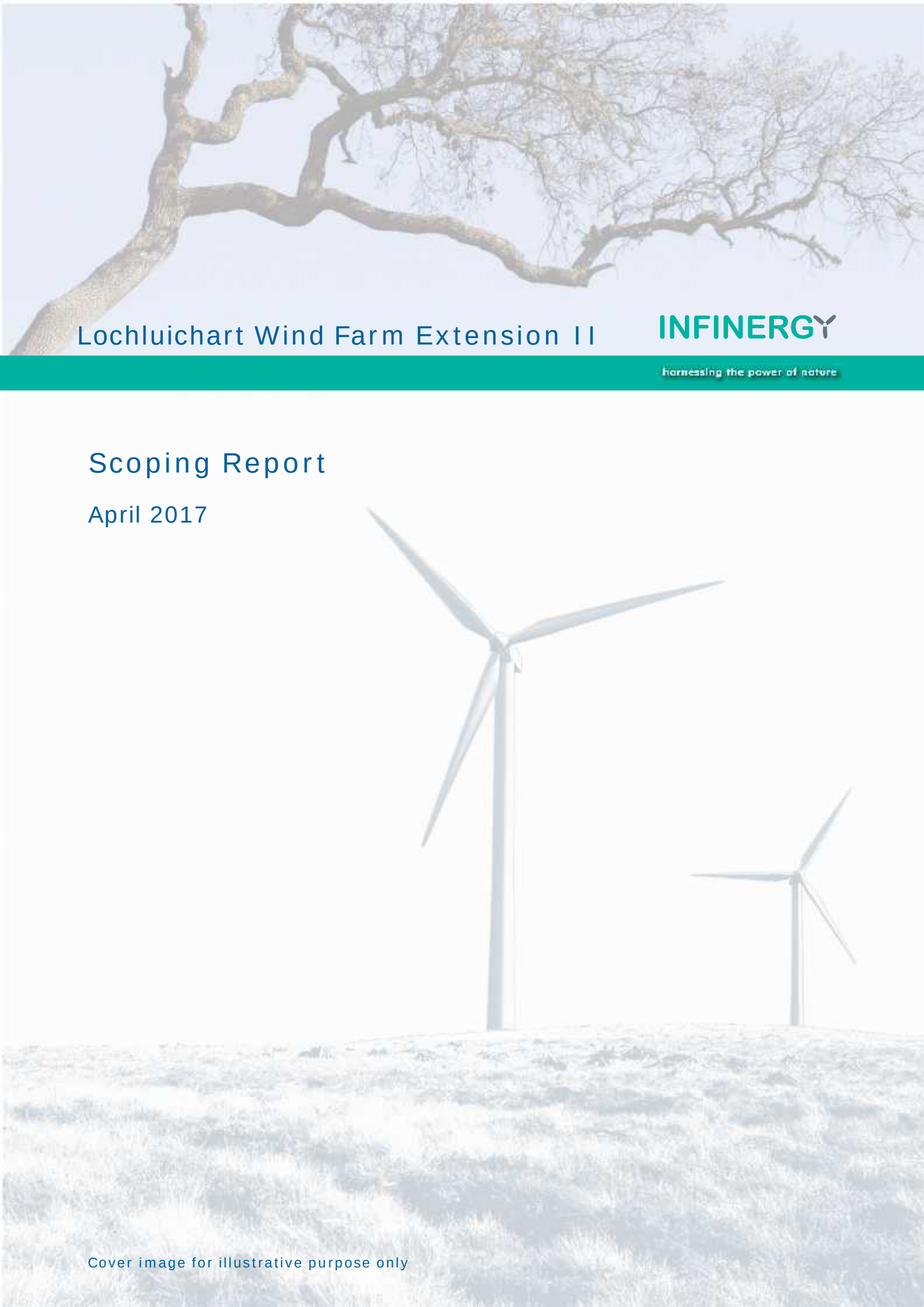
Lochluichart Wind Farm Extension II

INFINERGY

harnessing the power of nature

Scoping Report

April 2017



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1. Introduction

The Proposal

1.1. Infinergy Limited (hereafter referred to as the 'Applicant') proposes to submit an application for consent to the Scottish Ministers under Section 36 of the Electricity Act 1989 and deemed planning permission under Section 57(2) of the Town and Country Planning (Scotland) Act 1997. The Highland Council (hereafter referred to as 'THC') is a statutory consultee in this process. The application will be for the erection of up to 8 wind turbines and associated infrastructure at the Loch Luichart Estate, north-west of Dingwall. The proposal will be known as the Lochluichart Wind Farm Extension II (referred to as the 'Proposed Development'). The general site location is centred on OS Grid reference E 232487 N 868453, and is illustrated on Figure 1.1 below.

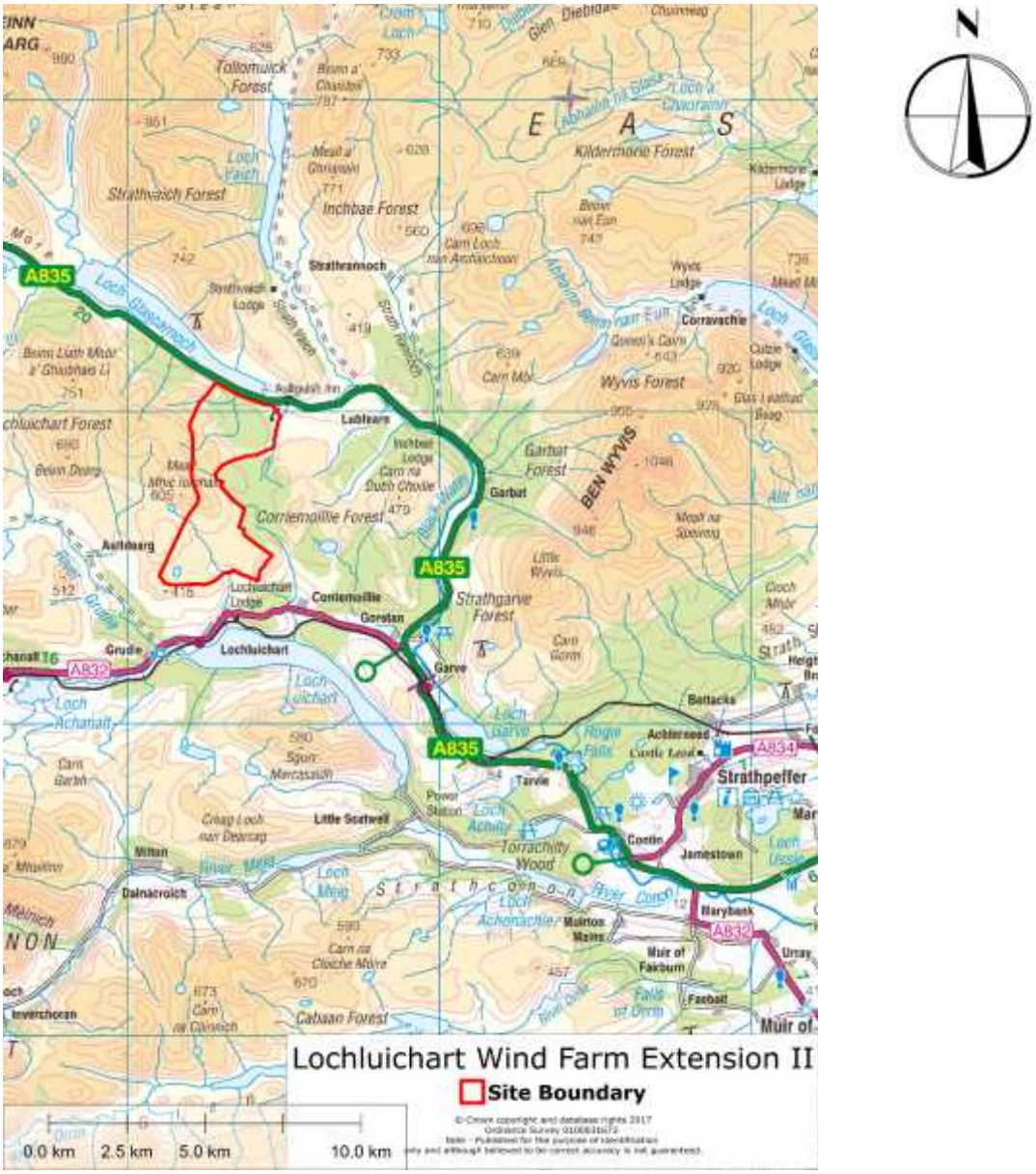

Figure 1.1 – Scoping Site Boundary

1.2. In order to support an application for consent, the Proposed Development will require an Environmental Impact Assessment (EIA), conducted in line with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 as amended (the EIA Regulations). Under the EIA Regulations 'a person who is minded to apply for a section 36 consent or a section 37 consent for development which is or may be EIA development may make a written request for the Secretary of State to state in writing his opinion as to the information to be provided in the environmental statement (a "scoping opinion").'

1.3. This document enacts a formal request for a Scoping Opinion under the EIA Regulations, and invites statutory consultees and other stakeholders to provide relevant input or environmental information relating to the proposal, the site and the surrounding area. It also seeks comment and confirmation on the adequacy of environmental data required to support the Environmental Impact Assessment (EIA) and assessment methods being proposed to inform the final Environmental Statement (ES).

1.4. This report sets out the scope of the EIA for the proposed development. The purpose of this Scoping Report is therefore to:

- Outline the consenting and EIA requirements in relation to the proposed development;
- Outline the development being considered;
- Outline the aspects of the project that could potentially have significant environmental effects;
- Outline the suggested scope of work/methodologies that will be used to assess the significance of any potential impacts during the EIA;
- Outline the proposed statutory and non-statutory organisations to be consulted during the EIA process; and
- Prepare a proposed contents list for the ES.

The Applicant

1.5. Infinergy Ltd is a renewable energy business which has been developing onshore wind farms in the UK since 2003. Infinergy is a member of the trade organisations Renewable UK and Scottish Renewables. The company has offices in Wimborne (England), Edinburgh and Inverness in Scotland. For more information please visit http://www.infinergy.co.uk.

Environmental Impact Assessment

1.6. The EIA Regulations require that before consent is granted for particular types of development, an EIA must be undertaken. The EIA Regulations set out the types of development which must be subject to an EIA ('Schedule 1' development) and other developments which may require an EIA if they are above certain thresholds or are likely to give rise to significant environmental effects ('Schedule 2' development). 'Schedule 2' developments only require an EIA, if criteria set out in 'Schedule 3' indicate that a development is 'likely to have significant effects on the environment by virtue of its nature, size or location'. The proposed development is a 'Schedule 2' development, and based on the criterion set out in 'Schedule 3', the Applicant considerers that

an EIA would be appropriate, based on the nature, size and location of the Proposed Development.

1.7. An EIA is a systematic process which identifies the potential environmental effects which in turn inform the design of a proposal. The process seeks to avoid, reduce, offset or minimise any adverse effects through mitigation. Effects are evaluated over the whole lifecycle of a development including construction, operation and decommissioning.

1.8. Establishing which aspects of the environment are likely to be significantly affected by a particular development is captured through the EIA scoping process. Scoping identifies those aspects of the environment that need to be considered when determining the potential effects of a development. This recognises that there may be some environmental elements on which a development is unlikely to have significant effect and hence where there is no need for further investigation to be undertaken as part of an EIA. The scope of the EIA for the proposed development is set out in section 4 of this report.

1.9. The EIA methodologies proposed in this scoping report are based on recognised good practice and guidelines specific to each topic area.

1.10. In addition, the EIA Regulations state that cumulative effects should be considered as part of the EIA process. Therefore, it is important to consider the cumulative effects of the proposed development alongside other wind energy developments in the area, including those that are currently operational, consented and in planning.

Background and Context

1.11. The context and background in which onshore wind energy schemes in the UK must be developed has changed. The Renewables Obligation Certificates mechanism has now been closed and its replacement, the Contract for Difference, is unlikely to be available for onshore wind energy developments in the future. It is envisaged that all new onshore wind farm developments in the UK will now be required to be financially viable on a 'zero-subsidy' basis. As a consequence, only those onshore wind farms utilising state of the art wind turbine technology, built in the best locations, with high wind speeds and affordable grid and site access routes will be viable in this new and challenging operating environment.

1.12. Turbine manufacturers have recognised this new reality, which is not only the case in the UK, but can be seen around the world. As such, manufacturers are working on optimising the generation potential of turbines; by increasing rotor diameters and tip heights and improving the efficiency of generators, to eke out increased performance while at the same time decreasing the unit cost of energy generated.

1.13. Against this background, internationally, onshore wind developers are now building wind farms with turbine tip-heights up to 200m and rotors up to 140m, with an installed capacity of up to 7.5 MW. It is recognised that the dimensions of these new turbines may not be acceptable in the UK context at this point, but it is an unavoidable requirement of the new operating environment, to step up the scale of turbines compared to the dimensions that

have been considered the norm in the past, to ensure the viability of onshore wind developments in the future. Recently planning applications submitted in Scotland and Wales have proposed turbines with tip heights between 125m – 200m with an installed generation capacity of up to 4MW.

1.14. It is significant to note that by building larger, more efficient turbines the energy generation per turbine can be increased significantly. Therefore, compared to turbines currently being installed in the UK, the same amount of energy could be generated by fewer larger turbines overall. Although the potential environmental impacts of larger turbines may be greater (EIA would be required to determine any impacts are 'acceptable' in planning terms), fewer larger turbines would be required to meet Scotland's challenging target to generate the equivalent of 100% of electricity from renewable sources by 2020. If larger turbines were adopted in the UK, it would have the effect to reduce the total footprint area required for wind farm development and potentially the number of sites where such development is required. In addition, the direct environmental impact, for example in the use of steel for turbines, concrete and rock for access roads and foundations would also decrease per unit of electricity produced.

1.15. For the proposed Lochluichart Wind Farm Extension II, the joint-venture partners, Infinergy Limited (as the "developer") and Loch Luichart Estate, will consider turbines with greater tip heights, rotor diameters and installed capacity per turbine than those already installed at the Lochluichart and Corriemoillie schemes if, as the project progresses through the planning and Environmental Impact Assessment process, it can be demonstrated there is capacity for the environment to absorb turbines of this scale.

2. Project Description

The Site

2.1. The proposed site (E 232487 N 868453) lies 18km to the northwest of Dingwall in the Highlands. Figure 1.1 illustrates the Scoping Site Boundary, and Figure 2.1 illustrates the preliminary turbine locations for the Proposed Development.

2.2. Loch Luichart Estate is managed primarily for farming, forestry, and as a sporting and recreational estate. The proposed site extends over approximately 116 hectares of gently sloping open moorland intersected intermittently by burns. The A835 lies immediately north of the Proposed Development and runs alongside the scoping site boundary.

