction

Where water abstraction is proposed we request that the ES, or planning submission, details if a public or private source will be used. If a private source is to be used the information below should be included. Whilst we regulate water abstractions under The Water Environment (Controlled Activities) (Scotland) Regulations 2011, the following information is required at the planning stage to advise on the acceptability of the abstraction at this location:

- Source e.g. ground water or surface water;
- Location e.g. grid reference and description of site;
- Volume e.g. quantity of water to be extracted;

- Timing of abstraction e.g. will there be a continuous abstraction;
- Nature of abstraction e.g. sump or impoundment;
- Proposed operating regime e.g. details of abstraction limits and hands off flow;
- Survey of existing water environment including any existing water features;
- Impacts of the proposed abstraction upon the surrounding water environment.

If other development projects are present or proposed within the same water catchment then we advise that the applicant considers whether the cumulative impact upon the water environment needs to be assessed. The ES or planning submission should also contain a justification for the approach taken.

Pollution prevention and environmental management

One of our key interests in relation to major developments is pollution prevention measures during the periods of construction, operation, maintenance, demolition and restoration. The construction phase includes construction of access roads, borrow pits and any other site infrastructure.

We advise that the applicant should, through the EIA process or planning submission, systematically identify all aspects of site work that might impact upon the environment, potential pollution risks associated with the proposals and identify the principles of preventative measures and mitigation. This will establish a robust environmental management process for the development. A draft Schedule of Mitigation should be produced as part of this process. This should cover all the environmental sensitivities, pollution prevention and mitigation measures identified to avoid or minimise environmental effects. Details of the specific issues that we expect to be addressed are available on the [Pollution Prevention and Environmental Management](#) section of our [website](#).

A Construction Environmental Management Document is a key management tool to implement the Schedule of Mitigation. We recommend that the principles of this document are set out in the ES outlining how the draft Schedule of Mitigation will be implemented. This document should form the basis of more detailed site specific Construction Environmental Management Plans which, along with detailed method statements, may be required by planning condition or, in certain cases, through environmental regulation. This approach provides a useful link between the principles of development which need to be outlined at the early stages of the project and the method statements which are usually produced following award of contract (just before development commences).

We would refer you to best practice advice prepared by SNH, SEPA and the windfarm industry [Good Practice During Windfarm Construction](#). Additionally, the Highland Council (in conjunction with industry and other key agencies) has developed a guidance note [Construction Environmental Management Process for Large Scale Projects](#).

Borrow pits

Detailed investigations in relation to the need for and impact of such facilities should be contained in the ES or planning submission. Where borrow pits are proposed, information should be provided regarding their location, size and nature. In particular, details of the proposed depth of the excavation compared to the actual topography and water table should be submitted. In addition details of the proposed restoration profile, proposed drainage and settlement traps, turf and overburden removal and storage for reinstatement should be submitted.

The impact of such facilities (including dust, blasting and impact on water) should be appraised as part of the overall impact of the scheme. Information should cover, in relation to water; at least the information set out in [Planning Advice Note PAN 50 Controlling the Environmental Effects of Surface Mineral Workings](#) (Paragraph 53). In relation to groundwater, information (Paragraph 52 of PAN 50) only needs to be provided where there is an abstraction or groundwater dependent terrestrial ecosystem within 250 m of the borrow pit. Additional information on groundwater is provided above.

Air quality

The local authority is the responsible authority for local air quality management under the Environment Act 1995 and therefore we recommend that Environmental Health within the local authority be consulted.

They can advise on the need for this development proposal to be assessed alongside other developments that could contribute to an increase in road traffic. They can also advise on potential impacts such as exacerbation of local air pollution, noise and nuisance issues and cumulative impacts of all development in the local area. Further guidance regarding these issues is provided in NSCA guidance (2006) entitled [Development Control: Planning for Air Quality](#).

Flood risk

The site should be assessed for flood risk from all sources in line with Scottish Planning Policy (Paragraphs 196-211). Our [Indicative River & Coastal Flood Map \(Scotland\)](#) is available to view online and further information and advice can be sought from your local authority technical or engineering services department and from our [website](#).

If a flood risk is identified then a Flood Risk Assessment should be carried out following the guidance set out in the Annex to the [SEPA-Planning Authority flood risk protocol](#). Our [Technical flood risk guidance for stakeholders](#) outlines the information we require to be submitted as part of a Flood Risk Assessment, and methodologies that may be appropriate for hydrological and hydraulic modelling.

Regulatory advice for the applicant

Details of regulatory requirements and good practice advice for the applicant can be found on our website at www.sepa.org.uk/planning.aspx. If you are unable to find the advice you need for a specific regulatory matter, please contact a member of the Dumfries & Galloway operations team in your local SEPA office at:

Rivers House
Lochside Industrial Estate
Irongray Road
Dumfries
DG2 0JE
Tel No 01387-720502

3. SNH

Thank you for your e-mail dated 25 April 2013 consulting us on the above and thank you also for allowing additional time to respond. Please find comments below as they relate to various subject areas in the scoping report.

Landscape and Visual Impact Assessment

Firstly, given the height of the turbines and that they are at the top end of the scale for on shore wind turbines we think it likely that in landscape and visual terms turbine scale is anticipated to be a key issue, turbine size and perceived scale in the landscape context must be fully explored in the ES.

A possible way to explore this issue is for a range of turbine sizes to be tested through the assessment and visualisation processes of the LVIA. Additional to the proposals the following thresholds could be used: 120m, and 100m, and 80m. Alternative layouts may also be beneficial.

The large number and height of turbines included in this scheme will likely contribute to a concentrated band of turbine development, eventually linking the Glenkens to Nithsdale, and the resultant cumulative landscape and visual effects that this may cause. We expect this issue to be dealt with as part of the assessment. We also consider that there will be cumulative landscape and visual effects with existing and consented wind farms within the Ken and Cairnsmore units.

Comments on Methodology/Scoping Report

A few of the references contained within the report are out of date, GLVIA has recently been updated, the 3rd issue should now be referenced, with the consultant using this updated version when considering the specific method for assessing the impacts.

Our guidance on assessing cumulative impact has also been updated and is now available on our website, referenced as '*Assessing the cumulative impact of onshore wind energy developments* March 2012.

Landscape

The scheme is located partly within the Galloway Hills RSA. We strongly recommend that the effect of the scheme upon the key characteristics on this designated landscape be investigated. These effects may include visual intrusion on Glenkens and Rhinns of Kells.

The scheme is located within the Southern Uplands with Forest 'Ken' unit, where we consider there is capacity for wind development, however we consider this capacity will be lessened by the number of consented, constructed and in application schemes, plus the substantial interest (i.e. number of scoping schemes) coming forward. This will increase the likelihood of significant cumulative impacts and lessen the capacity for this area to accommodate significant wind development.

Visual Assessment

We expect photomontages be used for all viewpoints up to 17km from the proposal, with all viewpoints being represented by an existing photo and wireline.

We consider the range of viewpoints selected to be adequate, though wish to request a viewpoint from the summit of Corserine.

Cumulative Landscape and Visual

Given the number of schemes coming forward within this area, we think it likely that most viewpoints should also contain cumulative wireframes as appropriate. We recommend that the applicant liaise with Dumfries and Galloway Council as well as South and East Ayrshire for an up to date list of in application schemes, as we no longer keep an up to date list.

Ecology

We note that most of the ecological survey work, with the exception of great crested newt, is planned for 2013 and therefore nothing to comment on at this point. So far as the breadth of surveys for certain habitats and species are concerned we find these adequate. Note that the survey period for bats, as per BCT guidance, extends the period April to October and not May to September as proposed.

In addition to a Phase 1 survey, habitats consistent with those on Annex 1 of the EC Habitats Directive together with UKBAP Priority Habitats should be mapped to NVC standard, accompanied by supporting quadrat information. There should also be an assessment of impacts on any rare and scarce associated species. Following the survey, the results should be used to inform the design and layout process, so that the development avoids, where

possible, fragile and priority habitats. Where this is not possible suitable restoration and/or compensation will be required.

Ornithology

Surveys began in October 2012 and will run up to end September 2013. Aside from the fact that we have already advised the applicant that Vantage Point (VP) watches were not required for autumn and spring migration periods (see 8.11) the scoping report nevertheless sees surveys during these periods as 'prime objectives' (8.33). It is therefore unclear as to what the main aims of VP watches are outwith the breeding season as VP watches alone for the autumn and spring season would require 72 hours per VP, leaving little or no time for the winter period (accepting a degree of overlap). Also, at 19.9 in Appendix C, it is stated that watches are being undertaken in each month of the year and so it needs to be clarified where the main survey effort will be concentrated and primary objectives clearly stated.

Figure 6 clearly shows 4 VPs and associated viewsheds which does not correspond to the two stated at 19.9, Appendix C. At 19.10, Appendix C, it is stated *that "normally, all points within the survey area will be within 2km of a VP"*. We accept that under certain circumstances there may be blind spots within the survey boundary, however, Figure 6 clearly shows an area to the north of the site that is not covered by any VP with turbine 44 located in this area, and turbines 43 and 45 on the periphery of viewsheds 2 and 1 respectively. If turbine 44 remains outwith the viewshed of any VP then clearly this will have an impact on collision risk assessments and so either this turbine is removed or relocated within a viewshed at this state of the survey period unless the VP survey design and watches are revised.

At 8.32 the applicants allow themselves a flexible approach to survey methods suggesting possible revisions to effort if deemed necessary. It is not clear what this actually means, but a word of caution to note that deviations from established methodologies and effort will need to be fully justified within the Environmental Statement should the proposal proceed.

Table 8.1, first column, second row, should not be headed 'summer 2013' At 8.46 consultees are invited to consider a number of questions. First bullet asks if we consider any SPAs where a Habitats Regulations Assessment would be required. Without performing our own analysis of data we cannot answer this question at this point.

If and when we advise the Competent Authority that an Appropriate Assessment is required we will suggest any 'in combination' plans or projects to include.

