CLASHINDARROCH II WIND FARM

Scoping Report 2017

Prepared for: Vattenfall Wind Power Ltd

Technical Appendix 6.1

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Clashindarroch II Wind Farm

Environmental Impact Assessment Scoping Report

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1.0 INTRODUCTION

1.1 Background

Vattenfall Wind Power Ltd ('Vattenfall') is promoting a proposed wind farm development at Clashindarroch, Aberdeenshire. The location of the site is shown on Figure 1.1. The proposed Clashindarroch II development (the proposed development) would be sited adjacent to the existing Clashindarroch Wind Farm.

As the proposed development is at an early stage in the Environmental Impact Assessment (EIA) process, there is limited baseline information available at this time. An initial layout has been prepared and it is anticipated that the layout will evolve through the EIA process. A candidate turbine has yet to be selected, however, it is currently anticipated that the proposed development will comprised 16 turbines with a tip height of 149.9m. The generating capacity of the proposed development is currently unknown but it is anticipated that it would exceed 50MW.

Vattenfall acknowledges that the intended application is for a generating station whose generating capacity exceeds 50MW and constitutes a Schedule 2 development as provided for by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (as amended 2008). As the development is partially located within a commercial forestry plantation and will require felling of trees, the assessment will also consider the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999. Vattenfall wishes to establish the scope of that EIA through this document. The aforementioned Electricity Works and Forestry EIA Regulations (2000 and 1999 respectively) will be referred to collectively hereafter as the 'EIA Regulations'.

Vattenfall has appointed SLR Consulting Ltd (SLR) to undertake a scoping study and prepare this Scoping Report to accompany a request to the Scottish Government Local Energy Consents, to adopt a Scoping Opinion under the EIA Regulations.

The findings of the EIA process will be used to inform the final design of the proposed development and assess its predicated environmental effects. The results will be presented in an Environmental Statement (ES) that will be submitted with the application consent under Section 36 of the Electricity Act 1989 (the 1989 Act).

1.2 Purpose of the Scoping Report

Undertaking an EIA scoping study is regarded as good practice [1] and is considered to be an important step in EIA as it allows all parties involved in the process to agree on key environmental issues relevant to the proposed development and to agree on the methodology used for their assessment.

The specific aims of this Scoping Report are:

- To identify the technical subject areas that may be subject to significant environmental effects as a result of the development proceeding and therefore require further study;
- To identify the technical subject areas that are unlikely to be subject to significant environmental effects and can be scoped out from further study;

[1] A Handbook on EIA, SNH revised 2013

- To provide a basis for a consultation process to agree the scope and content of the EIA with Aberdeenshire Council (AC); and
- To provide a basis for agreeing methodologies for undertaking required studies with AC based upon currently available baseline data, site characteristics and best practice in individual technical disciplines.

In arriving at its formal scoping opinion, it is anticipated that AC will consult with a number of consultees and incorporate their view within the Scoping Opinion.

1.3 Vattenfall Wind Power Limited

Vattenfall is one of the world's leading wind power developer and operators, operating wind turbines in Sweden, Denmark, the Netherlands and the UK. In the UK, Vattenfall operates eight wind farms totally 698.2MW and another 374.8MW under construction.

Further information on Vattenfall Wind Power Limited can be found on its corporate web site at http://corporate.vattenfall.co.uk/.

1.4 SLR Consulting Limited

SLR is the UK's fastest growing multi-disciplinary environmental consultancies. Within the energy sector, SLR provides a wide range of planning, environmental and technical services relating to the design and development of wind farms and other renewable energy projects. The company becomes involved in all aspects of facility development, from initial concept design, through planning and permitting to the detailed design, construction management and closure stages.

SLR is a registered Environmental Impact Assessor and Member of the Institute of Environmental Management and Assessment (IEMA). The company has significant experience in the preparation of Section 36 applications and undertaking EIA for a wide variety of projects, including renewable energy, minerals, waste and infrastructure developments.

Further information on SLR Consulting Limited can be found on its corporate web site at www.slrconsulting.co.uk.

1.5 Report Structure

Following this introductory section, the remainder of this report comprises the following sections:

Section 2	provides a description of the site and its surroundings;
Section 3	provides a description of the proposed development;
Section 4	describes the process of scoping the EIA and the proposed approach to consultation;
Section 5	outlines that planning policy context for the proposed development;
Sections 6 to 15	describe the specialist environmental studies that are proposed to be undertaken to assess the impact of the proposed development on the environment;

Section 16 describes the other environmental topics which have been considered and are to be 'scoped out' of assessment; and

Section 17 concludes by providing contact details for SLR with whom any matters contained within this report may be discussed in greater detail prior to responding to the scoping exercise.

2.0 SITE AND SURROUNDINGS

2.1 Site Location and Topography

The application site is located within Clashindarroch Forest, approximately 6km to the south west of the settlement of Huntly, Aberdeenshire. The entire site is located within the AC administrative boundary. The site is owned by Forestry Commission Scotland.

The area of the site extends to 1560ha, with the proposed wind turbines located in the southern part of the site. Access to the site would be taken from the A920 and would utilise as far as possible the existing onsite access tracks.

The site is located approximately 6km to the south west of Huntly and 55km north west of Aberdeen. Nearby settlements include Rhynie, Haugh of Glass and Cabrach .

The site is predominately covered by commercial forestry but has some areas of open moorland and ancient woodland. The forestry is of varying ages and will be felled at the appropriate time.

There are no statutory ecological designations within the site. Nearby statutory designations include

- Craigs of Succoth Site of Special Scientific Interest (SSSI),
- Moss of Kirkhill SSSI,
- Rhynie Chert SSSI,
- Hill of Towanreef SSSI and Special Area of Conservation (SAC) and
- The Tips of Cosesmaul and Tom Mor SSSI and Special Protection Area (SPA),

There are no landscape designations within the site. Nearby landscape designations include:

- Bennachie SLA,
- Upper Don Valley SLA,
- Howe of Cromar SLA,
- Moray Area of Great Landscape Value

The Cairngorms National Park (CNP) (including Wild Land and National Scenic Area designations) is located to the south west of the site.

There are no archaeological or cultural heritage designations within the site. Wormy Hillock is the closest designated site to the site.

3.0 DESCRIPTION OF THE DEVELOPMENT

3.1 The Proposed Development

Careful consideration has been given to the provisional layout of the proposed development, and the design evolution will progress as the EIA progresses, taking into account environmental and technical constraints, and feedback obtained during consultation.

Although the layout will be optimised through the EIA and conceptual design process, based on preliminary feasibility work, it is anticipated that the proposed development would consist of the following components:

- in the order of 16 turbines each with an installed capacity in excess of 50MW when considered with the existing development;
- power cables linking the turbines laid in trenches underground;
- met mast;
- substation and control building;
- energy storage facility;
- on-site access tracks;
- crane hardstandings adjacent to each turbine;
- temporary site construction compound and associated infrastructure; and
- borrow pits.

3.1.1 Turbines

A candidate turbine manufacture and model will be selected during the design and EIA process. The candidate turbine is likely to have a blade tip height of 149.9m and be of a tubular tower design with three rotor blades on a horizontal axis, finished in a light grey semi-matt colour.

An indicative layout of 16 turbines is shown on Figure 3.1.

3.1.2 Grid Connection

A connection to the grid is likely to be made at the existing grid connection associated with the Clashindarroch Wind Farm. The precise route of cabling has not yet been determined.

3.1.3 Access

It is anticipated that access to the site from the A920 would be provided along much of the same route used for the original Clashindarroch Wind Farm, initially via existing forestry routes onto the highway network. To reach the access junction on the A920 large vehicles would travel east along the A920 from the A96.

3.1.4 Borrow Pits

Material for the construction of on-site tracks would, where possible, be derived from borrow pits within the site should the materials found be suitable. The potential for borrow pits and their location and design of borrow pits will be defined as part of the EIA process and site design.

3.1.5 Forestry

The development area includes part of Clashindarroch Forest, which is owned and operated by Forest Enterprise Scotland (FES). The forestry chapter of the ES will verify the baseline situation within the forest and assess the implications of the construction, operation and decommissioning of the proposed wind farm on forestry activities. The study will follow standard FES assessment methodology, including detailed examination of existing forest structure, site topography and ground conditions. Other issues to be addressed include the extent of forest clearance, restock proposals, stability of the forest stands, timescales for felling and opportunities for habitat management improvements. The effects of felling will be addressed within each relevant ES chapter.

3.1.6 Energy Storage

The development will include an energy storage facility in order to deliver supportive services to the local and wider grid network. The facility location and design will be defined as part of the EIA process and site design.

3.2 Construction Works

The duration of the construction works is expected to be in the order of 18 months.

4.0 ENVIRONMENTAL IMPACT ASSESSMENT

4.1 Introduction

The EIA will be undertaken in accordance with the EIA Regulations and the best practice guidelines of the Institute of Environmental Management and Assessment (Guidelines for Environmental Impact Assessment) published in 2003. The principal purpose of the EIA will be to assess in a systematic manner the likely significant environmental effects of the development.

It should be noted that the EIA Regulations (as discussed in Section 1.1) are currently being revised as a result of the new EIA Directive (2014/52/EU) which needs to be transposed into UK legislation by 16th May 2017. The Scottish Government's consultation period, on how the Directive will be transposed in the Regulations, ran from 9th Aug 2016 to 31st October 2016. Since this request for a Scoping Opinion is made prior to the updated EIA Regulations coming into force in the UK, it is noted that there is no statutory obligation for the EIA to comply with the new requirements of the 2014 Directive. However, Vattenfall wish to take a proactive approach to the proposed development and the anticipated requirements of the new Regulations have been considered in the scope of work proposed e.g. addition of population and human health impacts; and consideration of impacts on flora and fauna as impacts on 'biodiversity'. The principal purpose of the EIA will be to assess in a systematic manner the likely significant environmental effects of the proposed development.

Throughout the process of undertaking the EIA, the results obtained will be used in an iterative manner to influence the design of the development, in order that any significant detrimental environmental impacts can be minimised or negated completely through the careful design of mitigation measures. The EIA Regulations specify that the ES should describe those:

"aspects of the environment likely to be significantly affected by the development, including in particular population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and inter-relationship between the above factors."

4.2 Potential Environmental Effects

Previous experience of other wind farm development sites, combined with knowledge of the site and possible effects of the proposed development, has identified the following topics for consideration in the EIA. A summary of known baseline conditions of relevance, predicted effects, any outline mitigation measures that can be recommended at this stage and the proposed scope for the EIA is provided for each of these topic areas in Sections 6 to 14.

These are:

- Landscape and Visual;
- Ecology;
- Ornithology;
- Soils, Geology and the Water Environment;
- Noise;
- Access, Traffic and Transportation;
- Cultural Heritage;
- Aviation and Defence;
- Telecommunications;
- Forestry; and

- Other Issues.

For each topic that is identified as requiring further study, a detailed technical assessment will be carried out in accordance with the scope and methodology agreed with relevant consultees. Each technical assessment will be carried out by an appropriate qualified consultant to prevailing technical standards and reported in a dedicated ES Chapter.

Impacts and Effects

For clarity, the following terms are defined:

Impact: any change attributable to the proposed development.

Effect: is the consequence of any impacts arising from the proposed development on an environmental receptor.

Type of Effect

All effects need to be considered as part of the EIA, these pertain:

- **Direct effects –** which occur because the proposed development (or part of) is directly connected to the environmental receptor.
- **Indirect effects –** arise through a consequence of a connected environmental receptor being directly impacted by the proposed development.
- **Cumulative effects –** result due to a number of concurrent projects influencing the same environmental receptor.

The assessment of effects upon environmental receptors will cover the period over the construction and operation of the proposed development. These are considered as follows:

- **Construction –** environmental effects may result from construction activities; these effects are likely to be temporary in duration.
- **Operation –** environmental effects may result from the proposed development during the operational phase; these effects are likely to be long term or permanent.

The spatial scope will differ between disciplines. The proposed geographical survey areas will be outlined and agreed for each individual scope area.

4.2.1 Assessment of Effects

The assessment of potential effects, using appropriate methodologies, will take into account the construction and operation of the proposed development in relation to the Site and its environs.

An assessment of the effects of the decommissioning of the proposed development at the end of its operational life will not be undertaken as part of the EIA as the future baseline conditions (environmental and other developments) cannot be predicted accurately at this stage. Furthermore, the proposals for decommissioning and site restoration as well as the future regulatory context are unknown. It is also envisaged that the decommissioning effects would be equal to or less than those effects experienced during the construction phase. For these reasons, it is proposed that the assessment of effects resulting from decommissioning activities is scoped out of the EIA.

Methodologies for predicting nature and magnitude of any potential environmental effects vary according to the technical subject area. Numerical or quantitative methods of

assessment can predict values which can be compared against published thresholds and indicative criteria contained in relevant guidance and standards.

Not all technical subject areas are capable of being assessed numerically or quantitatively, and thus, qualitative assessments are used. Such assessments rely on previous experience of similar projects, environments and professional judgement.

4.2.2 Sensitivity of Receptors

The sensitivity of the baseline conditions is defined according to the relative sensitivity of existing environmental features on or in the vicinity of the Site, or by the sensitivity of receptors which would potentially be affected by the proposed development. Criteria for the determination of sensitivity or importance will be established based on prescribed guidance, legislation, statutory designation and/or professional judgement. The criteria for each environmental parameter will be outlined in the ES according to the technical subject area.

4.2.3 Magnitude of Effects

The magnitude of effects on environmental baseline conditions will be identified through detailed consideration of the proposed development, taking due cognisance of any legislative or policy standards or guidelines, and/or the following factors:

- The degree to which the environment is affected, e.g. whether the quality is enhanced or impaired;
- The scale or degree of change from the baseline situation;
- Whether the effect is temporary or permanent, indirect or direct, short term, medium term or long term;
- Any in-combination effects; and
- Potential cumulative effects.

In some cases the likelihood of effect occurrence may also be relevant, and where this is a determining feature of the assessment this will be clearly stated.

4.2.4 Significance of Effects

Assessing the significance of effects relies, at least in part, on value judgements, including placing weight or value on the environment likely to experience the change. The significance of an effect is derived from an analysis of:

- The sensitivity of the environment to change, including its capacity to accommodate the kinds of changes the proposed development may bring about;
- The amount and type of change, often referred to as the impact magnitude which includes the timing, scale, size and duration of the effect;
- The likelihood of the effect occurring, which may range from certainty to a remote possibility;
- Comparing the effects on the environment which would result from the proposed development with the changes that would occur without the proposed development – often referred to as the “do nothing” or “do minimum” comparison; and
- Expressing the significance of the effects of the proposed development, usually in relative terms, based on the principle that the more sensitive the resource, the more likely the changes and the greater the magnitude of the changes, compared with the do nothing comparison, the greater will be the significance of the effect. Where relative significance is reported the assessment will identify the threshold for significant effects.

4.2.5 Mitigation

Mitigation is considered an integral part of the overall design strategy for the proposed development. SLR and Vattenfall adopt an iterative approach to design whereby mitigation is assessed and considered at all stages.

Where significant environmental effects are predicted in the EIA process, the ES will provide measures to eliminate or ameliorate the effects to acceptable levels. Mitigation measures are envisaged through the consideration of alternatives, physical design, project management and/or operation to prevent, reduce or, where possible, offset any adverse significant effects. Mitigation measures follow standard techniques and best practice and are, therefore, considered to be effective for the purposes of assessment.

4.2.6 Residual Effects

Any remaining effects of the proposed development, following implementation of available mitigation measures will be referred to as 'residual effects'. The EIA will assess each residual effect and identify a significance level.

4.2.7 Cumulative Effects

An assessment will be made of the likely cumulative effects of the proposed development in combination with other wind farm developments in proximity to the proposed site which:

(1) Have been submitted to the relevant consenting body but not yet determined;
(2) Consented;
(3) Are under construction; or
(4) Are operational.

The extent to which the potential combined effects through that co-existence will be considered, is described (as appropriate) throughout Sections 6 to 15 of this Scoping Report. The results of each technical assessment will be reported in the ES and will be accompanied by technical appendices and illustrative material where relevant.

4.3 Consultation

4.3.1 Pre-scoping Consultation

During the process of undertaking the pre scoping meeting was held in January 2017 to discuss the proposed development.

4.3.2 Scoping Consultation

A copy of this Scoping Report will be issued to key consultees and stakeholders. Bodies to be consulted include statutory agencies and selected other bodies. The purpose of the consultation is to identify:

- key local issues and concerns;
- issues of environmental importance that may affect the proposed development;
- existing information that will be of assistance in the assessment of the environmental effects; and
- the need for further consultation.

The agencies and bodies to be consulted are noted in Table 4-1 (although this is not considered to be an exhaustive list at this stage and further consultation will be undertaken as recommended in any scoping opinion).

Table 4-1
Proposed Consultees

Consultee/ Stakeholder	Topic(s)
Aberdeen Airport	Aviation
Aberdeen & Grampian Chamber of Commerce	Socio-economic
Aberdeenshire Council	General consultation, landscape and visual, noise methodology, private water supply information, socio-economics, traffic & transport, ,ecology and ornithology.
Archaeology Service for Aberdeenshire, Moray and Angus	Archaeology/ Cultural Heritage
Association of Salmon Fishery Boards	Ecology, river information/fisheries
British Horse Society Scotland	Access and recreation
BT	Telecommunication
Cabrach Community Association	General consultation
Cairngorms National Park Authority (CNPA)	Landscape
Civil Aviation Authority – Airspace (CAA)	Aviation
The Crown Estate	River information/fisheries
Cycling Scotland	Access and recreation
Defence Estates / Ministry of Defence (MoD)	Aviation
Deveron District Salmon Fishery Board (DDSFB)	Ecology, river information/fisheries
Forestry Commission Scotland (FCS)	Forestry
Gartly Community Association	General consultation
Glass Community Association	General consultation
Historic Environment Scotland (HES)	Cultural Heritage
Huntly Community Council	General consultation
Huntly Nordic Ski Club	Access and recreation
Joint Radio Company (JRC)	Telecommunication

Consultee/ Stakeholder	Topic(s)
Marine Scotland	Ecology
National Air Traffic Services (NATS)	Aviation
North East Scotland Raptor Study Group (NERSG)	Ornithology
OfCom	Telecommunication
Ramblers Association	Access and recreation
RSPB Scotland	Ornithology
Scottish Association for Country Sports	Recreation
Scottish Badgers	Ecology
Scottish Environment Protection Agency (SEPA)	Flooding information, surface water quality data, surface water flow data, rainfall data, groundwater quality and elevation data, licensed discharges and licensed abstractions Carbon emissions. Waste (only if it is a concern regarding disposal of peat). Ecology.
Scottish Natural Heritage (SNH)	Landscape and Visual Impact Assessment methodology and receptors. Ecology and Ornithology
Scottish Ornithology Club (SOC)	Ornithology
Scottish Rights of Way and Access Society (Scotways)	Access and Recreation
Scottish Water	Public water supply infrastructure
Scottish Wildlife Trust (SWT)	Ecology and Ornithology
Strathbogie Community Council	General consultation
Sustrans	Access and recreation
Tap o'Noth Community Council	General consultation
Transport Scotland	Traffic and Transport

5.0 PLANNING POLICY CONTEXT

The proposed development will be considered under Section 36 (s.36) of the Electricity Act 1989. As part of the S.36 application process, the applicant will request that the Scottish Ministers issue a Direction under s.57(2) of the Town and Country Planning (Scotland) Act 1997 ("the 1997 Act") that deemed planning permission be granted for the proposed development.

Schedule 9 paragraph 3 of the Electricity Act 1989 sets out environmental features which the decision maker must have regard to and identifies that mitigation must be considered. Sub-paragraph 1 is relevant to an applicant if they hold a License at the date the application is submitted. Sub-paragraph 2 applies to all applicants and refers to sub paragraph 1. Sub-paragraph 2 states:

> "*In considering any relevant proposals for which his consent is required under section 36 or 37 of this Act, the Secretary of State shall have regard to—*
>
> (a) *the desirability of the matters mentioned in paragraph (a) of sub-paragraph (1) above; and*
>
> *(b) the extent to which the person by whom the proposals were formulated has complied with his duty under paragraph (b) of that sub-paragraph*."

Sub paragraph 1 states:

> "*In formulating any relevant proposals, a licence holder or a person authorised by exemption to generate, transmit, distribute or supply electricity*
>
> *(a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and*
>
> *(b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."*

The ES will not assess the proposed development against the relevant planning policy. This will be done in a separate Planning Statement. The planning statement will consider the positive and negative significant effects of the prosed development as set out in the EIA. It will consider the findings of the EIA in the context of the decision making process.

The planning input to the ES will focus on the relevant development plan, and material considerations. The development plan for the site comprises the Aberdeen City and Shire Structure Plan (2009) and the Aberdeenshire Local Development Plan (2012). The Aberdeenshire Local Development Plan is currently in the process of being revised. Aberdeenshire Council submitted the Proposed Local Development Plan 2015 for examination on 1st December 2015. It is envisaged that the emerging Local Development Plan will be formally adopted and published in early 2017.

5.1 Development Plan

5.1.1 Aberdeen City and Shire Strategic Development Plan (2009)

Within the Aberdeen City and Shire Strategic Development Plan is a target "*for the city region's electricity needs to be met from renewable sources by 2020."* In order to meet the target local development plans and supplementary guidance will identify areas or technology which can contribute to the supply of renewable energy.

5.1.2 Aberdeenshire Local Development Plan (2012)

The key policy within the Aberdeenshire Local Development Plan relevant to the proposed development is Policy 3 – Development in the Countryside. The supporting text attached to Policy 3 notes that the policy will be used to meet the needs of business proposals that, by their very nature, will need a rural location, such as minerals development, landfill development, wind energy and other renewable energy facilities.

5.1.3 Aberdeenshire Local Development Plan (2012) Supplementary Guidance

Supplementary Guidance Policy 'Development 2 – Wind farms and medium to large wind turbines' notes that the Council will approve wind energy development, subject to other policies, if it is located, sited and designed in accordance with the following criteria. The applicant must demonstrate that:

1) *"The proposal will not compromise public health and safety; AND*
2) *The proposal will be set back from roads and railways to a greater distance than the height of the turbine(s) proposed; AND*
3) *(I) The safety of UK aerodromes, aircraft and airspace is not adversely affected (including radar or air traffic control systems of National Air Traffic Services (NATS);*
   (II) it does not significantly impede or compromise the safe and effective use of any defence assets (including radar or air traffic control systems of the Ministry of Defence (MoD);
   (III) It does not adversely affect the quality of radio or TV reception;
   (IV) It does not have a detrimental impact on the safeguarding zones for airports, airfields, airstrips (either licensed or unlicensed), aircraft flight paths, or MoD low-flying areas; AND
4) *The proposal will not have a significant adverse effect on the amenity of dwelling houses; AND*
5) *The proposal will not have a significant adverse effect on tourism or recreation interests, including users of any Core Path or other established access for walking, cycling or horse riding; AND*
6) *Assessment of the proposal has taken into consideration the cumulative impacts of neighbouring wind turbines, wind farm development previously granted consent and valid application which have not yet been determined. At least these cumulative impacts should include potential impacts on landscape, local amenity and natural heritage."*

In all cases, the Council will impose appropriate conditions (along with a legal agreement under Section 75, where necessary), relating to the removal of the turbine(s) and associated equipment, and to the restoration of the site, whenever the consent expires or the project ceases to operate for a specific period.