2.3. The operational Lochluichart and Corriemoillie wind farms are adjacent to the Proposed Development. The nearest residential property is Aultguish Inn, approximately 2.4km to nearest proposed turbine.

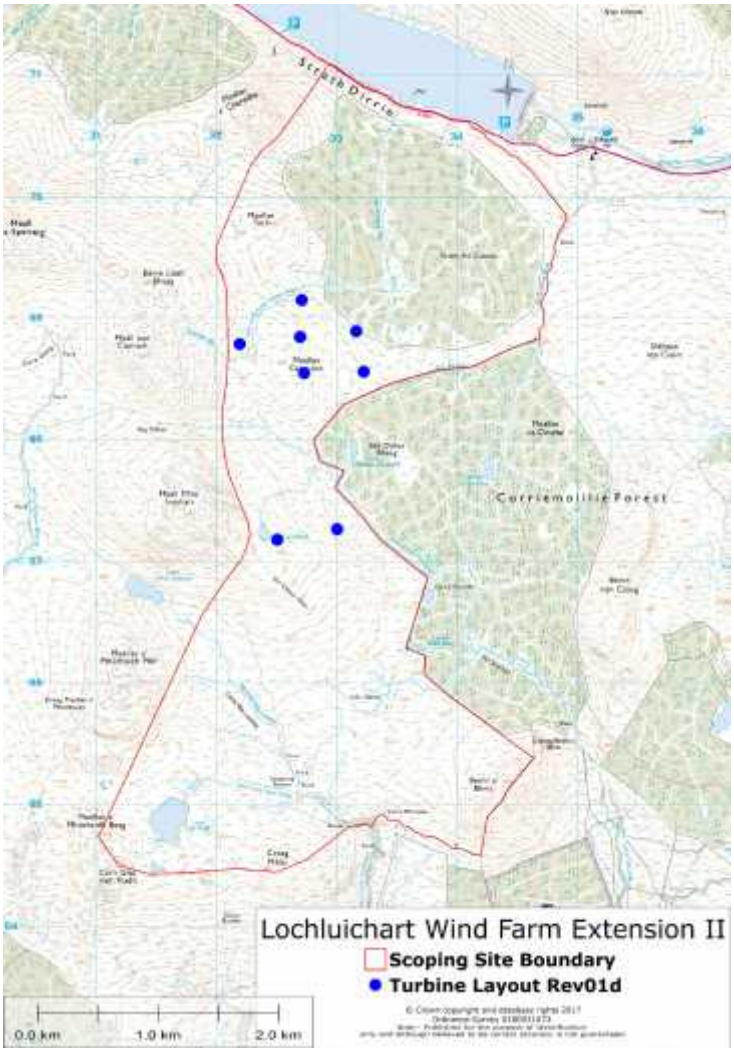

Figure 2.1 - Preliminary Turbine Layout for the Lochluichart Wind Farm Extension II

Description of the Development

2.4. Infinergy is proposing to construct and operate a wind farm of approximately 8 wind turbines at the Loch Luichart Estate. For the purposes of this Scoping Report it is assumed that the turbines will have a minimum generation capacity of 3.0 MW, giving a total installed capacity of at least 24 MW.

2.5. The main components of the Proposed Development are:

- Up to 8 wind turbines (with a maximum blade tip height of approximately 125 m) with associated infrastructure turbine foundations and hardstandings;
- An onsite network of underground cables linking the turbines to a grid connection;
- A series of onsite access tracks connecting each of the turbine locations;
- An onsite substation (if required) and control/maintenance building;
- Temporary works including a construction compound;
- A permanent anemometer mast to measure wind speed and wind direction;
- On-site borrow pit/s; and
- A battery Storage Facility.

2.6. The wind farm will make as much use of the existing infrastructure, for example access tracks, borrow pits, substation and control building, as possible.

2.7. Figure 2.1 illustrates the proposed turbine layout; while Appendix A provides a grid reference for each turbine location.

2.8. The ES will include a detailed description of all the wind farm components.

2.9. It is recognised that throughout the EIA process, the number, tip height and/or layout of the turbines may change due to emerging technical, financial and environmental constraints.

Access

2.10. Site access will be required for the delivery of turbine components, construction materials and plant, and for general construction and maintenance traffic. An existing access track which was constructed for the Lochluichart and Corriemoillie wind farms will be utilised for the Proposed Development, which connects the Proposed Development directly to the A835.

2.11. The abnormal load route for the delivery of turbine components is anticipated to run from Invergordon approximately 60km to the east, following the delivery route for the original Lochluichart scheme. Once an optimal route for abnormal loads has been identified, a full swept path analysis will be carried out from port to site to determine whether any upgrades will be required to accommodate the delivery of the turbine components.

Grid Connection

2.12. The proposed development will be connected into the local transmission network at 132kV. The applicant is progressing a Grid Connection Agreement with the local Network Operator (SHETL) & National Grid. As the grid connection will likely be developed by SHETL, the connection to the electricity transmission network falls under a separate application process and will be subject to a separate consent.

Construction

2.13. The construction of the proposed 8 turbine wind farm would take approximately nine months, but this would, to a certain extent, depend on weather conditions and ecological considerations.

2.14. The construction process will consist of the following principal activities:

- Construction of temporary construction compound;
- Import of construction materials;
- Construction/upgrade of on-site access tracks interlinking the turbine locations and the control building, incorporating relevant works to maintain site hydrology and manage surface water run-off;
- Construction of turbine foundations;
- Construction of control building;
- Excavation of trenches and cable laying adjacent to on-site access tracks;
- Connection of electrical distribution and signal cables;
- Movement onto site and erection of wind turbines;
- Commissioning of site equipment; and
- Site Restoration.

2.15. Many of these operations will be carried out concurrently, although predominately in the order identified, which will minimise the overall length of the construction programme.

Site Restoration

2.16. Site restoration will be programmed and carried out to allow the restoration of disturbed areas as early as possible and in a progressive manner. Vegetation and soils will be stored and reinstated in accordance with best practice.

2.17. The main site restoration activity will occur alongside access tracks, hardstandings and turbine foundations. Most excavated material will be stored adjacent to excavations, before being used to dress back working areas to facilitate re-vegetation. Where vegetation exists this will be scraped off and stored separately prior to re-use as the top layer of any restored areas. This approach will maximise the potential for natural re-vegetation from the existing onsite seed bank.

Maintenance and Servicing

2.18. Routine maintenance and servicing of turbines would be carried out twice a year, with a main service at 12 month intervals and a minor service at 6 month intervals. Teams of two people with a 4x4 vehicle would carry out the servicing, which takes on average one day for each turbine.

Decommissioning

2.19. The proposed development will be designed to have an operational life of 25 years. At the end of this time, it is envisaged that the Proposed Development will be decommissioned and the turbines dismantled and removed. Any alternative to this action would require a new planning approval.

3. Planning Context

National Planning Context

3.1. The National Planning Framework 3 (NPF3) and the Scottish Planning Policy (SPP) set out the national planning context for the proposed development.

3.2. In addition, national planning advice is outlined in a number of documents including Planning Advice Notes (PANs).

National Planning Framework 3 (2014)

3.3. Scotland's third National Planning Framework (NPF3) was published by the Scottish Government on 23 June 2013. NPF3 is a long term strategy for Scotland and is the spatial expression of the Government's Economic Strategy and plans for development and investment in infrastructure. Together, NPF3 and Scottish Planning Policy (referred to below) applied at the strategic and local levels, are intended to help the planning system deliver the Government's vision and outcomes for Scotland and to contribute to the Government's central objective: sustainable development.

3.4. NPF3 sets out the Government's 'Vision' for Scotland which is referred to as inter alia:-

- A successful, sustainable place – 'we have a growing low carbon economy which provides opportunities…'
- A low carbon place – 'we have seized the opportunities arising from our ambition to be a world leader in low carbon generation, both onshore and offshore…'
- A natural resilient place – 'natural and cultural assets are respected; they are improving in condition and represent a sustainable economic environmental and social resource for the nation..'

A Low Carbon Place

3.5. Chapter 3 of the NPF3 addresses 'A Low Carbon Place'. As noted below, this is also a 'subject policy' in the Scottish Planning Policy (2014). Paragraph 3.1 explains that planning will play a key role in delivering on the commitments set out in 'Low Carbon Scotland: The Scottish Government's report on Proposals and Policies (RPP2)'. It adds:

'the priorities identified in this spatial strategy set a clear direction of travel which is consistent with our world leading climate legalisation'.

3.6. The introduction to Chapter 3 States that the Governments ambition 'is to achieve at least an 80% reduction of greenhouse gas emissions by 2050'.

3.7. The introductory section acknowledges that at present, the energy sector accounts for a significant share of the country's greenhouse gas emissions and

that a planned approach to development has ensured that onshore wind development has widely avoided internationally and nationally protected areas.

3.8. Paragraph 3.7 states that whilst there is strong public support for wind energy as part of the renewable energy mix, opinions about onshore wind in particular locations can vary. It adds that the technology is also '..recognised as an opportunity to improve the long term resilience of rural communities'.

3.9. Overall, NPF3 supports the development of wind farms in locations where the technology can operate efficiently and environmental and cumulative impacts can be addressed satisfactorily.

Scottish Planning Policy 2014

3.10. A new Scottish Planning Policy (SPP) was published on 23rd June 2014. The purpose of the SPP is to set out national planning policies which reflect Scottish Government Ministers' priorities for the operation of the planning system and for the development and use of land. The SPP is a statement of Scottish Government policy on how nationally important land use planning matters should be addressed.

3.11. Paragraph (iii) states that as a statement of Ministers' priorities, the content of the SPP is a material consideration that carries significant weight, although it is for the decision maker to determine the appropriate weight to be afforded to it in each case.

Relationship of SPP to National Outcomes

3.12. SPP contains two Principal Policies: 'sustainability' and 'place making'. Sustainability is addressed at Page 9. The SPP states:

'the Scottish Government's central purpose is to focus Government and public services on creating a more successful country with opportunities for all of Scotland to flourish through increasing sustainable economic growth'.

3.13. Paragraph 25 adds that the Scottish Government's commitment to the concept of sustainable development is reflected in its Purpose.

3.14. Paragraph 27 cross references the Government's Economic Strategy which it states 'indicates that sustainable economic growth is the key to unlocking Scotland's potential…. and to achieving a low carbon economy…" It also makes reference to the need to maintain a high quality environment and to pass on a sustainable legacy for future generations'.

3.15. Importantly, 'sustainability' as set out under the Principal Policies of the SPP '…introduces a presumption in favour of development that contributes to sustainable development'.

SPP Subject Policies – A Low Carbon Place

3.16. SPP addresses 'A Low Carbon Place' as a 'subject policy' on page 36 and refers to 'delivering electricity'. Paragraph 152 refers to the NPF3 context and states

that NPF3 is clear that planning must facilitate the transition to a low carbon economy and help to deliver the aims of the Scottish Government. It is stated that Scotland has significant renewable energy resources, both onshore and offshore.

3.17. Paragraph 153 states that terrestrial planning 'facilitates' development of renewable energy technologies, and guides new infrastructure to appropriate locations. It adds that 'sufficient supply of low carbon and low cost generation of electricity from renewable energy sources are vital to reducing greenhouse gas emissions…' It explains that renewable energy also presents a significant opportunity for associated development, investment and growth of the related supply chain.

3.18. In terms of 'Policy Principles', Paragraph 154 states that the planning system should:

- Support the transformational change to a low carbon economy, consistent with national objectives and targets, including deriving:
  - 30% of overall energy demand from renewable sources by 2020; and
  - the equivalent of 100% of electricity demand from renewable resources by 2020.
- Support the development of a diverse range of electricity generation from renewable technologies – including the expansion of renewable energy generation capacity.
- Guide development to appropriate locations and advise on the issues that will be taken into account when specific proposals are being assessed.
- SPP also cross references a range of "key documents". Those of relevance include:
  - The Electricity Generation Policy Statement;
  - The 2020 Routemap for Renewable Energy in Scotland; and
  - Low Carbon Scotland: Meeting Our Emissions Reductions Targets 2013 –2027.

Onshore Wind

3.19. Onshore wind is specifically addressed at Paragraphs 161 et seq. of SPP. Detailed guidance is provided for Planning Authorities with regard to the preparation of spatial frameworks for onshore wind development, and it makes it clear that proposals for onshore wind turbine development should continue to be determined whilst spatial frameworks and local policies are being prepared and updated. It makes it clear at Paragraph 166 that moratoria on onshore wind development are not appropriate.

3.20. In terms of spatial framework guidance, a 'community separation for consideration of visual impact' is set out as an area not exceeding 2 km

around cities, towns and villages identified on the local development plan with an identified settlement envelope or edge.

3.21. As with the previous SPP, this separation distance seeks to guide the preparation of spatial frameworks and is not a requirement for a 'set back' to settlements for wind farms in terms of development management.

Development Management for Energy Infrastructure Developments

3.22. In terms of development management, Paragraph 169 of SPP set out that 'proposals for energy infrastructure should always take account of spatial frameworks for wind farms and that considerations will vary relative to the scale of proposals and area characteristics but are likely to include a number of matters'. These are set out as follows:-

- net economic impacts, including local and community socio economic benefits such as employment, associated business and supply chain opportunities;
- the scale of contribution to renewable energy generation targets;
- effects on greenhouse gas emissions;
- cumulative impacts – planning authorities should be clear about the likely cumulative impacts arising from all of the considerations below;
- impacts on communities and individual dwellings, including visual impact, residential amenity and noise and shadow flicker;
- landscape and visual impacts including effects on wild land;
- effects on the natural heritage, including birds;
- impacts on carbon rich soils using the carbon calculator;
- public access, including impact on long distance cycling and walking routes and scenic routes identified in the NPF;
- impacts on the historic environments, including scheduled monuments, listed buildings and their settings;
- impacts on tourism and recreation;
- impacts on aviation and defence interests and seismological recording;
- impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised.
- impacts on road traffic;
- impacts on adjacent trunk roads;
- effects on hydrology, the water environment and flood risk;

- the need for conditions relating to the decommissioning of developments, including ancillary infrastructure and site restoration; and
- the need for a robust planning obligation to ensure that operators achieve site restoration.

3.23. Paragraph 170 states that areas identified with wind farms should be suitable for use in perpetuity. It further adds that consents maybe time limited, but nevertheless 'wind farms should be sited and designed to ensure impacts are minimised and to protect an acceptable level of amenity for adjacent communities'.

3.24. In terms of the various considerations set out above, SPP also contains detailed policies on a number of the topics referred to: for example cultural heritage and the historic environment, natural heritage and landscape designations.