Hydrology and Hydrogeology

Appropriate field surveys should be undertaken to determine the extent of peat deposits as part of the EIA process and to inform site design and layout. If peat is found to be present on site, we would expect the applicant to carry out a peat stability assessment. It is important that Peat Depth Surveys and

Peat Slide Risk Assessments are as extensive as necessary to capture and assess all relevant areas. The assessment should include turbine, infrastructure and laydown locations, plus the access tracks and any borrow pits. We also strongly recommend early engagement with SEPA with regard to excavated peat reuse and disposal.

4. Forestry Commission Scotland

No comments received

5. Historic Scotland

Thank you for your scoping opinion request, which we received on 25 April 2013. This letter contains our comments for our historic environment interests. That is, scheduled monuments and their setting, category A listed buildings and their settings and gardens and designed landscapes and battlefields included in their respective inventories.

You should seek information and advice from the relevant planning authority archaeologist and conservation advisor for matters including unscheduled archaeology and impacts on B and C listed buildings, if you have not already done so.

Historic Scotland's advice

Without prejudice and on the basis of the information supplied, we have concerns that the setting of a number of scheduled monuments would be significantly adversely affected by the proposals. While we envisage potential for wind energy development at this location, the current proposal is likely to raise issues for our historic environment interests. Our detailed comments are set out in the attached Annex I.

In light of the concerns that we have raised, we would be strongly recommend that the developer undertakes further pre-application consultation with Historic Scotland. As part of that, we would be happy to provide comments on the visualisations produced in advance of any application being submitted.

I hope this letter has been helpful to you. If you would like to discuss any of the issues raised please feel free to contact me on the details above.

Annex I

General

I understand that the proposed development would consist of up to 45 turbines with maximum height to blade tip of 146.5m, access tracks, substation building, permanent meteorological mast and other associated development, on land east of Carsphairn.

I advise that consideration is given to our guidance on the setting of historic environment assets when carrying out the assessment, which can be accessed via the following link:

<http://www.historic-scotland.gov.uk/setting-2.pdf>.

Additional guidance on our role and information requirements in the EIA process can be found on our website:

<http://www.historic-scotland.gov.uk/index/heritage/policy/environmental-assessment/eiafaqs.htm>.

Scheduled Monuments – HS assessment of settings and potential impacts

The three monuments with which we are most concerned are:

Stroanfreggan Craig, fort, Smittens Bridge (Index No. 1095)

Stroanfreggan Bridge, cairn (Index No. 1043)

Craigengillan, cairn (Index No. 2238)

Stroanfreggan Craig, fort, Smittens Bridge (Index No. 1095)

This probable Iron Age fort is located halfway down a narrow ridge running northeast-southwest, and is overlooked by higher ground to the northeast. Marked by a stone cairn of later date, it has extensive views over the immediate landscape to the southwest, south and southeast. It is also a very prominent monument when viewed from these points in the immediate landscape. The key element in the setting of this monument is its relationship to the topography of the ridge. Views towards the fort from the southwest, south and southeast are therefore sensitive elements in this monument's setting. The fort is located on open upland grazing with practically no modern development in the vicinity. The extensive commercial woodlands to the west form part of the baseline of this setting, and contribute to a sense of rural upland isolation.

The proposed turbines would feature in the backdrop of views towards the fort from the lower ground to the south and southeast, and possibly on the periphery of views towards it from the southwest. The turbines would also be a prominent element in views westwards from the monument. The introduction of turbines would represent a highly visible and industrial intrusion into the open upland setting, and the degree of change to this setting would be high. Therefore, there is potential for a significant adverse impact on this monument. Along with the proposed Longburn wind farm to the immediate north of the fort, there is also potential for a significantly adverse cumulative impact.

We recognise that the proposed turbines in the southern half of the development site are set well back from the site boundary. We would strongly recommend that turbines are not proposed any closer to the fort, and that an assessment of the setting impacts seeks to identify any necessary mitigation to reduce impacts. This may include relocation of a number of the proposed turbines.

Stroanfreggan Bridge, cairn (Index No. 1043)

This large circular cairn and cist is situated at the edge of a bank on low-lying ground. The monument appears as a low circular cairn of stones c. 24m in diameter, and features a burial cist on the eastern side of the cairn. Such cairns were designed to be visible from adjacent farmland and routeways, and

to have reciprocal views outwards. The location of this cairn on a gentle slope leading southwards towards the Stroanfreggan Burn suggests that the key element in the setting of the cairn consists of views to the east and west along the watercourse, and that distant views to the north and south are subsidiary elements in this setting. The monument is not particularly isolated from modern development, and the small number of dwellings to the west and east form part of the baseline setting.

The introduction of turbines on the hillsides to the northwest of the site may have an adverse impact on the setting of the cairn. Along with the proposed Longburn wind farm to the north, there is also potential for a cumulative adverse impact.

Craigengillan, cairn (Index No. 2238)

The cairn is presently located in a clearing within a forestry plantation, and has not been visited by Historic Scotland in recent years. However, we recently responded to a scoping exercise for a Long Term Forest Plan for this area. In this we recommended ensuring that replanting incorporated a 20m buffer zone around the scheduled area, and reopening views to and from the southeast to enhance the setting of the monument. (I have attached a copy of this response as Annex II to this letter).

The cairn lies on a steep southeast-facing slope, and views to and from the east and southeast are likely to be a significant element in the setting of the monument. These views are likely to be re-established as part of the restocking work. Apart from the visual element of the setting, the monument is located in a relatively isolated upland landscape, and this also contributes to the setting of the monument.

The potential impact of the proposed development on this setting may be significant. The scale and proximity of turbines to the cairn would represent significant and industrial introductions into its setting. Perceptions of the cairn and its setting would largely be dictated by the sense that it lay within a wind farm. The isolated location of the monument would be significantly altered. This would represent an adverse impact even if fewer trees than recommended were removed as part of the forest plan. Turbines 6, 9, 10, 11, 13, 17 and 35 would represent particularly significant issues in this regard. Along with the proposed Longburn wind farm to the east of the cairn, there is also potential for a cumulative adverse impact.

Other Monuments in the Vicinity

The following monuments are also in the vicinity of the development and lie within the zone of theoretical visibility as demonstrated in the diagram provided. As such, we would expect that impacts upon their settings would be included in the Environmental Statement:

Dundeugh Castle (Index no. 2476)

Braidnoch Hill, cross slabs (Index no. 1105)

Polmaddy, medieval and post-medieval settlement (Index no. 5391)

Information required and mitigation potential

In order to fully assess the potential impacts on the setting of the Stroanfreggan monuments (Index numbers 1095 and 1043), we recommend that the ES includes the following photomontages:

- From both monuments, looking towards the wind farm
- From the unnamed road leading eastwards from Smittons Bridge looking northwestwards towards Stroanfreggan fort
- From the south side of the Stroanfreggan Burn looking northwestwards towards the Stroanfreggan Bridge cairn and the proposed development. Where feasible, the viewpoint should be within c.30 – c.50m of the cairn.

In order to assess the potential impact on the setting of Craingengillan cairn, we recommend that a series of wireframes be undertaken:

From the monument, looking in the direction of the proposed development site. This series of wireframes should show (at a minimum) Turbines 6, 9, 10, 11, 13, 17 and 35.

We are of the opinion that there is potential for wind energy development at this location, but not to the extent envisaged at this stage. The potential impacts discussed above can be mitigated through design changes which take a full and reasonable assessment of impacts into account.

6. Marine Scotland

Marine Scotland Science Freshwater Laboratory (MSS-FL) provides scientific advice on migratory and freshwater fish in Scotland to allow the Scottish Government to protect and promote the development of sustainable fisheries. We are a Scottish Government internal consultee providing fisheries advice to the Energy Consents and Deployment Unit (ECDU).

Wind farm and transmission line proposals which are considered under Section 36 and 37 of the Electricity Act may adversely affect water quality and fish populations through a number of mechanisms. These include: increased sediment transport and deposition; pollution incidents; altered hydrological pathways; removal or degradation of fish habitat, including spawning areas; reduction in food supply and obstruction to upstream and downstream migration of fish, all of which should be fully addressed in the Environmental Statement (ES).

Atlantic salmon, trout (sea trout and brown trout) and European eel are of particular interest to MSS-FL. Fish and fisheries issues will also be of concern to the local District Salmon Fishery Boards (DSFBs), which have a statutory responsibility to protect salmon populations. As such this organisation should also be contacted at the outset of any development. In addition to the DSFBs, local Fisheries Trusts have information regarding local fish populations. The following web sites have lists of all DSFBs and Fisheries Trusts in Scotland:

<http://www.asfb.org.uk>

<http://www.rafts.org.uk>

The developer should also note that fish and fisheries issues are also likely to be of concern to Scottish Natural Heritage (SNH) when species of conservation interest are involved (see <http://www.snh.gov.uk/about-scotlands-nature/species/fish/freshwater-fish/>) and to the Scottish Environment Protection Agency (SEPA) due to their role in ensuring compliance with the requirements of the Water Framework Directive.

Environmental Statement

In preparation of the ES careful consideration should be given to the following activities which can have an impact on fisheries: turbine foundations, excavation of borrow pits, road construction/upgrading, cable laying, water abstraction and discharge.

Water bodies and stream crossings

It is recommended that construction avoids water bodies wherever possible. If construction is to be carried out near watercourses, a buffer zone of at least 50m should be established. Where river crossings are proposed the Scottish Executive guidance “River Crossings and Migratory Fish” (2000) <http://www.scotland.gov.uk/Topics/marine/science/Publications/publicationslatest/rivercrossings> should be consulted in addition to SEPA’s “Engineering in the Water Environment Good Practice Guide Construction of River Crossings” (http://www.sepa.org.uk/water/water_regulation/guidance/engineering.aspx).

Peat stability

Peat slides can have a direct impact on fisheries and peat disturbance can have indirect effects on water quality, therefore all construction should avoid areas of deep peat, where this is not possible appropriate mitigation measures should be put in place. Natural peat drainage channels should be preserved throughout the development; excavated material should not be stock piled in areas of unstable peat; concentrated water flows onto peat slopes should also be avoided.

Flooding

The propensity of the development site to flooding, prior to any construction activities, should be considered. Drainage throughout the proposal should be designed such that it does not alter surface water runoff leading to a reduction in baseflows or influence the magnitude and/or frequency of flooding. Such changes in the hydrological regime can have a large impact on fisheries.