5.2 Aberdeenshire Proposed Local Development Plan (2017)

The Proposed Local Development Plan (2016) has introduced policies and proposals that tackle climate change. The policies contained within the proposed plan encourage the development of new renewable energy resource.

Policy C2 – Renewable energy notes that AC will support solar, wind, biomass and hydro-electricity developments which are in appropriate sites and of the right design.

Policy C2 notes that turbines greater than 15m in height will not be allowed in an area of "significant protection" unless it can be demonstrated that any significant effects on the qualities for which the area is identified can be substantially overcome.

All wind turbines must not compromise public health or safety, and must not adversely affect aircraft or airfields and/or telecommunications.

Policy C2 states that "*applications for wind turbines will only be approved if they comply with the layout, siting and design prescriptions set out in the Strategic Landscape Capacity Assessments for Wind Turbines (2014).*

5.3 Material Considerations

Material considerations relevant to the proposed development include, but are not limited to the following documents:

- Scottish Planning Policy (Scottish Government, June 2014);
- The National Planning Framework 3 (Scottish Government, June 2014);
- Onshore Wind Turbine Specific Advice Sheet (Scottish Government, updated May 2014);
- Planning Advice Note (PAN) 1/2011 Planning and Noise (Scottish Government, March 2011);
- PAN 2/2011 Planning and Archaeology (Scottish Government, March 2011);
- PAN 1/2013 Environmental Impact Assessment (Scottish Government, August 2013);
- PAN 51 Planning, Environmental Protection and Regulation (Scottish Government, August 2004);
- PAN 75 Planning for Transport (Scottish Government, August 2005); and
- PAN 79 Water and Drainage (Scottish Government, September 2006).

6.0 LANDSCAPE AND VISUAL

6.1 Environmental Baseline and Potential Sources of Impact

The Landscape and Visual Impact Assessment (LVIA) will be prepared by Chartered Landscape Architects in accordance with current guidance. The LVIA will identify and assess the potential effects during the construction, operational and decommissioning stages that the proposed development may have on the landscape and visual resource of the 40km radius study area. The LVIA will also outline mitigation measures that will be implemented to prevent, reduce, or offset potential adverse landscape and visual effects.

6.1.1 Landscape Character

The site lies within the Grampian Outliers landscape character area within the Moorland Plateau landscape character types as defined within the Scottish Natural Heritage (SNH) South and Central Aberdeenshire Landscape Character Assessment (1998) and as illustrated on Figure 6.1. The Moorland Plateau is part of the transitional landscape between the much higher Grampian Mountains within the Cairngorms National Park to the west and south, and the lowland rolling agriculture landscapes, to the east and north. The landscape consists of distinct ridges and open moorland summits which contrast with the surrounding farmed landscape. However, the area the site lies within is more forested than open moorland. The site also lies near the boundary within the 'Open Uplands with Settled Glens' landscape character type described within the recently revised Moray and Nairn Landscape Character Assessment relating to Moray Council's Wind Energy Landscape Capacity Study (July 2016). These adjacent uplands are at a similar elevation to the Moorland Plateau but are consistently more open than forested. A more detailed analysis of landscape character within approximately 15km of the site will be carried out in order to reflect local landscape variations which may not be reflected in the SNH national assessments. The key landscape characteristics of each landscape character type or area in the study area with predicted visibility of the proposed wind farm will be described, together with the nature of views and the value of each landscape character type.

It is understood that SNH are currently updating the landscape character assessments for all areas of Scotland. These assessments will be utilised if they are published before the commencement of the LVIA. The landscape character types covering the site and surrounding study area identified in the currently published SNH national data set are shown on Figure 6.1.

6.1.2 Landscape Designations

Aberdeenshire has ten proposed Special Landscape Areas (SLAs) set out within supplementary guidance in April 2016 to support Policy E2; Landscape; of the Aberdeenshire Local Development Plan (LDP) 2016. The site does not lie within any of the SLAs but several of them lie within the study area including the Bennachie SLA, Upper Don Valley SLA, and Howe of Cromar SLA. The Cairngorms National Park (CNP) (including Wild Land and National Scenic Area designations) and Areas of Great Landscape Value (AGLV) designations within Moray Council (MC) lie adjacent to the AC boundary within the proposed study area. Further designations include several Gardens and Designed Landscapes (GDL) listed in the Historic Scotland Inventory. The special qualities and or citations for these various designated landscapes will be identified and the effects of the proposed wind farm will be assessed against these qualities. All relevant landscape designations within the study area are shown on Figure 6.2.

6.1.3 Visual Receptors

The range of visual receptors within the study area will be identified which is anticipated to include the following:

- Residential properties within 2km of the wind farm will be the subject of a Residential Visual Amenity Survey which will be a Technical Appendix of the ES.
- Settlements including Cabrach, Bridgend (River Bogie), Haugh of Glass and Keith.
- Road users including on the A941 (Rhynie to Elgin), A920 (Huntly to Dufftown), A97 (Banff to Ballater), A96 (Aberdeen to Inverness), A95 (Boat of Garten to Banff), and B9002 (south of the site).
- Users of the Speyside Way and Gordon Way long distance footpaths as well as Core Paths and the many summits within the Cairngorms National Park;
- Users of the cycle network including National Cycle Route 1 (Dover to Shetland) (aka Eurovelo 12 and North Sea Cycle Route); and
- Recreational visitors to attractions including the Malt Whisky Trial focussed on Dufftown and also several castles and historic houses. In addition, the many visitors to outdoor pursuits within the CNP and wider area.

6.1.4 Potential Sources of Impact

The proposed development will have a direct impact on the landscape fabric or physical elements of the landscape on the site due to the removal or alteration to the vegetation and land cover to accommodate the various components of the wind farm. The main source of landscape and visual impacts from the proposed development will be the appearance of the turbines from the surrounding landscape resource and in views obtained by people in the surrounding area. The effect of other elements of the proposed development which may be visible from the surrounding area, such as the access track and substation will also be assessed.

6.2 Method of Assessment and Reporting

The LVIA of the proposed Clashindarroch II wind farm will be undertaken to assess the potential effects of the proposed wind farm on the landscape resource and visual amenity within a 40km radius study area. The assessment will also address potential cumulative landscape and visual effects.

The aim of the LVIA is to identify, predict and evaluate potential effects arising from the proposed wind farm. Wherever possible, identified effects are quantified, but the nature of landscape and visual assessment requires interpretation by professional judgement. In order to provide a level of consistency to the assessment, landscape sensitivity to change, the prediction of magnitude of impact and assessment of significance of the residual effects has been based on pre-defined criteria which are based on guidance provided in the GLVIA 3, as refined for the purposes of wind farm assessment and taking account of Scottish Natural Heritage (SNH) guidance.

Landscape sensitivity will be assessed by combining the value of the landscape as recognised through designation or by consideration of a range of other criteria (landscape quality, scenic quality, rarity, representativeness, conservation interest, recreational value, perceptual aspects and associations), with its susceptibility to change of the nature envisaged from wind farm development. Landscape susceptibility can be defined by consideration of landscape character, quality or condition, aesthetic and perceptual aspects as well as planning policies and strategies. Sensitivity will be defined as high, medium or low based on professional interpretation of a combination of parameters.

Viewpoint sensitivity will be assessed by combining the value of a particular view with susceptibility of the visual receptor which is a function of the occupation or activity of people at any particular location. Sensitivity would be defined as high, medium or low based on interpretation of a combination of parameters.

The magnitude of change arising from the proposed development will be described as substantial, moderate, slight or negligible based on the interpretation of a number of largely quantifiable parameters, such as size of scale of change, geographical extent as well as duration and reversibility.

Landscape and visual effects will be assessed as major, major / moderate, moderate, moderate / minor, minor and negligible with effects identified as major or major / moderate being considered significant effects in terms of the EIA Regulations.

Reference to the sensitivities and recommendations within the Aberdeenshire Strategic Landscape Capacity Assessment for Wind Turbines (2014) will be also considered within the design development and assessment.

6.2.1 Wind Farm Design and Development

The wind farm is at an early stage with environmental baseline data being gathered and assessed which will inform the layout development. It is envisaged that landscape and visual considerations will be a key input to the design development process. Analysis of the landscape of the site and immediately surrounding area will be undertaken to identify key landscape and visual characteristics and sensitivities. Key cumulative sites to be considered in addition to the existing Clashindarroch Wind Farm include Dorenell and Hill of Towie in Moray and Glens of Foundland and Dummuies in Aberdeenshire.

Following completion of the main baseline landscape and visual assessment, design objectives will be developed and used to evaluate a series of layout options. These layouts will be examined from key design viewpoints to assess and optimise the number, size and layout of the proposed turbines in relation to the landform of the site and surrounds as well as adjacent wind farm development. The design iteration process will take account of other environmental and technical factors to establish the final layout for the proposed wind farm. The design optimisation process will be reported and illustrated in the Environmental Statement.

6.2.2 Study Areas

The currently proposed turbines are 149.9m to blade tip height. Consequently, in accordance with SNH's Visual Representation of Windfarms Good Practice Guidance (December 2014), the study area will be 40 km radius from the outer edges of the proposed turbines.

Also in accordance with SNH's Cumulative Impact guidance (2012) a plan showing wind farms within 60km will be prepared identifying the location and status of these developments. However, it is proposed that the study area for the cumulative assessment will also be 40km and that the wind farms to be included will be agreed with AC and SNH during the consultation process to consider those relevant to the identification of significant cumulative effects from the proposed development.

6.2.3 Zones of Theoretical Visibility

Computer generated Zones of Theoretical Visibility (ZTVs) from a starting point for the LVIA as they identified the parts of the study area which will have potential visibility of the

development in terms of landscape character areas or types, landscape designations and visual receptors.

In addition to blade and hub height ZTVs, cumulative ZTVs for the wind farm developments agreed to be included in the assessment will be prepared. Analysis of the cumulative ZTVs will inform the selection of sequential routes through the landscape to be assessed.

6.2.4 Assessment

Once the baseline landscape and visual context has been established and following completion of the design optimisation process, the detailed assessment will be undertaken.

The assessment will be carried out in accordance with the agreed methodology to identify the susceptibility and overall sensitivity of the landscape and visual receptors in the study area, as well as the magnitude of change, including cumulative change and related effects on these receptors caused by the proposed development.

An assessment of the potential effects on both landscape character and visual amenity arising from the proposed development at each of the agreed viewpoints will be carried out. This assessment will involve the production of computer generated wirelines and, in some cases, photomontages to predict the views of the proposed turbines from each of the agreed viewpoints. The existing and predicted views from each of these viewpoints will be analysed to identify the magnitude of change and the residual effects on landscape character and visual amenity based on field work as well as desk based assessment.

The findings of the LVIA will draw on the viewpoint assessment as well as desk study and field work to identify effects on landscape character, landscape designations and visual amenity receptors in the study area.

6.2.5 Viewpoint Selection

Initial ZTV analysis and site work has been carried out based on the currently proposed turbine layout for the proposed development in order to identify a list of suggested viewpoints representative of the main landscape and visual receptors within the study area, and at varying distances, directions and elevations from the proposed development. These consider the viewpoints assessed in 2009 for the existing Clashindarroch Wind Farm and also those viewpoints highlighted as important within the Aberdeenshire Strategic Landscape Capacity Assessment for Wind Turbines (2014).

Subsequent to the issue of the draft scoping report, a site visit was undertaken and the viewpoint list was updated to include more detailed locations for the approximate locations given previously. In addition the viewpoint at Cabrach Churchyard was removed due to confirmation of no visibility of the proposed development at this location or within the vicinity. The viewpoint on the A97 at Mossat was also removed due to the potential limited visibility of the proposed development and lack of an appropriate viewpoint location without any foreground screening. The updated viewpoints are listed in Table 6-1 and illustrated on the blade tip ZTV shown on Figure 6.3 Rev A. The final selection of viewpoints for assessment will be agreed with AC, MC and SNH during the consultation process.

Table 6.1 Proposed Viewpoints

VP No*	Viewpoints	Approx. Grid Ref	Landscape Character Type (LCT) / Landscape Designation	Visual Receptor Type	Approx. Elevation (AOD)	Approx. distance from Clashindarroch II (km)	Direction from nearest development area
1 (1)	Minor Road near Tillathrowie	348028,835184	Agricultural Heartlands LCT	Road users Local Residents	269m	2.8km	NE
2 (2)	Minor road near Backside	341127,836123	Straths and Valleys LCT Aberdeenshire Deveron Valley SLA	Road users Local Residents	290m	3.0km	NNW
3 (new)	Haugh of Glass	342437,839570	Straths and Valleys LCT Aberdeenshire Deveron Valley SLA	Local Residents	200m	4.5km	NW
4 (4)	Tap O'Noth	348407, 829302	Moorland Plateau LCT	Walkers	563m	5.5km	SE
5 (5)	The Buck	341229, 823385	Open Uplands LCT Moray AGLV	Walkers	723m	7.5km	S
6 (6)	Clashmach Hill	349794, 838548	Moorland Plateau LCT	Walkers	375m	6.5km	NE
7 (7)	A920 between Huntly and Dufftown	340658, 840383	Farmed Moorland Edge LCT	Road users	312m	6.8km	N
8 (8) alt	Minor Road off A941 near Bridgend	338099,831290	Open Uplands LCA Moray AGLV	Road users	300m	5.0km	WSW
9 (new)	B9022 west of Milltown of Rothiemay	353669,848635	Upland Farmland LCT	Local Residents	130m	16.0km	NE

VP No*	Viewpoints	Approx. Grid Ref	Landscape Character Type (LCT) / Landscape Designation	Visual Receptor Type	Approx. Elevation (AOD)	Approx. distance from Clashindarroch II (km)	Direction from nearest development area
10 (10)	A96 between Huntly and Keith	344694, 846105	Farmed Moorland Edge LCT	Road users	229m	12.0km	N
11 (11)	Battle Hill, Huntly	353913, 839441	Straths and Valleys LCT	Walkers	155m	10.3km	NE
12 (13)	Correen Hills	354469, 823341	Moorland Plateau LCT	Walkers	380m	13.6km	SE
13 (14)	Ben Rinnes	325506, 835441	North Eastern Hills LCT Moray AGLV	Walkers	840m	16.4km	W
14 (15)	A96 Near Forgie	338700, 854450	Upland Farmland LCT	Road users	183m	22.5km	N
15 (16)	Knock Hill summit	353707, 855141	Upland Farmland LCT	Walkers	429m	23.0km	NNE
16 (17)	Ben Aigan	330993, 848163	Upland Farmland LCT Moray AGLV	Walkers	471m	19.5km	NW
17 (new)	A96 layby, near Dummuie Wind Farm	357530, 835730	Agricultural Heartlands LCT	Road users	250m	12.0km	ENE
18 (19)	Summit of Oxen Craig	366283,822591	Moorland Plateau LCT Aberdeenshire Bennachie SLA	Walkers	528m	24.5km	SE
19 (new)	Newmill, nr Keith	343592,852367	Deveron and Bogie Straths LCA or Open Uplands LCA Aberdeenshire Deveron Valley SLA or Moray AGLV	Local Residents	200m	4.5km	NW

VP No*	Viewpoints	Approx. Grid Ref	Landscape Character Type (LCT) / Landscape Designation	Visual Receptor Type	Approx. Elevation (AOD)	Approx. distance from Clashindarroch II (km)	Direction from nearest development area
			(depending on exact location of viewpoint tbc)				
20 (29)	View from the Ladder Hills	327930, 818866	North-Eastern Hills LCT Cairngorms National Park	Walkers	754m	19.0km	SW
21 (30)	Meikle Balloch	347163, 849563	Upland Farmland LCT	Walkers	365m	16.0 km	N

**** For ease of reference viewpoint numbers in brackets indicate Clashindarroch 2009 ES viewpoint number***

6.2.6 Consultation

A consultation meeting will be held with AC, MC and SNH in order to identify and agree the key matters likely to be of concern which should be addressed in the LVIA, including the cumulative context. Agreement will also be sought on the proposed methodology, study areas and preliminary list of viewpoint locations issued with this Report.

Further consultations will be carried out by email and telephone to agree the scope of the cumulative assessment and the final selection of representative viewpoints as well as related visualisation requirements.

6.2.7 Matters Scoped Out

As discussed in Section 6.2.2, it is proposed that the study area for the cumulative assessment will be 40km radius and that the wind farms to be included will be agreed with AC and SNH during the consultation process to consider those relevant to the identification of significant cumulative effects from the proposed development.

6.3 References and Standard Guidance

The LVIA will be prepared in accordance with the Guidelines for Landscape and Visual Impact Assessment (GLVIA 3), Landscape Institute and the Institute of Environmental Management and Assessment (2013). It will also take account of the following:

- Aberdeenshire Local Development Plan, (2016);
- Aberdeenshire Strategic Landscape Capacity Study for Wind Turbines (2014);
- Aberdeenshire Special Landscape Areas, supplementary guidance (2016);
- Moray Wind Energy Landscape Capacity Study (Consultation Draft, July 2016)
    - Siting and Designing Windfarms in the Landscape Version 3, SNH (February 2017);
    - Visual Representation of Windfarms - Good Practice Guidance, Version 2.2, SNH (February 2017);
- Assessing the Cumulative Impact of Onshore Developments, SNH, March (2012);
- Use of Photography and Photomontage in Landscape and Visual Assessment, Landscape Institute Advice Note, 01/11 (2011);
- Landscape Character Assessment, The Countryside Agency and Scottish Natural Heritage (SNH) 2002; and
- SNH Review 37: National programme of landscape character assessment: Banff and Buchan (1994)
- SNH Review 101: Moray and Nairn landscape character assessment (1998)
- SNH Review 102: South and Central Aberdeenshire landscape character assessment (1998)
- SNH Review 75: Cairngorms landscape assessment (1996)
- Cairngorms National Park Landscape Toolkit (2012)
- SNH Commissioned Report 375: The Special Landscape Qualities of the Cairngorms National Park (2010).

The assessment will also take cognisance of relevant national and local landscape planning policy.

7.0 ORNITHOLOGY

7.1 Environmental Baseline and Potential Sources of Impact

7.1.1 Scope of Study

MBEC Ecological Consultants were appointed by Vattenfall in April 2015 to carry out baseline ornithological surveys for the site of the proposed Clashindarroch II wind farm. A map showing an indicative wind turbine layout was provided by Vattenfall at that time and this was used to define the extents of the various survey areas (see Figure 7.1). The indicative wind turbine layout has changed since April 2015. However the various bird survey areas from 2015-16, including the vantage point viewsheds for the flight activity survey, still include the current layout with sufficient buffer zones.

Data collated for the assessment of the original Clashindarroch wind farm proposal and results from more recent ongoing monitoring of the now operational wind farm were taken into consideration in determining the focal species, appropriate scope and duration of the baseline surveys for the assessment of the Clashindarroch II wind farm.

The overall aim of the surveys was to systematically record and, where appropriate, quantify use of the survey area by the key species of interest. A focus was given to bird species, identified in guidance and from the scientific literature, of moderate to high sensitivity to the effects from the construction and/or operation of onshore wind farms. Particular consideration was also given to those species whose populations are also of conservation concern in the UK and/or Europe, such as:

- Species listed on Annex I of European Council Directive 2009/147/EC on the conservation of wild birds (that is, Annex I species), in particular those that may be associated with populations of species that are qualifying interests of Special Protection Areas in the wider area;
- Species listed in Schedule 1 to the Wildlife and Countryside Act 1981, as amended (Schedule 1 species); and
- Species of national conservation concern, not include within the above categories, but that are potentially present within the study area in nationally or regionally important numbers.

The focal species for this study (also referred to as key ornithological receptors) are listed in Table 7.1, below. This includes breeding & wintering raptors, breeding moorland waders and potential overflights of the site by wintering / passage geese. Common gull was also included due to the proximity of breeding colonies of this species, which are also designated as Special Protection Areas, to the proposed development site (see Section 7.1.2 for further details).

Table 7.1: Key Ornithological Receptors and their Legal and Conservation Status

Common name	Scientific Name	Sch. 1[i]	Ann. I[ii]	UK BOCC[iii]	BAP[iv]	SBL[v]
Pink-footed goose	*Anser brachyrhynchus*			Amber		
Greylag goose	*Anser anser*			Amber		
Black grouse	*Tetrao tetrix*			Red	✓	✓
Hen harrier	*Circus cyaneus*	✓	✓	Red		✓
Goshawk	*Accipiter gentilis*	✓		Green		
Osprey	*Pandion haliaetus*	✓	✓	Amber		✓

Curlew	*Numenius arquata*			Red	✓	✓
Golden plover	*Pluvialis apricaria*		✓	Green		✓
Common gull	*Larus canus*			Amber		
Merlin	*Falco columbarius*	✓	✓	Red		✓
Peregrine	*Falco peregrinus*	✓	✓	Green		✓

i. Species listed on Schedule 1 to the Wildlife and Countryside Act 1981 (as amended).

ii. Species listed on Annex I of the EC Birds Directive (Directive 2009/147/EC on the conservation of wild birds - the codified version).

iii. Birds of Conservation Concern (BoCC) in the UK (Eaton et al*. 2015).*

iv. Priority species in the 2007 UK Biodiversity Action Plan, The UK BAP has been superseded by the UK Post-2010 Biodiversity Framework (JNCC 2012).

v. Species included on the Scottish Biodiversity List (2005), which is part of the Scottish Biodiversity Strategy (originally published by the Scottish Government in May 2004).

The following ornithological baseline surveys have been completed between May 2015 and August 2016:

- Flight activity surveys (May 2015 – July 2016), with a minimum of 160 hours of observation completed from each of 3 vantage points covering the proposed wind farm site;
- Woodland breeding bird survey (April – July 2016);
- Breeding raptor survey (May – July 2015 and March – August 2016); and
- Black grouse survey (April 2016).

The survey areas referred to in this report, and shown on Figure 7.1, are defined as follows:

- The 'core survey area' is defined as the indicative proposed wind turbine locations plus a surrounding 500 m wide buffer (shown as the '500 m turbine buffer'). Key receptors and all other bird species of conservation concern were considered surveyed within this area. This core area was also the focal area for the flight activity surveys.
- The 'black grouse survey area' includes the 500 m turbine buffer plus a further 1.5 km buffer for the 2015 surveys and a 1 km buffer for the 2016 surveys.
- The 'Schedule 1 raptor survey area' extended up to 2 km from the turbine area for both the 2015 and 2016 surveys. This area was surveyed for breeding activity by hen harrier, peregrine and merlin with a smaller area up to 1 km from the proposed wind turbine areas being the focus for goshawk and other woodland raptor and owl species.

All surveys were completed by suitably experienced and, where necessary, licensed surveyors following current SNH guidance (SNH 2005, most recently updated in May 2014). This guidance refers to the preference for 2 years of baseline surveys to be completed for wind farm EIA. In this case two breeding seasons have been surveyed (with some limitations with respect to the relatively late start of surveys in 2015) and one complete autumn-winter-spring period. This level of survey effort is considered to be sufficient in the context of the key species of interest using the site and the amount of information from other sources that is available to reliably characterise the ornithological sensitivity of the site. However, consultation is ongoing to confirm whether SNH is in agreement that there is sufficient baseline data available to inform the assessment of the proposed wind farm.