National Policy Conclusions

3.25. Support for renewable energy development at an appropriate scale and location is detailed within both the NPF 3 and SPP. The 2020 targets are highlighted and support for onshore wind development is firmly stated. The Proposed Development is entirely consistent with both the NPF3 and SPP and would further the sustainable development and low carbon objectives set out in these policy documents.

The Development Plan

3.26. The Development Plan comprises the Highland-wide Local Development Plan 2012 (HwLDP) and the Ross and Cromarty East Local Plan (as continuing in force, July 2015), together with Supplementary Guidance including the Onshore Wind Energy Supplementary Guidance (2016).

Highland-wide Local Development Plan 2012

3.27. The HwLDP policies considered relevant to the Proposed Development are set out in Table 3.1, below:

3.28. An initial assessment of the relevant policies is displayed in Table 3.1.

Table 3.1 Relevant Highland-wide Local Development Plan Policies

Policy	Details
Policy 53 Minerals	Policy 53 concerns mineral extraction and has limited relevance to the development of wind farms, with the exception of the third paragraph which states that borrow pits will be supported where near to or on the site of the associated development if it can be demonstrated that they are the most suitable source of material, are time limited and appropriate environmental safeguards are in place for the workings and the reclamation.
Policy 55	Policy 55 seeks that development proposals demonstrate how they avoid unnecessary disturbance, degradation or erosion of peat and soils. Disturbance of Peat soils must be clearly outweighed by

Policy	Details
Peat and Soils	social, environmental, or economic benefits.
Policy 57 Natural, Built and Cultural Heritage	Policy 57 is a multi-criteria based policy which seeks to ensure that natural, built and cultural heritage resources are safeguarded. Different policy tests apply to resources of local/regional, national and international importance.
Policy 58 Protected Species	Policy 58 is a multi-criteria based policy which applies to development proposals that may affect protected species, including European protected species.
Policy 59 Other Important Species	Policy 59 identifies that the Council will take into consideration any adverse effects of development proposals on the species identified in the policy.
Policy 60 Other Important Habitats and Article 10 Features	Policy 60 relates to the protection of important habitats from the effects of development.
Policy 61 Landscape	Policy 61 promotes the preservation and enhancement landscape characteristics and qualities by development proposals.
Policy 64 Flood Risk	Policy 64 aims to direct development away from areas subject to flooding and to promote sustainable flood management practices across the Highlands.
Policy 67 Renewable Energy Developments	Policy 67 is a multi-criteria policy which provides general support for wind energy proposals provided they will not be significantly detrimental overall, having regard in particular to any significant effects on the specific criteria contained in the policy.
Policy 72 Pollution	Policy 72 seeks to protect against development proposals that would result in significant noise, air waste and/or light pollution. Such development requires adequate assessment of the levels, character and transmission of the pollution and must demonstrate how pollution can be appropriately avoided or mitigated.

3.29. Policy 67: Renewable Energy developments is the principal policy of the HWLDP relating to the assessment of wind energy developments. The policy states that renewable energy developments should be well related to the source of the primary renewable resource that is needed for their operation. The council will consider the proposals contribution towards meeting renewable energy targets together with positive or negative effects on the local and national economy.

3.30. The policy goes on to state that, subject to balancing these considerations, the council will support proposals 'where it is satisfied that they are located, sited and designed such that they will not be significantly detrimental overall, either individually or cumulatively with other developments (see glossary), having regard to any significant effects on the following:

- natural, built and cultural heritage features;
- species and habitats;
- visual impact and impact on the landscape character of the surrounding area (the design and location of the proposal should reflect the scale and character of the landscape and seek to minimise landscape and visual impact, subject to any other considerations);
- amenity at sensitive locations, including residential properties, work places and recognised visitor sites (in or out with a settlement boundary);
- the safety and amenity of any regularly occupied buildings and the grounds that they occupy- having regard to visual intrusion or the likely effect of noise generation and, in the case of wind energy proposals, ice throw in winter conditions, shadow flicker or shadow throw;
- ground water, surface water (including water supply), aquatic ecosystems and fisheries;
- the safe use of airport, defence or emergency service operations, including flight activity, navigation and surveillance systems and associated infrastructure, or on aircraft flight paths or MoD low- flying areas;
- other communications installations or the quality of radio or TV reception;
- the amenity of users of any Core Path or other established public access for walking, cycling or horse riding;
- tourism and recreation interests; and
- land and water based traffic and transport interests.

3.31. In addition to the polices outlined in Table 3.1 the following polices potentially relevant to the proposed development will be taken into consideration as part of the EIA process:

- Policy 28 – Sustainable Design
- Policy 30 – Physical Constraints
- Policy 31 – Developer Contributions
- Policy 34 – Settlement Development Areas
- Policy 36 – Development in the Wider Countryside
- Policy 56 – Travel
- Policy 62 – Geodiversity
- Policy 63 – Water Environment

- Policy 66 – Surface Water Drainage
- Policy 68 – Community Renewable Energy Development
- Policy 69 – Electricity Transmission Infrastructure
- Policy 77 – Public Access
- Policy 78 – Long Distance Routes

Ross and Cromarty East Local Plan (as continuing in force, July 2015)

3.32. Only the parts of the Plan covering the area around Achnasheen continue in force. It is anticipated that the content of this plan remaining in force is unlikely to be significant to the determination of the Proposed Development.

Supplementary Planning Guidance

The Highland Council's - Onshore Wind Energy: Supplementary Guidance (2016)

3.33. The Supplementary Guidance (SG) provides:

- a spatial framework to guide the location of large wind farms (still ongoing);
- A set of ten criterion which set out key landscape and visual aspects that will be used as a framework and focus for assessing proposal; and
- additional guidance.

3.34. The SG summarises the new Spatial Framework that groups areas into three categories:

- Group 1: Areas where windfarms will not be acceptable
- Group 2: Area of significant protection
- Group 3: Areas with potential for wind farm development

3.35. Most of the proposed site is classified as Group 3, and as such is located in an area 'with potential for windfarm development'. However, it should be noted that some areas of the site are classified as Group 2: an area of significant protection. This classification is due to the potential presence of carbon rich soils, deep peat and priority peatland habitat. Therefore, any application will require a peat survey and assessment.

4. Key Environmental Issues

4.1. This chapter describes the baseline conditions, potential impacts of the wind farm and proposed assessment methodologies for completion of the EIA in respect of the following environmental parameters:

- Non-avian Ecology
- Avian Ecology
- Landscape and Visual Impact
- Geology and Peat
- Hydrology, Hydrogeology
- The Historic Environment
- Traffic and Access
- Noise and Vibration
- Climate Change Impact
- Air Quality
- Aviation and Radar
- Telecommunications
- Shadow Flicker
- Socio-Economic, Recreation and Land Use

Non-avian Ecology

Introduction

4.2. This section details the approach to the assessment of the Ecological interest on and surrounding the proposed development site and the evaluation of any potential effects.

4.3. The turbines are proposed on the sloping hill of Meallan Caoriunn, north of Lochluichart Wind Farm Extension (operational) and north east of Corriemoillie Wind Farm (currently under construction).

4.4. The Proposed Development will share the constructed access roads for Lochluichart Wind Farm, Lochluichart Wind Farm Extension and Corriemoillie Wind Farm.

4.5. The Non-Avian Ecology Chapter will outline the desk study, field survey and assessment methodology and summarise the baseline information. The Chapter will set out the effects of the development on ecological features including statutory designated sites, habitats and species (excluding birds) prior to and following enhancement and mitigation. The assessment will adopt a precautionary approach where any uncertainty exists, based on professional judgement.

4.6. The following section summarises baseline information for desk study and field surveys undertaken to date (January 2016) and outlines the proposed assessment methodology.

Baseline Conditions

4.7. Upland habitats predominate across the site including mire, heath, still and running water and mixed forestry plantation. The topography is generally gentle and rolling although steeper, less accessible ground is present just beyond the site boundary to the west. The altitude ranges between just over 250m on the shore of Loch Glascarnoch to around 500 in the western parts of the central portion of the site (on the summit of Meall Caoruinn and in the vicinity of Loch na Sàlach to the south).

4.8. The site and its environs are upland in character and dominated by habitats typical of this biogeographical zone. Blanket bog is the most prominent habitat type across the entirety of the site and beyond and it varies from heath-like, heather-dominated stands with bog-moss and a high proportion of feather mosses, on the better-drained slopes, to sedge-dominated stands in wetter situations with an almost continuous cover of bog-mosses.

4.9. Plantation woodland is of poor quality, with many trees failing to establish in wetter areas atop blanket bog.

4.10. Limited protected species interest has been recorded within the Site, with the exception of water vole. A moderately sized population is considered to use the water courses within the site.

Desk Study

4.11. Table 4.1 provides a list of statutory designated sites with non-avian qualifying interest features within 10km of the proposed development.

Table 4.1: Designated Sites within 10km of the Proposed Development.

Site	Designation	Distance & Orientation	Designated Features
Beinn Dearg	SSSI, SAC	5.3km; N	SSSI Features o Native pinewood o Quaternary of Scotland o Vascular plant assemblage SAC Features o Acidic scree o Alpine and subalpine calcareous grasslands o Alpine and subalpine heaths o Blanket bog o Caledonian forest o Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels o Dry heaths o High-altitude plant communities associated with areas of water seepage o Montane acid grasslands o Mountain willow scrub
Achanalt Marshes	SSSI	5.3km; S	SSSI Features o Flood-plain fen o Mesotrophic loch
Ben Wyvis	SSSI, SAC	8.1km; SE	SSSI Features o Blanket bog o Dystrophic and olgliotrophic lochs o Quaternary geology and geomorphology o Upland mosaic o Vascular plants. SAC Features o Acidic scree o Alpine and sub alpine heaths o Blanket bog o Clear water lakes – low nutrient – aquatic vegetation o Montane acid grasslands o Plants in acidic crevices o Tall herb community
Fannich Hills	SSSI & SAC	5.5km W	SSSI Features o Acidic scree o Alpine and subalpine heath

			o Blanket bog o Clear water lakes o Dry heath o Montane grasslands o Wet heathlands o invertebrates SAC Features o Northern Altlantic wet heath with Eria tetralix o Alpine and Boreal heaths o Siliceous alpine and boreal grasslands o Oligotrophic to mesotrophic standing water

4.12. A number of habitats identified in the Local (Ross and Cromarty East) Biodiversity Action Plan are present within the wind farm extension site boundary. These include the nationally important blanket bog and upland heathland habitats that are also included in Annex 1 of the Habitats Directive for their international significance.

4.13. Records of protected and notable species and habitats will be requested from the local records centre: The Highland Biological Recording Group (HBRG).

4.14. The documents from the following applications will also inform the baseline:

- Corriemoillie Wind Farm 'Revised' Environmental Statement and Post Consent Reports 2016:
  - Terrestrial Mammal Surveys (badger, bats, otter, pine marten, red squirrel, water vole, wildcat) 2014.
  - Phase 1 Habitat Survey Report 2016.
- Lochluichart Wind Farm Extension Environmental Statement 2011 and appendices which include the following baseline surveys:
  - Extended Phase 1 Habitat Survey June 2010.
  - National Vegetation Classification Survey 2010.
  - Terrestrial mammal surveys including otter, water vole, red squirrel, badger, pine marten, wildcat and bats July 2010.
  - Freshwater pearl mussel surveys July 2010.
- Corriemoillie Wind Farm Environmental Statement 2010 and appendices which include the following baseline surveys:
  - Extended Phase 1 Habitat Survey 2008, 2009 and 2010.
  - Terrestrial mammal surveys including bats, otters, water voles, red squirrel and badger 2009.

4.15. Initial consultation was undertaken with SNH (Appendix B) and the Highland Raptor Study Group and RSPB will be consulted as part of the application. Pre-application advice has also been received from THC (dated 13th December 2016).

Field Surveys

4.16. Table 4.2 below details the field surveys which have been undertaken within the Site, including data from the surrounding wind farms, where appropriate.

Table 4.2: Summary of field surveys completed.

Survey Type	Survey Area	Frequency/progress	Methodology
Extended Phase 1 Habitat Survey	Site Boundary, Figure 4.3	July 2010 July 2015	JNCC (2010). SNIFFER (2009).
National Vegetation Classification Survey	Figure 9.2 of Lochluichart Wind Farm Extension ES	July 2010	Rodwell, J. S. (1991-2006). Stace, C. (1997). Field flora of the British Isles. Cambridge University Press, Cambridge.
Terrestrial Mammals: • Otter • Badger • Water vole • Red squirrel • Pine marten • Wildcat	At least turbines + 250m buffer	2015 2010	Bang and Dahlstrom); Neal and Cheeseman; within Harris et al: National Rivers Authority (1993); Ward et al (1994); Macdonald et al (1998); Cresswell et al (1989); Strachen and Moorhouse (2006); Moorhouse and Gelling (2011): Gurnell et al (2009); Forestry Commission Scotland guidance (Guidance Note 35d); Sargent & Morris (2003), Channin (2003).
Freshwater Pearl Mussel	Figure 9.3 of Lochluichart Wind Farm Extension ES	2010	Cosgrove and Young (1998) and Young et al. (2001b).
Bat Activity Surveys	Figure 4.3	2015	Bat Conservation Trust (2012)
Bat Roost Surveys	Suitable trees within Site Boundary	2010 2015	Bat Conservation Trust (2007)

4.17. No other desk study or surveys are proposed.

Potential Impacts

4.18. The project could result in a permanent physical loss of important habitat and species on the land required for the turbines and ancillary elements. It could also cause temporary physical loss of habitat on areas only required for construction, for example through:

- Access track construction;
- Infrastructure development (cable trenches, construction processes, borrow pits); and
- Erosion caused by excavation and/or drainage activities.

4.19. There could additionally be habitat severance and fragmentation, particularly from linear elements such as new access tracks. In addition the construction and maintenance of the project could cause disturbance to local wildlife.

4.20. Any impacts on habitats could subsequently affect populations of protected or notable species such as otter and water vole, if present. Construction activity could also lead to injury or death of individual animals.

4.21. During construction, aquatic fauna could be adversely affected if significant amounts of silt or any hydrocarbons or chemicals are allowed to enter water bodies.

4.22. Bats can be affected by wind turbines, either through habitat loss and fragmentation, loss of commuting routes or through interaction with the operational turbine blades (from collision or barotrauma).

Assessment Methodology

4.23. The assessment of potential impacts to ecological receptors and the significance of these impacts will be in accordance with guidelines provided by the Chartered Institute of Ecology and Environmental Management (CIEEM) (2016). Impact assessment is informed through information gathered from the habitat appraisal, consultations; record centre searches and a review of available online resources.