Abstraction and discharge of water

SEPA, through The Water Framework Directive, regulates abstraction from and discharge of polluting matter to all wetlands, surface waters and groundwaters. (SEPA-The Water Environmental (Controlled Activities) (Scotland) Regulations 2005 A Practical Guide http://www.sepa.org.uk/water/water_regulation.aspx). Where water abstraction is proposed, the developer should ensure that they comply with The Salmon (Fish Passes and Screens) (Scotland) Regulation 1994 which states that screens, at the point of water abstraction, should serve to prevent the entry and injury of salmon. <http://www.legislation.gov.uk/ukxi/1994/2524/regulation/6/made>. Surface water run-off must be discharged in such a way to minimise the risk of pollution of the water environment.

Pollution

The Water Framework Directive requires any activity that is liable to cause water pollution to be authorised by SEPA. This includes point source pollution (eg sewage and trade effluent) and diffuse pollution (fuel, concrete spills, sediment discharge) all of which can be detrimental to the survival of fish see SEPA Pollution Prevention Guidelines <http://www.netregs.gov.uk/netregs/links/107968.aspx>

Acidification

Particular attention should be paid to acidification issues if they are known to be a problem in the area. Anthropogenic acidification of freshwaters is largely caused by the input of sulphur and nitrogen compounds, derived from the combustion of fossil fuels, exceeding the buffering capacity of the soils and underlying rocks through which the streams flow. Peat deposits and marine derived sulphates can also contribute to acidity. Salmonid fish are particularly sensitive to acid water, particularly due to the increased mobility of labile aluminium in acid conditions which is toxic to aquatic organisms.

Forestry

The developer should be aware of the potential impacts of tree felling on the aquatic environment including nutrient release, increased acidification risk, loss of habitat, impacts on hydrology, increased fine sediment transport and deposition, all of which can have a detrimental impact on fish populations and should therefore be addressed in the ES. "The Forest and Water Guidelines" should be consulted for further information <http://www.forestry.gov.uk/forestry/INFD-88VGX9>.

Monitoring Programmes

In order that MSS- FL can assess the potential impact of developments the developer should provide information on all species and abundance of fish within the development area. MSS- FL may not have local knowledge of the site and consequently the onus is on the developer to provide adequate information on which to base an assessment of risk.

Where local salmonid and eel populations are present and the development has the potential to have an impact on the freshwater environment MSS FL requests that a baseline study be carried out at least one year prior to construction to assess all species and abundance of fish and water quality in standing and running waters likely to be affected by the proposed development. Particular attention should be paid to species of high economic and/or conservation value as outlined below:

Atlantic salmon, sea lamprey, river lamprey and brook lamprey are listed under the European Habitat Directive. Atlantic salmon, trout (ancestral forms and sea trout), European eel, river lamprey, sea lamprey and Arctic charr are UK Biodiversity Action Plan (UKBAP) species-listed as priorities for conservation. European eel is also protected by EU regulation (EC No 1100/2007). The following links provide further information regarding the protection of fish species and water bodies in Scotland.

http://www.jncc.gov.uk/ProtectedSites/SACselection/SAC_species.asp

http://www.jncc.gov.uk/ProtectedSites/SACselection/SAC_list.asp?Country=S

<http://www.jncc.gov.uk/page-5164>

http://www.nasco.int/pdf/far_habitat/HabitatFAR_Scotland.pdf

Although MSS-FL will be primarily concerned with species of fisheries interest (e.g. salmon, trout and eels), other consultees will have an interest in other species.

Adherence to best available techniques is expected throughout the development. Site specific mitigation measures and/or enhancement programmes to protect and/or compensate freshwater habitats should always be included in the ES.

Monitoring throughout the development phase should be carried out to identify impacts and allow remediation at the earliest opportunity for sites where there are thought to be risks to fish populations. The experimental design of the monitoring programme should focus on the risks presented by the development and be clearly justified. Methods of analysis, reporting mechanisms and links to site management should also be clearly identified. The following publication may be helpful in considering fish monitoring programmes; http://www.scotland.gov.uk/Uploads/Documents/SFRR_67.pdf .

Developers should ensure that all fish work complies with the Animal (Scientific Procedures) Act (1986) and Animal Health and Welfare (Scotland) Act (2006) where required.

The combined effect on water quality and fisheries from all existing and proposed construction developments in the area should be addressed in the ES in addition to angling, as a recreation interest, and the impact that the proposed development may have on it.

Where the development can be clearly demonstrated to be of low risk to fish populations the developer should still draw up **site specific** mitigation

plans to minimise any impact to fish and their inhabiting waters. If the developer considers that there will be no significant impact from the development and as such no monitoring will be required this should be clearly presented in the ES with supporting data and information thereby enabling MSS-FL to finalise the decision on monitoring requirements. If this information is not provided, MSS-FL will have no information on which to base an assessment of risk and as such will recommend that the developer carry out a full monitoring survey of fish and water chemistry in addition to appropriate mitigation plans. Due to limited staff resources MSS-FL normally do not attend meetings held in relation to proposed developments.

Summary

- MSS-FL is an internal Scottish Government consultee providing scientific advice on fish and fisheries in Scotland to protect fish populations and promote sustainable fisheries.
- Other organisations including DSFBs, Fishery Trusts, SNH and SEPA also have an interest in fish and fisheries issues.
- Energy developments can impact fish populations through a wide range of mechanisms that need to be considered in the ES.
- It is the responsibility of the developer to provide data on the distribution, species and abundance of fish within and around the development site to allow MSS-FL to assess levels of risk from the proposed development.
- It is the responsibility of the developer to provide a clear and honest assessment of the risks posed to fish populations as a result of the proposed development.
- If there is any reasonable doubt as to the potential impacts a monitoring plan should be put in place to assess impacts and allow remedial action at the earliest opportunity.
- Monitoring plans should be clearly defined and justified and must tie into site management.

Useful links

Good practice during windfarm construction:
<http://www.snh.org.uk/pdfs/strategy/renewables/Good%20practice%20during%20windfarm%20construction.pdf>

SEPA water publications:
http://www.sepa.org.uk/water/water_publications.aspx

Peat Landslide Hazard and Risk Assessments: Best Practice Guide for proposed Electricity Generation Developments.
<http://www.scotland.gov.uk/Publications/2006/12/21162303/0>

SFCC electrofishing protocols:
<http://www.scotland.gov.uk/Topics/marine/science/sfcc/Protocols/ElectrofishingSurveys>

Construction of floating roads:
<http://www.roadex.org/uploads/publications/Seminars/Scotland/FCE:SNH%20Floating%20Roads%20on%20Peat%20report.pdf>

7. Transport Scotland

No comments received

8. Association of Salmon Fishery Boards

No comments received

9. Civil Aviation Authority - Airspace

Having reviewed the Scoping Report for the proposed Shepherds' Rig Wind farm, the appropriate aviation consultees have been identified in Chapter 13 although the positions of each consultee regarding the proposed development should be established by consultation. I would also add the need, if the proposed development is approved, to inform the Defence Geographic Centre ICGDGC-ProdAISAFDb@mod.uk of the locations, heights and lighting status of the turbines and meteorological masts, the estimated and actual dates of construction and the maximum height of any construction equipment to be used, prior to the start of construction, to allow for the appropriate inclusion on Aviation Charts, for safety purposes.

10. The Crown Estate

No comments received

11. Defence Infrastructure Organisation

The principal safeguarding concerns of the MOD with respect to the development of wind turbines relate to their potential to create a physical obstruction to air traffic movements, and cause interference to air traffic control and air defence radar installations.

Air Traffic Control (ATC) Radar & Range Control Radar

Where wind turbines are visible to ATC radars they have been shown to have detrimental effects on radar performance. These effects include the desensitisation of radar in the vicinity of the turbines, and the creation of "false" aircraft returns which air traffic controllers must treat as real. The desensitisation of radar could result in aircraft not being detected by the radar and therefore not presented to air traffic controllers. Controllers use the radar to separate and sequence both military and civilian aircraft, and in busy uncontrolled airspace radar is the only sure way to do this safely. Maintaining situational awareness of all aircraft movements within the airspace is crucial to achieving a safe and efficient air traffic service, and the integrity of radar data is central to this process. The creation of "false" aircraft displayed on the radar leads to increased workload for both controllers and aircrews, and may have a significant operational impact. Furthermore, real aircraft returns can be obscured by the turbine's radar returns, making the tracking of conflicting unknown aircraft (the controllers' own traffic) much more difficult.

Precision Approach Radar (PAR)

The MOD's PAR is a very accurate radar used by air traffic controllers to guide aircraft down in inclement weather (although the procedure is practised in all weather conditions). The accuracy and integrity of this radar is critical as air traffic controllers must control the aircraft in descent and very close to the ground. Wind turbines constructed in line of sight of the PAR can cause localised "track seduction", leading to aircraft disappearing from the radar. A further possible effect is the overload of the radar's processor, in that wind turbines generate "false plots" which use up processing ability. Once its threshold is reached the radar may be unable to detect smaller targets, which are likely to be aircraft in head-on profile. Technical aspects of the PAR are covered by international arms traffic regulations, and therefore cannot be released by the MOD, but on these grounds the MOD will object to any wind turbine constructed within the PAR's coverage.

Air Defence (AD) radar

Trials carried out in 2005 concluded that wind turbines can have detrimental effects on the operation of radar which include the desensitisation of radar in the vicinity of the turbines, and the creation of "false" aircraft returns. The probability of the radar detecting aircraft flying over or in the vicinity of the turbines would be reduced, and the RAF would be unable to provide a full air surveillance service in the area of the proposed wind farm.

Secondary Surveillance Radar (SSR)

SSR relies on co-operative transmission from aircraft carrying equipment known as transponders. For this reason confusion between returns from aircraft and from other objects is highly unlikely and many of the effects caused to normal radars will not occur. However reflection of transmissions could be caused by wind turbines particularly if they are in close proximity to an SSR site. In this eventuality misidentification or mislocation of aircraft could occur. This could have potential flight safety implications.