The following section provides a summary of the key findings from the desk studies and baseline surveys completed to date.

7.1.2 Baseline Summary

Designated Sites

The proposed wind farm site is not located within any site designated solely, or in part, for its ornithological interest. Statutory and non-statuary sites designated for ornithological interest that occur in the surrounding area are shown on Figure 8.1.

The closest statutory site designated for its ornithological interest is the Tips of Corsemaul and Tom Tor Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and RSPB Important Bird Area (IBA). The closest part of the SPA (it consists of two separate locations) is approximately 6 km north-west of the nearest proposed wind turbine. The IBA designation covers three separate areas to the north-west of the survey area; these are located at Gallow Hill, Tips of Corsemaul, and Ben Main. The ornithological interest of the site is related to breeding colonies of common gull (*Larus canus*); the site was estimated to have supported 15,870 pairs in 1998, representing 23% of the GB population and 3% of the world population.

There are a number of biological SSSIs within the wider area (for example, Craigs of Succoth SSSI and Hill of Towanreef SSSI). These sites are designated primarily for their botanical interest and the relative rarity of the grassland and heathland habitats associated with serpentine rock outcrops, an uncommon feature in Scotland.

Previous Studies Relating to Clashindarroch Wind Farm

A review was completed of the data presented in the Clashindarroch Wind Farm Environmental Statement (Chapter 11: Ornithology), published in April 2009 and also of the Ornithological Monitoring Report, published in November 2015; which provides details of ornithological surveys that were carried out as part of an Ornithological Monitoring Programme for the now operational Clashindarroch wind farm. The surveys included general breeding bird and point count surveys, as well as breeding raptor surveys and vantage point flight activity surveys for specific notable species. The results of these surveys are summarised below.

Goshawk was the only notable raptor species recorded within the wind farm area during the initial baseline surveys for the wind farm. A single nest was found in the northern sector of the site, with a further probable nest located toward the southern end of the site, where a number of display flights were observed. Hen harrier were recorded on the edge of the site, and a breeding pair were confirmed approximately 1.5 km from the edge of the survey area.

Breeding raptor surveys carried out in 2013 and 2014 identified one pair of breeding goshawk and one pair of breeding hen harrier within the 750 m study area in both years of survey. Further goshawk nests were confirmed in the wider area (that is, within 2 km of the buffer boundary), with two nests and a total of five fledged young in 2013, and four nests and nine fledged young in 2014.

Following the breeding raptor surveys, it was concluded that the operational wind farm was not having any negative impact on breeding goshawk or hen harrier populations.

There were no records of black grouse from the surveys carried out in 2008 for the EIA. However, they were believed to be present in the wider area, as records from external sources showed that lekking males had been observed approximately 1.5 km to the south of the application site.

Surveys for black grouse leks were carried out in both 2013 and 2014. No leks were observed within the survey area (encompassing the site plus a 1.5 km buffer). However, up to 31 lekking males were recorded outside of the buffer area in 2013; their close proximity to the buffer suggested that this species could possibly be breeding within the study area for the operational wind farm. None of these leks are within the black grouse survey area for the proposed development.

A total of 48 bird species were recorded during the breeding bird surveys carried out for the EIA. These included two Annex I species (hen harrier and merlin), four Schedule 1 species (goshawk, merlin, hen harrier, and common crossbill), six UK red-list species, and 17 amber-list species.

A total of 44 species were recorded during the breeding bird surveys carried out in 2013 and 2014 as part of the wind farm monitoring study. Notable observations include two curlew registrations in 2014, nine cuckoo in 2014, 96 song thrush in 2014, two spotted flycatcher in 2013, 20 mistle thrush in 2014, five bullfinch in 2014, and 76 common crossbill in 2014.

The vantage point surveys for breeding raptors carried out as part of the ornithological monitoring programme in 2013-14 were focused on Schedule 1 / Annex I raptor species, as well as wildfowl (geese and swans). Goshawk was the most frequently recorded species, with 29 timed flights with an average duration of 156 seconds, followed by hen harrier, with 21 timed flights averaging 115 seconds duration. Short-eared owl, merlin and peregrine were also recorded, with flight times for these species being much lower.

A pair of breeding merlin were confirmed in 2015, with at least two chicks fledging within the 750 m raptor study area.

2015-16 Flight Activity Surveys of the Proposed Development Site

The location of the vantage points selected for the flight activity survey of the proposed development site are shown on Figure 7.1. The vantage point viewsheds and the mapped flight lines, for both target and secondary species, relative to the proposed wind farm site are detailed in a separate report summarising the 2015-16 survey results and this report has been provided to SNH. A summary of the observations of key species from the flight activity survey are provided in Tables 7.2 and 7.3 below.

Table 7.2: Number of Flights / Number of Birds for Target Raptor & Owl Species per Month (the number of flights recorded per hour of observation is in parentheses).

Year	Month	Goshawk	Hen harrier	Honey buzzard	Osprey	Short-eared owl
2015	May					
	Jun.			1 / 1 (0.04)	1 / 1 (0.04)	
	Jul.					
	Aug.					
	Sep.					
	Oct.					
	Nov.	1 / 1 (0.02)	1 / 1 (0.02)			3 / 3 (0.05)
	Dec.					
2016	Jan.					
	Feb.	3 / 3 (0.11)				
	Mar.	14 / 14 (0.42)				
	Apr.	1 / 1 (0.02)				

Year	Month	Goshawk	Hen harrier	Honey buzzard	Osprey	Short-eared owl
	May	2 / 2 (0.04)				
	Jun.	1 / 1 (0.03)				
	Jul.					

Table 7.3: Number of Flights / Number of Birds for Other Target Species per Month (the number of flights recorded per hour of observation is in parentheses).

Year	Month	Curlew	Greylag goose	Golden plover	Pink-footed goose
2015	May				
	Jun.				
	Jul.				
	Aug.				
	Sep.				1 / 7 (0.26)
	Oct.				
	Nov.				1 / 90 (1.59)
	Dec.			1 / 45 (2.14)	2 / 42 (2)
2016	Jan.			1 / 25 (0.93)	1 / 6 (0.22)
	Feb.				2 / 184 (6.81)
	Mar.		1 / 24 (0.73)		7 / 595 (18.03)
	Apr.	1 / 2 (0.04)	1 / 9 (0.16)		7 / 934 (16.39)
	May				1 / 17 (0.31)
	Jun.				
	Jul.				

Flights that were wholly or partially within the collision risk height band are provided in in Tables 7.4 and 7.5 below.

Table 7.4: Number of Flights of Target Raptor and Owl Species Occurring at Risk Height (total number of birds at risk height in parentheses)

Year	Month	Goshawk	Hen harrier	Honey buzzard	Osprey	Short-eared owl
2015	May					
	Jun.			1 (1)	1 (1)	
	Jul.					
	Aug.					
	Sep.					
	Oct.					
	Nov.	1 (1)	1 (1)			
	Dec.					
2016	Jan.					
	Feb.	1 (1)				
	Mar.	7 (7)				
	Apr.	1 (1)				
	May	2 (2)				

Year	Month	Goshawk	Hen harrier	Honey buzzard	Osprey	Short-eared owl
	Jun.	1 (1)				
	Jul.					

Table 7.5: Number of Flights of other Target Species Occurring at Risk Height (total number of birds at risk height in parentheses)

Year	Month	Curlew	Greylag goose	Golden plover	Pink-footed goose
2015	May				
	Jun.				
	Jul.				
	Aug.				
	Sep.				
	Oct.				
	Nov.				
	Dec.			1 (45)	
2016	Jan.			1 (25)	
	Feb.				
	Mar.				1 (110)
	Apr.	1 (2)			3 (244)
	May				1 (17)
	Jun.				
	Jul.				

The flight activity results did not highlight locations or ‘corridors’ where flight activity by key species was concentrated to such an extent that it would be appropriate to avoid siting wind turbines. In relation to goshawk it was also necessary to consider that the pattern and level of flight activity would be expected to decrease markedly once the trees had been cleared to accommodate the construction and operation of the wind turbines.

Goshawk was the most frequently recorded target raptor species, with 22 flight lines recorded during the survey as a whole, all but one of these flights occurred between February and June, coinciding with the breeding season and peak display period for this species.

One hen harrier flight line was recorded during the 2015/16 flight activity surveys. This was of a male bird on the eastern edge of the survey area, flying partly at collision risk height in November 2015.

A single osprey flight line was recorded during the 2015/16 flight activity surveys, in June 2015. The record was of an adult bird flying across the Red Hill / Craigie Beg area, partly at collision risk height.

A single female honey buzzard was recorded once during the flight activity surveys. The flight occurred in June 2015, and occurred entirely within the collision risk height band. This was a notable record given the relative rarity of this species in the UK. Following this observation, the potential for a breeding attempt to be occurring in the area was carefully

considered during the 2015 and 2016 raptor surveys. No further evidence of the use of the site by this species was found.

Common kestrel (secondary species, not included in the summary tables above) was the most frequently observed raptor species, with a total of 34 flight lines recorded through the survey period as a whole. This species was recorded in several areas of the site, in both the summer and winter periods, with the majority of flight activity occurring at and below collision risk height. Flight activity was concentrated in two key areas: at Craigie Beg / Red Hill towards the northern end of the site, and over the area of clear-fell north of The Shank, where birds were seen hunting on several occasions.

Breeding Raptors

The key findings from the breeding raptor and owl surveys during 2015 and 2016 are provided in Table 7.6 below. The mapped locations are provided on a figure within a separate confidential report that will be provided to SNH (this information is confidential due to the potential risk to some species from human persecution, egg collectors etc.).

Table 7.6: Summary of Breeding Raptor and Owl Survey Results 2015-16

Species	Site ID	Breeding Status		Notes
		2015	2016	
Goshawk	GI1	Confirmed	Possible early breeding attempt that failed	Confirmed breeding in 2015. Some evidence of an early breeding attempt in 2016 but appears to have failed.
	GI2	Probable		Probable breeding attempt in 2015. GI2 is the only site within 500 m of the indicative turbine layout. No evidence of breeding at this location in 2016.
	GI3	Possible /unknown		Possible breeding attempt in 2015. No evidence of breeding at this location in 2016.
Sparrowhawk	SH1	Confirmed		One confirmed sparrowhawk territory in 2015, but none confirmed in 2016.
Common buzzard	BZ1	Confirmed		One confirmed common buzzard territory in 2015, but none confirmed in 2016.
Common kestrel	K.1	Confirmed		One successful common kestrel breeding attempt in 2015 with adults feeding young. None confirmed in 2016.
Long-eared owl	LE1		Probable	An adult bird was flushed in 2015 from the south of the 2 km survey area and is probably nesting in the surrounding area. No evidence of this species breeding in 2016.
Hen harrier	HH1		Confirmed	This site was outwith the 2 km survey area, however a breeding attempt was confirmed at this location in 2016 (see Confidential Annex for further details).
Tawny owl	TO1-6		Probable	Approximately six breeding territories were recorded (calling males) in 2016.

No goshawk pairs were confirmed as breeding within the 1 km survey area in 2016, however there was one probable breeding attempt. An adult male was heard alarm-calling close to an old nest, however that nest was confirmed not to have been used as a breeding site in 2016.

Outwith the 1 km survey area but within the 2 km raptor survey area, one goshawk pair was confirmed as successfully breeding in 2015; this was located to the east of the 2 km survey area. An adult female bird was observed with possibly two juveniles in close proximity to an empty nest that was considered likely to have been used by goshawk. A possible goshawk nest was identified towards the eastern 2 km survey boundary; however there was insufficient evidence to confirm a breeding attempt at this location.

Whilst there is suitable habitat for hen harrier in a small number of locations to the west and south of the survey area, the only sighting of hen harrier in 2015 was a male bird recorded during the flight activity surveys.

One confirmed sparrowhawk breeding attempt was noted on the eastern edge of the survey area, at Slack Meathland. A female bird was observed carrying prey to a nest site and juvenile birds were heard calling. A successful common kestrel breeding attempt was recorded approximately 1 km to the south of the core survey area to the south of Boganclogh Lodge. Adult birds were observed feeding fledged young at this location. Two common buzzard territories were recorded within suitable woodland habitat.

No goshawk sites had evidence of successful breeding attempts in the survey area during the 2016 surveys. However, there was activity recorded during the early part of the breeding season at the GI2 breeding site, but not enough evidence to confirm a breeding attempt. As surveys were prioritised within the 1 km goshawk survey area, less evidence was obtained from outwith this area. There was no other breeding evidence from within the 2 km raptor survey area, including in the vicinity of sites GI1 and GI3.

Hen harrier were observed in the same location (HH1) where breeding was suspected in 2015, which is outside of the 2 km survey area. In June 2016 a female was observed leaving and returning the same location on the ground, a food pass was recorded in the same area, and the birds were seen to chase a kestrel from this location, which strongly suggests that there was a nest in this area.

A long-eared owl was flushed just outwith and to the south of the 2 km survey area. Suitable mature woodland in this area suggests this species is probably breeding in the surrounding area.

A total of six probable tawny owl territories were recorded from surveys in 2016, all evidence from calling males in suitable woodland breeding habitat.

There was no evidence of breeding by short-eared owl occurring within the survey area during 2015 or 2016. A single bird was observed in flight within the site on one occasion during November 2015.

Black Grouse

The black grouse surveys were carried out in 2016 in areas that were considered to be suitable habitat for the species including potentially suitable lekking sites. No observations of this species were made during any of the surveys.

Breeding Birds (excluding raptors and owls)

During the breeding bird surveys that were carried out in 2016, a range of bird species were recorded that were considered to be typical of the habitats in which are present.

On the whole there was a relatively low density of breeding territories recorded, across both the open and wooded habitats within the survey area. There was also an absence of evidence of any breeding waders from the open moorland areas (and very few waders recorded during other surveys). Similarly, the number of red grouse and moorland passerines was also low overall.

Table 7.8 lists all bird species (with the exception of raptors and owls) that were recorded during the 2016 breeding bird surveys, as well as their conservation status.

Table 7.8: List of all Species Recorded during Breeding Bird Surveys Completed in 2016 (excluding raptor and owl species) and their Conservation Status

Common Name	Scientific Name	Sch.1[i]	Ann. I[ii]	BoCC[iii]	UK BAP[iv]	SBL[v]
Red grouse	*Lagopus lagopus*			Amber	✓	
Woodpigeon	*Columba palumbus*			Green		✓
Great spotted woodpecker	*Dendrocopos major*			Green		✓
Jay	*Garrulus glandarius*			Green		
Goldcrest	*Regulus regulus*			Green		✓
Coal tit	*Parus ater*			Green		
Chiffchaff	*Phylloscopus collybita*			Green		
Willow warbler	*Phylloscopus trochilus*			Amber		
Wren	*Troglodytes troglodytes*			Green		
Blackbird	*Turdus merula*			Green		
Song thrush	*Turdus philomelos*			Red		
Mistle thrush	*Turdus viscivorus*			Red		
Robin	*Erithacus rubecula*			Green	✓	✓
Dunnock	*Prunella modularis*			Amber		
Meadow pipit	*Anthus pratensis*			Amber		✓
Chaffinch	*Fringilla coelebs*			Green	✓	
Bulfinch	*Pyrrhula pyrrhula*			Amber		
Common crossbill	*Loxia curvirostra*	✓		Green		
Siskin	*Carduelis spinus*			Green	✓	✓

i. Species listed on Schedule 1 to the Wildlife and Countryside Act 1981 (as amended).

ii. Species listed on Annex I of the EC Birds Directive (Directive 2009/147/EC on the conservation of wild birds - the codified version).

iii. Birds of Conservation Concern (BoCC) in the UK (Eaton et al. *2015).*

iv. Priority species in the 2007 UK Biodiversity Action Plan (UK), The UK BAP has been superseded by the UK Post-2010 Biodiversity Framework (JNCC 2012).

v. Species included on the Scottish Biodiversity List (2005), which is part of the Scottish Biodiversity Strategy (originally published by the Scottish Government in May 2004).

Other Notable Species Records

There were two records of crossbills during the flight activity surveys. These occurred in February and March 2016, one record being of a group of 16 birds. Crossbills were also occasionally observed during the walkover breeding bird surveys carried out in 2016.

A woodcock (*Scolopax rusticola*), which is on the UK Red list and the Scottish Biodiversity List, was observed 'roding' (male breeding display flight) in March 2106, outside the core survey area at the south-eastern end of the 2 km raptor survey area. A single woodcock was flushed from the edge of a forest track, towards the eastern edge of the survey area, in dense pole stage plantation at the eastern end of Cloichedubh Hill, in September 2016.

Seventeen flights of common gull were recorded in survey area during the flight activity surveys. All sightings were made during May and June 2015. These were mainly of individual birds, with a small number of groups of two or three recorded. Almost all flights involved some time within the collision risk height band.

2015-16 Baseline Survey Conclusions

The surveys completed between May 2015 and July 2016 confirmed the presence of at least one pair of breeding goshawk within the survey area and up to two others in the wider raptor survey area. Hen harrier (1 pair) were confirmed as breeding in 2016 but the nest site was outside of the 2 km raptor survey area.

Flight activity over the proposed wind farm area by any of the target species was relatively limited. The majority of the observed activity by pink-footed geese commuting over the general area was at heights well above the collision risk height band. Goshawk flight activity was also relatively high, with flights recorded primarily within and above the collision risk height band during the breeding season. Activity by this species in the area would be expected to reduce markedly following felling for the proposed development. Common gull activity was limited to a period in May and June 2015 and was recorded in low numbers passing through the survey area. Only one hen harrier flight line was recorded during the 2015-16 flight activity surveys.

The proposed development site is located in a commercially forested landscape which limits the number of bird species of conservation concern likely to be present, and can be subject to high levels of disturbance depending on the intensity of tree harvesting and forest management. The open moorland areas of the site appear to be suitable to support breeding waders, although none were recorded during the surveys and the proximity of the forest edge reduces the suitability of the moorland to such ground nesting birds.

There were no records of black grouse presence within the survey area. However, they are known to be present within the wider surrounding area, as shown through the results of the monitoring study for the operational Clashindarroch wind farm.

The breeding bird surveys carried out in 2016 revealed the presence of a range of widespread and commonly occurring passerine species that are considered to be typical of the habitats present. A number territories of species whose populations are of high conservation concern at a national level were recorded low numbers, including song thrush and mistle thrush. Common crossbill were recorded on a number of occasions during surveys and are considered very likely to be breeding in suitable habitat within the survey area.

7.1.3 Potential Sources of Impact

The surveys completed to date are intended to provide sufficient data to inform a robust assessment of the following main potential impacts from the proposals on the key ornithological receptors:

- 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 and roosting habitat from the operating wind farm;
- Mortality from collision with wind turbines;
- Potential cumulative impacts with the existing wind farm and other operational and proposed wind farms in the wider region; and
- Consideration of potential impacts arising from tree felling in order to accommodate the wind farm and any proposed changes to existing forest felling plans and management (also consideration of any interactions from felling and forest management on other impacts as listed above).

As part of the EIA process, the data from the baseline surveys, and relevant information collated during a comprehensive desk study, can be used to inform a full assessment of the potentially significant impacts of the proposed development and also to identify appropriate mitigation to avoid or minimise the effects.

The impacts on nesting goshawk within the proposed development area will be considered in detail in the EIA. Goshawk is listed on Schedule 1 to the Wildlife & Countryside Act 1981 (as amended) and therefore has special protection requiring careful consideration in relation to the potential for disturbance during felling and wind farm construction. In terms of the long-term impacts of habitat loss / change, it is important to make that assessment in the context of the rotational felling of commercial plantation such as Clashindarroch Forest. Also that goshawks typically have several alternative nesting sites / tree stands that they use in different years. Certain mature tree species and coupes are often preferred as nest sites. An assessment of the extent of such potentially suitable habitat that would remain after felling to accommodate the proposed development will be made. Combining this with data from raptor monitoring in the surrounding Clashindarroch Forest, it should be possible to make an informed assessment of the potential impact of the habitat change and displacement in the context of the local goshawk population and to determine if any further mitigation is required or appropriate.

In relation to other species, there will be a need to consider the potential impacts on breeding birds from the required felling and the construction process. Best practice would be followed to ensure that disturbance to all nesting bids (all of which are protected to some degree under the Wildlife & Countryside Act 1981, as amended) is minimised. This is best achieved through the sensitive timing of the felling works to avoid the main breeding season. Additionally, it will be necessary to ensure that felling does not affect breeding crossbills, which can nest outside of the main breeding season for other woodland songbirds. This issue could be addressed through pre-felling surveys.

7.2 Method of Assessment and Reporting

The approach taken to this study will draw on a range of guidance from a number of sources including guidance produced by SNH and available published scientific literature. Listed at the end of this chapter are some of the key guidance documents, considered together with professional judgement and experience of wind farm EIA, in determining the detailed approach to the baseline surveys and assessment for this proposal.

A summary description of the existing baseline ornithological interest of the study area will be included in the ES chapter, along with the assessment of the potential impacts of the wind farm proposal on the identified ornithological receptors. Detailed technical description and discussion of the baseline data will be provided in separate appendices to the ES. The nature conservation value / sensitivity of the receptors would be assessed using current best practice EIA methodology (e.g. in agreement with relevant and current SNH and CIEEM guidance). The evaluations and effect assessments would be undertaken on the basis of the field survey information collated, augmented with information available from the desk study.

Bird flight activity data will be collated and analysed to assess the potential risk to individual species of conservation concern from collision mortality, following the method described by Band *et al*. (2007). Appendices will be provided in the ES giving further detail on the source data and the collision risk calculations. Current SNH guidance on collision avoidance rates will be used in the analysis.

The EIA would be carried out using a set of standardised 'impact categories' that describe the scales at which an impact can occur and its subsequent effect(s) and significance. These impact categories have been developed following best practice guidance and professional experience and knowledge of EIA. The likely effects that the development (construction and operation) would have on the ecological interests will be assessed for their potential to be significant.

Any mitigation measures required to offset or reduce identified effects will be described and assessed along with any recommendations for ecological enhancement (e.g. habitat management proposals to help offset any potentially significant effects on sensitive habitats and species).

Any sensitive data (e.g. nest site locations of Schedule 1 raptor species) will be included in a confidential annex to the ES which will be issued to SNH and the Scottish Government only and will not be made publically available.

The previous EIA baseline surveys had established that common gulls, potentially associated with the Tips of Corsemaul and Tom Tor SPA population, tend to commute and feed along the course of the River Deveron, well to the north of the proposed development site. Occasional common gull flights through the proposed development area were observed during the 2015-16 flight activity surveys. SNH have advised (during pre-scoping consultation) that an assessment under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), is likely to be required in this case. The process, often referred to as a 'Habitats Regulations Appraisal', would be completed by the planning authority following advice provided by SNH. Following standard practice for these types of assessments, the developer, Vattenfall, will undertake a study, which will be provided with the ES documents, to help inform this process.