4.24. The effect of each phase of the development (construction, operation and decommissioning) will be established on the ecological features identified through baseline study. Cumulative impact assessment will be required for statutorily designated sites, habitats and protected species.

4.25. A significant impact is assessed to be an impact that either supports or undermines biodiversity conservation, including impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (such as extent, abundance and distribution). The 2016 CIEEM guidelines on ecological impact assessment note that "A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures as long as the mitigation hierarchy has been applied effectively as part of the decision-making process."

4.26. Professional judgement is used based on these variables. In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant impact, a significant impact has been assumed as a precautionary approach. Where uncertainty exists, this is acknowledged.

4.27. For an impact to be significant, the ecological integrity or conservation status of a sensitive feature must be influenced in some way. It may be that the impact is substantial in magnitude or scale, irreversible, has a long-term impact, or coincides with a critical period in a species' life-cycle.

4.28. A significant impact in the context of the assessment is considered to be any 'major' or 'moderate' impact on an important ecological feature, whether positive or negative. Professional judgement will be employed throughout and where ecological features of lower value or importance could experience significant impacts, albeit at a Local or Site geographic scale, this is discussed and a precautionary approach is adopted where appropriate.

4.29. Where appropriate, mitigation and/or enhancement measures will be included and a final (residual) impacts assessment conclusion will then be drawn.

Potential Mitigation and Enhancement

4.30. An important form of mitigation will be the adoption of an iterative approach to the design of the wind farm layout, number of turbines and ancillary elements so as to avoid and minimise ecological impacts.

4.31. A range of 'best practice' measures will be employed during construction to avoid ecological impacts, including, for example, fencing off important areas of habitat and sensitive handling, storage and reuse of topsoil and peat and avoidance of works near watercourses. These measures will be set out in construction method statements which will be incorporated into construction contracts.

Avian Ecology

Introduction

4.32. This section details the approach to the assessment of the ornithological interest on and surrounding the proposed development site and the evaluation of any potential effects.

4.33. The turbines are proposed on the sloping hill of Meallan Caoriunn, north of Lochluichart Wind Farm Extension (operational) and north east of Corriemoillie Wind Farm (currently under construction).

4.34. The Avian Ecology Chapter will outline the desk study, field survey and assessment methodology and summarise the baseline information. The Chapter will set out the effects of the development on ornithological features prior to and following enhancement and mitigation. The assessment will adopt a precautionary approach where any uncertainty exists, based on professional judgement and directly comparable experience.

4.35. The following summarises baseline information for desk study and field surveys undertaken to date (January 2016) and outlines the proposed assessment methodology.

Baseline Conditions

4.36. The Site lies within Natural Heritage Zone 7: Northern Highlands, which is generally of low interest for birds, with the exception of supporting low to moderate numbers of golden eagle, black grouse, greenshank, curlew, snipe, dunlin, golden plover, merlin and goshawk.

Desk Study

4.37. A review of the government's online GIS constraints mapping system: Scottish Natural Heritage Information Service (SNHi) and MAGIC website the following sites were identified within 10km:

4.38. Table 4.3 provides a list of statutory designated sites within 10km of the proposed development with avian qualifying interest features.

Table 4.3: Designated Sites within 10km of the Proposed Development.

Site	Designation	Distance & Orientation	Designated Features
Glen Affric to Strathconon	SPA	3.8km; S	Breeding golden eagle supporting up to 10 pairs (SNH, 2009), 2.2% of the Great Britain breeding population.
Beinn Dearg	SSSI, SAC & SPA	5.3km; N	SSSI Features: Breeding bird assemblage SPA features: Breeding dotterel
Achanalt Marshes	SSSI & SPA	5.3km; S	SSSI Features: Breeding bird assemblage SPA Features: Breeding wood sandpiper comprising 3 pairs, 30% of the Great Britain breeding population.
Ben Wyvis	SSSI, SAC & SPA	8.1km; SE	SSSI Features Breeding dotterel SPA features: Breeding dotterel

4.39. The wider region is important for golden eagle and red-throated diver are known to be present in low numbers. It is considered the adjacent moorland and woodland has the potential to support a range of notable bird species including scarce raptors, waders and black grouse.

4.40. Records of protected and notable species will be requested from the local records centre: The Highland Biological Recording Group (HBRG) and the Raptor Study Group.

4.41. Surveys have been undertaken within the developable area in 2010 for the operational Lochluichart Wind Farm Extension and within the adjacent Corriemoillie Wind Farm in 2009 and these data will be referred to within the application as they are still considered relevant to the Proposed Development. Surveys were undertaken within the Proposed Development developable area in 2010 for the operational Lochluichart Wind Farm Extension comprising the following surveys, undertaken in line with best practice guidance available at the time, survey areas are presented on Figure 4.3:

- Breeding Bird Survey (April-July 2010);
- Diver searches (April-August 2010);
- Raptor searches (March-July 2010);
- Black grouse surveys (March-May 2010); and,
- Vantage Point surveys (November 2009 – October 2010).

4.42. Additionally, information submitted for the adjacent Corriemoillie Wind Farm (under construction) comprised field surveys within the immediate local area between 2002 and 2009. These data recorded similar species, with the addition of red kite and goshawk. The following surveys are considered to be the most recent and were completed for the Corriemoillie Wind Farm:

- Breeding Bird Survey (April-June 2007, April-June 2009 and access track surveys in 2010);
- Breeding Raptor Vantage Point Surveys (April-July 2009);
- Raptor walkover searches (March-July 2009);
- Red Throated Diver Lochan Surveys (June-July 2009);
- Red Throated Diver Vantage Point Surveys (April-August 2009);
- Black grouse (April-May 2009); and,
- Winter walkover surveys (September-November 2009).

4.43. Initial consultation was undertaken with SNH (Appendix B) and the Highland Raptor Study Group and RSPB will be consulted as part of the application. Pre-application advice has also been received from the Highland Council (dated 13th December 2016). The response acknowledges the lack of recent use of Loch na Sallach by red-throated divers.

Field Surveys

4.44. To inform the ornithological baseline of the Proposed Development and surrounding areas the additional following surveys have been completed in line with SNH guidelines (2014) within the Proposed Development developable area, as shown on Figure 4.5:

- Vantage Point surveys April 2015 to March 2016;
- Breeding Birds (BBS) (April-June 2015);
  - SNH (2014) guidance based on an adapted Brown and Shepherd (1993) methodology and comprised four visits
- Grouse surveys (May 2015); and,

- Raptor / diver searches (May to July 2015).

4.45. Two years of survey are normally required in line with SNH guidance; however, consultation with SNH (response Liz McLachlan email dated 10/08/2016) confirmed that existing data from previous planning applications, supported by surveys in 2015/2016 provide adequate information on which to base the assessment.

4.46. Field surveys have been undertaken by experienced ornithologists, some of which have previously undertaken surveys for the adjacent Corriemoillie Wind Farm and are therefore knowledgeable of the local area. Surveyors were fully conversant in standardised field methodologies. Surveys have been completed by the following personnel: Mr A Carroll, Mr P Carroll, Mr R Whytock, Mr G Riddoch, Mr E McHaugh and Mr M Wood.

4.47. A field survey plan is presented as Figure 4.5. The following survey effort has been completed. Figure 4.6 shows the study areas for Corriemoillie wind farm. Initial results from 2015 surveys are summarised below.

4.48. Four breeding bird surveys have been completed between April and June 2015 within the site, extended to include all habitats within 500m of the proposed turbines.

4.49. The 2015 BBS has been undertaken in accordance with SNH (2014) guidance based on an adapted Brown and Shepherd (1993) methodology and comprised four visits. Surveys recorded an assemblage of moorland breeding birds including some of conservation value such as black grouse and greenshank, similar to previous surveys.

4.50. The grouse survey area comprised all land within the site, extended to include all habitats within 500m of the proposed turbines. A black grouse lek was confirmed during a check in early May 2015. The lek comprised 2 males, outside the developable area.

4.51. Searches for breeding raptors and divers were undertaken in April to July 2015 within a 2km radius of the developable area. No evidence of breeding raptors has been found within the search radius.

4.52. Red-throated divers have been historically present at Loch na Sallach. During previous baseline surveys for the operational Lochluichart wind farm and Corriemoillie wind farm (under construction). SNH considered the loss of this pair to be not significant to the wider population (SNH, June 2010 for Lochluichart Wind Farm Extension Ref: CNS/REN/WF/ERC/Corriemoillie). A single bird was observed on the loch on one occasion in June 2015. No evidence of breeding was observed.

4.53. Two VP locations have been used to sample the VP viewshed across the Proposed Development developable area. Figure 4.5 shows the proposed site boundary and the VP locations. Figure 4.5 presents the approximate 'viewshed' from each VP, showing the development site boundary. In addition to providing suitable coverage of potential rotor swept area, the VP locations were chosen to minimise disturbance impacts on breeding birds, notably raptors and grouse.

4.54. VP surveys comprised watches of no more than 3 hours in duration, in accordance with SNH (2014) guidance. Survey effort per Vantage Point completed to date, or currently proposed, is as follows:

Table 4.4: VP survey effort.

	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16
VP1	5.5	15	12	15	6	6	6	0	12	5	6	6
VP2	11.5	12	12	12	6	6	6	6	6	6	6	6

4.55. Results demonstrate low usage of the site by target species to date, including: golden eagle (3 flights), golden plover (8 flights), merlin (1 flight), hen harrier (1 flight), red kite (1 flight) and osprey (2 flights) over a total of 60 hours VP survey from both VP's.

4.56. A collision model will be calculated based on Vantage Point survey data following the standard Band (2007) model. This will include standard species and turbine parameters, with the 'collision risk area' defined as a 200m radius around the proposed turbines.

Potential Impacts

4.57. The project could result in a permanent physical loss of important habitat and species on the land required for the turbines and ancillary elements. It could also cause temporary physical loss of habitat on areas only required for construction, for example construction compound and laydown areas.

4.58. Potential effects are considered as follows:

- Construction: habitat modification, land-take, disturbance and displacement.
- Operation: disturbance and displacement, collision mortality.
- Decommissioning: similar effects as for construction but of lower intensity temporally and spatially.
- Cumulative: combined effects across Lochluichart Wind Farm, Lochluichart Wind Farm Extension and Corriemoillie Wind Farm.

4.59. There could additionally be habitat severance and fragmentation, particularly from linear elements such as the access tracks. In addition the construction and maintenance of the scheme could cause disturbance to local wildlife.

4.60. No direct effects on statutorily designated sites are anticipated, but the potential for impacts on mobile interests (birds) will also be determined.

4.61. When the wind turbines are operational, some bird species could avoid the area due to the rotating blades or increased human activity, and could consequently be affected by a loss of breeding, feeding and roosting habitat. This is likely to be restricted to some wader species, such as snipe and curlew.

4.62. Some bird species are considered vulnerable to collision impacts, e.g. raptors and wildfowl. Accordingly, a 'Collision Risk Model' will be required to quantify the likelihood of any impacts on these species and statutory designations. Importantly, these will need to be considered in combination with other wind farm projects over a large (regional) area – in particular the adjacent Lochluichart Wind Farm, Lochluichart Wind Farm Extension and Corriemoillie Wind Farm.

4.63. The nearest designated site is Glen Affric to Strathconon SPA located c.5.6km from the proposed turbines, for which golden eagle is a qualifying interest species during the breeding season. It is acknowledged that the wider area surrounding the site supports eyries and the species occupies large territories which could include the Site; however, the activity recorded to date and historical survey data does not indicate the site is of importance for this species, and not located within a favoured area. In terms of other raptors including hen harrier, osprey and merlin, activity within the site has been consistently low, and any collision risk model figures are likely to be negligible.

Assessment Methodology

4.64. The assessment of potential impacts to ornithological receptors and the significance of these impacts will be in accordance with guidelines provided by the Chartered Institute of Ecology and Environmental Management (CIEEM) (2016). Impact assessment is informed through information gathered from the habitat appraisal, consultations; record centre searches and a review of available online resources. Reference to SNH, 2005, 2006, 2010, 2012, 2014 and 2016 guidance will also be referred to.

4.65. The effect of each phase of the development (construction, operation and decommissioning) will be established on the ornithological features identified through baseline study. Cumulative impact assessment will be required for statutorily designated sites and protected species.

4.66. A significant impact is assessed to be an impact that either supports or undermines biodiversity conservation, including impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (such as extent, abundance and distribution). The 2016 CIEEM guidelines on ecological impact assessment note that "A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures as long as the mitigation hierarchy has been applied effectively as part of the decision-making process."

4.67. Professional judgement is used based on these variables. In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant impact, a significant impact has been assumed as a precautionary approach. Where uncertainty exists, this is acknowledged.

4.68. For an impact to be significant, the ecological integrity or conservation status of a sensitive feature must be influenced in some way. It may be that the impact is substantial in magnitude or scale, irreversible, has a long-term impact, or coincides with a critical period in a species' life-cycle.

4.69. A significant impact in the context of the assessment is considered to be any 'major' or 'moderate' impact on an important ecological feature, whether positive or negative. Professional judgement will be employed throughout and where ecological features of lower value or importance could experience significant impacts, albeit at a Local or Site geographic scale, this is discussed and a precautionary approach is adopted where appropriate.

4.70. Where appropriate, mitigation and/or enhancement measures will be included and a final (residual) impacts assessment conclusion will then be drawn.

Potential Mitigation and Enhancement

4.71. An important form of mitigation will be the adoption of an iterative approach to the design of the wind farm layout, number of turbines and ancillary elements so as to avoid and minimise ecological impacts.

4.72. A range of 'best practice' measures will be employed during construction to avoid ecological impacts, including, for example, fencing off important areas of habitat and sensitive handling, storage and reuse of topsoil and peat. These measures will be set out in construction method statements which will be incorporated into construction contracts.

Landscape and Visual Impact

Introduction

4.73. The Landscape and Visual Impact Assessment (LVIA) evaluates the effects of the Lochluichart Wind Farm Extension II (the 'Proposed Development') on the landscape and visual resource. The requirement to assess the environmental impacts of the Proposed Development is provided for in 'The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000'. The assessment will accord with the 'Guidelines for Landscape and Visual Assessment Third Edition' (GLVIA3) (2013). The LVIA will be undertaken by Optimised Environments Limited ('OPEN'), a practice registered with The Landscape Institute and experienced in this field of work.

4.74. The study area for the LVIA of the Proposed Development will cover a radius of 35 km from the nearest turbine. This is considered to be the maximum radius within which a significant landscape and/or visual effect could occur given the height of the turbines that are being considered and follows guidance given in 'Visual Representation of Wind Farms Guidance: Version 2.2' (February 2017). The study area and the location of the turbines are shown in Figure 4.7 of the scoping figures supporting this section of the document.