Meteorological Office radar

Wind turbines can interfere with Met Office Radars in similar ways to Air Traffic Control Radars as detailed above and impair their ability to detect weather phenomena.

Low Flying

The whole of the UK may be used for military low flying operations. The proliferation of obstacles is not only a safety hazard but also severely impacts on its utilisation for essential low flying training. The MOD will often request that turbines be fitted with aviation warning lights.

Area Air Traffic Control (ATC) radar

There are 12 National Air Traffic Services (NA TS) radars under contract to provide the MOD with airspace monitoring services throughout the UK.

Physical Safeguarding

Turbines constructed within statutory safeguarding zones have the potential to cause physical obstructions which could interfere with the safe operation of defence assets.

Eskdalemuir Seismological Recording Station

Following research jointly commissioned by DTI (now the Department of Business, Innovation and Skills), BWEA (now RenewableUK) and MOD, it has been confirmed that wind turbines of current design generate seismic noise which can interfere with the operational functionality of the array. In order to ensure the UK complies with the Comprehensive Nuclear-Test-Ban Treaty, a noise budget based on the findings of the research has been allocated to a Safeguarding Zone around the array. At present the reserved noise budget has been reached, so the MOD must object to further applications if they are not accompanied by a MOD approved mitigation scheme.

The allocated noise can alter on a regular basis as new schemes reach planning and others do not obtain consent. We recommend you contact us regularly to ascertain current allocation levels. Any schemes to which the MOD does not object, which subsequently do not gain planning consent, will have their noise quota added back to the available noise budget. Calculations are based on current turbine designs. If future technological solutions can be applied to turbines and be scientifically proven to reduce or remove the noise generated, the MOD will reassess its policies.

Threat Radar

RAF Spadeadam, in north Cumbria, is home to an Electronic Warfare Tactical Range which provides vital training, using threat radars and targets, to prepare aircrews for operations which they are likely to face in contemporary warfare. This type of military flight training activity is conducted in air space extending across northern England and Southern Scotland interacting with Threat Radar sites which are scattered across the same region. In 2010 MOD conducted a trial that concluded that threat radar systems were subject to degradation from wind turbines.

Long Range Very Low Frequency (VLF) Transmitters

VLF radio is a very specialised area of electronics, and the effects of wind turbines have been subject to only limited scientific study. However, there are a number of known means by which wind turbines can adversely affect the characteristics of VLF transmission. It is probable that turbine constructed in the vicinity of an VLF transmitter would have a discernable adverse impact on transmission through one of these means. The MOD is currently undertaking various studies to further understand the effects of wind turbines on VLF transmission. Planning guidance establishes that wind energy developers should assess the affects of their proposed development upon aviation and defence interests and that they should engage in dialogue with the MOD at an

early stage to identify concerns and potential mitigation to support of their application.

Accordingly the applicant should take account of MOD aviation and radar operations in completing the EIA particularly in identifying a suitable site for development and the dimensions of the turbines that are to be installed.

We therefore ask that the MOD be consulted about all wind turbine developments with a height of 11m or more or a rotor diameter of 2m or more by the developer at the earliest possible time in the development process in accordance with "Wind Energy & Aviation Interests Interim Guidelines". <http://www.bwea.com/pdf/Wind-Energy-and-aviation-interim-guidelines.pdf> This is so that the development can be fully assessed and any MOD concerns be made known to the developer at an early stage of the development process. We also ask that MOD be consulted by Consenting Authorities regarding all applications for wind turbine developments with a height of 11m or more or a rotor diameter of 2m or more so we can ensure that our concerns are taken into account in the decision making process.

In order to assess a proposed development, we need the following information:

1. Accurate grid coordinates for each turbine to the nearest metre,
2. The height of the turbines to blade tip, hub height and rotor diameter,
3. The number of rotor blades,
4. The wind farm generation capacity,
5. The number of turbines

MOD Safeguarding wishes to be consulted and notified about the progress of planning applications and submissions relating to this proposal to verify that it will not adversely affect defence interests.

I hope this adequately explains our position on the matter. If you require further information or would like to discuss this matter further please do not hesitate to contact me.

Further information about the effects of wind turbines on MOD interests can be obtained from the following websites:

MOD:

<http://www.mod.uk/DefenceInternet/WhatWeDo/Operations/Mo/Safeguarding.htm>

12. NATS Safeguarding

I attach some general guidance from NATS regarding the potential impact upon our infrastructure and operations. Whether any potential impact might exist, can be ascertained through the use of our self-assessment maps or pre-planning service. Please note these maps are now available as easy to use Google Earth layers.

Our advice is for developers to familiarise themselves with the aviation aspects of wind farms and to include any evidence of assessments in their documentation. We would also advise developers to engage with NATS should they anticipate any issues, at the earliest opportunity.

13. RSPB Scotland

Thank you for consulting RSPB Scotland on the Scoping Report for this project. In general, RSPB Scotland is supportive of the use of renewable energy, but believes that wind farms must be carefully sited and designed to avoid negative impacts on sites and species of conservation importance.

We have the following comments on the Scoping Report for this project.

Site Location

The development site location falls within an area of Medium Sensitivity for breeding and wintering birds (RSPB/SNH Bird Sensitivity Map 2006)ⁱ, and an area of Potential Constraints (within Dumfries and Galloway Council's Wind Energy IPP) and is also within an area for wildfowl migratory birds (Annex 1 wintering whooper swans, Greenland white-fronted geese and greylag geese). In addition, we have data of black grouse leks within 1-2km of the site boundary and, based on this and additional regional data, the general area has been identified by the RSPB as 'sensitive' for potential cumulative impact from wind farm development for this species. Breeding raptors are also known to be in the area including peregrine and merlin. We would therefore expect that the EIA for this project gives full consideration to the potential impacts on these sites and associated bird species, which may include consideration of the need for a habitat management plan to address potential cumulative impact on black grouse.

Ornithological Survey

We are generally satisfied with the level of bird survey work agreed for this site and acknowledge the level of detailed raptor survey work proposed. We agree with the species which have been identified as target species (raptors, black grouse) but would request the addition of whooper swan as target species. We acknowledge SNH recommendations that migratory survey work need not be undertaken at this site due to the relatively low number of Greenland white-fronted geese at Loch Ken SPA. However, we consider that due to the potential for this route to be used by migrating birds, particularly by whooper swans (tracking data provided by WWT ⁱⁱ has shown this species to migrate to the east and directly over the development site, please see map enclosed and associated text descriptor) and the high number of turbines proposed at this site, that migratory survey work should be undertaken. We would recommend that this would involve additional vantage point watches being carried out for migratory wildfowl/whooper swan from mid March to mid-April/May, at least once per week as per SNH guidanceⁱⁱⁱ.

Vantage Point Survey

We welcome the level of hourly vantage point (VP) watches proposed at this site. However, we note from the viewshed map that the two VP locations do not achieve one hundred percent coverage of this site. Turbine 44 is not covered by the viewshed from either location and there is only partial coverage of turbines 43 and 45. We would therefore, advise that an additional VP location is established and subsequent survey work is undertaken to address this omission. Should this not be possible, detailed reasoning should be included within the ES.

Peat land/Bog Habitat

We note that peat has been highlighted as a key sensitivity at this site and that should peat be present on the site in sufficient abundance and depth, the potential effects associated with construction on peat land will be considered as part of the EIA. Peat is a significant store of carbon and also has a high biodiversity value. We would therefore, expect that potential impact on this habitat is fully assessed including the use of the Scottish Government's carbon calculator and should include measures undertaken as part of the design process to avoid construction and operations impact on deep peat soils (over 0.5m).

Habitat Management

The ES should include full details of proposals for mitigation in relation to important habitats and species on the site, as well as any enhancement measures. We request that a Habitat Management Plan is prepared and an outline plan submitted as part of the ES to secure the biodiversity objectives for the scheme.

Relevant Guidance, Legislation and Policies

We would like to highlight that the SNH Guidance documents cited in the Scoping Report are not the most recent publications as follows: Survey Methods for Use in Assessing the Impacts of Onshore Windfarms on Bird Communities was updated in 2010; Cumulative Effects of Windfarms was updated in 2012. In addition, SNH has revised guidance on the assessment of collision risk for wildfowl (May 2013).

Data Research

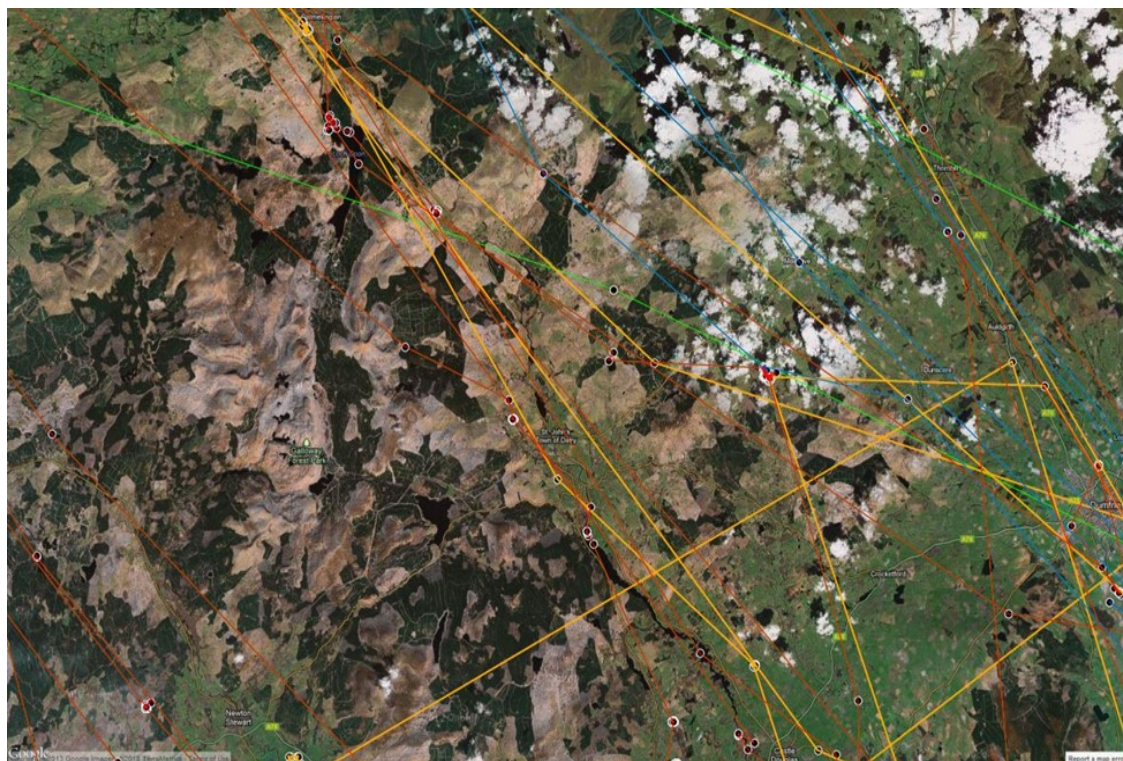
We note that the report includes RSPB and the local Raptor Study Group as appropriate bodies that will be contacted for further baseline data to inform the impact assessment. The Dumfries and Galloway Raptor Study Group can be contacted for data on breeding raptors within the project area (chris.rollie@rspb.org.uk). RSPB Scotland can provide data searches upon request via the data unit at Edinburgh (dataunit@rspb.org.uk). In addition, the Dumfries and Galloway Environmental Resource Centre (info@dgerc.org.uk) can provide further data on bird species in this area.