7.2.1 Consultation

Some initial consultation with SNH was undertaken in April 2016 with respect to confirming the key ornithological receptors for the proposed development site and to request any information that SNH may hold for the site on important habitats and species. Further consultation is ongoing during March 2017 to confirm that SNH are satisfied that there is sufficient baseline ornithological data to inform a robust assessment of the wind farm proposals.

The RSPB, Scottish Ornithologists' Club and the North East Raptor Study Group will also be consulted and requests for relevant records of key species they may hold for the study area will be made.

7.2.2 Matters Scoped Out

In relation to other designated sites in the wider area (i.e. excluding the Tips of Corsemaul and Tom Tor SPA), there are considered to be no sites with qualifying species that could be at risk of appreciable impacts from the proposed development. In relation to wild geese, the nearest relevant SPAs are 28 km north (Moray and Nairn coast SPA) and 38 km north-west (Loch Spynie SPA). Both of these sites exceed the SPA connectivity range for commuting pink-footed goose and greylag goose, as defined in current SNH guidance (SNH 2016).

7.3 References and Standard Guidance

Survey Methods

- SNH (2005) Survey Methods for Use in Assessing the Impacts of Onshore Windfarms on Bird Communities, revised May 2014.
- Bibby, C.J., Burgess, N.D., Hill, D.A. & Mustoe, S. (2000). Bird Census Techniques. Second Edition. Academic Press, London. Brown, A.F. and Shepherd, K.B. (1993). A method for censusing upland breeding waders. Bird Study 40: 189-195.
- Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods. Royal Society for the Protection of Birds, Sandy, UK.
- Hardey, J., Crick, H.Q.P., Wernham, C.V., Riley, H.T., Etheridge, B. and Thompson, D.B.A. (2009). Raptors: a Field Guide to Survey and Monitoring (2nd Edition). The Stationery Office, Edinburgh.

Impact Assessment & Mitigation

- CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition.
- SNH (2006) Assessing significance of impacts from Onshore windfarms on birds outwith Designated areas. July 2006.
- SNH (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments. March 2012.
- SNH (2013) A handbook on environmental impact assessment Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment Process in Scotland, 4th Edition.
- SNH (2016) Wind farm proposals on afforested sites – advice on reducing suitability for hen harrier, merlin and short-eared owl. January 2016.
- SNH (2016) Assessing Connectivity with Special Protection Areas (SPAs). June 2016.
- SNH (2016) Environmental Statements and Annexes of Environmentally Sensitive Bird Information Guidance for Developers, Consultants and Consultees, Version 2.

Other References

- Band, W., Madders, M. and Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at Wind Farms. In de Lucas, M., Janss, G. and Ferrer, M. (eds.) Birds and Wind Power. Quercus.
- Eaton, M. A., Aebischer, N. J., Brown, A. F., Hearn, R. D., Lock, L., Musgrove, A. J., Noble, D. G., Stroud, D. A and Gregory, R. D. (2015). Birds of Conservation 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. In *British Birds* 108, 708-746.

8.0 ECOLOGY

8.1 Environmental Baseline and Potential Sources of Impact

This section provides a brief summary of baseline (non-avian) ecological data collected to date and potential sources of impacts.

8.1.1 Scope of Study

Desk-based Study

A search was made for statutorily designated sites within 10km of the site boundary which are designated for their (non-avian) ecological interest, including Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs). This was based on information obtained from the SNH Sitelink website[2].

The ecology chapter of the Environmental Statement (ES) for the existing Clashindarroch Wind Farm[3], which contains baseline data relevant to the site, was reviewed. A summary of relevant data obtained during a review of web-based sources by MBEC to supplement field surveys undertaken in 2015-16 was also reviewed.

Further desk-based study will be carried out as part of the EIA (see Section 8.2).

Field Survey

A range of ecological baseline surveys were undertaken by MBEC in 2015 and 2016. Surveys covered an area based on the provisional turbine layout under consideration at the time, plus various buffers (i.e. 1km for Phase 1 habitats and protected species and 0.5km for National Vegetation Classification (NVC) surveys). The provisional turbine layout has subsequently changed. The 2015-16 surveys included all of the currently proposed wind turbine positions and the recommended buffer zones for most of the wind turbines. As illustrated in Figure 8.2 the exceptions are wind turbines 2 and 3 which are within 250m of the NVC survey area boundary. As part of the EIA, Vattenfall will ensure that there is sufficient baseline data in place, including the recommended buffer zones, to inform the assessment. An area to the east of the existing wind farm was also included in the survey area, although this area is no longer under consideration as part of the proposed development.

Table 8.1 summarises the surveys which were undertaken in 2015 and 2016 and the methodology used. Further details regarding survey methodology will be provided in the ES.

Table 8-1
Baseline ecological surveys undertaken in 2015 and 2016

Survey type	Date(s)	Methodology
Phase 1 habitat	Sep 2015	Survey based on standard JNCC methodology[4].
NVC	Sep 2016	Survey based on standard methodology[5]. This survey covered

[2] http://gateway.snh.gov.uk/sitelink/ [accessed 15th December 2016]

[3] Vattenfall Wind Power Limited. (2009). *Clashindarroch Wind Farm Environmental Statement*. April 2009.

[4] Joint Nature Conservation Committee (JNCC). (2010). *Handbook for Phase 1 Habitat Survey. A technique for environmental audit. Revised re-print*. JNCC, Peterborough.

Survey type	Date(s)	Methodology
		the area within 500m of the provisional turbine layout under consideration at the time.
Bats	Jun to Oct 2015 and Apr to Aug 2016	Survey based on Hundt (2012)[6] and included: - an assessment of trees and structures for bat roost potential; - driven transect surveys on three dates each year; and - static recording using 2-3 pairs of static detectors (2015) and 4-5 pairs of static detectors (2016). Detectors were paired so that one detector monitored activity along habitat edges or linear features such as woodland edges, whilst another simultaneously monitored activity in a more open situation, more typical of habitats where wind turbines would be located. Each pair of detectors was set to record for at least 5 nights on three occasions in each year. This survey covered the area within 500m of the provisional turbine layout under consideration at the time.
Terrestrial Mammals (including badger *Meles meles*, otter *Lutra lutra*, pine marten *Martes martes*, red squirrel *Sciurus vulgaris*, water vole *Arvicola amphibius* and wildcat *Felis sylvestris sylvestris*)	Sep 2015 and Aug 2016	Survey for badger, otter and water vole included all potentially suitable habitat within the survey area and took place in accordance with standard methodologies[7],[8],[9]. For pine marten a general assessment of habitat quality was completed in accordance with Cresswell *et al*. (2012)[10], along with a search for evidence of the presence of pine marten and potentially suitable den sites. For red squirrel signs of squirrel presence were searched for along walked transects. In addition an assessment of habitat quality was made using Forestry Commission information and the classification used by Vattenfall (2009)[3]. For wild cat initial surveys completed in 2015 concentrated on identifying and assessing potentially suitable habitat for wildcat within the proposed development site as well as locating potentially suitable den sites. In September 2016, further targeted surveys were carried out, based on information provided by the SNH wildcat officer from previous radio tracking surveys carried which highlighted areas that had been used by wildcats in 2015.

[5] Rodwell J.S (Ed) (1991 *et seq.*) *British Plant Communities*. Cambridge University Press.

[6] Hundt, L. (Ed) 2012. *Bat Surveys Good Practice Guidelines, 2nd edition*. Bat Conservation Trust.

[7] Neal E. and Cheeseman C. (2006) *Badgers*. Poyser Natural History, Cambridge, UK

[8] Strachan, R., Moorhouse, T. & Gelling, M. (2011) *Water Vole Conservation Handbook (third edition)*. WildCRu: Oxford.

[9] Bang, P. and Dahlstrom, P. (2001) *Animal Tracks and Signs*, Oxford University Press.

[10] Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trewhella, W.J., Wells, D. & Wray, S. (2012). *UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation*. The Mammal Society.

8.1.2 Baseline Results

Desk Study

Designated Sites

Statutory sites within 10km of the proposed turbine layout are shown in Figure 8.1. No designated sites are located within the site boundary. Brief details of statutory sites within 10km, excluding sites designated solely for their ornithological interest (see Section 7) and sites designated solely for their geological interests (see Section 9), are provided in Table 8-2.

Table 8-2
Statutory designated sites within 10km (excluding sites designated solely for ornithological or geological interests)

Site Name	Designation	Distance/Direction from Proposed Development	Reasons for Designation
Craigs of Succoth	SSSI	2km N	Calaminarian grassland and serpentine heath; and Subalpine flushes
Hill of Towanreef	SAC / SSSI	4.6km S	Alpine and subalpine heaths; blanket bog; dry heaths; grasslands on soils rich in heavy metals; juniper on heaths or calcareous grasslands; and marsh saxifrage (*Saxifraga hirculus*) (SAC) Calaminarian grassland and serpentine heath; marsh saxifrage; upland assemblage; and vascular plant assemblage (SSSI)
Moss of Kirkhill	SSSI	8.9km SE	Basin fen
River Spey	SAC / SSSI	8.9km NW	Atlantic salmon (Salmo salar), Freshwater pearl mussel (*Margaritifera margaritifera*), otter, sea lamprey (*Petromyzon marinus*) (SAC and SSSI)

There is one area of ancient woodland of semi-natural origin within the site (see Figure 8.1).

Protected and Notable Species

The following protected or notable species were recorded in the vicinity of the site during surveys undertaken to inform the 2009 EIA for the existing wind farm:

- Intermediate wintergreen *Pyrola media;*
- Common lizard *Zootoca vivipara;*
- Badger;
- Otter;
- Pine marten; and
- Red squirrel.

In addition the 2009 ES reported that the surrounding area is known to support adder, brown long-eared bat *Plecotus auritus*, common pipistrelle bat *Pipistrellus pipistrellus*, brown hare *Lepus europaeus*, mountain hare *Lepus timidus*, red deer *Cervus elaphus*, roe deer *Capreolus capreolus* and wildcat. The 2009 ES also reported records for the following plant

species included on the Scottish Biodiversity List[11]: harebell *Campanula rotundifolia*; juniper *Juniperis communis*; and Scots pine *Pinus sylvestris* plus the fungi *Cortinarius limonius*.

The site is situated within the Strathbogie Wildcat Priority Area, which extends north of Huntly and eastwards over Gartly Moor. Camera trapping surveys undertaken in the area, e.g. Littlewood *et al*. (2014)[12], identified ten cats (although three of these were domestic cats and at least three were hybrids). However, the numbers recorded were believed to be a significant underestimate of the population in the area because of the short duration of the survey. During July 2016 the Scottish Wildcat Action (SWA) project officer was contacted. The project officer helpfully provided data from a Strathbogie Wildcat Priority Area camera survey (which included Clashindarroch Forest) undertaken during winter 2015-16. The purpose of the survey was to gauge the distribution and proportions of wildcats, hybrids and feral cats present in the area to inform future practical conservation actions. This survey revealed the presence of at least five different cats (including animals classed as hybrids and wildcats) using the proposed development study area. In addition to this SWA provided data from a male hybrid wildcat that had been trapped and fitted with a GPS collar in 2015. The GPS data showed locations where the wildcat had been stationary for extended periods within the proposed development study area, which indicate the potential locations of resting sites (i.e. dens or lying-up areas) used by this animal.

Field Surveys

Baseline survey results will be presented in detail in the ES. A brief summary of key findings from surveys completed in 2015 and 2016 is provided below.

Habitats

The site is dominated by coniferous plantation woodland. The woodland is intersected by a number of minor watercourses which typically flow through corridors dominated by damp neutral grasslands. In a number of areas these riparian zones have been planted with native broadleaf trees. In some of the higher-lying and open unplanted areas, where there is some accumulation of peat and the ground is less suitable for forestry, there are small areas of dry and wet heath, as well as an area of wet modified bog. Generally, across all open areas of the site, there is encroachment by self-seeded Sitka spruce trees.

The area surveyed contains small areas characterised by the NVC community MG9 *Holcus lanatus* - *Deschampsia cespitosa* grassland, which has moderate potential to be groundwater dependent according to current SEPA guidance[13]. No NVC communities with high potential to be groundwater dependent were recorded during the survey.

Bats

The majority of the survey area is dense conifer plantation of low value to foraging bats. Better foraging habitat is associated with the plantation edges, especially where adjacent to watercourses and farmland. Four structures within the survey area appeared to provide

[11] Scottish Executive (2013) Scottish Government Scottish Biodiversity List SBL [online] Available at: www.scotland.gov.uk [Accessed 15th December 2016].

[12] Littlewood, N., R, C., Dinnie, L., Hooper, R., Iason, G., Irvine, J., Kilshaw, K., Kitchener, A., Lackova, P., Newey, S., Ogden, R. & Ross, A. (2014). *Survey and scoping of wildcat priority areas*. Scottish Natural Heritage Commissioned Report No. 768.

[13] Scottish Environment Protection Agency (SEPA) (2014) *Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems*. Land Use Planning System SEPA Guidance Note 31, Version 1, 07/10/14.

features that could potentially support a bat roost, although no trees located within 200m of provisional turbine locations under consideration at the time of survey were considered to provide bat roost potential.

Common and soprano pipistrelle (*Pipistrellus pygmaeus*) were the only bat species recorded during the driven transect surveys carried out in 2015 and 2016, and the number of calls recorded was relatively low. In general, bat activity was greater at lower elevations near to watercourses.

The static detector surveys recorded at least four species: common pipistrelle (56% of bat passes in 2015 and 65% in 2016); soprano pipistrelle (44% of bat passes in 2015 and 35% in 2016); and very low numbers of *Myotis* bats (most likely Daubenton's or Natterer's bats, *M. daubentonii* or *M. nattereri*) and brown long-eared bat. Levels of activity were generally much lower in open areas, e.g. clearfell and pre-thicket areas and open moorland (i.e. areas most representative of proposed turbine locations), than in locations near to watercourses and forest edges.

Terrestrial Mammals

A single badger sett was found within the survey area during the surveys, a single-hole sett that was considered to be inactive at the time of the survey.

A single otter resting site was found within the survey area during the surveys. Other evidence of otter included two spraints and an otter slide.

Overall habitat quality was rated as 'high' for pine martin within the survey area. There were no confirmed pine marten dens recorded but a number of potential denning sites were found. There were several sightings of adult pine marten on tracks and numerous records of probable pine marten scats across the survey area, usually on the edge of forestry. The evidence indicates that the survey area may support a relatively high density of pine marten.

The survey area contains habitats ranging in their suitability for red squirrel from optimal to habitat of little or no value. One possible red squirrel drey was identified during the surveys and evidence of squirrel feeding was identified in a number of locations. A single red squirrel sighting was also recorded during the surveys.

No evidence of water vole was found during surveys carried out in 2015 and 2016 and there is very little suitable habitat for this species within the survey area.

Habitats within the survey area which are likely to be of greatest value to wildcat include areas of clear-fell and pre-thicket forestry and the lower fringes of the plantation adjacent to farmland. During the surveys carried out in 2015 and 2016, 13 scats considered to be from cats (either wildcat, domestic cat or hybrid) were found within the survey area. These were all recorded in open areas adjacent to tracks. As noted above, data indicating potential locations of resting sites used by a male hybrid wildcat trapped and fitted with a GPS collar in 2015 were provided by SWA. These locations were carefully searched for and inspected (by ecologists with a wildcat survey license) during September 2016. No den sites were found but some of the areas did have features such as sections of windthrown trees which provide dense in cover which could be used by a wildcat to rest above ground. All areas of windthrow, brash and log piles, which may be potentially suitable for wildcat, have been searched for and mapped within the study area.

8.1.3 Potential Sources of Impact

Potential negative impacts on important ecological features could arise during the construction, operation and decommissioning stages. These are defined as follows:

Construction

During construction of the proposed development, in the absence of mitigation, it is anticipated that impacts may arise from:

- Habitat loss or damage (permanent and temporary) due to tree clearance and subsequent construction of wind farm infrastructure, including drainage impacts to modified bog habitats;
- Possible changes to groundwater flows affecting groundwater dependent terrestrial ecosystems (GWDTEs) (albeit the site contains only small areas with moderate potential to be groundwater dependent);
- Inadvertent killing or injuring of protected or otherwise notable fauna during construction or inadvertent damage to their breeding sites or resting places;
- Disturbance to protected or otherwise notable fauna due to tree clearance, vehicular traffic, plant and the presence of construction workers; and
- Sedimentation or other pollution of watercourses from tree clearance or construction activities and vehicular traffic.

Operation

During operation of the proposed development, in the absence of mitigation it is anticipated that impacts may arise from:

- Vehicular traffic causing disturbance to protected or otherwise notable fauna;
- Environmental incidents and accidents (e.g. spillages); and
- Moving turbine blades leading to mortality due to collision or barotrauma (bats).

Decommissioning

Potential impacts associated with decommissioning are likely to be the similar to those identified for construction (with the exception of tree clearance), although they would usually take place over a shorter time period.

Habitat Management Plan (HMP)

An Outline Habitat Management Plan (OHMP) will be developed during the course of the EIA and will be provided as part of the ES. The aim of the OHMP will be to provide compensation for negative impacts, if required, plus additional nature conservation enhancements and as such there is potential for the HMP to provide a positive impact. At this stage it is too early to set out the likely content of the OHMP, although the OHMP will seek to complement the HMP for the existing Clashindarroch Wind Farm and any other local conservation initiatives, if possible.

8.2 Method of Assessment and Reporting

8.2.1 Method of Assessment

Further Desk Study

Further desk study will be undertaken in order to inform the assessment. The desk study will seek to obtain data for non-statutory designations and protected/notable species within a distance of 2km from the site boundary (10km for bats). During the desk study the following organisations will be contacted to request data:

- North East Scotland Biological Records Centre (NESBReC)
- Scottish Badgers
- Scottish Wildcat Action
- Deveron, Bogie & Isla Rivers Trust

Monitoring reports for Clashindarroch Wind Farm will also be reviewed as part of the desk study along with any other sources of relevant information (e.g. additional studies on wildcat in the area and/or data from other nearby wind farms).

Additional Field Surveys

A fish habitat assessment will be undertaken for all watercourses likely to be affected by the proposed development following the standard SFCC methodology[14]. The need for detailed fish and/or aquatic invertebrate surveys will be confirmed following completion of the fish habitat assessment, review of any existing data provided by Deveron, Bogie & Isla Rivers Trust and a review of emerging development proposals. If fish surveys are required they would be carried out in accordance with standard methodologies[15] between the months of June and October.

No further baseline survey is considered necessary to inform the assessment.

Assessment of Effects

The ecological impact assessment will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance (CIEEM 2016[16]), which is endorsed by SNH. The assessment will also draw on other, more specific guidance as appropriate (see Section 8.3). Liaison with other technical specialists (e.g. with hydrologists with respect to GWDTEs) will be carried out as required.

The impact assessment process will involve the following steps:

- Identifying important ecological features, i.e. features of sufficient value and/or features subject to legal protection, for which detailed assessment is necessary. From survey work completed to date these are expected to include:
  - Heathland and modified bog habitats;

[14] Scottish Fisheries Coordination Centre (SFCC) (2007). *Habitat Surveys Training Course Manual. Revised August 2007*. Available online at: http://www.sfcc.co.uk.

[15] EU standards 14011:2003 *Water quality - Sampling of fish with electricity* and 14962:2006 *Water quality - Guidance on the scope and selection of fish sampling methods*

[16] 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

  - Potential GWDTE;
  - Bats;
  - Red deer[17];
  - Badger;
  - Otter;
  - Pine marten;
  - Red squirrel; and
  - Wildcat.
- Identifying and characterising impacts on important ecological features. In accordance with the CIEEM guidelines when describing impacts, reference will be made to the following: magnitude (area or number of individuals to be impacted); extent; duration; and reversibility, i.e. will the impact be permanent or reversible over a given timescale. Impacts will be considered during the construction, operational and decommissioning phases and will be assessed on the basis that a clearly-defined range of avoidance and standard good practice measures are implemented.
- Identifying significant effects, using appropriate guidance and professional judgement. In accordance with CIEEM guidelines a 'significant effect' is defined as an effect that either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general. Effects can be considered significant at a wide range of scales from international to local depending on the value of the relevant feature.
- Identifying additional measures to mitigate potentially significant effects, if required.
- Assessing the significance of any residual effects, i.e. after additional mitigation measures have been implemented.
- Identifying appropriate compensation measures to offset significant residual effects, if necessary.
- Identifying opportunities for ecological enhancement, including the development of an outline HMP.
- Identifying any monitoring requirements.
- Assessing cumulative impacts with other developments (see below).

<u>Cumulative Impacts</u>

The potential for cumulative impacts with other wind farm proposals will be assessed. For (non-avian) ecological features cumulative impacts are only likely to be significant for other developments within the same hydrological catchment(s) or located within the regular range of more mobile species, e.g. bats. As such the cumulative assessment will be restricted to other wind farms within the same hydrological catchment, i.e. the catchment of the River Bogie, and any other wind farms within c 10km. Assessment will include operational projects; projects under construction; consented projects which are not yet under construction; and projects for which planning applications have been submitted.

[17] Although not likely to be of significant conservation importance an assessment of the potential impacts on deer welfare, habitats, neighbouring and other interests (e.g. access and recreation, road safety, etc) will be included in accordance with current SNH guidance.

Sensitive Data

8.2.2 Any sensitive data (e.g. badger sett locations) will be included in a confidential annex to the ES which will be issued to SNH and the planning authority only and will not be made publically available. Consultation

Initial consultation with SNH was undertaken in April 2016 with respect to confirming the key ecological receptors for the proposed development site. During this meeting the potential for the proposals to affect wildcat was also discussed and relevant information was subsequently provided by SWA (as noted above).

Further consultation with SNH is proposed following receipt of scoping responses in order to agree the detailed approach to the assessment and mitigation of potential impacts on wildcat, including appropriate approaches to minimise the risk of disturbance to resting sites during felling and construction works for the proposed wind farm. Consultation would also include any other issues raised by SNH in their scoping response.

Consultation will also be undertaken with other relevant organisations, e.g. Forestry Commission Scotland, SEPA, The Deveron, Bogie and Isla Rivers Trust, Scottish Wildlife Trust and Scottish Wildcat Action, as required, following receipt of scoping responses.

8.2.3 Matters Scoped Out

The closest designated sites are Craigs of Succoth SSSI and Hill of Towanreef SAC/SSSI, located 2km and 4.6km from the site boundary respectively. None of the designated sites within 10km are hydrologically connected to the site and none are designated for mobile (non-avian) species, i.e. bats. As such no designated sites are likely to be affected by the proposed development and the detailed assessment of effects on designated sites is therefore proposed to be scoped out of the EIA.

Surveys for the following species have been scoped out for the following reasons:

- Invertebrates – current SNH guidance[18] states that invertebrates will not require surveys to inform the EIA as they are unlikely to experience a significant environmental effect during construction/operation of onshore wind farms.
- Reptiles – current SNH guidance[18] states that invertebrates will not require surveys to inform the EIA as, with standard mitigation, they are unlikely to experience a significant environmental effect during construction/operation of onshore wind farms.
- Amphibians - surveys for great crested newt are not necessary as the site lies outside of the current known range of this species within Scotland[19]. In addition, no potentially suitable breeding ponds were identified during the Phase 1 habitat survey in 2015. For other amphibian species, current SNH guidance[18] is that surveys are not required to inform the EIA for onshore wind farms.
- Other mammals – no other mammal species are likely to be subject to significant effects and therefore surveys for mammal species other than those listed in Table 8-1 are not considered necessary.