4.75. The cumulative assessment will cover a study area to be agreed with THC and SNH. The Proposed Development is located to the immediate north of Lochluichart Wind Farm Extension, which lies to the immediate north of Lochluichart Wind Farm, on the Loch Luichart Estate. Corriemoillie Wind Farm is located in this cluster, to the immediate east of Lochluichart Wind Farm. Lochluichart Wind Farm comprises 17 turbines, Lochluichart Wind Farm Extension comprises 6 and Corriemoillie Wind Farm comprises 19. All the turbines in this cluster are 125m to blade tip height, including those of the Proposed Development. The relationship between these developments will be assessed in the LVIA.

4.76. A review of the broad windfarm context within a 60km radius has been undertaken by OPEN, based on the latest SNH mapping of large scale wind farm development. It is considered that any cumulative effects that will occur will arise as a result of the pattern of development within the 35km study area radius rather than as a result of changes beyond this. It is proposed that following a detailed review of the cumulative sites within the area, a plan will be produced showing the locations of wind farms within 35km that are operational, under construction, consented or which are at application stage and where the turbines are greater than 50m to blade tip. THC and SNH will be consulted over the final list of sites to be considered within the detailed cumulative assessment. Exceptionally, scoping stage sites may also be included where they are considered to be of specific relevance to the Proposed Development.

4.77. Known baseline wind farms within a 35km study area are shown for scoping purposes in Figure 4.8.

Preliminary Design of the Wind Farm

4.78. Following Pre-Scoping discussions with THC and SNH, the Applicant has undertaken some initial layout design work to identify the potential capacity of the site to accommodate the Proposed Development. The evolution of the layout design process will be explained in the ES/ LVIA with justification given for the final layout chosen.

4.79. It is considered from this initial work by OPEN that the site and wider area has landscape and visual capacity for approximately 8 wind turbines, of a similar design to the operational wind turbines. This includes the addition of two wind turbines into a gap, to the East of Loch na Salach, in the operational Lochluichart Wind Farm Extension, which was previously avoided to mitigate for ornithological interests which are no longer considered to apply.

4.80. The initial design has been subject to several iterations since Pre-Application meeting, in order to test how the existing wind farm group could be extended whilst achieving a high degree of visual integration. The draft wirelines contained within the scoping report demonstrate that the addition of 8 wind turbines can be achieved successfully, without crossing a threshold in terms of the landscape or visual capacity. The Scoping layout optimises the energy capacity of the site whilst securing a layout that integrates well with the existing windfarm. However, the wind farm layout has not as yet been optimised from a financial viability perspective, taking the latest turbine technology into account.

4.81. The final layout design will reflect a full range of environmental, financial and technical considerations, of which the landscape and visual aspects will form a part.

Site context

4.82. The preliminary application site boundary is centred on a small rounded hill marked on OS mapping as Meallan Caoruinn (499m AOD). It is set below a higher and craggier ridge of hills to the west, which extend from the north to the south through the high points of Meall na Speireig (676m AOD), Beinn

Liath Bheag (609m AOD), Meall nan Caorach (604m AOD) and Meall Mhic Iomhair (607m AOD). The landform rises to become more mountainous, with the Fannich mountains to the west, and the Ben Wyvis mountains to the east. The ZTV in Figure 4.9 shows how these mountain landscapes contain the extent of theoretical visibility across the wider study area.

4.83. To the east of the Proposed Development lies Corriemoillie Forest, although most of this forest has now been clear felled to accommodate the Corriemoillie wind farm and it is not clear if this former plantation will be replanted. This used to form an almost continuous broad band of forestry from Loch Glascarnoch in the north, to Loch Luichart in the south. Loch Glascarnoch lies approximately 1.8km to the north of the nearest proposed turbine and Loch Luichart, 3.8km to the south. Loch Fannich lies approximately 6.1km to the south-west, set in the massif of the Fannich Hills. All these lochs are man-made with large hydro dams at the south-eastern or eastern ends.

4.84. The site and its immediate surroundings are characterised by an upland landscape of predominantly open moorland with large forestry blocks across the more marginal lower slopes. Land use is broadly limited to wind farm development, hill sheep farming and forestry. There is a distinct lack of settlement or infrastructure across these hills. Vehicular tracks access the wind farms and parts of the forestry and moorland, while a few rough paths extend deeper into the higher hills.

4.85. There are two roads in this area; the A835, which is the main road between Tore and Ullapool; and the A832, which forms a more circuitous loop around from the A835 via Gairloch and Poolewe on the west coast. These roads typically lie within the valleys and along the shorelines of the lochs. Neither of these roads is designated as part of Scotland's 12 National Tourist Routes, although both are important routes in respect of tourism.

4.86. Settlement is sparse with development concentrated in very intermittent small villages along the main roads. The closest settlements to the Proposed Development are Lochluichart, approximately 3.7km to the south of the nearest proposed turbine and Gorstan, approximately 6.9km to the south-east.

Landscape Character

4.87. SNH has prepared Landscape Character Assessments (LCAs) for the whole of Scotland and these provide a consistent and valuable source of information against which the development or management of a piece of land can be assessed, albeit that it is recognised within SNH's 'Siting and Designing Windfarms Guidance' from May 2014 that they have some limitations. SNH notes "It should be noted that many of the LCAs were produced during the 1990s and, although they remain relevant as descriptors of landscape character, do not necessarily address the sensitivity of particular landscape character types to wind farm development...". They also do not address the extent to which landscape character has been altered by the presence of built wind farm developments.

4.88. The relevant SNH LCA is the 'Ross and Cromarty landscape character assessment' and this will be referred to in the baseline character assessment.

The LVIA will identify the relevant Landscape Character Types (LCTs) within a 35km radius of the wind farm. The distribution of the landscape character types (LCTs) within the Study Area described by these LCAs is shown in Figure 4.9, with the blade tip ZTV overlaid. Because the LCTs can be split into different geographical areas across this part of the Highlands, the LVIA will also identify individual parts of each LCT as Landscape Character Units (LCUs), where these have the potential to be significantly affected by the Proposed Development.

4.89. The site is located within LCT 'Rounded Hills' identified in the SNH study. This is the same LCT in which operational Lochluichart, Lochluichart Wind Farm Extension and Corriemoillie Wind Farms are located. While the character assessment will consider the effects of the Proposed Development on the LCTs and LCUs that lie across the study area, the assessment will focus on areas within a 15km radius, as significant effects on landscape character are unlikely to occur beyond this range.

Wild Land

4.90. While no part of the application site is located within a Wild Land Area (WLA), there are five WLA's within the study area, two of which are in proximity to the Proposed Development. The closest WLA is the Fisherfield, Letterew, Fannichs WLA which lies less than 1km to the west. This WLA covers the mountainous landscapes extending to the west coast, although as shown in Figure 4.10, visibility of the Proposed Development is very limited both in extent and levels of visibility. This is due to the screening effect of the higher upland ridge to the west of the Proposed Development. This WLA is already influenced by Lochluichart Wind Farm, Lochluichart Wind Farm Extension and Corriemoillie in similar proximity, albeit also to similar limited extents and levels.

4.91. Rhiddoroch, Beinn Dearg and Ben Wyvis WLA wraps round the Proposed Development to the north, north-east and east, with the northern boundary being the closest at approximately 3.6km from the nearest proposed turbine. Figure 4.10 shows that higher levels of visibility may occur on the hill slopes facing the Proposed Development and along the ridges, where the existing wind farm developments already have an influence.

4.92. Central Highlands WLA lies to the south, associated with the landscapes of the Strathconan, Monar and Mullardoch WLA at the greater range of approximately 12.6km. Visibility is limited in this WLA to the upper north facing slopes and ridges.

4.93. Flowerdale, Shieldaig – Torridon WLA and Coulin and Ledgowan Forest WLA lie to the west of the study area at distances beyond 24km and 30km respectively and with very limited theoretical visibility as shown in Figure 4.10.

4.94. Wild Land effects will be considered in the LVIA in respect of the two closest WLAs, despite the very limited visibility shown across the closest Fisherfield, Letterewe and Fannichs WLA. It is proposed that the effects on the remaining three WLAs be scoped out of the LVIA as significant effects on Wild Land are unlikely to occur. Although visibility is shown across the Central Highlands

WLA, the eight turbines of the Proposed Development will occur set behind the closer range 23 turbines of Lochluichart and Lochluichart Wind Farm Extension.

4.95. SNH has recently published a draft version of 'Assessing Impacts on Wild Land technical guidance' open for consultation between 26th January and 7th April 2017. This document sets out guidance for those assessing the impact of development on WLAs. Wild Land descriptions or citations have also been published which, for each of the 42 WLAs in Scotland, describe the key attributes and qualities of each wild land area. The LVIA will reference these documents should the final publication occur within a reasonable period prior to submission. SNH's opinion on which version of the methodology should be applied to the assessment is sought through this scoping report.

Landscape Designations

4.96. The site and its immediate surroundings are not subject to any national or local landscape designations intended to protect landscape quality, as shown in Figure 4.11. The site lies within an undesignated area.

4.97. Special Landscape Area (SLA) is the regional tier designation used by THC. Three SLAs occur in the study area; Fannichs, Beinn Dearg and Glen Calvie SLA to the north and west at a minimum distance of 5.3km; Ben Wyvis SLA to the east at a minimum distance of 9.1km; and Strathconan, Monar and Mullardoch SLA at a minimum distance of 10.3km.

4.98. National Scenic Area (NSA) is the national designation used by SNH to identify Scotland's most scenic landscapes. Three NSAs occur in the study area, although all lie beyond a 22km radius of the Proposed Development. These comprise Wester Ross NSA to the west at a minimum distance of 22.3km; Glen Strathfarrar NSA to the south at a minimum distance of 25.4km; and Dornoch Firth NSA to the north-east at a minimum distance of 32.9km. The special qualities of these areas, is presented in the SNH Commissioned Report No. 374 'The Special Qualities of the National Scenic Areas'.

4.99. There are nine nationally important Inventory Gardens and Designed Landscapes (GDL) within the study area. The importance of the GDLs are described in the Inventory held by Historic Environment Scotland. Figure 4.11 shows that only Fairburn House GDL will be subject to any theoretical visibility. The enclosure of this GDL by mature tree cover will limit actual visibility.

4.100. Table 4.5 below lists the designated areas and provides information about their distance to the Proposed Development turbines and relationship to the ZTV, as shown in Figure 4.11. Thereafter, it is assessed in the final column whether, in OPEN's opinion, these designated areas can be scoped out of the assessment, unless changes to the layout during the detailed design process materially alter the potential for significant effects. The boxes that are shaded grey will be assessed further within the LVIA. THC's and SNH's agreement to this is sought through this scoping exercise to enable the LVIA to be focussed on key considerations.

Table 4.5: Designations

Designation / WLA		Distance to nearest turbine (km)	Subject to ZTV-theoretical visibility?	Need to assess effects further within LVIA?
NSA	Wester Ross NSA	22.33	Yes	No – very limited ZTV shading.
	Glen Strathfarrar NSA	25.37	No	No – no ZTV shading.
	Dornoch Firth NSA	32.92	No	No – no ZTV shading.
Garden and Designated Landscape	Leckmelm	27.44	No	No – no ZTV shading.
	Dundonnell	26.72	No	No – no ZTV shading.
	Castle Leod	16.91	No	No – no ZTV shading.
	The Spa Gardens, Strathpeffer	17.84	No	No – no ZTV shading.
	Brahan	20.70	No	No – no ZTV shading.
	Novar	27.35	No	No – no ZTV shading.
	Ardross Castle	26.57	No	No – no ZTV shading.
	Fairburn	17.71	Yes	No – limited ZTV shading and enclosure by mature tree cover.
	Beaufort Castle	29.12	No	No – no ZTV shading.
SLA	Fannichs, Beinn Dearg and Glen Calvie	5.27	Yes	Yes – the ZTV shows visibility in localised patches from relative proximity and with the Proposed turbines appearing to the fore of the existing turbines.
	Strathconan, Monar and Mullardoch	10.34	Yes	No – ZTV shows localised patches of visibility on north facing slopes and summits. The location of the Proposed Development behind Lochluichart and its comparatively small number

Designation / WLA		Distance to nearest turbine (km)	Subject to ZTV-theoretical visibility?	Need to assess effects further within LVIA?
				of turbines will limit the potential for a significant effect to arise.
	Ben Wyvis	9.12	Yes	Yes – the ZTV shows visibility across west facing slopes and associated summits / ridgelines.
WLA	Fisherfield, Letterewe, Fannichs	0.73	Yes	Yes – despite very limited ZTV shading, this WLA is in proximity to the Proposed Development.
	Rhiddoroch, Beinn Dearg, Beinn Wyvis	3.58	Yes	Yes – the ZTV shows visibility across west and south facing slopes and associated summits / ridgelines in proximity to the Proposed Development.
	Central Highland	12.62	Yes	No – ZTV shows localised patches of visibility on north facing slopes and summits. The location of the Proposed Development behind Lochluichart and its comparatively small number of turbines will limit the potential for a significant effect to arise.
	Coulin and Ledgowan Forest	24.60	Yes	No – very limited ZTV shading.
	Flowerdale, Shieldaig, Torridon	30.42	Yes	No – very limited ZTV shading.

Visual Receptors and Visual Amenity

4.101. The LVIA will undertake an assessment of the likely visual effects of the Proposed Development through consideration of the specific visual effects at a selection of representative viewpoints and by considering the wider effects on visual amenity with reference to a range of principal visual receptors.

Visualisations

4.102. Visualisations and figures will be produced to SNH's standards as set out in 'Visual Representation of Wind Farms Guidance: Version 2.2' (February 2017). A further set of figures will be prepared in accordance with THC's current visualisation guidance 'Visualisation Standards for Wind Energy Developments' (July 2016).

General Visibility

4.103. The pattern of theoretical visibility on the ZTV shows that close range and more distant landform has a strong influence, markedly restricting theoretical visibility of the Proposed Development. The Proposed Development would be sited on a moderate sized hill next to a higher ridge that lies to the west. This generally contains visibility in this direction apart from higher vantage points. To the north and east visibility extends across facing slopes of Beinn Dearg and Ben Wyvis although this mountain group largely contains visibility from extending further in these directions. To the south, the tiers of successive hill ridges reduce the extent of visibility while to the south-east typically lower levels of visibility are shown to extend through the lower lying landscapes of Loch Shin and River Shin. Where visibility is shown to occur along the shores of Loch Glascarnoch and Loch Luichart, this is also shown to be of lower levels.

4.104. Visibility is shown to be largely contained within a radius of 15km. Outwith this area, visibility is generally from high ground locations where there are few visual receptors, or from low ground locations where levels of visibility are low and more likely to be reduced by intervening tree cover and forestry.