¹ *Bird Sensitivity Map to provide locational guidance for onshore wind farms in Scotland 2006 - J. A. Bright, R. H. W. Langston, R. Bullman, R. J. Evans, S. Gardner, J. Pearce-Higgins & E. Wilson*

¹ *Map provided by Larry Griffin at WWT Caerlaverock.*

¹ *SNH Survey Methods for use in Assessing the Impacts of Onshore Windfarms on Bird Communities November 2005 (revised December 2010) p.29 106*

Tracks from tagging c.40 whoopers at Martin Mere – red – and 5 at Caerlaverock –blue – in spring 2009, plus any return autumn tracks – green; and 6 tracks from Martin Mere in spring 2010 – orange. Spring tracks spread out on a migratory front by the time birds reach the Solway from Martin Mere, and the birds tend to concentrate their migratory routes along many of the N-S valleys across the region. However the Carsphairn valley does appear to be one of the more popular routes for crossing the higher topography of the region and it is likely that the typical 100 or so that winter at Threave would take the same route if these were tracked. A bird tagged at Caerlaverock in 2009 also cut across to that valley and a zoom of a GPS showing the contours in the likely area of the windfarm suggests the bird was travelling at 358m (+-20m) across an area where examination of the contours show the land to be 350-360m high, i.e. it was close to ground level at that point (we know from the tag's speed measure that it was flying).



14. Mountaineering Council of Scotland

Thank you for the opportunity to respond to the scoping opinion request.

After consideration, we do not intend to make a formal response.

15. Scottish Water

A review of our records indicates that the proposed wind farm is adjacent to Kendoon Loch which is the upper part of the Galloway hydro electric scheme. There are 2 further impoundments downstream of Kendoon the next one being Carsfad Loch. Scottish Water have a raw water pumped abstraction from Carsfad to Lochinvar Loch which supplies Lochinvar water treatment works. It is therefore essential that these sources and assets are protected from the risk of contamination and damage.

The following is a list of precautions that we would ask you to take to ensure that the aforementioned does not occur or affect our assets:

- 1) A detailed method statement and a risk assessment must be submitted to Scottish Water and agreed prior to any operations taking place.
- 2) You or your developer must make every effort to reduce the risk of soil erosion and pollution from oils, etc. during and after the construction phase.
- 3) You or your developer should at all times allow us access to assets belonging to Scottish Water and must avoid the obstruction or hindrance to them.
- 4) You or your developer will give full facilities to Scottish Water and our representatives to determine by inspection or otherwise whether our assets protected and whether special requirements of Scottish Water are being observed.
- 5) Locations where public water supplies may be vulnerable should be identified and the impact assessed. In particular:
 - Any impact to the hydrology of the area should be assessed throughout all stages of the site's development and operation. This should include natural drainage patterns, base flows / volume, retention / run off rates and water quality.
 - Any potential pollution risk which could affect water quality should be considered. This includes sediment run-off, erosion and management of chemicals and oils throughout all operations at all stages of development. You should follow appropriate General Binding Rules under the Controlled Activities Regulations and follow the guidance provided by the Scottish Environment Protection Agency (SEPA) on pollution prevention, visit www.sepa.org.uk/guidance/ppg/index.htm
 - Any new road infrastructure should take into account local watercourses that are feeding reservoirs and any crossing of these should be kept to a minimum. Pollution prevention measures should be put in place at each crossing point and silt traps, or equivalent, should be constructed at regular intervals to minimise the risk from pollution. Once constructed, site roads should be regularly maintained to ensure minimal erosion and hence pollution, from the road surface. Sites roads should be constructed from inert materials.

- Depending on the vulnerability of the public water supply, a sampling programme to assess the baseline water quality and to monitor any damaging effects caused by the development may be advised.
 - A site pollution prevention plan and contingency plan should be developed to prevent or to deal with pollution incidents and it should be agreed with SW prior to any operations taking place.
- 6) Mitigation measures to ensure minimum pollution to water courses / bodies should be highlighted.
- 7) In addition, any forestry activity likely to affect the drinking water supply should follow the Forest and Water guidelines and appropriate General Binding Rules. Please contact us if you are likely to carry out any such activity.
- 8) No re-fuelling to take place within the catchment area or storage of fuel or hazardous materials.
- 9) Scottish Water will not accept liability for any costs incurred by you or your developer in fulfilling any of these requirements.
- 10) If a connection to the water or waste water network is required, you must make a separate application to Scottish Water Customer Connections section for permission to connect. It is important to note that the granting of planning consent does not guarantee a connection to Scottish Water assets.

Prior to any activities commencing on site, please notify Scottish Water and upon completion. In the event of an emergency, please contact Scottish Water on 0845 600 8855.

I trust that the above is acceptable however, if you have any questions relating to the above do not hesitate to contact me at the above address.

16. Visit Scotland

Thank you for giving VisitScotland the opportunity to comment on the above wind farm development. Apologies for the delay in responding.

Our response focuses on the crucial importance of tourism to Scotland's local and national economy, and of the natural landscape for visitors.

Background Information

VisitScotland, as Scotland's National Tourism Organisation, has a strategic role to develop Scottish tourism in order to get the maximum economic benefit for the country. It exists to support the development of the tourism industry in Scotland and to market Scotland as a quality destination.

While VisitScotland understands and appreciates the importance of renewable energy, tourism is crucial to Scotland's economic and cultural well-being. It sustains a great diversity of businesses throughout the country. According to a recent independent report by Deloitte, tourism generates £11 billion for the economy and employs over 200,000 - 9% of the Scottish workforce. Tourism

provides jobs in the private sector and stimulates the regeneration of urban and rural areas.

One of the Scottish Government and VisitScotland's key ambitions is to grow tourism revenues and make Scotland one of the world's foremost tourist destinations. This ambition is now common currency in both public and private sectors in Scotland, and the expectations of businesses on the ground have been raised as to how they might contribute to and benefit from such growth.

Importance of scenery to tourism

Scenery and the natural environment have become the two most important factors for visitors in recent years when choosing a holiday location.

The importance of this element to tourism in Scotland cannot be underestimated. The character and visual amenity value of Scotland's landscapes is a key driver of our tourism product: a large majority of visitors to Scotland come because of the landscape, scenery and the wider environment, which supports important visitor activities such as walking, cycling wildlife watching and visiting historic sites.

The VisitScotland Visitor Experience Survey (2011/12) confirms the basis of this argument with its ranking of the key factors influencing visitors when choosing Scotland as a holiday location. In this study, over half of visitors rated scenery and the natural environment as the main reason for visiting Scotland. Full details of the Visitor Experience Survey can be found on the organisation's corporate website, here:

http://www.visitscotland.org/research_and_statistics/tourism_topics/wind_farms.aspx

Taking tourism considerations into account

We would suggest that full consideration is also given to the Scottish Government's 2007 research on the impact of wind farms on tourism. In its report, you can find recommendations for planning authorities which could help to minimise any negative effects of wind farms on the tourism industry. The report also notes that planning consideration would be greatly assisted if the developers produced a Tourist Impact Statement as part of the Environmental Impact Analysis, and that planning authorities may wish to consider the following factors to ensure that any adverse local impacts on tourism are minimised:

The number of tourists travelling past en route elsewhere The views from accommodation in the area The relative scale of tourism impact i.e. local and national The potential positives associated with the development The views of tourist organisations, i.e. local tourist businesses or VisitScotland. The full study can be found at www.scotland.gov.uk/Publications/2008/03/071135071

Specific Concerns

For many people around the world, Dumfries and Galloway 'is' Scotland, living up to their picture-postcard images with majestic scenery, exceptional

coastlines, awesome wild places, beautiful mountains, ancient pine forests and broad expanses of dark and shimmering lochs.

Dumfries and Galloway also offers unsurpassed opportunities for top-class climbing and off-road biking, dark sky stargazing, wildlife observation along with a host of other outdoor pursuits.

Due to these important facts and as this area also holds various important tourism facilities, including the 7sStanes biking trails, Galloway Forest Park, Europe's only Dark Sky Stargazing Park for example, VisitScotland would urge consideration of how this proposed development may affect the visitor experience of the area.

Industry View

Destination Dumfries and Galloway is the recognised representative group for the tourism industry and we have actively sought out their opinion on the proposed development at Carsphairn.

The group recommended that an independent assessment be made of the financial impact of the development on tourism businesses in the area, and that this be compared to any financial benefits to the local economy from the wind turbines being proposed.

While this assessment should acknowledge a Scotland-wide and Dumfries & Galloway-wide picture, there should also be a site specific survey. If there have been any objections from tourism businesses within sight of the turbines, then independent studies of the area's current visitors' likelihood to revisit the area if turbines were to be erected at the proposed site should be also included in the assessment.