[18] Scottish Natural Heritage. (2016). *SNH general pre-application/scoping advice to developers of onshore wind farms*. March 2016.

[19] http://jncc.defra.gov.uk/publications/JNCC312/species.asp?FeatureIntCode=S1166 [accessed 15th December 2016]

8.3 References and Standard Guidance

The following legislation and guidance is applicable to ecological assessment for onshore wind farm developments in Scotland and will be referred to as part of the assessment:

- The Conservation (Natural Habitats, &c) Regulations 1994 (as amended in Scotland);
- Wildlife and Countryside Act 1981 (as amended in Scotland);
- The Nature Conservation (Scotland) Act 2004;
- The Wildlife and Natural Environment (WANE) (Scotland) Act 2011;
- Chartered Institute of Ecology and Environmental Management (2016). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*;
- Natural England (2014) *Technical Information Note TIN051 Bats and onshore wind turbines Interim Guidance. Third Edition*[20];
- Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency and Forestry Commission Scotland (2010) *Good Practice During Wind farm Construction*, Version 1, October 2010;
- SEPA (2014). *Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems*. Land Use Planning System SEPA Guidance Note 31 (LUPS – GN31). Version 1 Issued 07 October 2014;
- SNH (2012) *Planning for development: What to consider and include in Habitat Management Plans*.
- SNH (2016) *SNH general pre-application/scoping advice to developers of onshore wind farms*. March 2016.

Additional reference material which is relevant to the assessment will also be referred to as required.

[20] New guidance on bats and wind turbines in Great Britain, which will supersede TIN051, is currently in preparation and is due to be published shortly.

9.0 SOILS, GEOLOGY AND THE WATER ENVIRONMENT

9.1 Environmental Baseline and Potential Sources of Impact

9.1.1 Baseline Conditions

Much of the site has been subject to commercial forestry and is located on elevated ground between 300 and 500m Above Ordnance Datum (AOD).

The site lies within the catchments of the River Deveron and River Bogie. Both support good salmon and trout populations and are highly regarded fisheries. It is understood that the River Deveron is also used as a public water source for Huntly. Many of the isolated properties locally are known to be sustained by private water supplies.

From a review of published geological mapping and our existing knowledge of the site we known that bedrock is close to surface over much of the study area. Bedrock is present at surface on the hill tops and Glacial Till lies over the lower slopes of the hills and in the valleys locally. It is known from previous investigations that there are deposits of peat within the site boundary and where present it is often degraded by historic forestry operations. The bedrock geology comprises psammite, a metamorphic rock, of the Clashindarroch and Macduff Formations.

9.1.2 Potential Sources of Impact

It is considered that the key sensitive receptors and constraints to the proposed development are likely to include:

- Surface watercourses within and downstream of the site (inc the River Deveron and River Bogie);
- Potential surface and groundwater abstractions downstream of the site;
- Peat deposits within the site; and
- Areas of potential Groundwater Dependent Terrestrial Ecosystems (GWDTEs).

9.2 Method of Assessment and Reporting

Using the information collated as part of the desk study and field surveys an assessment of baseline conditions will be completed. Constraints with respect to wind turbine development will be identified. Constraints might include; areas of potential peat instability, standoff to sensitive water features, buffers to private water supplies and GWDTE habitat, and preferred locations for watercourse crossings. An initial peat probing assessment will be completed.

In consultation with other disciplines the wind farm design will be finalised and any impacts assessed. Mitigation measures will be identified where required and an assessment of residual and cumulative effects then completed.

It is anticipated that the following technical reports will be prepared as technical appendices to the soils, geology and water environment chapter:

- Schedule of watercourse crossings;
- Peat slide risk assessment and management plan and
- Borrow bit appraisal.

The investigations completed will also inform the carbon assessment and engineering design sections of the EIA.

9.2.1 Method of Assessment

Desk Study

It is important to initially establish the baseline conditions so that an accurate conceptual hydrological, hydrogeological and geological model can be developed for the site. This model can then be used to inform the site design (e.g. location of access tracks, borrow pit(s), site compounds and turbines etc.).

The following source of information will be consulted a part of the desk study:

- surveys completed in support of Clashindarroch Wind Farm;
- the draft layout including proposed turbine locations and all associated infrastructure;
- surface and groundwater information, including local water quality and any relevant groundwater level data, will be obtained from SEPA;
- ground conditions will be initially determined using published geology maps and site specific geological information will be obtained from the British Geological Survey (BGS);
- review of Carbon and Peatland 2016 mapping;
- fisheries and water quality data from River Deveron and River Bogie Fisheries Trust;
- hydrogeological information will be obtained from the BGS;
- surface water flow information will be obtained from the Centre of Ecology and Hydrology as well as from the Flood Estimation Handbook (FEH);
- meteorological data for the area will be reviewed;
- information relating to private water supplies will be obtained from AC and if appropriate Moray Council;
- public water supply information and infrastructure will be obtained from Scottish Water.

The desk study will include a review of relevant historical maps, soil survey maps and aerial photographs together with (any) existing borehole records held by BGS.

A detailed review of the high resolution aerial photography is considered to be particularly important and is expected to yield valuable information on existing slope instability and possibly the extent of peat.

Digital Terrain Model data will be used to prepare a gradient map to inform the scope and location of the proposed field surveys.

Field Surveys

It is proposed that the desk study and initial conceptualisation of the site will be followed by an initial site visit that will:

- Verify the information collected during the desk study;
- Enable SLR to establish a first-hand appreciation of the site, including watercourses, ground conditions, condition of sensitive habitats etc, and to assess the relative location of all the components of the proposed development to water features and any sensitive hydrological/hydrogeological and geological features identified as part of the desk study;
- Allow SLR to identify potential constraints to the proposed development from the topography and ground conditions. Aspects which will be considered that relate to geology include:
    - Proximity of bedrock to surface across the site;

- Nature of superficial deposits;
- Peat presence, peat habitat and quality;
- Suitability of materials on site for use during construction;
- Location of potential borrow pits; and
- Potential constraints to the proposed development.

A Phase 1 peat probing survey will be undertaken. The full depth of the peat probed using a 100m grid in areas where peat is present. Grid co-ordinates (recorded using GPS Handheld or similar) were collected for each probe and an indication of the substrate below the peat recorded e.g. bedrock, weathered rock, glacial till, glacial sands/gravels, silt/clay, to inform the peat stability, peat volumes and potential for avoidance, or reuse of peat.

Following constraints mapping and further site design (see below) a Phase 2 peat probing investigation will be completed if required. Peat probing and sampling along the proposed tracks and at turbine bases will be undertaken to establish the thickness of the peat on a targeted basis. The probing will also provide information on the substrate below the peat. The probing will be undertaken to complete coverage of the areas of the site which will be occupied by infrastructure to accurately model the peat morphology. Probing will be undertaken at 50m intervals to allow any minor adjustments to be undertaken.

A National Vegetation Classification (NVC) survey for the site will be used to screen for the potential presence of GWDTEs. Areas of potential High and Moderate GWDTE will be investigated to assess whether they are sustained by groundwater as part of the field work.

Mitigation

Mitigation measures, where required, will be identified and be based on industry best practice techniques appropriate to site conditions.

It is anticipated that the following types of measures could be relevant:

- Avoidance of areas of deep peat where possible;
- Avoidance of areas that might be susceptible to peat slide or ground instability;
- Appropriate location of proposed site infrastructure, including access track crossing, with respect to watercourses, private water supplies and GWDTEs;
- The implementation of general pollution prevention measures so as to protect downstream water quality and safeguard fisheries interests;
- Suitable surface water management and appropriate design of drainage features; and
- Specification of a water monitoring plan.

Assessment of Effects

Potential impacts on the water and ground environment, including environmental receptors dependent upon these resources, will be identified, and mitigation measures required to address these impacts will be proposed in accordance with best practice guidance and with reference to site specific conditions.

A qualitative risk assessment methodology will be used to assess potential effects on geology, soils, and the water environment in which the probability of an effect occurring and the magnitude of the effect, if it were to occur, are considered. This approach provides a mechanism for identifying the areas where mitigation measures are required and from identifying mitigation measures appropriate to the risk presented by the proposed wind farm. This approach allows effort to be focussed on reducing risk where the greatest benefit may result.

The impact assessment will consider the construction and operational stage of the project.

Given the location and geographical and geographical context of the site, it is considered that a basic Flood Risk Assessment (FRA) will need to be prepared to satisfy Scottish Planning Policy. This will be incorporated into the text, of the impact assessment, and is likely to include recommendations for the control and management of runoff from parts of the proposed built development.

The project hydrologists and geologist will liaise with the project ecologists to complete an assessment of potential impacts on GWDTEs.

Residual and Cumulative Effects

A review of other existing and proposed wind farm developments in the vicinity of the proposed development will be undertaken and potential impacts with regard to hydrology, hydrogeology, geology and other carbon emissions and waste will be assessed to identify cumulative impacts. With regard to the proposed development, it is likely that mitigation measures will be proposed that will have a neutral effect or provide betterment compared to baseline conditions. It is considered unlikely that there will be any significant residual or cumulative impact to report.

9.2.2 Consultation

We will seek to obtain environmental data and preliminary views of the proposed development from relevant consultees, including:

- SEPA;
- SNH;
- River Deveron and River Bogie Fisheries Trust; and
- AC (and if required Moray Council);

9.2.3 Matters Scoped Out

It is proposed that the decommissioning stage of wind farm life cycle is scoped out of the EIA.

The study area will include all of the proposed site infrastructure. In addition to this information on local water use and quality will be obtained within a distance of 3km from the proposed site infrastructure.

9.3 References and Standard Guidance

The soils, geology and water environment chapter will be prepared with reference to best practice guidance and legislation, including (but not limited to):

- Scottish Planning Policy (SPP), Scottish Executive, June 2014;
- EC Water Framework Directive (2000/60/EC);
- Water Environment and Water Services (Scotland) Act 2003;
- Water Environment (Controlled Activities) Regulations 2011;
- Land Use Planning System – SEPA Guidance Note 31 (GWDTEs and Groundwater Abstractions), SEPA, October 2014;
- Control of Water Pollution from Linear Construction Projects – Technical Guidance, C648, CIRIA, 2006;

- Good Practice during Wind farm Construction, Ver3, a joint publication by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland and Historic Environment Scotland, Version 3, 2015;
- The SuDS Manual C753, CIRIA, 2016;
- Environmental Good Practice on Site C692, CIRIA, 2010
- Developments on Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste, Scottish Renewables and SEPA, 2012;
- SEPA Regulatory Position Statement - Developments on Peat, Scottish Environment Protection Agency, 2010;
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments, Scottish Government, January 2007;
- Developments on Peatland – Site Surveys and Best Practice, Scottish Natural Heritage, Scottish Environment Protection Agency, Scottish Government and The James Hutton Institute, August 2011;
- Carbon and Peatland 2016 Map. Scottish Natural Heritage;
- Management of Carbon Rich Soils (*www.gov.scot/resource/doc/921/0109512.pdf);*
- Managing Geotechnical Risk: Improving Productivity in UK Building and Construction, Institution of Civil Engineers, 2001;
- Ground Engineering Spoil: Good Management Practice, CIRIA Report 179, 1997;
- Scottish Roads Network Landslides Study Summary Report, Scottish Executive, 2005; and
- Guidelines for the Risk Management of Peat Slips on the Construction of Low Volume/Low Cost Roads on Peat, Forestry Commission, 2006.

10.0 CULTURAL HERITAGE

This section presents the proposed scope of work for the Cultural Heritage. The purpose of the process is to identify the potential effects of the proposed development on the historic environment and cultural significance of the area in which the development is located. The heritage Impact assessment will follow police and best practice guidance in order to establish a robust and transparent analysis

10.1 Environmental Baseline and Potential sources of Impact

A total of 168 designated heritage assets lie within a 10km zone around the turbines. It is possible that there may be indirect effects on some of these nationally important assets, principally through visual impact from the turbines, from factors such as proximity, dominance, flicker, as well as potentially from noise.

There are also 14 non-designated heritage assets which lie within the red line boundary, in close enough proximity to the turbines that assessment of potential direct impacts on these assets will be necessary.

In addition reference to a Bronze Age barbed and tanged arrowhead found within deep peat deposits, highlights the potential importance of the peat for palaeoenvironmental remains. Information from sampling the peat deposits can be significant in helping establish the onset of wet conditions and peat growth, as well as providing environmental context to the heritage assets and human land-use and activity which contributed to the development of the historic landscape.

10.1.1 Listed Buildings

Eight Category A Listed Buildings were found in the search area:

ENTITY_ID	ENTITY_REF	DES_REF	PARBUR
333701	AUCHINDOIR, ST MARY'S CHURCH	LB2732	Auchindoir and Kearn
333705	CRAIG CASTLE	LB2736	Auchindoir and Kearn
333712	DRUMINNOR CASTLE	LB2743	Auchindoir and Kearn
341420	BELDORNEY CASTLE	LB9164	Glass
341441	LEITH HALL	LB9183	Kennethmont
379368	HUNTLY, CHAPEL STREET, ST MARGARET'S RC CHURCH	LB34945	Huntly
379369	HUNTLY, CHAPEL STREET, ST MARGARET'S RC CHAPEL, PRESBYTERY	LB34945	Huntly
379393	HUNTLY, GLADSTONE ROAD, ALEXANDER SCOTT'S HOSPITAL	LB34962	Huntly

64 Category B Listed Buildings, the majority of which are located in Huntly

80 Category C listed Buildings, the majority of which are located in Huntly

In addition there are two Properties in Care

INDEXNO	COUNCIL	NAME
90024	MORAY	Auchindoun Castle,castle and fort
90267	ABERDEENSH	Auchindoir, St Mary's Church, Mote Hill and Dovecot

10.1.2 Scheduled Monuments

There are 24 scheduled monuments within the 10km search area, the majority being situated to the SE, in areas of predominantly moorland and woodland. The two closest monuments are Wormy Hillock, a Bronze Age henge (SM3278), and Tap o'North fort (SM63). These are situated 1,400m and 4,516m SE of Turbine 8. Within 5 km of the

proposed development there are twelve scheduled monuments, including hillforts on Tap o' Noth and Cnoc Cailiche, a stone circle, a standing stone and a cupmarked boulder.

The 24 monuments comprise 1 pill box, 1 limekiln, 1 castle (Auchindoun), 2 churches, 1 henge, 2 hut circles, 2 forts, 2 cairns, 3 stone circles, 7 stone monuments consisting of 1, 2 or 3 boulders and 2 dwellings.

DES REF	NAME	PARISH
SM11720	Innesbrae, buildings 320m SW of	Auchindoir and Kearn
SM11721	Innesbrae, farmhouse, farmsteading and township 450m NE of	Auchindoir and Kearn
SM5618	Dunbennan Old Church,church and burial ground	Huntly
SM8444	Leith Hall, two symbol stones	Kennethmont
SM90267	Auchindoir, St Mary's Church, Mote Hill and Dovecot	Auchindoir and Kearn
SM90024	Auchindoun Castle,castle and fort	Mortlach
SM11611	Braw land, cupmarked boulder 270m WSW of	Auchindoir and Kearn
SM11869	Rhynie Parish Church, two symbol stones 25m ESE of	Rhynie
SM11575	Bell Know e, cairn, Rhynie	Rhynie
SM11576	Gallow s Hill Cairn, 460m SSE of Mains of Lesmoir	Rhynie
SM11651	New seat, hut circles and platforms 240m NNE of	Rhynie
SM51	Ord, stone circle 635m WSW of	Auchindoir and Kearn
SM3278	Wormy Hillock, henge 690m WNW of Finglenny	Rhynie
SM11353	Mains of Cults, pill box 600m NW of	Kennethmont
SM36	Nether Wheedlemont,stone circle 80m NNE of	Auchindoir and Kearn
SM63	Tap o'Noth,fort	Rhynie
SM84	Rhynie, three symbol stones 60m SE of Manse	Rhynie
SM73	Huntly Market Square, symbol stone and standing stone	Huntly
SM69	Craw Stane, symbol stone and enclosure 575m E of Mains of Rhynie	Rhynie
SM33	Mill of Noth, standing stones 150m ENE of	Rhynie
SM15	Corrstone Wood, stone circle	Auchindoir and Kearn
SM11681	Cnoc Cailliche, fort 360m WSW of Upper Wheedlemont	Auchindoir and Kearn
SM11658	Currach Cottage, hut circles 330m NE of	Auchindoir and Kearn
SM11724	Limekiln Braes, kiln, quarries and platforms 650m NW of Bar na Beinn	Auchindoir and Kearn

10.2 Method of Assessment and Reporting

10.2.1 Study Area

The study area for the scoping report has included a zone 10km from the proposed turbines for designated heritage assets. In addition Pastmap was also consulted, and from this 14 locally important sites were found to lie within close proximity to the turbines. These consisted of relict grouse butts, farmsteads, mills, tracks hollow ways and peat cuttings. Of particular note however was the barbed and tanged flint arrowhead found "4.5 feet in the moss" indicating prehistoric activity in the immediate vicinity of the proposed turbines.

ID	Name	Description
315075	Craigen Hill	Grouse Butt
315071	Killin Burn	Dam/Lade pre 1st ed OS. Poss 16th C
315066	Burn of Bedlaithen	Lade (possible)
311909	Corrydow n	Cottage Garden 19th C
315068	The Lumps	Hollow Ways/Peat Cuttings
315069	The Lumps	Substantial Hollow Way to access peat cuttings
17296	Arrow head	Barbed and tanged flint arrow head w ith shaped calfskin found 4.5 ft dow n in the moss
315045	Farmstead, Mill	House w ith substantial cellar, surrounded by enclosure, lode and w heelpit.
315081	Track	Well preserved relict trackw ay as depicted on 18th C estate plan
315076	The Shank	Peat cutting
315070	The Shank	Hollow w ay associated w ith peat cutting
147723	Blind Stripe	Boundary stone located on 1st ed OS. Aka Shank of Badtimmer or Bogrotten Burn
315084	Hill of Finglenny	Grouse Butt
154982	Craigw ater	Remains of a cottage, farmstead as show n on 1st ed OS 6-inch map

10.2.2 Baseline Study

The aim of this stage of the EIA will be to establish an understanding of the historic environment of the proposed development area and adjacent study areas. It is proposed that for an inner study area (consisting of the proposed development areas within the application boundary) all cultural heritage assets, designated and undesignated, will be considered an assessed for potential direct impacts. On the basis of the data reviewed for this scoping report, it is considered that an outer study area comprising land up to 5km from the proposed turbines will be appropriate; the nature of the physical relief across the regions would make visual setting impacts highly unlikely beyond 5km from the turbines. Within this outer study area baseline data will be obtained for all designated heritage assets with particular sensitivity to long-distance change within their setting to assess for indirect impacts.

The following baseline elements will be undertaken:

- consultation with AC SMR for site specific information;
- consultation with Historic Environment Scotland;
- consultation with the local Conservation Officer to establish and assess listed buildings and conservation areas;
- consultation of web-based facilities for other information;
- map regression using historic mapping sources to identify changes and development of the historic landscape;
- review of available Historic Landscape Characterisation;
- a review of aerial photographs;
- synthesis of published sources to establish historic landscape and archaeological context, including data from the NMRS;
- data on designated assets including scheduled monuments, listed buildings and gardens and designed landscapes; and
- a walkover survey within the boundary of the proposed development to study the historic landscape and features in the context of their topographic location and to identify any visible historic environment assets not previously mapped which might be impacted by the design (turbines, roads, borrow pits, sub-station)
- visit the site and locality (normally from areas which are publicly accessible) to place the heritage assets in context and to identify aspects of cultural heritage not already identified in existing sources (recorded in field notebook & photographs).

Analysis of these data about the historic environment layered into a GIS will be provided to the design team to assist with avoiding or minimising both direct and indirect effects on heritage assets. Where potential adverse impacts on cultural heritage are identified,

measures to prevent, reduce and/or where possible offset will be proposed. The data gathered will be synthesized and interpreted using our analytical skills and wider knowledge in order to produce a meaningful summary of the historic landscape and how the identified heritage assets fit within that framework.

Work will also comply with the Standard expressed in the CIfA's Standard and Guidance for Historic Environment Desk-Based Assessment (2014). The Standard includes the following definition:

- "Desk-based assessment will determine, as far as is reasonably possible from existing records, the nature, extent and significance of the historic environment within a specified area. …In a development context desk-based assessment will establish the impact of the proposed development on the significance of the historic environment (or will identify the need for further evaluation to do so), and will enable reasoned proposals and decisions to be made whether to mitigate, offset or accept without further intervention that impact."

10.2.3 Consultation

The national regulator with respect to cultural heritage is Historic Environment Scotland (HES). Their remit includes scheduled monuments, category 'A' listed buildings and the inventories of gardens and designed landscapes and battlefields. Regulatory responsibility at the local level lies with AC. Their remit includes category 'B' and 'C' listed buildings, conservation areas and non-designated archaeological sites. Issues concerning the non-designated historic environment are also handled by the Aberdeenshire Council Archaeology Service (ACAS). Both the national and local regulator will be concerned with both potential direct effects to cultural heritage and with issues of potential indirect effects due to changes in setting.

10.2.4 Field Surveys

Site visits will be undertaken in order to form a full understanding of the development area and locality. These visits will be undertaken to inform the baseline in terms of checking recorded assets and checking whether there are other unknown assets within the proposed development area which lie within land readily accessible by tracks, and to visit other assets as agreed through consultation within the inner and outer study areas in order to assess the setting of these assets, and the potential impact from development within their setting.

10.2.5 General approach to impact assessment

The archaeology and cultural heritage team will use a staged process to assess potential impacts on heritage assets. Following design freeze the EIA will assess the potential direct effects within the site to heritage assets, and also the potential indirect effects, including visual change to the settings of heritage assets within the Inner Study Area and designated heritage assets within the Outer Study Area.

Analysis of data gathered during the desk study and site visit layered within a GIS, combined if necessary with photographs and wireframe visualisations of the topography and proposed turbines from the location of key heritage assets, will be used to facilitate assessment.

These assessments will be carried out using professional judgement, taking into account designations and heritage significance as assessed against national standards (see below). Significance of effect will be based on a combination of heritage significance and magnitude of impact.

10.2.6 Impact assessment initial stages

The first stage will be to identify any assets/asset groups which would not be affected: for example where the development is located in an area of previous disturbance, or has a restricted scale or extent of visual impact, it may be possible to identify without detailed assessment heritage assets and their settings which clearly would be unaffected by the development.

The next stage will be to identify potential **direct impacts** on archaeological and cultural heritage assets. The team will:

- Identify heritage assets that may receive direct impacts
- determine the likely magnitude of direct impacts on known heritage assets; and
- through analysis of collected data and our wider knowledge and professional experience, address the potential for unknown heritage assets to be subjected to direct impacts.