4.105. The comparative ZTV on Figure 4.14 shows the extent of visibility of the Proposed Development in comparison with the extent of visibility of the operational Lochluichart, Lochluichart Wind Farm Extension and Corriemoillie Wind Farms. This shows that the extents are broadly comparable which means that visibility would mostly occur in areas where an influence from the operational turbines already occurs, with the exception of some additional patches, the most notable being a patch over Loch Glascarnoch, adjacent to the A835 and approximately 4.5-9km north of the Proposed Development.

Viewpoint Selection

4.106. A preliminary viewpoint list is shown in Table 4.6 below. The locations of the viewpoints are shown on Figure 4.12. This list has been derived from the viewpoints used in the Lochluichart Wind Farm Extension LVIA with some amendments to make it more suited to the assessment of the Proposed Development. The final list will be established through the scoping process and in agreement with THC and SNH. The viewpoints were selected to represent sensitive visual receptors with the potential to undergo significant effects. They were also selected to represent landscape receptors and with consideration of the potential for cumulative effects to arise.

Table 4.6: Preliminary Viewpoint List

ID	Viewpoint name	Grid ref. (Preliminary)		Dist. nearest turbine (km)	Description
1	A835 Aultguish Inn	235172	870390	2.50	Representative of road-users on the A835 to north-east of the Proposed Development.
2	A835 Black Bridge Road	237347	870830	4.61	Representative of road-users on the A835 to north-east of the Proposed Development.
3	Old Drover's Road, Corriemoillie	237561	866891	4.57	Representative of walkers on rural track through forestry and moorland.
4	Garve Bridge	242372	858937	12.53	Representative of road-users on the A835 to south-east of the Proposed Development.
5	Summit of Ben Wyvis	246294	868370	13.07	Representative of hill walkers in the Ben Wyvis range.
6	Summit of Coileachan	224175	868011	8.06	Representative of hill walkers in the Sgurr Mor range.
7	Summit of Sgurr Mor	220328	871797	12.25	Representative of hill walkers in the Sgurr Mor range.
8	Beinn a Chaistall (Summit of Meall a Ghrianain)	236555	877583	9.27	Representative of hill walkers in the Rounded Hills to the north.
9	Avenue of Fairburn Estate	247602	853050	20.37	Representative of residents, workers and road-users in this rural farmed area.
10	Summit of Creag Byaadh near Milton	227711	853921	14.10	Representative of hill walkers in the Strathconan range.
11	Sgurr a Choire Ghlais	225881	843024	25.05	Representative of hill walkers in the Strathfarrar range.
12	Summit of Beinn Dearg	225962	881147	13.77	Representative of hill walkers in the Beinn Dearg range.

Principal Visual Receptors

4.107. Several potential visual receptors are found within the 35km study area, as shown in Figure 4.13. The landscape and visual assessment will include consideration of the receptors listed below, although it should be noted that this is not intended to be a definitive list of receptors, but rather examples of those receptors that may be included.

Settlements and Residents

4.108. Due to the relatively isolated location of the Proposed Development, the settlements in the study area are limited in terms of occurrence and extent. There are few rural properties with potential to be affected by the Proposed Development, the nearest being Aultguish Inn, set to the south-east of the Loch Glascarnoch dam and 2.5km to the north of the nearest proposed turbine.

4.109. Villages and rural clusters occur most frequently within the valleys and along shorelines where there is road access. The four small settlements that occur within a 10km radius of the Proposed Development, include Lochluichart, Grudie, Gorstan and Garve. The ZTV in Figure 4.13 shows that none of these settlements will be affected by the Proposed Development, apart from Garve which shows very low levels and a marginal extent of visibility.

4.110. More settlements occur at a greater distance to the south-east and although some are located fully or partly within the ZTV, the effect of the Proposed Development on these settlements will be limited by the separation distance, the low levels of visibility that typically occur, the extent of intervening tree cover or forestry and the location of the Proposed Development set behind the existing turbines when seen from this south-easterly direction.

4.111. While Aultguish Inn will be represented by Viewpoint 1, it is unlikely that any of the settlements will be affected by the Proposed Development and therefore it is proposed that these be scoped out of the assessment.

Routes

4.112. There are relatively few routes in the Study Area due to the upland nature of much of the terrain. The routes tend to follow the river valleys or loch shorelines, and their low-lying locations often limits the potential for visibility of the Proposed Development due to intervening, higher landform or roadside forestry.

4.113. Routes include roads, railway lines, cycle routes and walking routes, which occur in the study area, and some of these require to be considered in the LVIA as views from them may be affected by the Proposed Development. The key routes to be considered are shown in Figure 4.13 and described below.

4.114. The Proposed Development lies within an upland landscape with mountains to the west and lower lying valley landscapes wrapping round the north, through the east, to the south. There is little hierarchy to the road system with only two main roads occurring in the 10km radius around the site and contained within the valley landscapes. The A835 is located approximately 1.8km to the north, and the A832 is located approximately 3.7km to the south of the Proposed Development, at the closest points.

4.115. The A835 is the main road linking the A9 on the Black Isle with Ullapool on the west coast. It follows the shorelines of Loch Garve, Loch Glascarnoch and Loch Broom. Its relatively low lying location means visibility of the Proposed Development will be limited, as indicated on the ZTV on Figure 4.13, although with a notable extent to the north-east of the Proposed Development.

4.116. The A832 forms a loop from the A835, between north of Garve and the Falls of Measach, via Kinlochewe, Gairloch and Poolewe on the west coast. It follows the northern shore of Lochluichart and Strath Bran to the west. The ZTV on Figure 4.13 shows that there will be no visibility of the Proposed Development from this road. The only other roads which are subject to visibility lie to the south-east, albeit at such a distance that it would be unlikely for significant effects to arise.

4.117. There are two rail routes through the study area; one connecting Inverness with Wick and Thurso, via Muir of Ord and Dingwall, and the other connecting Inverness with Kyle of Lochalsh, via Garve and Lochluichart. The ZTV in Figure 4.13 shows that there is very limited visibility from the rail routes and where it does occur it is distant, low in level or screened by intervening forest cover.

4.118. There is one cycle route in the study area; National Cycle Route 1 which is concentrated in the south-east of the study area. While Figure 4.13 shows some medium and low levels of visibility to occur from this route, visibility of the Proposed Development will be from such a distance and set behind the existing wind farm developments, such that any potential effect will be very limited.

4.119. Core Paths within the study area are concentrated around settlements. The closest core paths to the Proposed Development are concentrated around Garve. Visibility of the Proposed Development from these routes will be very limited by the low occurrence and low levels of visibility as shown on the ZTV on Figure 4.13, as well as the extent of enclosure around these routes of mostly forestry.

4.120. Other walking routes, not defined as core paths, occur in the more mountainous parts of the study area. The high tops are an attraction to hill walkers, in particular Ben Wyvis, Beinn Dearg and Sgurr Mor. These tops are covered by representative viewpoints and the effect of the Proposed Development across the wider mountain area will be fully considered in the LVIA.

Aviation Lighting

4.121. Subject to the outcome of discussions with the MOD, if visible aviation is required (as is the case with Corriemoillie Windfarm), then the visual effects of visible lighting will be fully assessed.

Mitigation Measures

4.122. The principal mitigation of landscape and visual effects of wind farms is achieved through careful layout design and turbine height selection, which can reduce effects, or in some cases, prevent effects from arising. Some considerable input to the layout design has already been made to support the Scoping layout, which has been tested from various locations to achieve a high degree of integration with the existing wind farms. The potential for mitigation of landscape and visual effects will be considered throughout the iterative design and assessment processes. SNH's 'Siting and Designing Wind Farms in the Landscape Version 2' (May 2014) will be a key reference.

Methodology

4.123. The landscape and visual assessment will assess the potential effects of the Proposed Development on landscape character and visual receptors around the study area. This includes the effects of the access tracks, substation, operations and maintenance building, and other associated infrastructure, as well as the turbines.

4.124. The assessment will be carried out using a methodology that has been specifically devised by OPEN for the landscape and visual assessment of wind farms. This methodology accords with 'GLVIA3'. The following summary provides information on the methodology.

4.125. The potential effects of the Proposed Development on the landscape and visual resource are grouped into four categories: physical effects, effects on landscape character, effects on views, and cumulative effects.

4.126. Physical effects are restricted to the area within the site boundary, and are the direct effects on the fabric of the site and its access, such as the removal or addition of trees and alteration to ground cover. This category of effects is made up of landscape elements.

4.127. Effects on landscape character arise either through the introduction of new elements that physically alter the pattern of elements that makes up landscape character, or through visibility of the Proposed Development, which may alter the way in which the pattern of elements is perceived. This category of effects is made up of landscape character receptors, which are landscape character types, designated areas and WLAs.

4.128. The assessment of effects on views is an assessment of how the introduction of the wind farm will affect views throughout the study area. The assessment of effects on views is carried out in two parts:

- an assessment of the effects that the wind farm will have on a series of viewpoints that have been selected to represent the views of people, for example, residents, walkers and road-users, throughout the study area; and
- an assessment of the effects that the wind farm will have on views from principal visual receptors, which are people living in the notable settlements, travelling on routes as well as visiting features and attractions found throughout the study area.

4.129. The visual assessment will describe the impacts that are likely to occur at each of the representative viewpoints and it will also address the effects that people will experience more widely as they travel through and around the study area.

4.130. Cumulative effects arise where the study areas for two or more wind farms overlap so that both wind farms are experienced at proximity where they may have an incremental effect, or where wind farms may combine to have a sequential effect, irrespective of any overlap in visibility. The cumulative assessment will include existing wind farms, those that are under construction and consented, and those for which planning applications have been submitted, where the turbines are greater than 50m to blade tip. Sites that are at scoping stage will only be included exceptionally, if they are of specific relevance to the assessment. The cumulative assessment will focus on the most relevant cumulative sites as recommended in SNH's guidance.

Significance of Effects

4.131. The broad objective in assessing the effects of the Proposed Development is to determine, as required by the EIA Regulations, what the predicted significant effects of the Proposed Development on the landscape and visual resource will be. In this LVIA, effects will be assessed to be either significant or not significant.

4.132. The significance of effects is assessed through a combination of two considerations; (i) the sensitivity of the landscape element, landscape character receptor, view or visual receptor, and (ii) the magnitude of change that will result from the introduction of the Proposed Development.

4.133. Sensitivity is an expression of the ability of a landscape element, landscape character receptor, view or visual receptor to accommodate the Proposed Development, and is dependent on baseline characteristics including its susceptibility to change, value, quality, importance, the nature of the viewer, and existing character.

4.134. Magnitude of change is an expression of the scale of the change on landscape elements, landscape character receptors and visual receptors that will result from the Proposed Development.

4.135. The factors that are considered in sensitivity and magnitude of change are assimilated to assess whether the Proposed Development will have an effect that is significant or not significant. OPEN's methodology for assessing wind farm development is not reliant on the use of a matrix to determine the significance of landscape and visual effects, nor does it define levels of significance. It is, however, considered useful to include a matrix in the methodology to illustrate how combinations of sensitivity and magnitude of change can give rise to a significant effect and to provide an understanding as to the threshold at which significant effects may arise. Table 4.7 below provides this illustration.

Table 4.7: Illustrative Matrix of Significance of Effects

Magnitude Sensitivity	High	Medium-High	Medium	Medium-Low	Low	Negligible
High	Significant	Significant	Significant	Significant or not significant	Not Significant	Not Significant
Medium-High	Significant	Significant	Significant or not significant	Significant or not significant	Not Significant	Not Significant
Medium	Significant	Significant or not	Significant or not	Not Significant	Not Significant	Not Significant

		significant	significant			
Medium-Low	Significant or not significant	Significant or not significant	Not Significant	Not Significant	Not Significant	Not Significant
Low	Significant or not significant	Not Significant	Not Significant	Not Significant	Not Significant	Not Significant

4.136. Effects that are assessed within the dark grey boxes in the matrix are assessed to be significant in terms of the requirements of the EIA Regulations. Those effects that are assessed within the light grey boxes may be significant, or not significant, depending on the specific factors and effect that is assessed in respect of a particular landscape or visual receptor. In accordance with the Landscape Institute's 'GLVIA3' (paragraph 3.23), experienced professional judgement is applied to the assessment of all effects and reasoned argument is presented in respect of the findings in each case.

4.137. A significant effect occurs where the Proposed Development will provide a defining influence on a landscape element, landscape character receptor or view. A significant cumulative effect occurs where the combined effect of the Proposed Development with other existing and Proposed Developments will result in a landscape character or view that is defined by the presence of more than one wind farm and is characterised primarily by wind farms.

Nature of Effects

4.138. 'Electricity Works (Environmental Impact Assessment) (Scotland) Regulations (2011)' state that the Environmental Statement should include a description of the likely significant effects of the Proposed Development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short and long-term, permanent and reversible, positive and negative effects of the Proposed Development. Guidance provided by the Landscape Institute on the Nature of Effect, in its publication GLVIA3, is limited to a single entry which states that "One of the more challenging issues is deciding whether the landscape (or visual) effects should be categorised as positive or negative. It is also possible for effects to be neutral in their consequences for the landscape. An informed professional judgement should be made about this and the criteria used in reaching the judgement should be clearly stated..".

4.139. In relation to many forms of development, the ES will identify beneficial, neutral and adverse effects under the term Nature of Effect. The landscape and visual effects of wind farms are difficult to categorise in these brackets as, unlike other disciplines, there are no definitive criteria by which these effects can be measured as being categorically beneficial or adverse. For example, in disciplines such as noise or ecology it is possible to identify the nature of the effect of a wind farm by objectively quantifying its effect and assessing the nature of that effect in prescriptive terms. However, this is not the case with landscape and visual effects, where the approach combines quantitative and

qualitative assessment. The LVIA will determine whether effects are beneficial, neutral or adverse in accordance with defined criteria.

4.140. Judgements on the nature of effect are based on professional experience and reasoned opinion informed by best practice guidance.

Cumulative Assessment

4.141. The operational, consented, application stage and scoping stage cumulative wind farms within a 35km radius of the Proposed Development are shown on Figure 4.8.

4.142. The cumulative assessment will be carried out in accordance with 'Assessing the cumulative impact of onshore wind energy developments', SNH 2012, and advice will be sought from THC and SNH as to sites to be included in the assessment, as well as agreement of a cut-off date for updating cumulative data prior to submission.

4.143. The cumulative assessment will focus on the most relevant cumulative sites as recommended in SNH's guidance. The cumulative effect of the Proposed Development in conjunction with the existing cluster of Lochluichart, Lochluichart Wind Farm Extension and Corriemoillie will be given due consideration.