Conclusion

Given the aforementioned importance of Scottish tourism to the economy, and of Scotland's landscape in attracting visitors to Scotland, VisitScotland would strongly recommend any potential detrimental impact of the proposed development on tourism - whether visually, environmentally and economically - be identified and considered in full. This includes when taking decisions over turbine height and number.

VisitScotland would also urge consideration of the specific concerns raised above relating to the impact any perceived proliferation of developments may have on the local tourism industry, and therefore the local economy.

17. John Muir Trust

No comments Received

18. Scottish Wildlife Trust

No comments Recieved

19. British Horse Society

Thank you for consulting with BHS on the above wind farm, horse riders do ride in the project area and do use some routes in the vicinity, I am currently seeking comments from our members, but meanwhile could you please take the following information into account and actively pursue the opportunity to create paths, tracks and links for multi-use access.

BHS Scotland supports the Scottish Government's Renewables Strategy to produce 20% of Scotland's energy from renewable sources by 2020. As a matter of general policy, BHS is not against wind farms. As an organisation BHS normally restricts its comments (both those made by BHS at national level and those made by local BHS representatives) to those most relevant from an equestrian perspective, including safety and the potential economic impact on equestrian access or local equestrian businesses. Individual BHS members may choose to take other factors into account in supporting or objecting to wind farm development proposals.

This information has been produced to help promote better understanding amongst developers and planning authorities of how horses may react to wind turbines. It offers recommendations as to how any potential negative impacts or wind farm development or operation can be minimised, and highlights opportunities to maximise the benefits of wind farm development for equestrian access. Chapter 7 of Good Practice During Wind Farm Construction(<http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=1618>) offers more general guidance on access and recreation in relation to wind farm design, construction and operation.

Legal rights of access for horse riders and carriage drivers

The Land Reform (Scotland) Act 2003 provides a right of responsible access for all non-motorised recreational users to most land. This includes wind farms (other than during the construction phase – see below). In theory, riders and carriage drivers have a legal right to access most land on wind farms, provided they do so responsibly, although most will choose to follow paths and tracks.

Key issues for horses

The main concerns about turbines from an equestrian perspective are:

- blade movement, particularly when blades start to turn within a horse's sight line, or blades which come into view at eye level;
- moving shadows cast by blades, which some horses may perceive as a threat to their safety, exacerbated by the fact that the object casting the shadow may not be obvious to the horse. Blade shadows are not a problem if the turbine is north of the track or path;
- sun or light flicker off blades;

- noise from turbines, particularly erratic noise during start-up or deceleration;
- risk of snow and ice shedding off blades;
- risk of electrocution (particularly during lightning strike);
- risk of injury or fright resulting from structural failure, breakage or collapse of the tower, blades or other constituent parts of turbines.

A BHS survey of riders' and carriage drivers' experience demonstrated a correlation between increased reaction of horses and proximity to turbines, particularly within 200 m.

Site assessment

BHS recommends that no anemometer should be situated closer than fall over distance plus 10% from any track used, or likely to be used, by horse riders or carriage drivers, and that no associated cables should be situated any closer than 30m from an equestrian route, as the cables may be difficult to see, especially by a startled horse.

Design

BHS expects turbine siting and wind farm development plans to respect all existing equestrian access, and to consider opportunities for development of further access wherever possible. This includes access within, across, through and adjacent to sites. Scope to use new tracks constructed to enable turbine erection to link other routes out with the site is encouraged. Both BHS nationally and local riders will be happy to help identify existing riding routes, and to offer suggestions for how access could be improved as an integral part of wind farm development.

- BHS' standard guidance is that there should be a separation distance of at least four times the overall height of turbines (i.e. to tip of blade) for core paths, nationally promoted routes such as Scotland's Great Trails and other promoted riding routes, as these are most likely to be used by equestrians unfamiliar with turbines.
- BHS recommends a target of three times overall height between turbines and all other routes which pre-date wind farm development or turbine erection, including roads.
- BHS recommends a minimum separation distance of 200 m between turbines and core paths, rights of way or promoted riding routes.

Where recommended separation distances cannot be achieved, BHS will expect developers to demonstrate how safety issues can be addressed,

including development and signage of alternative routes of comparable length, gradient and appeal to horse riders and carriage drivers to cater for those who prefer not to take their horses so close to turbines. From an equine perspective, turbines which suddenly come into view at close range without any warning are likely to cause the greatest risk of horses reacting.

Traffic during and after development

- Drivers of all vehicles visiting the site should be alerted to where they are most likely to meet horses.
- All vehicles should be required to slow down or stop when meeting walkers, cyclists, and particularly horses.
- Where construction traffic has to cross an equestrian route, this should be at right angles to the path or track, with warning notices for both vehicle drivers and horse riders/carriage drivers. Construction traffic should give way to recreational users.
- A Temporary Traffic Regulation Order should be in place before closure of any core path or promoted route which may be necessary during transportation of large components.
- Traffic movement which may impact on equestrian access should be planned to allow horse riders and carriage drivers to continue to ride safely in the early morning, evening, at the weekend and on bank holidays.
- All drivers of large vehicles should follow BHS' guidance to minimise risk to horse riders and carriage drivers (<http://www.bhsscotland.org.uk/resources-for-developers.html>).
- Where there is no alternative to using the line of a core path or promoted route as an access track during the construction phase, the route should be widened and a fence erected to segregate vehicles from horses using the route.

Surfacing

BHS recognises that the first priority from a developer's perspective for tracks providing access to turbines is capacity to support required vehicular access, which usually involves stone surfacing, whereas the ideal surface for horses is firm, well drained turf.

Stoned tracks may increase opportunities for year-round riding, particularly over boggy or waterlogged ground, but sharp stone, particularly if unconsolidated, can quickly lame horses, and will usually restrict pace to walk. Horse riders and carriage drivers understandably feel aggrieved when paths and tracks along which they have previously enjoyed scope to trot, canter or gallop are stone surfaced as part of wind farm development, resulting in loss of amenity for equestrian users.

As a matter of policy:

- Where wind farm development or turbine erection results in loss of previously unsurfaced, firm beaten earth tracks enjoyed by horse riders and carriage drivers, BHS expects developers to provide substitute routes of similar length, gradient and character.
- BHS encourages developers to identify in their proposals what, if any action, is proposed to ameliorate the surface of construction tracks on completion of construction. Where traffic movement and natural consolidation with earth or mud is insufficient to bind sharp stone, dressing with whin dust or similar material may be necessary. .
- BHS does not expect paths or tracks with a past history of multi-use, or intended for future multi-use to be surfaced with tarmac, but accepts that developers may agree to bound surfacing of specific routes for the benefit of walkers and cyclists in some instances.

Further guidance on the general principles of equestrian access can be found at <http://www.bhsscotland.org.uk/resources-for-developers.html>.

Access controls

All access controls should ensure that horse riders and carriage drivers, as well as other non-motorised users, are able to exercise their legal access rights. In order to ensure this, and in accordance with national guidance, BHS expects developers and planners to ensure that:

- the least restrictive option is used to provide access for all legitimate recreational users;
- where it is necessary to erect or lock gates across a track to restrict illegal vehicular access, a suitable gap, bridlegate or horse stile should be maintained alongside. Guidance on appropriate widths and designs can be downloaded from the BHS website. Sites likely to be used for carriage driving should incorporate facility such as the Kent Gap design (<http://www.ride-uk.org.uk/standard/kent.htm>).

BHS Scotland is happy to provide further guidance and advice on appropriate access controls tel. 01764 656334.

Other facilities

Incorporation within site design of areas with sufficient space for horse boxes and trailers to park, turn and unload easily will be much appreciated by horse riders and carriage drivers. Parking areas should not be close to any turbines to allow horses unfamiliar with turbines to be safely unloaded and opportunity to acclimatise. Corals, tying rails and mounting blocks are valuable additional features.

20. Scottish Rights of Way and Access Society (ScotWays)

The National Catalogue of Rights of Way shows that routes DS15, DS16 and DS21 may be affected by the site boundary shown on Figure 1 Site Location of the Scoping Report. DS15 and DS16 are recorded as rights of way, whilst DS21 is listed as an “other route”. A map is enclosed showing rights of way DS15 and DS16 highlighted in orange and other route DS21 highlighted in yellow. As there is no definitive record of rights of way in Scotland, there could be additional routes that meet the criteria to be rights of way but have never been recorded because they have not come to our notice.

It appears that the applicant is aware that the Southern Upland Way (SUW) lies shortly to the east of the proposed wind farm site. Closer still, right of way DS17 forms part of a route promoted for its historic interest by the Heritage Paths project; both this old route and the affected section of the SUW are described in our popular publication Scottish Hill Tracks.

For ease of reference, on the enclosed map, the SUW has been highlighted in pink and the Heritage Path has been highlighted in green. If further information is required about routes over a wider search area in order to prepare the Environmental Impact Assessment, the applicant is welcome to contact us directly.

You will no doubt be aware there may now be general access rights over any property under the terms of the Land Reform (Scotland) Act 2003. The Society is pleased to note that the Scoping Report mentions Core Paths (p26), the plans of which have been prepared by local authorities as part of their duties under this Act.

Although I understand that there is very little guidance regarding the siting of turbines in relation to established paths and rights of way, I would like to draw your attention to the following:

Extract from the Welsh Assembly Government’s Technical Advice Note on Renewable Energy (TAN 8) Proximity to Highways and Railways

2.25 It is advisable to set back all wind turbines a minimum distance, equivalent to the height of the blade tip, from the edge of any public highway (road or other public right of way) or railway line.

Neither the Society nor its individual officers carries professional indemnity insurance and in these circumstances any advice that we give, while given in good faith, is always given without recourse.

I hope the information above is useful to you. Please do not hesitate to contact me if you need more detail or if you have any further queries.

21. Prestwick Airport

The development is located roughly 40km to the south east of Glasgow Prestwick Airport. Using estimated co-ordinates from the maps provided the site appears to be well terrain shielded from our Primary Surveillance Radar.

However only once we have firm co-ordinates for each of the turbines can we conduct a full assessment for each and give a more definitive response as to whether we would have a safeguarding objection.

22. BT

We have studied this Windfarm proposal with respect to EMC and related problems to BT point-to-point microwave radio links.