The following stage will be to identify **indirect impacts** on assets. These are likely principally to be impacts due to changes in setting caused by the proposed development. The following will be undertaken:

- use tools such as zone of theoretical visibility and field notes to identify areas that would be unaffected by visual impact due to screening from topography, vegetation or neighbouring buildings;
- identify logical groups of heritage assets for which a group assessment is appropriate; include all assets in each group even if they fall beyond the visually affected area.

Once the potentially affected assets and potential direct and indirect impacts have been identified, the heritage significance of the potentially affected assets will be assessed using a methodology developed by SLR, according to age, rarity, level of documentation, survival and group value. Assessment will take into account the heritage value criteria set out in HES Policy Statement June 2016, HES's Managing Change in the Historic Environment guidance notes, particularly the guidance on setting, and Historic England's Conservation Principles (Evidential, Historical, Aesthetic and Communal value).

10.2.7 Assessment of heritage significance and the contribution of setting

The next stage in the assessment process will be to assess heritage significance and the contribution of setting to that heritage significance for potentially affected assets, as follows:

- identify what is of significance about the heritage asset, principally its function, design, aesthetic quality, sacred or communal importance;
- identify the aspects of setting which contribute to the heritage significance of each asset, focussing on these which are potentially affected by the proposed development; and
- the results of site visits will be incorporated: field note book entries will be presented as a table within the assessment. This will include entries for the main elements to be considered, such as: how much change to the historic setting has occurred, the presence of modern intrusions and detraction from the existing baseline appreciation of the heritage asset, land-use, topography, inter-visibility to other contemporary and related heritage assets, relevance to modern communities, distance to development etc.

The significance of heritage assets will be described on a five position scale ranging from negligible to highest.

10.2.8 Impact assessment final stages

The magnitude of setting impacts (change to existing conditions) will be assessed using the principles described within HES's Managing Change in the Historic Environment. The magnitude of impact arising from the proposed development for cultural heritage assets will be quantified as high, medium, low or negligible, beneficial or adverse, and short term, long term or permanent, based on the interpretation of a combination of parameters, such as size or scale, geographical extent and change to the ability to appreciate the heritage asset, as well as duration. The magnitude of impact will be based on incremental changes from the current baseline; the baseline will include operational wind farms that are intervisible with the proposed development. In order to assist in the process of setting assessment it is envisaged that selected visualisations might be helpful, and these can be identified through consultation with the principal stakeholders.

The significance of effects will be assessed using a matrix, with effect significance being assessed on a scale from substantial to very slight, and whether they enhance or harm the cultural heritage asset's significance.

10.2.9 Mitigation

The assessment process will then consider any conservation and outline mitigation that may be necessary and then present the residual impacts and effects. There is a strong regulatory preference for mitigation through avoiding impacts through design, of both the wind turbines and supporting infrastructure. Where physical impacts are unavoidable, mitigation through recording of cultural heritage assets prior to impact will be suggested. Impact mitigation on currently unknown archaeological remains will also be covered in the mitigation recommendations. Setting impacts are generally difficult to mitigate other than by site and turbine design.

10.2.10 Residual Effects

Following design of appropriate mitigation measures, and presumption of their implementation in design and construction, a matrix showing the resultant residual effect will be produced.

10.2.11 Cumulative Effects

A cumulative effect will be considered to occur when there is:

- an effect on an asset or group of assets due to changes which would be caused by the proposed development under assessment; and
- an effect on the same asset or groups of assets which would be caused by another development or developments.

Consideration of the other contributor developments will be limited to those of the following kind:

- wind farm developments which have been applied for with decision pending; and
- wind farm developments which have been granted permission but not yet implemented.

Consultation with Historic Environment Scotland, Moray Council and ACAS will assist with identifying contributor developments. Having firstly assessed the effects of the current application alone, cumulative effects will be addressed in two stages:

- assess the combined effect of the developments including the proposed development; and
- assess the degree to which the proposed development adds to the combined effects of the other developments.

10.2.12 Technical Appendices

Technical appendices will consist of:

- a detailed impact assessment methodology;
- a gazetteer of heritage assets within the proposed development area and study area; and
- a full report of the visits undertaken to the site and locality.

10.2.13 Matters Scoped Out

It is not proposed that cultural heritage issues in general or concerns with respect to specific assets within the defined study areas will be scoped out. Where it is found that it can be reasonably predicted that impacts cannot affect specific assets this will be noted in the environmental statement and no further assessment of such assets undertaken.

10.3 References and Standard Guidance

The key legislative elements that will be referred to are as follows.

- the Historic Buildings and Ancient Monuments Act 1953;
- the Ancient Monuments and Archaeological Areas Act 1979; and
- the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.

These laws have been amended by the Historic Environment (Amendment) (Scotland) Act 2011 is a piece of legislation that improves the management and protection of Scotland's historic environment.

Assessment will take into account the heritage value criteria set out in HES Policy Statement June 2016, and refer as appropriate to Scotland's Archaeology Strategy 2015. Baseline survey will follow CIfA's Standard and Guidance for Historic Environment Desk-Based Assessment (2014). Analysis of the heritage assets and historic mapping will allow synthesis and interpretation of the historic development of the site. This analysis will also establish what comprises the setting for the designated heritage assets, and what elements of that setting contribute to how the asset is experienced, understood and appreciated in accordance with HES's guidance "*Managing Change in the Historic Environment: Setting (2016)".*

11.0 NOISE

11.1 Environmental Baseline and Potential Sources of Impact

11.1.1 Baseline

The site is located in a rural forested area, populated with residential properties and farmsteads, where background noise levels will be typically low during night-time hours; however, ambient noise levels may be influenced by the Clashindarroch Wind Farm wind turbines under certain wind conditions.

Baseline (background) noise levels were measured at two locations (Boganclough House and Oldtown) from December 2008 to January 2009 in support of the planning application for Clashindarroch Wind Farm. Overall, it was found that noise levels were predominately influenced by the wind through trees and vegetation at each location, along with additional noise from a nearby stream at Boganclough House.

Considering the proximity of the proposed development to the operational Clashindarroch Wind Farm and the potential for these existing turbines to influence the background noise levels at certain receptor locations under certain wind conditions, the requirement and strategy for collecting further baseline noise data will be discussed in detail with AC at an early stage. Based on the proposed area of interest for the wind farm, and the potential for the proposed turbines to impact on receptors not included in the noise assessment for Clashindarroch Wind Farm, a further background noise survey may be required.

In this respect, a number of potential Noise Sensitive Receptors (NSRs) have been identified in proximity to the proposed development, as detailed in Table 11-1. At this stage, the NSRs have been identified based on the proposed area of interest, not a proposed turbine layout; therefore, this list is not exhaustive and NSRs may be added to or removed from the list subject to further assessment work.

Table 11-1
Potential Noise Sensitive Receptors (NSRs)

NSR ID	NSR Name	Approximate OS Grid Coordinates	
		X	Y
NSR01	Lower Gordonsburn	347340	838130
NSR02	Upper Gordonsburn	346470	837690
NSR03	Kittlemanoch	349510	836360
NSR04	Whitestones	347960	835450
NSR05	Tillathrowie	347070	835100
NSR06	Corrylair	346370	834110
NSR07	Old Merdrum	346740	829870
NSR08	Bruntland	345500	828140
NSR09	Broomhill Cottage	344920	828140
NSR10	Blackmiddens	342580	826010
NSR11	Nether Howbog	340480	825600
NSR12	Upper Howbog	340210	826320
NSR13	Haddoch	339410	827330
NSR14	Tomnaven	340460	833480
NSR15	Meikle Gouls	341920	834800

To determine where background noise monitoring is required, an initial 'screening' exercise will be undertaken. This will be based on a proposed turbine layout and a candidate turbine model, and those receptors where turbine noise immission levels are predicted to be above 35dB L_{A90} (at wind speeds up to 10m/s) will be identified. These receptors will be the subject of a further and more detailed assessment in accordance with ETSU-R-97.

The locations identified for background noise monitoring, and the survey methodology, will be discussed and agreed with AC; however, where required, this will be undertaken in accordance with the IOA GPG and will be of sufficient duration to record typical background noise levels over a representative wind speed range.

The measured background noise levels will be analysed (with the standardised 10m height wind speeds) to derive daytime and night-time noise limits, which will be used in combination with existing noise limits in place for Clashindarroch wind farm.

11.1.2 Potential Sources of Impact

The construction of the wind farm will introduce temporary noise sources in the form of plant and activities, along with the movement of vehicles. Noise will be generated during the construction of access tracks, excavation for turbine foundations and as a result of the haulage of materials within the site.

With respect to operational noise, wind turbines generate noise by two mechanisms; mechanical noise from the gearbox and generator in the nacelle, and aerodynamic noise caused by the noise of wind passing over the turbine blades. Wind turbines are designed to minimise mechanical noise; for example, noise sources in the nacelle are contained within insulated enclosures. Aerodynamic noise is minimised by the design of the turbine blades; however, some aerodynamic noise is unavoidable. Aerodynamic noise increases in proportion with the speed of the turbine blade; therefore, noise levels generally increase with wind speed.

11.2 Method of Assessment and Reporting

The assessment will consider the potential effects of the proposed development due to noise associated with both the construction and operational phases of the development. The assessment will also consider the impact of construction traffic and the potential cumulative effects of operational turbine noise from Clashindarroch Wind Farm and other neighbouring developments (consented and/or proposed) within 5km of the proposed development.

11.2.1 Construction Noise

The assessment of temporary construction noise effects will include the calculation of noise levels from the anticipated plant and activities at the closest NSRs. Predictions of construction noise levels will be undertaken in accordance with BS5228-1:2009+A1:20014[21] using published source noise level data. The calculations will be undertaken in accordance with Annex F2.2, *'Method for Activity L_{Aeq}'* and Annex F2.4 *'Method for Mobile Plant in a Defined Area'* of BS5228, and will assume a worst case scenario of all plant operating continuously and simultaneously for 10 hours.

[21] British Standards Institute (2014). *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*.

The predictions of construction noise levels will be assessed against assumed evaluation criteria to identify the significance of temporary construction noise effects. In the absence of specific national guidance on noise limits during construction activities, the guideline noise limits in BS5228 will be used.

The impact of traffic associated with the construction phase will be based on the results of the Transport Assessment, where consideration will be given to the increase in traffic flows generated on the proposed transport routes. This will be based on baseline and predicted flows and assessed following the guidance detailed within the Design Manual for Roads and Bridges[22] (DMRB).

The residual effects of construction noise and construction traffic will be undertaken in accordance with relevant good practice, policy and guidance.

11.2.2 Operational and Cumulative Noise

The overall approach for the operational and cumulative noise assessment will be discussed in detail and agreed with AC. Ultimately, the assessment will be undertaken in accordance with ETSU-R-97, *'The Assessment and Rating of Noise from Wind Farms'*, whilst also following the recommendations detailed within the Institute of Acoustics' *Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (IOA GPG), as recommended by Aberdeenshire Council and national planning guidance.

AC's specific requirements for wind farm operational noise assessments are outlined within their Submission Guidance Note (SGN)[23]. The SGN, which was published in February 2015, provides guidance on site-specific noise assessments, including cumulative noise and the setting of appropriate noise limits within planning conditions. Therefore, following the guidance of AC, the existing wind farm planning permission will be considered in the context of the matter.

In this respect, the cumulative assessment will consider other turbines (within a distance of 5km) which are operational, consented and/or within the Section 36 or planning application process, namely Dorenell wind farm. This will be undertaken with reference to current best practice and the noise limits contained in the respective planning consent for each cumulative site (where relevant). As per the guidance of ETSU-R-97 and the IOA GPG, daytime and night-time noise limits will be applicable to all wind turbines operating cumulatively. Therefore, the assessment of cumulative noise will be a key consideration with respect to the proposed wind farm.

In terms of operational turbine noise, mitigation will be considered throughout the design process in the form of changes to the proposed location of the turbines and/or the candidate turbine model. Mitigation, if required, will be based on the results of noise level predictions, assessed against established and/or derived cumulative noise limits as appropriate.

The residual effects of operational noise will be undertaken in accordance with relevant good practice, policy and guidance.

[22] Transport Scotland (2008). *Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7 – Traffic Noise and Vibration.*

[23] Aberdeenshire Council (2015), *Wind Turbine Development: Submission Guidance Note on the Information required for an Assessment of the Noise Impact of Proposed Wind Turbine Developments to be undertaken in Connection with a Planning Application.*

11.2.3 Consultation

Consultation with the designated Environmental Health Officer (EHO) of AC will be undertaken at the start of, and throughout, the assessment process with respect to their specific requirements for the noise assessment. This process will aim to agree the approach to the assessment of construction, operational and cumulative noise effects, along with the assessment methodologies and limit criteria for both operational and cumulative noise.

11.2.4 Matters Scoped Out

- Noise associated with decommissioning the turbines at the end of their lifespan is likely to be equal to or less than noise generated during the construction phase;
- Noise associated with traffic during the operation of the proposed development, as this is likely to be low and not significant in the context of the existing road network; and
- Vibration effects as a result of construction activities and associated traffic, considering the distances to the closest NSRs.

11.3 References and Standard Guidance

The following policy and legislation will be referenced within the assessment:

- Scottish Government (2014), *Scottish Planning Policy*;
- Scottish Government (2011), Planning Advice Note PAN 1/2011, *Planning and Noise*, and the associated Technical Advice Note (TAN);
- Scottish Government (2013), *Onshore Wind Turbines* (web-based guidance); and
- The Working Group on Noise from Wind Farms (1996), ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*.

The following good practice and guidance documents will be referred to throughout the assessment:

- British Standards Institute (2014), British Standard BS5228-1:2009+A1:2014, *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise*;
- Transport Scotland (2008), Design Manual for Roads and Bridges, Volume 11, Section 3, *Part 7 – Traffic Noise and Vibration*;
- Institute of Acoustics (2013), *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*, including Supplementary Guidance Notes;
- International Organisation for Standardisation (1996), ISO9613-1, *Acoustics – Attenuation of Sound during Propagation Outdoors: Part 1 – Method of Calculation for the Attenuation of Sound by Atmospheric Absorption*; and
- International Organisation for Standardisation (1996), ISO9613-2, *Acoustics – Attenuation of Sound during Propagation Outdoors: Part 2 – General Method of Calculation*.

12.0 ACCESS, TRAFFIC AND TRANSPORT

12.1 Environmental Baseline and Potential Sources of Impact

There are a total of 18 wind turbines located at the Clashindarroch Wind Farm site (planning application APP/2009/1380) which was completed in July 2015, the existing access junction and some internal site infrastructure will be available for access to Clashindarroch II.

The proposed development would utilise the existing access. It is anticipated that access to the site from the A920 would be provided along much of the same route used for the Clashindarroch Wind Farm site, initially via existing forestry routes onto the highway network. To reach the access junction on the A920 large vehicles would travel east along the A920 from the A96.

During the construction phase, the selected rote will be used by abnormal load vehicles carrying wind turbine components, together with conventional construction vehicles, such as lorries, vans and private cars.

During the operational phase, the proposed development would generate a negligible number of vehicle movements. These would predominantly be for maintenance visits by technicians. Abnormal load vehicle access is unlikely, but may be needed, if a turbine component requires replacement.

During the decommissioning stage of the proposed development, construction access would again be required for the removal of equipment. However the number of vehicle movements would be fewer in number in comparison to the construction phase. In terms of Access, Traffic and Transport, the primary source of impact arising from the proposed development would be the traffic generation resulting from the construction.

The cumulative effect of the proposed development, in relation to other developments which may have an effect on the baseline transport conditions, will also require assessment.

12.2 Method of Assessment and Reporting

Desk Study

A desk based review of the impacts arising from the construction of the proposed development will be undertaken, including the following;

- Collection and analysis of available road traffic accident data over the defined study area;
- Undertaking of swept path analyses for abnormal loads at potentially restricted locations along the abnormal loads access routes (surveys undertaken over 1:1,250 scale OS mapping data);
- Road boundary data will be obtained for “pinch points”, to confirm (or otherwise) that the swept path of abnormal load vehicles would remain within the extent of the land owned by AC Highways;
- Determination of a construction phase programme and quantification of construction phase trips based on the quantity of material required for the proposed development and the duration of the construction phase;
- Determination of a traffic baseline, taking account of measured existing traffic flow (itemised under Field Surveys) and other wind farm developments, that have been identified for inclusion within the cumulative assessment; and
- Quantification of material increases in traffic resulting from the construction and operation phase of the proposed development.

Field Surveys

Detailed visual inspections will be undertaken of the proposed access routes. The locations of potential "pinch points" will be identified through visual assessment (based on the assessor's experience) for further analysis.

Topographical surveys will be undertaken in areas where it is considered by the assessor that further details above the available OS mapping data will be required to fully inform the swept path analysis (that is, in terms of vertical alignment constraints).

24 hour automatic traffic counts (ATCs) will be undertaken at the A920 to the east of the existing access near the access to the Cairncraig property. The ATC will be set down on the A920 in a suitable location to provide 24-hour data over a period of seven days. The exact location of the counts will be determined once full details of the proposed development are understood.

Mitigation

Mitigation measures will be proposed following the completion of the impact assessments, as informed by baseline assessments. The purpose of these measures is to remove, minimise or compensate any significant effects. These mitigation measures will be agreed with AC who act as the local road authority. These measures will also be incorporated into the outline Construction Traffic Management Plan.

Outline designs will be prepared for:

- Access junction locations;
- Areas of temporary works required to facilitate abnormal load access to the site; and
- On-site access track design and temporary bypass design (if required).

Assessment of Effects

The potential effects, resulting from vehicle movements generated from the construction phase of the proposed wind farm will be assessed based on the material change in traffic levels and their effects on the baseline, including effects on road capacity, driver delay, community severance, road safety and the effects on vulnerable road users, for example, cyclists and pedestrians.

The proposed development would have a direct effect on users of the road network during the construction and decommissioning phases as a result of road borne traffic. The effects would be temporary and only arising during those phases of the project. Cumulative effects would arise from construction and/or decommissioning works arising during the period of other construction activities and would, again, be temporary. The operational phase of the proposed development would generate negligible trips and therefore no significant effects would arise.

Effects will be assessed according to the criteria defined in Guidance on the Environmental Assessment of Road Traffic, IEMA 1993 (the IEMA Guidelines).

Residual and Cumulative Effects

Where information is available, a review of the likely programming of other wind farm developments which are under construction, approved but not yet under construction will be undertaken so as to consider the overall cumulative effect of construction of the

developments with the proposed development. Once operational, the proposed development would generate negligible vehicle trips and need not be considered cumulatively.

The residual effects arising from the construction phase of the proposed development will be assessed following consideration of appropriate mitigation measures, which will be evaluated through the assessment process and in consultation with the relevant authorities.

12.2.2 Routing of Abnormal Loads

The site is located in the Aberdeenshire area of Scotland, to the south west of Huntly, south east of Elgin and north west of Aberdeen. The border between Aberdeenshire and Moray aligns with a section of the western boundary of the site. The site extends north east to the priority junction with the A920, approximately 2 miles west of Huntly. The A920 connects with the A96 at a ghost island priority junction. The A96 connects to Elgin in the north west and Aberdeen in the south east.

The delivery port would be Inverness with materials transported to the site via the A9, onto the A96 and then to the site access via the A920.

While it is unlikely for there to be unidentified constraints to abnormal load access along the A920, as the route was utilised for access to Clashindarroch Wind Farm, consideration is required as the turbine size may be larger for the proposed wind farm. The assessment will identify any potential road geometry constraints or physical barriers likely to impact on the movement of the abnormal loads along the A920.

An initial desk top review has not identified any specific areas for concern, the junction of the A920 with the A96 is not anticipated to be an issue due to the good width provided by the right turn lane and left filter. There appears to be a culvert which runs under the A920 approximately 180m to the east of Arnhall Cottages, the structure facilitates the flow of water to the River Deveron and will need to be investigated further.

12.2.3 Consultation

Consultation will be undertaken with AC in respect of:

- Confirmation of the proposed access routes to the site, including the requirements for abnormal load access;
- Proposed location of access point(s) to the proposed development site from the public highways and potential re-design of bellmouth entrance (if required); and
- Outline design of proposed access arrangements, temporary road improvements and other mitigation measures (if required).

12.2.4 Matters Scoped Out

In recognition of the design of the A96 and its proven capability of facilitating the transportation of abnormal loads, it is proposed that an assessment of the A96 will not be required.

It is expected that the effect during the operational phase will be negligible; therefore it is proposed that this stage of the project is scoped out of the Access, Traffic and Transport assessment.

It is also proposed that the decommissioning stage is scoped out of the Access, Traffic and Transport section, in recognition that this stage will occur 30 years after commencement of

commercial operations and an assessment should be made closer to this point in time to more accurately reflect the level of effect of this activity.

12.3 References and Standard Guidance

Transport Assessment and Implementation: A Guide published by the Development Department of the Scottish Executive in 2005.

Guidance on the Environmental Assessment of Road Traffic published by the Institute of Environmental Management and Assessment (IEMA) in 1993.

Accident data collected from AC and/or Police Scotland.

13.0 SOCIO-ECONOMICS, TOURISM, RECREATION AND LAND USE

13.1 Environmental Baseline and Potential Sources of Impact

Study Area

The proposed development is located near Huntly within the AC area. The site lies close to the boundary with Moray Council.

Due to the location of the site close to Moray, the proposed study area for the assessment of socio-economic effects will comprise both the AC and the Moray Council areas. The assessment will consider the impact of the proposed development on employment and the economy within both of these administrative areas as well as within the rest of Scotland.

For the assessment of effects on tourism, recreation and land use receptors, the study area will primarily focus on an area within 5km of the site, but will take account of high sensitivity receptors such as Cairngorms National Park beyond 5km.

Demographics

According to the 2015 midyear estimates, Aberdeenshire's population stands at 262,000, 4.9% of Scotland's total[24]. The population of Moray is 95,500, approximately 1.8% of the total population of Scotland[25]. Both Aberdeenshire's and Moray's working age populations (16-64) are lower than Scotland's average by 1.2% and 2.3% respectively.

By 2037 the population of Aberdeenshire is projected to be 299,813, an increase of 17.3 per cent compared to the population in 2012. In contrast, the population of Moray is projected to be 90,889 by 2037, a decrease of 2.2% compared to the population in 2012. The population of Scotland is projected to increase by 8.8% between 2012 and 2037[26].

Labour Market and Supply Chain

The economy in Aberdeenshire is growing, with employment rates at 82.1%, which is higher than the Scottish average of 77.2%. Average income within Aberdeenshire is £567.3 gross earnings, £30.7 higher than the Scottish average of £536.6.[24]

The economy in Moray is also growing with an employment rate of 76.9%, this is slightly lower than the Scottish average of 77.2%. Many of these posts are of a low wage income with gross earnings at £498.7, which is significantly below the Scottish average of £536.6. [25]

Tourism and Recreation

The 2015 Scotland Visitor Survey[27] identified that in 2013, Sustainable Tourism generates £195.1m GVA in Aberdeenshire, and employs 7,400 people. In Moray, it is estimated to generate £38.2m GVA and employ 2,600 people.

The 2012 Scotland Visitor Survey identified that in Aberdeenshire, the scenery/landscapes was the primary reason for visiting for 28% of visitors, while in Moray it was 57%. The most popular activity for visitors in Aberdeenshire was visiting historic venues (53%), followed

[24] NOMIS (2016) Labour Market Profile – Aberdeenshire.