Key Issues

4.144. The following bullet points summarise the key considerations that will be addressed in the LVIA. This is not intended to be a definitive list, but indicates OPEN's assessment of the potential key effects of the Proposed Development at the Scoping stage:

- The design of the wind farm extension and the degree to which the landscape can successfully accommodate the additional wind turbines, without causing adverse landscape and visual effects;
- The potential cumulative effects of the Proposed Development in respect of the cumulative context comprising the existing Lochluichart, Lochluichart Wind Farm Extension and Corriemoillie wind farms;
- The potential effects of the Proposed Development on the Special Landscape Areas of Ben Wyvis, and Fannichs, Beinn Dearg and Glen Calvie;
- The potential effects of the Proposed Development on the Fisherfield, Letterewe and Fannichs WLA and on the Rhiddoroch, Beinn Dearg and Ben Wyvis WLA;
- The potential effects on the views and visual amenity of road-users on the A835 and residents and visitors at Aultguish Inn; and
- The potential effects on the views and visual amenity of hill walkers on the surrounding mountains and hills.

Geology and Peat

4.145. An assessment of the impact of the Proposed Development on geology and peat will be undertaken. This will establish the baseline conditions, inform the

assessment and design whilst determining any suitable mitigation measures required.

4.146. The Proposed Development site occupies an undulating upland location with available British Geological Survey (BGS) mapping indicating that approximately 50% of the Proposed Development site is underlain by glacial till, with the remaining 50% classified as peat. The peat deposits are shown in the northern and southern sections of the Proposed Development Site.

Baseline Conditions

4.147. The Soil Survey of Scotland at a scale of 1:250 000 (Macaulay Institute for Soil Research, 1981) indicates that the site is underlain by a mix of gleys soils and blanket peats. This is supported by soil carbon mapping which suggests the site is underlain by a mix of two main categories:

- All vegetation cover is priority peatland habitats + All soils are carbon-rich soils and deep peat; and
- Soil information takes precedence over vegetation data + No peatland habitat recorded. May also show bare soil + All soils are carbon-rich soil and deep peat.

4.148. BGS mapping information on solid geology indicates that the majority of the Proposed Development site is Neoproterozoic aged Psammite belonging to the Morar Group. A north to south intrusion of Semipelite and Pelite, of same age and group, is also present within the central area of the Proposed Development Site.

Potential Impacts

4.149. Development of wind farms on peatlands can lead to potential peat slide risk. An assessment of the likely impact on peatlands and the potential for peat slide risk will be undertaken as part of the Environmental Impact Assessment (EIA).

4.150. Excavation of peat during construction of site infrastructure, including access tracks, crane hardstandings, turbine foundations and cable trenches may lead to potential impacts on any peat habitat. In addition, natural surface drainage systems may change in this regard which could lead to drying and oxidation of in-situ peat.

4.151. Disturbance of organic rich peat soils leading to carbon loss. Carbon effects are discussed in more detail under the Climate Change Impact Assessment (CCIA) section of this Scoping Report.

Potential Mitigation

4.152. Measures will be taken during the design phase of the Proposed Development to ensure that infrastructure is located appropriately to reduce the potential for peat slide risk. This includes siting turbines and other infrastructure within areas of shallow topography and which contain limited or no peat. Peat

greater than 1 m is classified as 'deep peat' and should be avoided where possible during the design phase.

4.153. The excavation of peat will be minimised or avoided where possible. Where peat excavation cannot be avoided, an approach will be developed for peat restoration and reinstatement in accordance with best practices. Monitoring of peat re-instatement or restoration will be carried out throughout the lifetime of the development.

4.154. As detailed during pre-application discussions with The Highland Council and SEPA, an outline Peat Management Plan (PMP) will be prepared as part of the ES. The outline PMP will include a high level estimation on peat excavation and re-use volumes based on recorded peat thickness, the approximate infrastructure dimensions and anticipated re-use streams. A more detailed PMP would follow post-consent.

Assessment Methodology

4.155. The purpose of this assessment will be to:

- Identify peat depth and properties (i.e. acrotelmic/catotelmic);
- Identify any areas susceptible to peat slide, using peat thickness and digital terrain model (DTM) data to analyse slopes;
- Assist in the micrositing of turbines and tracks into areas of shallow or no peat;
- Assess potential effects on soils, peat and geology, and sensitive habitats; and
- Develop an acceptable code for construction that will adopt best practice procedures, effective management and control of onsite activities to reduce or offset any detrimental effects on the geology and soils including peat.

Stage 1 Peat Probing

4.156. The Stage 1 Peat Probing survey will comprise of probes sunk at 100 m grid centres using a peat probe to a maximum depth of 6 m. This initial stage will cover the total Proposed Development area. In addition to determining the extent and thickness of peat, this probing exercise will also give an indication of the underlying substrate directly beneath the peat level.

4.157. Stage 1 peat probing will cover turbine locations, access routes and proposed borrow pits. During the survey, observations will be recorded of any evidence of existing or potential peat instability. The output from the field survey will comprise a record of each of the investigation locations and a summary of peat depths, substrate and topography. This data will be included in preliminary constraints mapping and will support the design of an appropriate infrastructure layout. Furthermore, this survey will inform the requirements of the Phase 2 probing survey.

Stage 2 Peat Probing

4.158. Following design freeze, the Stage 2 peat probing survey will be undertaken along the site infrastructure at 50 m centres as well as at 10 m centres at each turbine location.

4.159. This approach is in accordance with 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments' (Scottish Government, 2007) and 'Guidance on Developments on Peatland - Site Surveys' (Scottish Government, 2014).

Peat Condition Assessment

4.160. During Stage 2 peat probing, a selection of core sample locations will be selected to provide a full peat depth profile. This will be achieved by taking 50 cm cores from the surface layer through to the basal layer. A record of each core will be kept and will include, but not be limited to the following information:

- Photograph of each core;
- Depth of acrotelm layer;
- Degree of humification;
- Course and fine fibre content;
- Water content; and
- Information on the water table and the average soil pH level.

4.161. This approach is consistent with the document 'Good Practice During Windfarm Construction' produced by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency (SEPA), Forestry Commission Scotland and Historic Environment Scotland, (Scottish Renewables et al, 2015).

Peat Slide Risk Assessment

4.162. Should significant quantities of peat be present within the Proposed Development site, a peat slide risk assessment will be undertaken in accordance with Scottish Government guidance and 'Guidance on Developments on Peatland - Site Surveys' Scottish Government, 2014' along with full consultation with the relevant bodies.

4.163. The Peat Slide Risk Assessment will comprise of detailed analysis and reporting on the design freeze and will include a hazard and slope stability assessment and preliminary peat management.

4.164. In accordance with the 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments', Scottish Government (January 2007), the hazards existing on the site will be ranked based on factors that influence stability, namely peat depth and slope gradient. In addition, potential receptors exposure to risk will be established

and hazard rankings applied across the site, with management and mitigation measures recommended for an acceptable construction.

Hydrology and Hydrogeology

4.165. A hydrogeological survey will be undertaken in order to establish the baseline conditions of the Proposed Development site, assess the predicted impacts and their significance and propose a programme of mitigation where appropriate.

4.166. The Proposed Development site occupies an undulating upland location with areas of peat in the northern and southern sections of the site. The Proposed Development site rises from approximately 270 m above ordnance datum (AOD, approximately equivalent to sea level) at the site entrance (in the northern section of the site) to 500 m at Meallan Caoruinn (in the southern section of the Proposed Development Site).

4.167. Information regarding geology and peat is provided within the Geology and Peat Section (above) Section 4.0 of this scoping report but will form part of the Hydrology and Hydrogeology chapter of the ES and inform the assessment of potential impacts on hydrological receptors.

4.168. Scottish Environment Protection Agency (SEPA) were consulted as part of a pre-application meeting with the Highland Council and provided the following comments regarding the Development:

- "The site has existing tracks and the site layout must make best of use of these minimising the disturbance of previously undisturbed ground;
- It seems unlikely that any development will take place within 250 m of a groundwater supply source; if this is the case it would be helpful that the ES confirms this; and
- As long as watercourse crossings are designed to accommodate the 1 in 200 year [flow] and other infrastructure is located well away from watercourses we do not forsee [sic] a need for detailed information on flood risk to be provided."

4.169. These comments will be used to inform the assessment and scope of surveys, as described in the following sections.

Baseline Conditions

4.170. An initial review of the hydrological and ground conditions of the Proposed Development site has been undertaken. This section outlines the potential hydrological and geological receptors which have been identified within the site and the wider area.

Surface Water

4.171. The Proposed Development site lies within the catchment of Loch Glascarnoch and Glascarnoch River, approximately 1 km north of the site boundary, and is drained by a series of tributaries of the Allt Guibhais Mor and Allt Guibhais Beag Rivers.

4.172. Whilst Loch Glascarnoch is classed by SEPA as having 'good ecological potential', there are no statutory designations associated with watercourses within the Proposed Development site, Loch Glascarnoch or Glascarnoch River.

4.173. Site surveys will ground truth the presence of watercourses and drainage features. Appropriate buffers will be applied to watercourses and drains during the design phase.

Statutory Designated Sites

4.174. There are no statutory designated sites within the Proposed Development site, or in the surrounding area, which are potentially hydrologically connected to the Development.

4.175. Fannich Hills SSSI and SAC is located approximately 6 km west of the Proposed Development site and is designated for supporting blanket bog, clear-water lakes or lochs with aquatic vegetation and heath. Due to the intervening topography between the Proposed Development and Fannich Hills SSSI and SAC no hydrological effects on the designation are anticipated.

4.176. Beinn Dearg SSSI, SAC and SPA is located approximately 6 km north of the Proposed Development site at its nearest point and is designated for supporting a wide range of upland habitats, including blanket bog. Due to the intervening topography between the Proposed Development and Beinn Dearg SSSI, SAC and SPA, no hydrological effects on the designation are anticipated.

Ground Water Dependent Terrestrial Ecosystems (GWDTEs)

4.177. It is anticipated that peat deposits are located onsite and that GWDTEs will exist within the Proposed Development site. The location, type and extent of the GWDTEs will be determined with the aid of a National Vegetation Communities (NVC) survey, which will inform the assessment of the hydrological function of the GWDTEs, in accordance with Land Use Planning System Guidance Note 31, Version 2, (SEPA, 2014).

Private and Public Water Supplies

4.178. Information pertaining to the location, type and source of public and private water supplies will be identified through consultation with relevant statutory consultees.

4.179. It is proposed that a 2 km search radius from development infrastructure is used to request details on public and private water supplies.

Groundwater

4.180. The groundwater unit underlying the Proposed Development Site is identified as the Conon groundwater unit, which is classified as having a 'Good' quantitative and qualitative status under the SEPA River Basin Management Plan.

Flood Risk

4.181. The Indicative River and Coastal Flood Map (Scotland) produced by SEPA shows the areas of Scotland with a 0.5 % (1:200) or greater chance of flooding. These areas are known as medium to high risk areas for flooding.

4.182. Minor areas either side of the Allt Guibhais Mor River, to the north of the access track leading to the Proposed Development site, are classed as at risk from a 1:200 fluvial flood event.

4.183. The Highland Council Flood Risk Management Team provided the following comment regarding flood risk "Should any infrastructure be located within close proximity of any of the watercourses, we would request that a Flood Risk Assessment is submitted to demonstrate that the development is not at risk from flooding and will not increase flood risk elsewhere."

4.184. An initial 50 m buffer has been placed around watercourses onsite and therefore it is not anticipated that turbines or electrically sensitive equipment will be located within these areas of potential flood risk. As such, a concise section within the ES will consider how the Proposed Development will impact surface water run-off and effects on off-site receptors, in accordance with paragraphs 255 to 268 of the Scottish Planning Policy (SPP).

Potential Impacts

4.185. At this stage, the key sensitive receptors are considered to be the named and unnamed tributaries of Allt Guibhais Mor and Allt Guibhais Beag, peat, groundwater and the hydrological function of GWDTEs.

4.186. Private Water Supplies also have the potential to be affected by the Proposed Development if supplies are located within the same hydrological catchment. Information pertaining to private and public water supplies is yet to be received but will form part of the baseline data requests.

4.187. Potential impacts could occur from:

- Chemical pollution;
- Sedimentation as a result of construction;
- Acidification of watercourses;
- Impediments to watercourse and near-surface water flow;
- Increased run-off and flood risk;
- Migration of pollutants from contaminated land; and
- Compaction of superficial deposits.

4.188. The predicted significance of impacts will determined through a standard method of assessment and based on professional judgement, considering both the sensitivity of receptor and the magnitude of the potential impact.

Mitigation Measures

4.189. Where possible, a 50 m buffer zone will be established for all turbine bases and ancillary structures / infrastructure around the watercourses within the Proposed Development site. The requirement for access tracks crossing watercourses will also be minimised, where possible, during the design stage.

4.190. A Water and Construction Management Plan (WCMP) will accompany the ES and will form part of the embedded development design. The WCMP will comprise methods and works that are established and effective measures to which the Applicant will be committed through the development consent. Accordingly, the assessment of significance of effects of the Proposed Development should be considered with the inclusion of the WCMP.

4.191. Mitigation measures in order to protect the water environment will be outlined in the WCMP and will be based on good construction practice outlined in the following documents:

- Pollution Prevention Guidelines (PPGs) 1 to 21;
- Scottish Natural Heritage (SNH) (2015), Good Practice During Wind Farm Construction;
- The Construction Industry Research and Information Association (CIRIA) (2015), Environmental Good Practice on Site (C741); and
- CIRIA (2001), Control of Water Pollution from Construction Sites (C532).

Assessment Methodology

4.192. The following activities will be undertaken to inform the hydrological and hydrogeological assessment:

- Review of published data and maps;
- Consultation with SEPA, The Highland Council and the British Geology Survey;
- Identification of solid and surface geologies;
- Review of Pollution Prevention Guidelines;
- Identification of surface water features, catchments and GWDTEs;
- Preparation of a catchment plan;
- Identification of data on public and private abstractions and supplies, and risk assessment of these;
- Identification of other similar developments within 10 km;
- Collation of flood plain information, water quality data and groundwater vulnerability information;
- Production of a WCMP; and

- Concise section within the ES to assess Flood Risk to meet the requirements of the SPP Framework.