The conclusion is that, the Project indicated should not cause interference to BT's current and presently planned radio networks.

23. Carsphairn Community Council

No comments Received

24. Carsphairn Heritage Group

Scoping Response for the proposed Shepherds' Rig Wind Farm east of Carsphairn.

The proposed development is in an area dominated by forestry plantation. The forestry was planted on what were two sheep farms, Smeaton, sometimes known as Smittons planted in 1967 and Craigengillan planted in 1971. It is easier to look at the built heritage in the areas which have been felled.

- We do not know whether in the late 60s or early 70s it was obligatory for the forestry companies to consult the local authority with regard to the archaeology and cultural heritage of the proposed planting area.
- Bearing that in mind we would wish to make the following points having explored the area as much as possible without venturing into the unfelled areas which are dark and dense.
- Cultural heritage includes dykes(stone walls) stells (stone built sheep shelters) and buchts (enclosed areas built of stone into which farmers and shepherds gathered sheep). There is evidence of all three in the proposed area.
- We note in the proposed area that, 40 years ago, trees were often planted very close to dykes resulting in damaged dykes where timber has fallen. The dykes may be several hundred years old.

- Trees were planted extremely close to any bucht that we can see and they too have been or may be damaged by falling timber.

As hill sheep farms become rarer it is important to preserve and conserve their working heritage. We would urge that any wind farm development takes the protection of the cultural heritage described above into consideration when planning tracks, compounds, turbine positions or any other new structure connected with the development of the site.

There are no active or planned heritage trails for the proposed site as far as we are aware.

With reference to the key questions for consultees we do not know of any current or recent archaeological work or projects within or in the vicinity of the Development site.

We do not consider that any of the settings of the sites in Table 9.1 or Table 9.2 with the exception of the Craigengillan cairn will be affected. We note that the positioning of turbine 11 is some way from the cairn.

25. Carsphairn Renewable Energy Fund Ltd

Following a meeting of CREFL Directors last night, I have been asked to let you know that CREFL will not be sending in a response to the report, as it is felt that Carsphairn Community Council is the appropriate body to do this at this stage.

We understand that a response has been requested from them also, so we will leave things to them.

APPLICATION AND ENVIRONMENTAL STATEMENT CHECKLIST

	Enclosed	
1. Applicant cover letter and fee cheque	<input type="checkbox"/>	
2. Copies of ES and associated OS maps	<input type="checkbox"/>	
3. Copies of Non Technical Summary	<input type="checkbox"/>	
4. Confidential Bird Annexes	<input type="checkbox"/>	
5. Draft Adverts	<input type="checkbox"/>	
6. E Data – CDs, PDFs and SHAPE files	<input type="checkbox"/>	
<hr/>		
Environmental Statement	Enclosed	ES Reference (Section & Page No.)
7. Development Description	<input type="checkbox"/>	
8. OS co-ordinates for site and turbine layout	<input type="checkbox"/>	
9. Planning Policies, Guidance and Agreements	<input type="checkbox"/>	
10. Natural Heritage	<input type="checkbox"/>	
11. Economic Benefits	<input type="checkbox"/>	
12. Site Selection and Alternatives	<input type="checkbox"/>	
13. Construction and Operations (outline methods)	<input type="checkbox"/>	
14. Decommissioning	<input type="checkbox"/>	
15. Grid Connection details	<input type="checkbox"/>	
16. Carbon Assessment (include spreadsheet)	<input type="checkbox"/>	
17. Design, Landscape and Visual Amenity	<input type="checkbox"/>	
18. Archaeology	<input type="checkbox"/>	
19. Ecology, Biodiversity & Nature Conservation	<input type="checkbox"/>	
20. Designated Sites	<input type="checkbox"/>	
21. Habitat Management	<input type="checkbox"/>	
22. Species, Plants and Animals	<input type="checkbox"/>	
23. Water Environment - Hydrology	<input type="checkbox"/>	
24. Geology - Peat survey data and risk register	<input type="checkbox"/>	
25. Forestry	<input type="checkbox"/>	
26. Waste	<input type="checkbox"/>	
27. Aviation	<input type="checkbox"/>	
28. Telecommunications	<input type="checkbox"/>	
29. Noise	<input type="checkbox"/>	
30. Shadow Flicker	<input type="checkbox"/>	
31. Traffic Management	<input type="checkbox"/>	
32. Cumulative Impacts	<input type="checkbox"/>	

FORMAL SUBMISSION OF APPLICATION AND GATE-CHECKING

Applicants should note that prior to any application being accepted by the Energy Consents and Deployment Unit it will pass through a gate-checking exercise in which the content of the final Environmental Statement will be checked against the above checklist and against the comments made by all consultees in the Scoping Opinion. Applicants should ensure that their final ES pays cognisance to the advice within this Scoping Opinion, and fully addresses all concerns raised.

Applicants should not publicise applications in the local and national press until the application and the corresponding press notices have been checked and confirmed as acceptable by officials.

ⁱ Bird Sensitivity Map to provide locational guidance for onshore wind farms in Scotland 2006 - J. A. Bright, R. H. W. Langston, R. Bullman, R. J. Evans, S. Gardner, J. Pearce-Higgins & E. Wilson

ⁱⁱ Map provided by Larry Griffin at WWT Caerlaverock.

ⁱⁱⁱ SNH Survey Methods for use in Assessing the Impacts of Onshore Windfarms on Bird Communities November 2005 (revised December 2010) p.29 106

APPENDIX C – CUMULATIVE SITES

Cumulative Wind Farms within 35 km	
Operational	
Hare Hill	Plascow
Clyde	Sunnyside
Harestanes	Wether Hill
Hare Hill Extension	Dalswinton
Dersalloch	Windy Standard
Windy Standard II (Brockloch Rig Phase 1)	Minnygap
Under Construction	
Blackcraig	Torrs Hill
Afton	Whiteside Hill
Sanquhar	
Appeal Granted	
Benbrack	Mochrum Fell
Linburn Farm	South Kyle
Planning Permission Granted	
Penbreck	Knockman Hill
Crookedstane Farm	Twentysilling Hill
Kennoxhead	Glenmuckloch
Knockshinnoch	Sanquhar 'Six'
Lion Hill	Sandy Knowe
Windy Rig	
Appeal Lodged	
Enoch Hill	Pencloe
Linfairn	Longburn
Polquhairn	
Application Submitted	
Balunton	Windy Standard III (Brockloch Rig Phase 2)
Knockendurrick	Lowther Hills (North Lowther Energy Initiative)
Wether Hill Extension	Lorg Hill
Margree	Harryburn
Ulzieside	Over Hill
Lethans	
Scoping	
Troston	Glenshimmeroch
Cornharrow	

APPENDIX D – ORNITHOLOGY SURVEY METHODS

Desk Study

- 22.9. Desk studies have been completed in order to collate existing available information for key species of interest that may be present in the study area. The initial desk study included searches of available online sources for data on designated sites such as the SNH Sitelink Website (<http://gateway.snh.gov.uk/sitelink/>) within 20 km of the Site. Also, the desk study focused on establishing the potential species that may be present in the area based on surveys undertaken to inform other wind farm assessments and the consultant's general knowledge of the bird fauna of the region.
- 22.10. The collated information from the desk study was used to help inform, in combination with data from the completed baseline surveys, the scoping layout and will be used to influence the final Development design and inform the assessment of the effects of the Development.

Survey Areas

- 22.11. The survey areas are based on the Site Boundary (Figure 7, Appendix A). The various survey areas are defined as follows:
- 'site area' refers to the area enclosed by the Development site boundary;
 - 'breeding bird survey area', 'winter walkover survey area', 'core survey area' or 'flight activity survey area' refers to the site area plus an additional 500 m wide strip around the site area;
 - 'black grouse survey area' refers to the site area plus an additional 1.5 km wide strip; and
 - 'raptor survey area' refers to the site area plus an additional 2 km wide strip depending on the focal species and presence of contiguous suitable habitat outside of the core survey area.

Survey Methods

- 22.12. The first year of baseline ornithological surveys were completed between October 2012 and August 2013 (Table 1). The second year of baseline ornithological surveys commenced in April 2017 and are due to be completed at the end of March 2018 (Table 2).
- 22.13. The purpose of these surveys is to systematically record and assess the use of all habitats within the survey area by breeding and non-breeding birds, with a particular focus on species that are potentially sensitive to wind farm development and are also of conservation concern (i.e. species listed on Annex 1 of the EC Birds Directive, Schedule 1 of the Wildlife and Countryside Act 1981, species on the UK Red List of birds of conservation concern). All surveys have been undertaken by suitably experienced

ornithological surveyors, who have been trained in the detailed field and recording methods of each of the surveys they are completing.

- 22.14. Listed below are some of the key published guidance and scientific papers which have been considered in determining the detailed survey methods for this project:
- SNH (2005) Survey Methods for Use in Assessing the Impacts of Onshore Windfarms on Bird Communities, 2010 version (most recently revised May 2014);
 - SNH (2012) Assessing Connectivity with Special Protection Areas (SPAs);
 - Band *et al.* (2007) Developing field and analytical methods to assess avian collision risk at wind farms;
 - Bibby *et al.* (2000) Bird Census Techniques;
 - Gilbert *et al.* (1998) Bird Monitoring Methods;
 - Brown & Shepherd (1993) A method for censusing upland breeding waders; and
 - Hardey *et al.* (2013) Raptors: a Field Guide to Survey and Monitoring.
- 22.15. The survey area and vantage point locations for the flight activity surveys are shown on Figure 8. In summary, the following surveys have been completed:
- Winter, Spring, Summer and Autumn Flight Activity Surveys, from strategically located vantage points, to systematically quantify the use of the Site by key species (i.e. species of conservation concern and susceptibility to adverse effects from wind farm development);
 - Breeding Bird Surveys involving a range of surveys completed to determine the presence and approximate location of breeding territories/sites within the core and wider survey areas, including the following:
 - Moorland breeding bird surveys of the core survey area in 2013 (April to June) and also in 2017 (April to July);
 - Breeding raptor surveys, focusing on species listed on Schedule 1 of the Wildlife & Countryside Act 1981, within suitable habitats in the raptor survey area in the Spring/Summer 2013 and Spring/Summer 2017; and
 - Black grouse lek surveys in Spring 2013 and Spring 2017 within the black grouse survey area.
 - Winter Transect Surveys involving walkover surveys to assess the use of the Site by passage and wintering birds, supplementing observations from the flight activity survey. Wintering bird walkover surveys of the core survey area were completed between October 2012 and March 2013.
- 22.16. Bird flight activity was systematically monitored from strategically located vantage points in 2012, 2013, 2017 and 2018 following the methods described in Band *et al.* (2007) and SNH (2005, revised 2014). The purpose of these surveys was to inform estimates of the frequency of flight activity, by certain 'target' species, at the estimated wind turbine

height across the flight activity survey area. Target species were recorded in preference to secondary species if a target and secondary species were in the observer's view at the same time.