[25] NOMIS (2016) Labour Market Profile – Moray.

[26] National Records of Scotland, Moray Council Area - Demographic Factsheet 2014

[27] Visit Scotland (2015) Tourism in Scotland's Regions 2015.

closely by short walks (51%). In Moray the most popular activity was taking short walks (54%) followed by general sightseeing, visiting historic castles/houses and trying local food (51% each).

The information from the Scotland Visitor Survey identifies that walking is one of the most popular activities during visits to this part of Scotland. There are a number of local paths and trails running through the site of the proposed development although none of these are identified within the AC Core Paths Plans.

Huntly Nordic and Outdoor Centre

The Huntly Nordic and Outdoor Centre is run by AC and is located in the Clashindarroch forest. This forest is the best snow holding forest in the country averaging around 45 skiing days a year but is known to have up to 118 days. There are a number of set routes and trails throughout the forest, which have board maps at each junction throughout the forest to assist recreational users with navigation; some of the trails cross the area of the proposed wind farm development. The trails are managed by the Centre which also provides ski hire in the winter.

The Centre also has all weather tracks, a roller skiing track and dry tubing hills for when there is no snow in the forest. Other activities provided by the Centre for seasons where there is no snow are mountain bikes and gear, as well as trails and route maps through the forest for pony trekkers, cyclists and walkers.

13.1.2 Potential Source of Impact

Potential sources of impact that may be experienced during the construction, operational and decommissioning phases are set out below:

Construction

The majority of effects are expected to be experienced during the construction phase. These are likely to include beneficial effects on the local economy, including employment opportunities for local businesses and people, and increased spend on local services and accommodation from workers staying locally. The proposed development would lead to investment within the Aberdeenshire and Moray area. The ES will provide information on the types of jobs and investment to be created by the development proposals.

Vattenfall is committed to ensuring that local contractors and other businesses have an opportunity to tender for work on their projects. The assessment will consider the potential local availability of relevant supply chain businesses and workforce skills in this regard, and seek to quantify the potential effect, including direct, indirect and induced effects of the project arising from increased local spending.

Other potential construction phase effects may include temporary restrictions on recreational movements throughout the Clashindarroch forest. Potential secondary effects may also arise from disruption to the local road network or possible adverse effects on tourism arising from visual and noise effects whilst the construction work is taking place.

Operation

A number of studies have examined whether there is a link between the development of wind farms and changes in patterns of tourism spend and behaviour, and generally the conclusion is that there is little effect.[28] The assessment will draw upon the findings of these

studies when examining whether the operational development may have an adverse effect on the local visitor economy. Any potential adverse effects on usage of recreational trails and routes in the Clashindarroch forest will be assessed.

Decommissioning

The effects arising during the decommissioning phase are expected to be similar to those experienced during the construction phase.

13.2 Method of Assessment and Reporting

13.2.1 Method of Assessment

This chapter is concerned with assessing the potential construction and operational phase effects on:

- the local economy (employment and economic output);
- opportunities for local involvement in the business supply chain and employment, i.e. how the key construction and operational activities will translate into investment and jobs;
- recreation and tourism assets; and
- land use.

There is no industry standard guidance for this assessment.

Decommissioning effects are seen as very similar to construction effects.

13.2.2 Sensitivity criteria, magnitude and significance thresholds

The following parameters will be considered within the assessment in line with the EIA Regulations:

- beneficial or adverse (or neutral);
- extent (the area over which the effect occurs);
- duration (the time for which the effect is expected to last prior to recovery or replacement of the resource or feature);
- reversibility (permanent or temporary); and
- timing and frequency.

Sensitivity criteria

There are no published standards that define receptor sensitivity relating to socio-economic assessment. As a general rule the sensitivity of each receptor or receptor group will be based on its importance or scale and the ability of the baseline to absorb or be influenced by the identified effects. In assigning receptor sensitivity, consideration will be given to the following:

- importance of the receptor e.g. local, regional, national, international;
- availability of comparable alternatives;
- ease at which the resource could be replaced;

[28] Scottish Gov (2008) *'The economic impacts of windfarms on Scottish tourism'*. Available at: http://www.gov.scot/Resource/Doc/214910/0057316.pdf

- capacity of the resource to recover or adapt to identified impacts over a period of time; and
- level of usage and nature of users (e.g. sensitive groups such as people with disabilities).

Based upon professional judgement, it is proposed that four levels of sensitivity are used: High; Medium, Low and Negligible. Proposed sensitivity criteria are set out in Table 13.1.

Table 13.1: Proposed Sensitivity Criteria

Criteria	Description
High	The receptor: • has little or no capacity to absorb change without fundamentally altering its present character; or • is of high socio-economic, tourism, recreation or land use value[29]; or • is of national or international importance; or • is accorded a high priority in policy; and • there are no alternatives with available capacity within its catchment area.
Medium	The receptor: • has moderate capacity to absorb change without fundamentally altering its present character; or • has a moderate socio-economic, tourism, recreation or land use value; or • is of regional importance; and • is accorded a moderate priority in policy; and • there are some alternatives with available capacity within its catchment area.
Low	The receptor: • is tolerant of change without detriment to its character; or • is of low socio-economic, tourism, recreation or land use; or • is of local importance; • is accorded a low priority in policy; and • there is a choice of alternatives with available capacity within its catchment area.
Negligible	The receptor is resistant to change and is of low socio-economic, tourism, recreation or land use value or there is a wide choice of alternatives with available capacity within its catchment area.

Magnitude criteria

The proposed assessment criteria are based on professional judgement and experience from assessment of similar projects and are set out in Table 13.2.

Table 13.2: Magnitude of Impact

Receptor Group	High	Medium	Low	Negligible

[29] Which may include being of high value to a user group of high sensitivity (e.g. mobility impaired users)

Receptor Group	High	Medium	Low	Negligible
Business Supply Chain	An impact that would dominate over the baseline business population conditions and/or would affect a large proportion of business establishments.	An impact that would be expected to result in a moderate change to baseline business population conditions and/or would affect a moderate proportion of business establishments.	An impact that would be expected to result in a perceptible difference from baseline business population conditions and/or would affect a small proportion of business establishments.	An impact that would not be expected to result in a measurable variation from baseline business population conditions.
Local Labour Market	An impact that would dominate over baseline local labour market conditions and/or would affect a large proportion of the existing resident workforce.	An impact that would be expected to result in a moderate change to baseline local labour market conditions and/or would affect a moderate proportion of the existing resident workforce.	An impact that would be expected to result in a perceptible difference from baseline local labour market conditions and/or would affect a moderate proportion of the existing resident workforce.	An impact that would not be expected to result in a measurable variation from baseline local labour market conditions.
Tourism and Visitor Economy	An impact that would dominate over baseline tourism and visitor economy conditions.	An impact that would be expected to result in a moderate change to baseline tourism and visitor economy conditions.	An impact that would be expected to result in a perceptible difference to baseline tourism and visitor economy conditions	An impact that would not be expected to result in a measurable variation from baseline tourism and visitor economy conditions
Tourism and Recreation Assets	An impact that would be expected to cause a major restriction of access to or availability of tourism and visitor assets in the LIA or would result in a major change to existing patterns of use.	An impact that would be expected to have a moderate restriction of access to or availability of tourism and visitor assets in the LIA or would result in a moderate change to existing patterns of use.	An impact that would be expected to have a small restriction of access to or availability of tourism and visitor assets in the LIA or would result in a small change to existing patterns of use.	An impact that would be unlikely to result in a noticeable difference to tourism and visitor assets in the LIA.
Land Use	An impact that would lead to a major	An impact that would lead to a moderate	An impact that would lead to a minor	An impact that would lead to a negligible

Receptor Group	High	Medium	Low	Negligible
	restriction on the operation of a receptor, e.g. a farm business, or complete closure of receptor.	to major restriction on the operation of the receptor.	restriction on the operation of the receptor.	restriction on the use of the receptor.

Defining 'significant effects'

The level of effect of an impact on socio-economic, tourism, recreational and land use receptors will initially be assessed by combining the magnitude of the impact and the sensitivity of the receptor. The level of effects presented in Table 13.3 provides a guide to decision making.

Table 13.3: Level of Effect Matrix

Level of Effects Matrix				
Sensitivity or Value of Resource or Receptor	**Magnitude of Impact**			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Defining significant effects

Where an effect is classified as **Major**, this is considered to represent a 'significant effect' in terms of the EIA Regulations. Where an effect is classified as **Moderate** , this may be considered to represent a 'significant effect' but should always be subject to professional judgement and interpretation, particularly where the sensitivity or impact magnitude levels are not clear or are borderline between categories or the impact is intermittent.

The Level of Effects Matrix shown in Table 13.3 therefore provides a guide to decision making, but is not a substitute for professional judgment. Impacts and effects can be beneficial, neutral or adverse and these will be specified where applicable. It should be noted that significant effects need not be unacceptable or irreversible.

13.2.3 Cumulative Effects

In terms of recreation and tourism, consideration will be given to the cumulative effect of wind farms in the study area and whether there are sufficient substitute activities for recreational and tourism users. In particular, consideration will be given to cumulative effects on users of the Clashindarroch forest.

13.2.4 Approach to Mitigation

The proposed development would be constructed, operated and decommissioned in accordance with industry good practice which would include embedded environmental measures. Additional mitigation measures will be considered to mitigate any adverse effects that are identified after incorporating these measures.

13.2.5 Consultation

On completion of the scoping consultation, the relevant scoping responses will be reviewed. Issues raised and advice on assessment methodology will be addressed in the ES. Information to inform the baseline will be sought from various sources, including the following:

- Ramblers Association;
- Cycling Scotland;
- British Horse Society Scotland;
- Local community councils;
- Scottish Enterprise;
- Scottish Rights of Way (Scotways) and Access Society;
- Heritage Paths;
- Long Distance Walkers Association;
- Forestry Commission Scotland;
- British Nordic UK;
- Scottish Association for Country Sports; and
- Visit Scotland.

Direct contact will be sought with these organisations if required to:

- verify published information;
- identify potential effects; and
- help assess significance of potential impacts.

13.2.6 Matter Scoped Out

On the basis of the preliminary desk based work undertaken and professional judgement, the following aspects are proposed to be scoped out of the assessment:

- Decommissioning, which is seen as comparable works to construction; and
- Based on past experience of onshore wind farm projects of this scale, it is not expected that there will be a large influx of workers to the area during the construction phase. Consequently it is not expected that there would be a significant effect on the demand for housing, health or educational services).

13.3 References and Standard Guidance

The assessment will follow current best practice guidance as set out in the following documents:

- Scottish Government (2012) Good Practice Wind Guidance
- Scottish Natural Heritage (2013) A handbook on environmental impact assessment (EIA);
- Scottish Enterprise (2010) National Renewables Infrastructure Plan;
- Scottish Enterprise (2008) Economic Appraisal Guidance Note;
- Scottish Government (2016) Draft Advice on Net Economic Benefit and Planning

- Circular 3/2011: the Town and County Planning (Environmental Impact Assessment); (Scotland) Regulations 2011; and
- Scottish Natural Heritage (2015) Good Practice During Windfarm Construction.

13.3.1 Policy Review

Relevant national planning policies relating to socio-economics, tourism, recreation and land use are set out in the following policy guidance:

- Scottish Government (2014) Scottish Planning Policy; and
- Scottish Government (2011) A Low Carbon Economic Strategy for Scotland: Scotland - A Low Carbon Society.

Local policy is set out in the Local Development Plan, the key features of which are highlighted below.

Proposed Aberdeenshire Local Development Plan (2016)

Policy C2 Renewable Energy in the proposed Aberdeenshire Local Development Plan requires that the assessment of wind energy proposals should take the following considerations relevant to the socio-economic, tourism, recreation assessment and this project specifically, namely:

- impacts on tourism and recreation interest (including *core paths* and other established routes used for public walking, riding or cycling); and
- the cumulative impact of neighbouring/existing consented wind turbines.

13.3.2 Literature Review

A literature review will be undertaken of relevant literature published on the impact of wind farms on tourism, to provide context to the assessment of the effects of the proposed development on tourism and recreation.

14.0 AVIATION AND DEFENCE

The assessment will address the likely impact of the wind farm structures on airfield flight paths and military craft flying areas and likely impact on airport radar signals.

Consultation will take place with:

- Ministry of Defence
- Scottish Government
- National Air Traffic Services (NATS)
- Civil Aviation Authority (CAA)

Likely impacts on aircraft movements will be identified through the consultation process. Assessment would include an analysis of the likely consequence of the positioning of the turbines.

15.0 OTHER ENVIRONMENTAL ISSUES

15.1 Introduction

A single chapter would be prepared to draw together the implications of the proposed development on other facets of the environment that have been scoped out of the EIA process. It is anticipated that this chapter would include discussion of the following issues:

- Shadow Flicker;
- Carbon Balance;
- Air Quality; and
- Telecommunications

Matters which are expected to be forthcoming in the emerging EIA regulations including biodiversity and population and human health will be addressed in the ES.

15.2 Shadow Flicker

Rotating wind turbine blades can cast moving shadows that cause a flickering effect and can affect residents living nearby. Shadow flicker occurs when a particular combination of conditions coincide in specific locations at particular times of the day and year. It happens when the sun is low in the sky and shines on a building from behind a turbine rotor. This can cause the shadow of the turbine blades to be cast onto the building, which appears to flick on and off as the turbine rotates. When this flicking shadow is viewed through a narrow opening it is known as shadow flicker.

Shadow flicker only occurs in relative proximity to sites and typically at a distance of 10 rotor diameters, (equivalent in this case to approximately 1290m), a person will not perceive a wind turbine to be cutting through sunlight, but rather as an object with the sun behind it.

Residential receptors within 130 degrees of due north of any turbine and within a 1290m radius of the nearest turbine would be fully assessed for shadow flicker. In the event that no properties are located within the potentially affected area shadow flicker will be scoped out.

15.3 Carbon Balance

A carbon balance assessment will be undertaken for the proposed development using guidance Calculating Potential Carbon Losses and Savings from Wind Farms on Scottish Peatlands[30]. The main aims of the calculation are: to quantify sources of carbon emissions associated with the proposed development (i.e. from construction, operation and transportation of materials, as well as loss of peat/forestry as relevant); to quantify the carbon emissions which will be saved by constructing the wind farm; and to calculate the length of time for the project to become a 'net avoider', rather than a 'net emitter' of carbon dioxide emissions. The length of time is termed the 'payback time'.

15.4 Air Quality

Given the remote location of the site, the generation of dust during construction activity is unlikely to have a direct impact on any human receptors and will be controlled by means of best practice construction techniques to be described in the ES.

[30] Calculating Potential Carbon Losses and Savings from Wind Farms on Scottish Peatlands, Nayak et al., 2008; Nayak et al., 2010 and Smith et al., 2011

Consideration will be given within the Terrestrial Ecology and Hydrology chapters to the potential impacts that dust generation could have on any identified sensitive ecological or hydrological receptors. If required, detailed mitigation measures will be proposed within these ES chapters.

15.5 Telecommunications

Wind farms produce electro-magnetic radiation which has the potential to interfere with broadcast communications and signals.

In order to determine the potential impact of the proposed development, initial consultation will be undertaken with the following consultees:

- Ofcom (Scotland);
- Joint Radio Company;
- British Telecom;
- Cable and Wireless;
- Vodafone;
- O2;
- T-Mobile; and
- Orange.

Additional scoping work will identify all fixed link radio facilities, all broadcast television and radio transmitters within a 30km radius of the site.

The probability of a significant impact on fixed radio links and broadcast television signals will be assessed on the basis of site proximity to transmitter-receiver paths and rebroadcast links and calculation of Ofcom-recommended clearance zones. Potential changes to the telecommunications environment as a result of the development will be predicted by an assessment of the proximity of turbines to radio facilities and consultations with Ofcom.

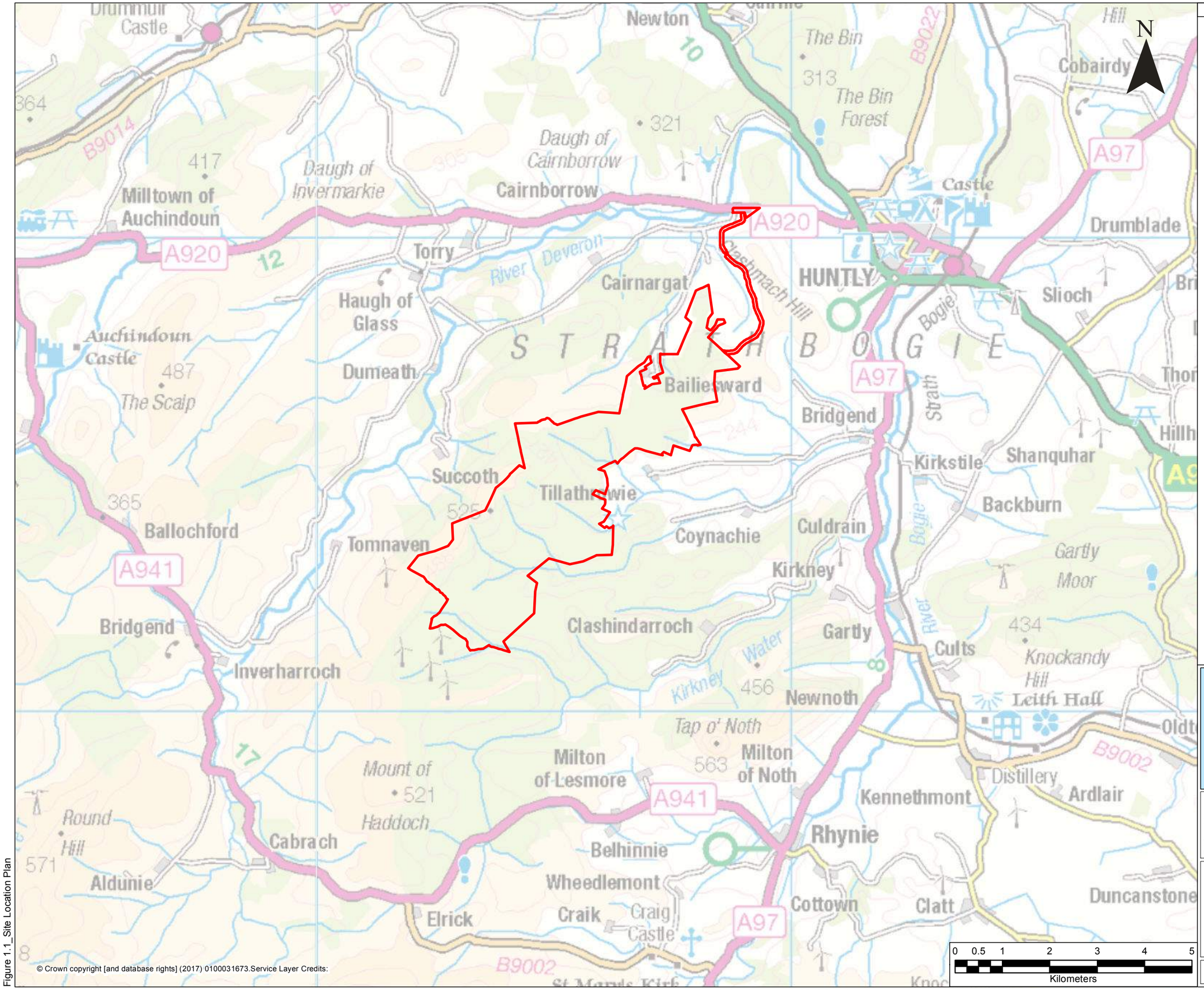
Determination of the impact of the wind farm will be determined principally through consultation with operators of the radio and television facilities.

16.0 INVITATION TO COMMENT

If you wish to discuss matters contained in this report in greater detail prior to responding to the scoping exercise, please contact:

Alison Sidgwick
SLR Consulting Ltd
4/5 Lochside View,
Edinburgh.
EH12 9DH

FIGURES



LEGEND

Site Boundary

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CLASHINDARROCH II WIND FARM

EIA SCOPING REPORT

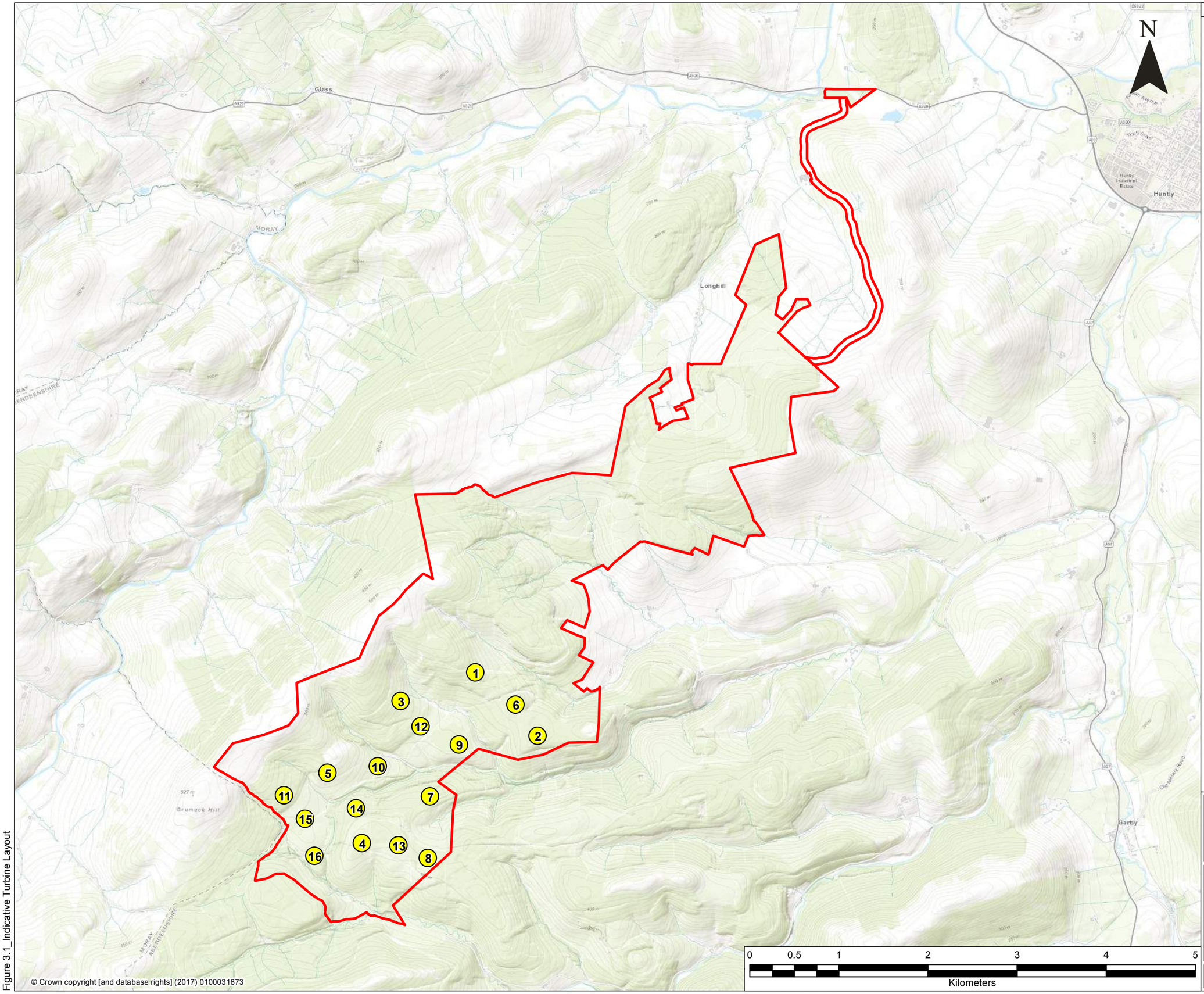
SITE LOCATION PLAN

1.1

Scale: 1:75,000@ A3

Date: APRIL 2017

Figure 1.1_Site Location Plan



LEGEND

Site Boundary

Indicative Wind Turbine

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EIA SCOPING REPORT

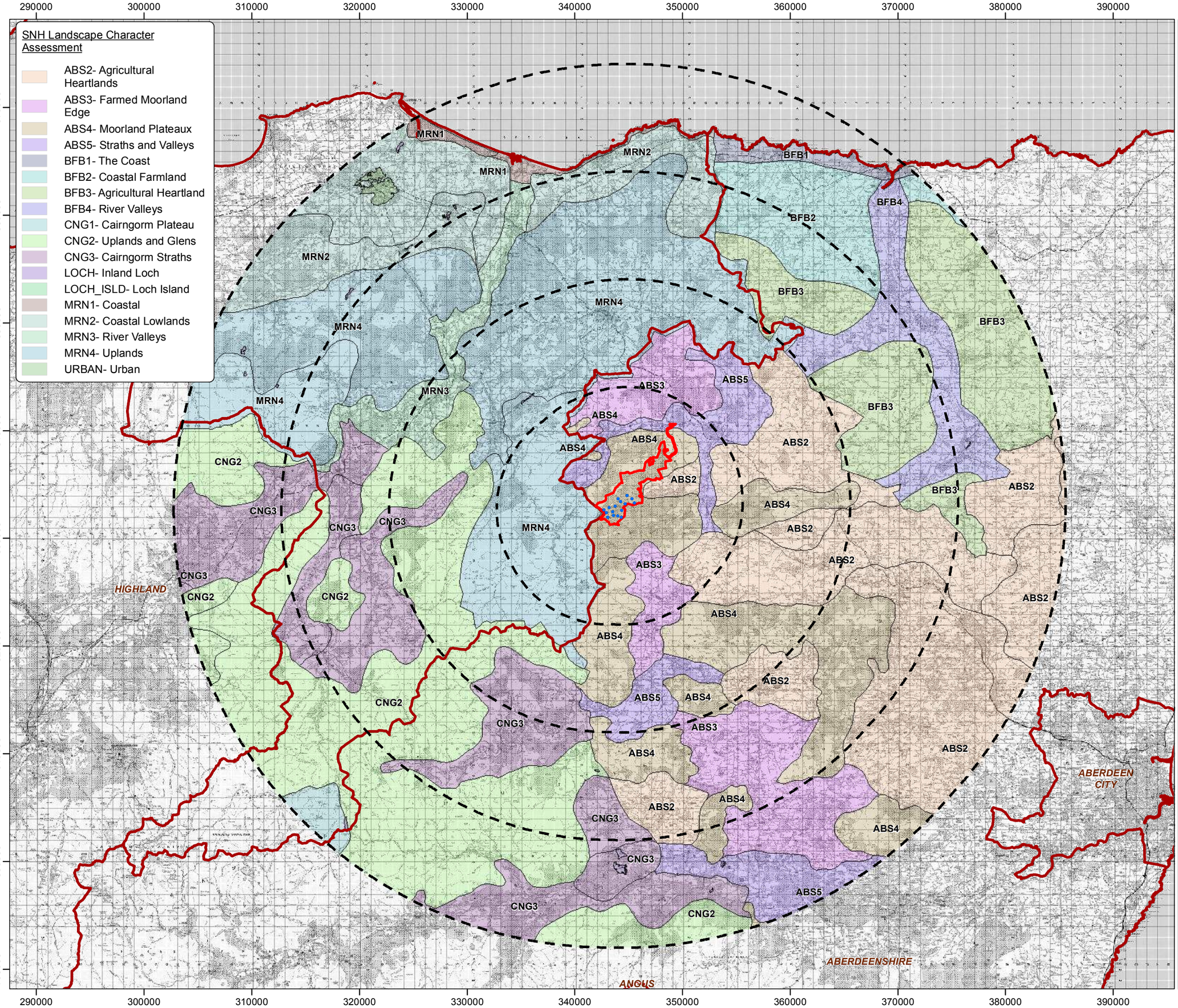
INDICATIVE TURBINE LOCATION

3.1

Scale: 1:40,000@ A3

Date: APRIL 2017

Figure 3.1_Indicative Turbine Layout



Legend

- Site Boundary
- Proposed Turbine
- 10km Turbine buffers
- Council boundaries

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1:325,000 @ A3

0 2.75 5.5 11 Km

N

Clashindarroch II Wind Farm

EIA Scoping Report

SNH Landscape Character Areas

6.1

Date: 04/04/2017 | Prepared By: JM

Ref: CLON_6.1_Landscape_Character Areas_161215jm

290000 300000 310000 320000 330000 340000 350000 360000 370000 380000 390000

870000 860000 850000 840000 830000 820000 810000 800000 790000

GORDONSTOUN (BOG O' PLEWLANDS)
INNES HOUSE
CULLEN HOUSE
DUFF HOUSE
North Aberdeenshire Coast
GRANT PARK AND CLUNY HILL
GORDON CASTLE (BOG OF GIGHT)
BRODIE CASTLE
PLUSCARDEN ABBEY (PRIORY)
DARNAWAY CASTLE
RELUGAS
FORGLEN
ADEN
Deveron Valley
HATTON CASTLE
MORAY
FYVIE CASTLE
LOCHINDORB
HADDO HOUSE
HADDO
HADDO
WILLIAMSTON HOUSE
LEITH HALL
NEWTON HOUSE (ABERDEENSHIRE)
PITMEDDEN
CASTLE GRANT
HIGHLAND
STRALOCH
AULTMORE
ABERDEENSHIRE
KEITH HALL
Bennachie
CASTLE FORBES
BALBITHAN HOUSE
North East Aberdeenshire Coast
BALMEDIE
KILDRUMMY CASTLE
HAUGHTON HOUSE
Upper Don Valley
MONYMUSK
CASTLE FRASER
CLUNY CASTLE
DOUNE OF ROTHIEMURCHUS
CANDACRAIG HOUSE
DOUNE OF ROTHIEMURCHUS
CRAIGIEVAR CASTLE
DUNECHT HOUSE
TILLYPRONIE
ABERDEEN CITY
Howe of Cromar
DUTHIE PARK
THE CAIRNGORM MOUNTAINS
15. CAIRNGORMS
DRUM CASTLE
Dee Valley
Clachnaben and
GLEN TANAR
PARK HOUSE
CRATHES CASTLE
BALMORAL CASTLE
South East Aberdeenshire Coast
INVERCAULD
DEESIDE & LOCHNAGAR
16. LOCHNAGAR - MOUNT KEEN
16. LOCHNAGAR - MOUNT KEEN
Clachnaben and Forest of Birse
ANGUS

290000 300000 310000 320000 330000 340000 350000 360000 370000 380000 390000

Legend

- Site Boundary
- Proposed Turbine
- 10km Turbine buffers
- Council boundaries
- Munro
- Corbett
- Graham
- Area of Wild Land
- National Scenic
- Gardens and Designed Landscapes
- National Park
- Country Park
- Area of Great Landscape Value (Moray)
- Candidate Special Landscape Area defined by Aberdeenshire Council

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1:325,509 @ A3

N

0 2.75 5.5 11 Km

Clashindarroch II Wind Farm

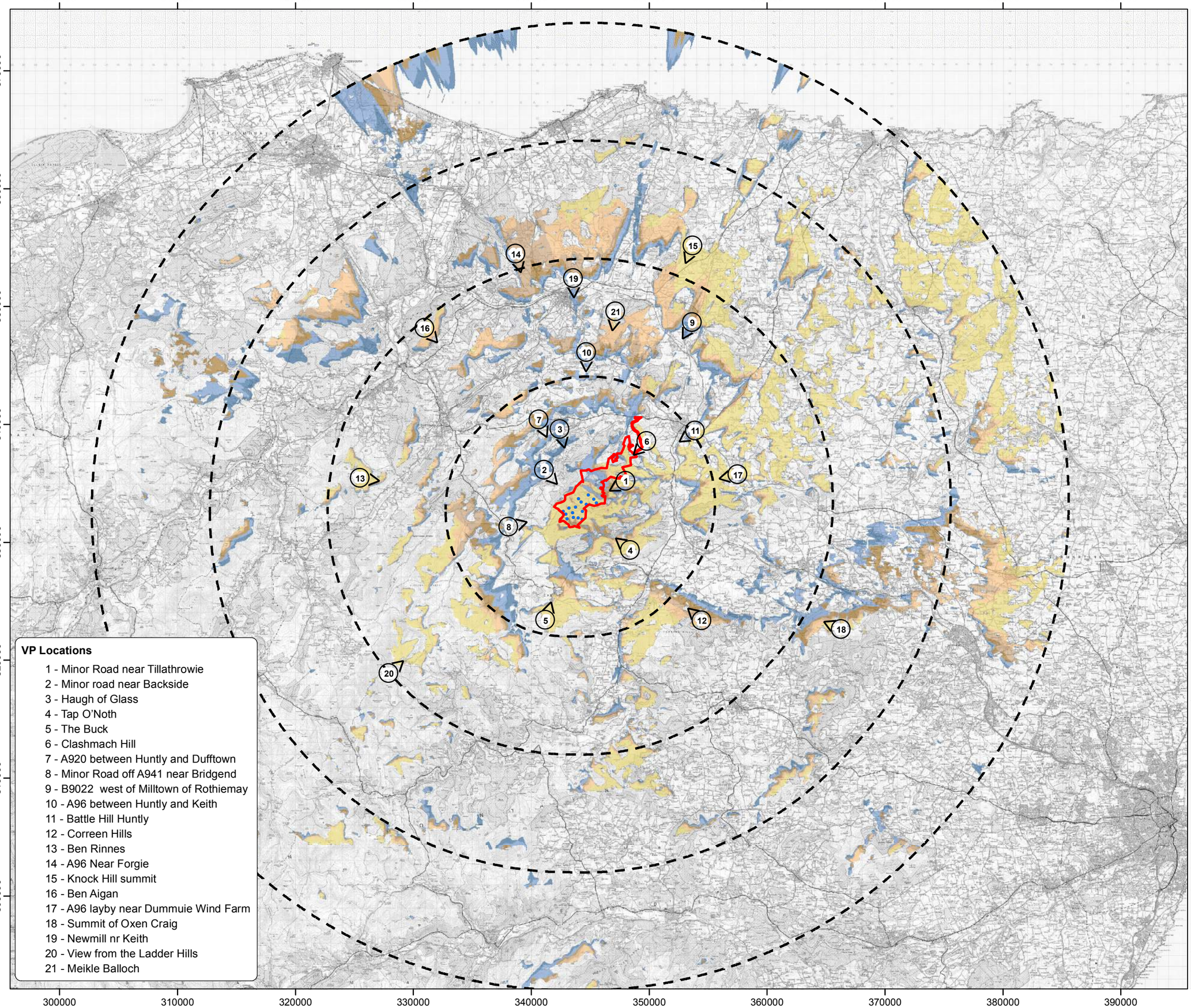
EIA Scoping Report

Landscape Designations

6.2

Date: 04/04/2017 | Prepared By: JM

Ref: CLON_6.2_Landscape_Designations_161215jm



VP Locations

1 - Minor Road near Tillathrowie
2 - Minor road near Backside
3 - Haugh of Glass
4 - Tap O'Noth
5 - The Buck
6 - Clashmach Hill
7 - A920 between Huntly and Dufftown
8 - Minor Road off A941 near Bridgend
9 - B9022 west of Milltown of Rothiemay
10 - A96 between Huntly and Keith
11 - Battle Hill Huntly
12 - Correen Hills
13 - Ben Rinnes
14 - A96 Near Forgie
15 - Knock Hill summit
16 - Ben Aigan
17 - A96 layby near Dummuie Wind Farm
18 - Summit of Oxen Craig
19 - Newmill nr Keith
20 - View from the Ladder Hills
21 - Meikle Balloch

Legend

Site Boundary
Proposed Turbine
10km Turbine buffers
VP Location (1)

Number of Turbines Predicted to be Visible at Blade Tip (149.9m)

1 - 2
2 - 5
5 - 8
8 - 10
10 - 13
13 - 16

Notes

1. Predicted visibility is for observer eye level 2m above ground level

2. The analysis does not take into account the screening effects of vegetation, buildings or other surface features

3. Created using Ordnance Survey digital terrain data on a 50m grid

4. ZTV created using ArcMap 10.2.2 ZTV using Viewshed tool

5. Distance of ZTV calculations based on SNH guidelines

Up to 50m tip - 15km	51 to 70 m tip - 20 km
71 to 85 m tip - 25 km	86 to 100 m tip - 30 km
101 to 130 m tip - 35 km	131 to 150 m tip - 40 km
Above 150 m tip - 45 km	

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1:300,000 @ A3

0 2.5 5 10 Km

N

Clashindarroch II Wind Farm

EIA Scoping Report

Blade Tip ZTV and Viewpoint Locations

6.3 Revision A

Date: 04/04/2017	Prepared By: JM

Ref: CLON_6.3_Blade Tip ZTV and VPs170306_JM

LEGEND

- Turbine Location (LCLON017)
- Site Boundary
- Core Survey Area for Breeding Birds (500m Buffer of Layout LCLON004)
- Black Grouse Survey Area (1.5km Buffer of Layout LCLON004)
- Maximum Extent of Raptor Survey Area (2km Buffer of Layout LCLON004)
- Vantage Point Location

N

0 0.5 1 2 3 4
Kilometers

Figure 7.1_Ornithological Survey Area and Vantage Point Locations

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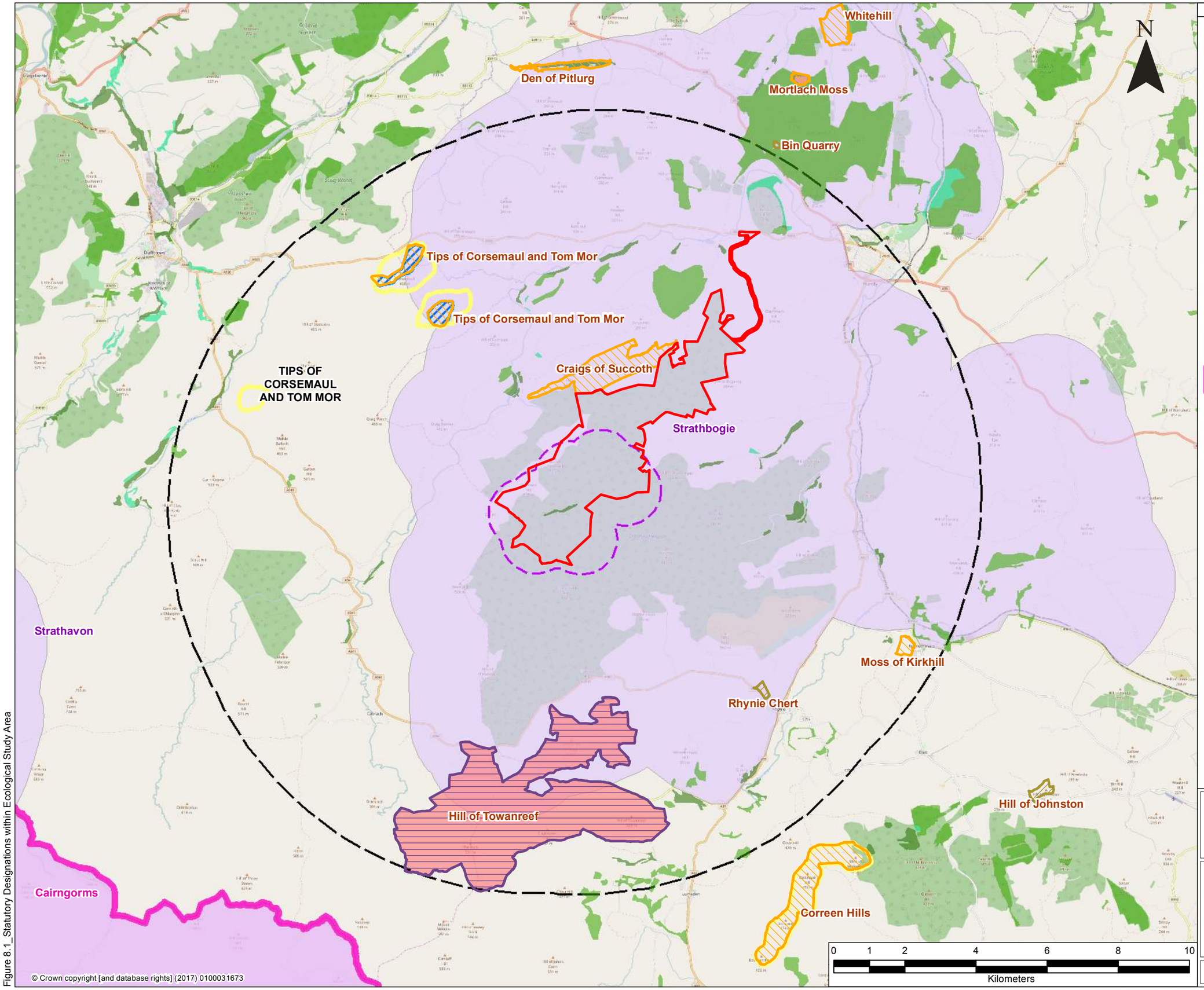
EIA SCOPING REPORT

ORNITHOLOGICAL SURVEY AREA AND VANTAGE POINT LOCATIONS

7.1

Scale: 1:30,000@ A3

Date: APRIL 2017



LEGEND

- Site Boundary
- 1km Turbine Buffer (Based on Layout LCLON017)
- 10km Turbine Buffer (Based on Layour LCLON017)

Statutory Designations

- Special Protection Area (SPA)
- Special Area of Conservation (SAC)

Site of Specific Scientific Interest (SSSI)

- Biological
- Geological
- Mixed
- National Park

Non-Statutory Designations

- RSPB Important Bird Area (IBA)
- Wildcat Priority Area (WPA)

Ancient Woodland Inventory (AWI) Site

- Ancient (of semi-natural origin)
- Long-Established (of plantation origin)
- Other (on Roy map)

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EIA SCOPING REPORT

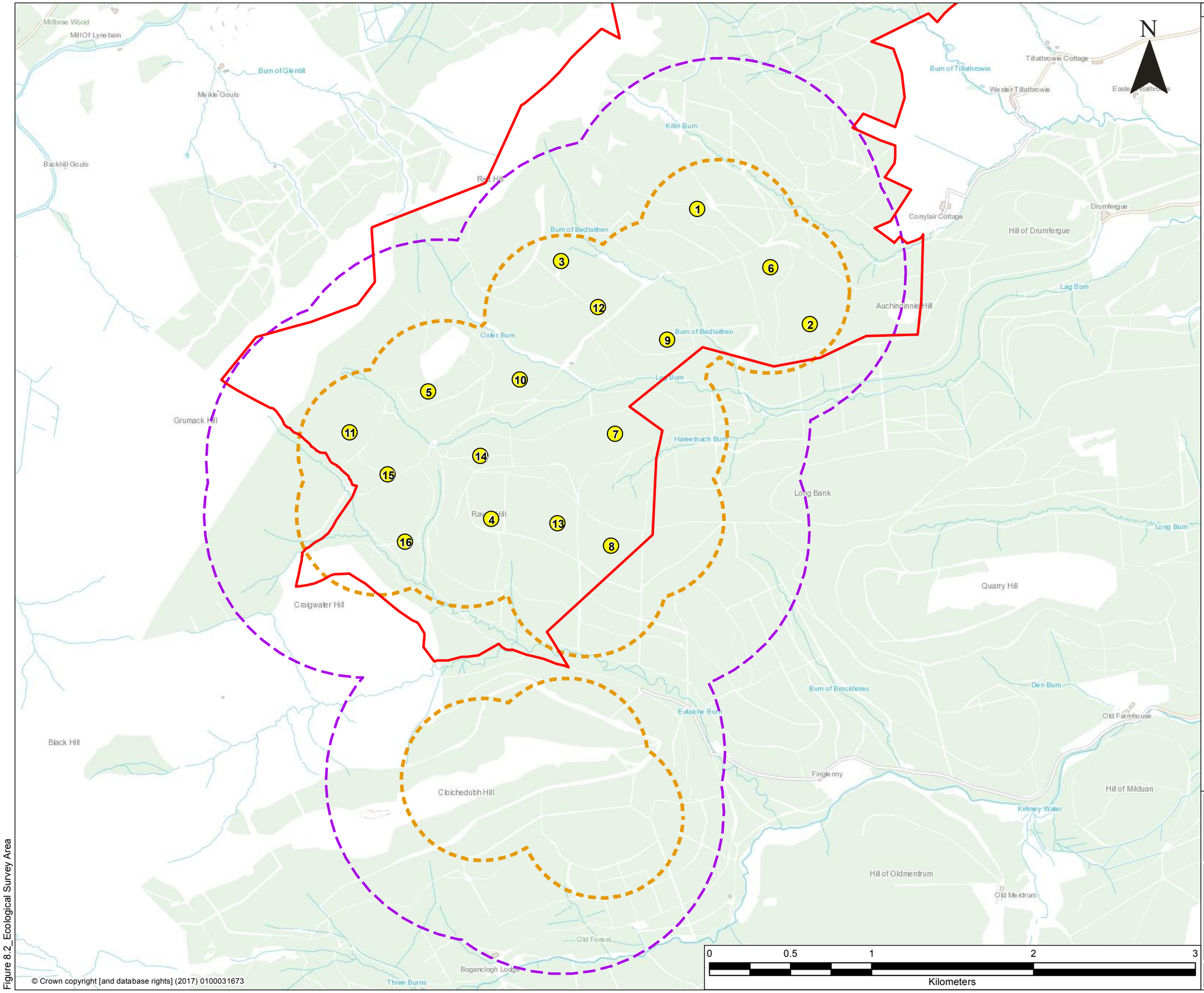
STATUTORY DESIGNATIONS WITHIN ECOLOGICAL STUDY AREA

8.1

Scale: 1:100,000@ A3

Date: APRIL 2017

Figure 8.1_Statutory Designations within Ecological Study Area



LEGEND

- Turbine Location (LCLON017)
- Site Boundary
- NVC Survey Area (500m Buffer of Layout LCLON005)
- Phase 1 and Protected Species Survey Area (1km Buffer of Layout LCLON004)

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EIA SCOPING REPORT

ECOLOGICAL SURVEY AREA

8.2

Scale: 1:22,000@ A3

Date: APRIL 2017

Figure 8.2_Ecological Survey Area