- 22.17. Watches from these vantage points were usually three hours long and were timed to ensure each vantage point had observations spread throughout daylight hours each month.
- 22.18. The height above ground level of target and secondary species flights was assessed by the observer to be within one of several bands so that an estimate could be made of flight activity within the zone where turbine blades would be operating. The height bands used in the flight activity surveys were <10 m, 10-30 m, 30-50 m, 50-100 m, 100-150 m and >150 m.

Species Records

- 22.19. The following brief summary focuses on records of target species. The desk studies identified that the survey area provide potentially suitable habitat to support breeding goshawk, hen harrier, osprey and red kite, although there was no current or recent historical evidence of breeding activity by these species within the Site. Breeding pairs of peregrine falcon and barn owl were known to be present in the general area. Kestrel and buzzard were also thought to breed in the general area.

Key Findings of the Baseline Surveys

- 22.20. In general, and in relation to target species, the findings of the baseline breeding and wintering bird surveys were consistent with the information collated during the desk studies.

Geese and Swans

- 22.21. The Site was rarely visited by significant numbers of wildfowl and patterns of flight activity showed no regular local or passage movements of geese or swans over the Site. The Site provides very limited suitable habitat for wintering / passage wildfowl.
- 22.22. South west Scotland is an important region for wintering geese and swans, including several internationally important sites including the Loch Ken and River Dee Marshes, Solway Estuary, Wigtown Bay, and the River Nith. However, all of these areas are more than 10 km from the Site and although there is the potential for geese and swans to occasionally fly over the Site, primarily during passage periods, the available evidence indicates that this type of movement is highly sporadic and typically at a height that is much greater than the wind turbines would be operating. More regular movements, and greater risk to local populations from collision mortality, might be expected if the Development was located adjacent to, or in between important roosting and foraging areas, but this is not the case.

Raptors

- 22.23. Within the raptor survey area, two red kite breeding territories were recorded as occupied in 2017. Both nest sites were located less than 2 km from the site. A third red kite nest site was also identified in 2017 and was located at a distance greater than 2 km from the Site.
- 22.24. Evidence of a breeding attempt by osprey was recorded in 2013; however, despite searches, no nest location was found.
- 22.25. Evidence of a breeding attempt by goshawk was recorded within the Site during 2017; however, despite searches, no nest location was found.
- 22.26. There was no evidence of breeding hen harrier in 2013 or 2017 or osprey in 2017. However, both these species were observed periodically and to varying frequencies during the flight activity surveys (see Tables 3 and 4).
- 22.27. During September 2017, a hen harrier winter roost site was found within the wider survey area; however the roost site was only occasionally used by a single male and wasn't recorded after October 2017.

Black Grouse

- 22.28. There was no evidence of lekking black grouse within the Site or black grouse survey area in 2013 or 2017. Two lekking males were observed in 2013, at a distance greater than 1.5 km to the east of the Site, near Round Craigs.
- 22.29. The only record of black grouse within 1.5 km of the site was of an individual male on 03 November 2017.

Waders

- 22.30. The survey area did not support breeding waders of moderate or high Nature Conservation value. Breeding wader species, typical of the habitats present in the area, are present in very low numbers and included oystercatcher, common sandpiper and snipe.

Barn Owl

- 22.31. One barn owl breeding site was confirmed during 2017, however it was at a distance greater than 2 km from the Site.

Other Species

- 22.32. The survey area supports a suite of breeding songbirds typically associated with upland moorland habitats (comprising a mosaic of acid/marshy grassland, heath and blanket bog vegetation) and commercial conifer plantation in south-west Scotland. The vast majority of species recorded are relatively widespread and common (that is, their populations are not of conservation concern in Scotland). The moorland breeding bird assemblage is considered to be relatively species-poor,

with extensive areas supporting low densities of relatively low number of moorland passerine species.

Flight Activity Surveys

- 22.33. A summary of the observed flight activity by target species is provided in Tables 3 and 4. Tables 3 and 4 give a summary of the number of flight lines (and number of birds for flight lines representing more than one bird) recorded during 2012, 2013 and 2017 within the flight activity survey area. Tables 3 and 4 also provide a summary of the distribution of time recorded at the six flight height bands for each species⁷².
- 22.34. Considering the length of the survey period and the survey effort as a whole, flight activity by target species was relatively infrequently recorded within the flight activity survey area, reflecting the generally poor habitat quality for most of the target species. The most frequently observed target species within the flight activity survey area was red kite with 32 flights followed by osprey (14), greylag goose (14), goshawk (11), and hen harrier (5). By comparison the most frequently recorded species (including secondary species) during the flight activity surveys was buzzard with a total of 410 flights observed.

⁷² N.B. Data collection is on-going until end of March 2018 and full results will be presented within the EIA.

Table 1: Summary of survey effort during 2012-2013. Data are in hours (hrs)													
Survey Type	Vantage Point	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Grand Total
Black grouse lek survey								3.50	6.50				10.00
Barn owl survey											0.58		0.58
Vantage Point Watches	VP1	7.00	6.00	5.50	6.00	6.00	6.50	7.50	7.00	6.50	9.50	7.50	75.00
	VP2	8.00	6.50	6.00	6.00	6.00	4.50	7.50	7.50	6.50	9.50	7.50	75.50
	VP3	9.00	6.50	5.75	6.00	6.00	4.50	6.00	8.00	9.50	8.00	7.50	76.75
	VP4		7.50	6.50	6.00	6.00	10.50	7.50	8.00	8.00	8.00	7.50	75.50
	Total	24.00	26.50	23.75	24.00	24.00	26.00	28.50	30.50	30.50	35.00	30.00	302.75
Moorland bird survey								5.25	10.00	1.50			16.75
Raptor survey								14.50	12.75	13.00	12.00		52.25
Winter transect survey		4.00	5.00	3.50	5.00	4.00	2.75						24.25

Table 2: Summary of survey effort during 2017. Data are in hours (hrs)											
Survey Type	Vantage Point	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Grand Total
Black grouse lek survey		10.83	12.50								23.33
Barn owl survey		0.58			3.83						4.42
Hen harrier roost survey							2.25	2.00			4.25

Table 2: Summary of survey effort during 2017. Data are in hours (hrs)											
Vantage Point Watches	VP2	3.00	13.00	8.00	6.00	6.00	6.17	6.00	6.00	4.00	58.17
	VP3	6.50	9.50	8.00	6.00	6.00	6.00	6.00	6.00	4.00	58.00
	VP5	5.00	10.50	8.00	6.00	6.00	6.00	6.00	5.00	4.00	56.50
	VP6	8.00	9.08	8.00	6.00	6.00	6.00	6.00	5.00	4.00	58.08
	Total	22.50	42.08	32.00	24.00	24.00	24.17	24.00	22.00	16.00	230.75
Moorland bird survey		5.32	17.25	10.87	5.17						38.60
Raptor survey		22.08	37.82	13.60	20.37						93.87

Table 3: Flight activity, in seconds, observed within the flight activity survey area, 2012-2013												
Species	Season	VP number	No of flights	No of birds	Total fly time (s)	Number adjusted total (s)	<10m	10-30m	30-50m	50-100m	100-150m	>150m
Goshawk	Apr-Aug	VP4	1	1	7	7		7				
Greylag goose	Sep-Mar	VP3	1	4						*		
Hen harrier	Sep-Mar	VP4	1	1	49	49		16	33			
Red kite	Apr-Aug	VP3	7	7	948	948	98	296	315	239		
Merlin	Apr-Aug	VP1	1	1	44	44			44			
Osprey	Apr-Aug	VP2	1	1	270	270			120	150		
		VP3	8	11	637	806	200	389		46	62	108
Whooper swan	Sep-Mar	VP1	1	2	174	348					94	254
		VP4	1	10	90	900					900	
Geese sp.	Sep-Mar	VP2	1	13							*	*

Table 4: Flight activity, in seconds, observed within the flight activity survey area, 2017												
Species	Season	VP number	No of flights	No of birds	Total fly time (s)	Number adjusted total (s)	<10m	10-30m	30-50m	50-100m	100-150m	>150m
Barnacle goose	Sep-Mar	VP6	1	160						*		
Goshawk	Apr-Aug	VP2	5	5	751	751	2	35	33	75	60	545
		VP3	1	1	51	51		17	17	17		
		VP5	3	3	23	23	9	14				
	Sep-Mar	VP3	1	1	43	43	43					
Greylag goose	Apr-Aug	VP2	4	10			*	*	*	*		
		VP3	7	14				*	*	*		
		VP6	2	27						*		
Hen harrier	Apr-Aug	VP3	1	1	78	78	16		16	47		
		VP6	1	1	46	46	46					
	Sep-Mar	VP6	2	2	512	512	375	137				
Hobby	Apr-Aug	VP3	1	1	43	43		43				
Red kite	Apr-Aug	VP2	6	6	833	833		94	280	291	92	76
		VP3	10	11	2329	2563	16	327	528	998	355	339
		VP6	7	7	981	981	120	200	205	317	137	
	Sep-Mar	VP6	2	2	566	566	184	382				
Osprey	Apr-Aug	VP2	2	2	271	271			15	225	31	
		VP3	3	3	387	387		73	93	221		
Pink-footed goose	Sep-Mar	VP6	1	5							*	*

Cover image for illustrative purpose only



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