4.193. The ES chapter will describe the potential effects of the Proposed Development including:

- Details of consultation undertaken;
- Assessment methodologies for construction and decommissioning phases;
- Hydrological walkover survey details and results;
- Assessment of the operational and decommissioning phases of the project to establish the effect on the hydrological resource;
- Identify mitigation measures, where necessary;
- Identify any residual effects following mitigation; and
- Cumulative assessment with other developments within 10 km of the Proposed Development; and
- Statement of significance in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008

4.194. A site walkover, consultation, desk studies and data requests will be undertaken to the baseline and assessment.

4.195. The following exercises will be undertaken to inform the hydrological and hydrogeological assessment:

- Review of published data and maps;
- Consultation with SEPA, The Highland Council and the British Geology Survey;
- Identification of solid and surface geologies;
- Review of Pollution Prevention Guidelines;
- Identification of surface water features, catchments and GWDTEs;
- Preparation of a catchment plan;
- Identification of data on public and private abstractions and supplies, and risk assessment of these;
- Identification of other similar developments within 10 km;
- Collation of flood plain information, water quality data and groundwater vulnerability information;
- Production of site water management plan; and

- Concise section within the ES to assess Flood Risk to meet the requirements of the SPP Framework.

4.196. The ES chapter will describe the potential effects of the Proposed Development including:

- Details of consultation undertaken;
- Assessment methodologies for construction and decommissioning phases;
- Hydrological walkover survey details and results;
- Assessment of the operational and decommissioning phases of the project to establish the effect on the hydrological resource;
- Identify mitigation measures, where necessary;
- Identify any residual effects following mitigation; and
- Cumulative assessment with other developments within 10 km of the Proposed Development; and
- Statement of significance in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008.

The Historic Environment

Introduction

4.197. This chapter of the ES will identify archaeological and cultural heritage assets that may be subject to impacts, both within the limits of the application site and beyond, establish the archaeological potential of the development site, assess the predicted impacts and propose a programme of mitigation where appropriate. It will consider both indirect and direct impacts, including impacts on the setting of cultural heritage assets.

4.198. A heritage asset is defined as any element of the historic environment which is of sufficient cultural significance to merit consideration in the planning process. Designated assets include Scheduled Monuments, Listed Buildings, World Heritage Sites, Conservation Areas, Inventory Gardens and Designed Landscapes, Inventory Historic Battlefields and Historic Marine Protected Areas. Other assets may also be locally designated through policies in the Local Plan.

4.199. The majority of heritage assets are not designated. Some undesignated assets are recorded in Historic Environment Records (HERs) maintained by local authorities and other agencies. However, many heritage assets are currently unrecorded, and the information contained in HERs is not definitive.

Baseline Conditions

4.200. There are no heritage assets recorded in Canmore or the Highland HER (searched through Pastmap) within 1km of the proposed turbines or access track. Considering the altitude and remoteness of the site, the potential for undiscovered archaeological remains on site is likely to be limited.

4.201. The only designated heritage assets within 5km of the application site are the Category B Listed Loch Glascarnoch Dam and three Category C Listed Buildings relating to the Conon Valley hydroelectric scheme at the south end of Loch Vaich. There is a group of Category B and C Listed Buildings at Kinlochluichart church, manse and steading, more than 5km to the south.

Potential Impacts

4.202. Construction work has the potential to damage or destroy cultural heritage assets. This may occur either as a result of the design of the development or as an accidental consequence of construction plant movement. The impacts may be direct, for instance where an archaeological deposit is removed or damaged during ground-breaking works, or indirect, for example where changes in hydrology may lead to waterlogged archaeological deposits becoming desiccated and degraded.

4.203. There is also the potential for the operational phase of this development to have an impact on the setting of cultural heritage assets which are present within the surrounding area.

Potential Mitigation

4.204. Construction impacts on heritage assets will be eliminated or reduced where possible through design and adopting preventative measures such as fencing off assets during construction. Where this is not practicable, impacts will be mitigated by an appropriate level of survey, excavation, recording, analysis and publication of the results.

4.205. Setting impacts will be avoided or reduced where possible through design.

Assessment Methodology

Consultation

4.206. The Highland Council's Historic Environment Team will be consulted regarding impacts on designated and undesignated heritage assets.

4.207. Historic Environment Scotland will be consulted regarding any impacts on nationally designated heritage assets.

Field Surveys and Assessment

4.208. The Inner Study Area will include a suitable buffer around all areas where construction works are proposed (at least 200m for turbines and 100m for the access tracks). A comprehensive desk-based study will be carried out for this area, based on all readily available sources including:

- Designation data downloaded from Historic Environment Scotland;

- The National Record of the Historic Environment (NRHE), including the Canmore database and associated photographs, prints/drawings and manuscripts held by HES;
- Historic Landscape Assessment data, viewed through the HLAMap website;
- The Highland Historic Environment Record (HER);
- The National Collection of Aerial Photography (NCAP);
- Lidar data supplied by the Scottish Government;
- Geological data available online from the British Geological Survey;
- Historic maps held by the National Library of Scotland;
- Ordnance Survey Name Books
- Unpublished maps and plans held by the National Records of Scotland; and
- Readily available published sources and unpublished archaeological reports.

4.209. The outer study area will extend up to 20km from the proposed turbines, which is taken as the maximum extent of potentially significant effects on the settings of heritage assets. Within the outer study area, assets will be included in the assessment based on the level of importance assigned to the asset, so as to ensure that all significant effects are recognised:

- Up to 2km from proposed turbines: Category C Listed Buildings, and any undesignated asset of local importance which has a wider landscape setting that contributes substantially to its cultural significance.
- Up to 5km from proposed turbines: all assets of national or regional importance, including Scheduled Monuments, Category A and B Listed Buildings, Conservation Areas, Inventory Gardens and Designed Landscapes, Inventory Historic Battlefields and undesignated assets of more than local importance.
- Up to 20km from proposed turbines: any asset which is considered exceptionally important, and where long-distance views from or towards the asset are thought to be particularly sensitive, in the opinion of the assessor or consultees.

4.210. A targeted walkover survey of the inner study area will be undertaken, including all areas potentially affected by construction works. This will check the results of the documentary research and will record any previously unrecorded assets and their current condition.

4.211. Cultural heritage assets with potential for significant impacts on their setting will also be visited to assess baseline conditions and assess the level of impact, with reference to visualisations where necessary.

4.212. The assessment of impacts will consider:

- Potential direct and indirect construction impacts upon cultural heritage assets within the inner study area; and

- Potential impacts on the settings of designated heritage assets during operation within the outer study area, including cumulative impacts with other existing, consented or proposed wind energy developments in the surrounding area.

4.213. The assessment will be carried out with reference to the following policy and guidance:

- Institute for Archaeologists 2008 Standards and Guidance for Archaeological Desk-Based Assessment;
- Scottish Planning Policy (2014)
- Historic Environment Scotland Policy Statement 2016
- Planning Advice Note 2/2011: Planning and Archaeology
- Managing Change in the Historic Environment: Setting (Historic Scotland 2016)
- The Highland – wide Local Development Plan (2012)
- Onshore Wind Energy Supplementary Guidance (The Highland Council, 2016)
- Standards for Archaeological Work (The Highland Council, 2012)

Traffic and Access

Baseline Conditions

4.214. The Traffic and Access chapter of the EIA will assess the impact of the Proposed Development on the local and regional road network. The Proposed Development Site is located between two trunk roads and is therefore ideally positioned for the delivery of wind turbine components. The delivery route from the port of Invergordon has been proven as suitable during the construction of the original Lochluichart Wind Farm, Lochluichart Wind Farm Extension and the adjacent Corriemoillie Wind Farm. Detailed analysis of the transport effects of these developments was carried out for the EIAs of each and no significant effects were identified. Construction of this Proposed Development will most likely utilise Invergordon Port and the same strategic delivery route. Following consultation further details of the proposed port of delivery and strategic transport routes will be provided in the EIA.

Potential Impacts

4.215. The movement of Heavy Goods Vehicles (HGVs) delivering construction materials to and from the proposed site, including concrete, aggregates, turbine structural components, and erection cranes pose the greatest impact on the surrounding road network. The most onerous determining loads are predominately the wind turbine blades, due to their considerable length, and the turbine nacelles due to their weight.

4.216. Rural or semi-rural road networks to wind farm sites can require some degree of upgrading to accommodate construction traffic especially the turbine delivery vehicles.

4.217. Transportation of abnormal loads could cause delays along the delivery route to the site, where as traffic queuing on the adjacent highway at the site entrance could cause delays and be a hazard to other traffic. Traffic leaving the site could be a hazard if there is not adequate visibility at the site access junction. Increased traffic flows generated by the construction works could cause delays on the road network in the vicinity of the site.

4.218. Once the Proposed Development is operational, it is envisaged that the volume of traffic associated with the scheme would be minimal. Occasional visits may be made to the site for maintenance checks. The vehicles used for these visits are likely to be a four wheel drive off road vehicles or similar and there may on occasion be a need for a HGV to access the site for maintenance and repairs. It is considered that the significance of the environmental effects of operational traffic would be negligible and therefore no detailed assessment of the operational phase of the Proposed Development is proposed in the EIA.

Potential Mitigation

4.219. A detailed investigation into potential routes to site will be undertaken, followed by swept path analysis to determine the route to site least impact based on a selection of candidate turbines and their abnormal load vehicle requirements.

4.220. Following pre-application consultation, The Highland Council have requested that a Framework Construction Traffic Management Plan (CTMP) is submitted with the application. This CTMP will provide further details regarding the design of accesses and any traffic management procedures that are to be implemented during construction of the development. The finalised CTMP will be agreed between the applicant and any relevant parties following consultation and prior to the start of construction.

4.221. The EIA chapter will be developed to include key areas of mitigation which will also be covered in detail in the Framework Traffic Management Plan. The likely mitigation will include the following aspects as a minimum:

- The road haulier will obtain the required permits for abnormal loads from Transport Scotland (who liaise with the Highland Council and other interested organisations), for the total route from port of entry to the Proposed Development site;
- The abnormal load vehicles to be escorted by pilot vehicles with traffic management trained staff and appropriately lit vehicles;
- Holding areas for HGVs to be established onsite in order to stagger vehicle arrivals and departures and therefore prevent queuing on the highway at the site entrance;
- Deliveries timed to arrive onsite as and when required to limit congestion in consultation with the main suppliers;
- Information provided to local Community Councils relating to the construction period, including abnormal load traffic movement schedules;

- Signage erected to identify the site access and to inform motorists that the local roads are accommodating construction traffic; and
- Wheel washing onsite and road sweeping will be carried out to keep the local road network clear of mud and debris.

Assessment Methodology

4.222. The assessment will follow guidance contained in the following planning policy documents:

- The Institute of Environmental Management and Assessment ("IEMA", 1993), 'Guidelines for the Environmental Assessment of Road Traffic'; and
- The 'Transport Assessment Guidance' (Transport Scotland, 2012).

4.223. It is proposed that baseline traffic conditions are established using existing Department for Transport (DfT) Traffic counts located on the A9 and A835. These should provide an up to date and comprehensive indication of the existing traffic levels on the strategic delivery route and as such no further traffic surveys are considered necessary. In order to factor in traffic growth during the time period between the assessment and the commencement of the construction phase of the Proposed Development the DfT's Trip End Model Presentation Program (TEMPRO) will be used to estimate appropriate traffic growth factors to apply to the measured baseline.

4.224. The assessment will then quantify the predicted traffic generated by the Proposed Development. This will principally focus on traffic generated during the construction phase of the Proposed Development, where the effects are expected to be most significant, but will also consider any effects caused by operational traffic movements. Traffic during construction can be expected to consist of abnormal loads for the delivery of turbine components, heavy goods vehicles for the delivery of other construction materials, light goods vehicles (LGVs) and cars for the transportation of construction personnel to and from the site. The principal effects that will be considered during the assessment are as follows:

- Traffic generation;
- Hazardous loads;
- Accidents and Safety;
- Driver delay;
- Pedestrian Amenity;
- Severance;
- Noise and Vibration; and
- Visual Effects.

4.225. The significance of the predicted increase in traffic levels caused by the Proposed Development will be assessed against the thresholds defined in the IEMA guidelines. Broadly, where the proposed increase in traffic is less than 30% then the effect of that increase may be considered to be not significant. It should also be noted that the majority of traffic associated with the Proposed Development will occur only during construction and is therefore temporary.

4.226. The assessment will also consider the effect of any increases in traffic on sensitive receptors and at focus points, for example at junctions, where lower thresholds of significance may be more appropriate. Any cumulative effects, where the construction phases of nearby developments overlap with construction of this development, will also be considered.

4.227. It is not proposed to submit a formal Transport Assessment (TA) to accompany the planning application of the Proposed Development. TAs principally relate to developments that generate significant permanent increases in travel as a direct result of development. The Traffic and Access chapter of the EIA should demonstrate that any permanent changes to traffic caused by the Proposed Development are insignificant and that a formal TA is not necessary.

Noise and Vibration

Baseline Conditions

4.228. The area surrounding Lochluichart Wind Farm was subject to comprehensive noise monitoring in order to establish background noise levels for the Lochluichart Wind Farm ES in 2004. Monitoring was undertaken at five locations representative of the closest noise-sensitive receptors. Noise limits derived from this monitoring were also used to assess the impact of Lochluichart Wind Farm Extension in 2010, as agreed with THC at the time.

4.229. Lochluichart and Lochluichart Extension Wind Farms are now operational. As such, it would not be possible to accurately determine the current baseline noise level in accordance with ETSU-R-97 (i.e. the background noise level with no contribution from existing wind turbines). However, due to the remote location of the Proposed Development, the existing baseline noise level is considered unlikely to have changed substantially since it was measured as part of the original Lochluichart ES. It is therefore proposed that noise due to the Proposed Development will be assessed against the noise limits derived from the previous monitoring, accounting for the cumulative effects of the previous development phases. No additional baseline monitoring is therefore necessary.

Potential Impacts

Construction Impacts

4.230. Noise during the Proposed Development's construction phase will consist of that generated by on-site activities and noise due to construction traffic on public roads.

4.231. Access to the Proposed Development will be via an existing track to the north of the Proposed Development site, previously constructed for Lochluichart Wind Farm. This access point is located approximately 1 km from the nearest residential receptor, The Aultguish Inn.

4.232. The Aultguish Inn is also anticipated to be the closest receptor to on-site construction activities, being approximately 800 m from the site boundary.

4.233. By virtue of the large separation distances from both the site access point and site boundary to the closest residential receptor, construction noise impacts are anticipated to be minimal. Notwithstanding this, the assessment will include a discussion of construction noise guidance, and detail best practice methods for minimising construction noise impact in line with the requirements of BS5228 (British Standard, 2009 and 2014). This is in line with recommendations made by The Highland Council's Environmental Health Officer during pre-application discussions.

Operational Impacts

4.234. Operational noise impacts are associated primarily with the aerodynamic noise generated by the movement of the turbine blades through the air, and to a lesser extent by the operation of mechanical components housed within the turbine itself.

4.235. While noise from the wind turbines increases with wind speed, at the same time, ambient background noise (for example wind in trees) usually increases at a greater rate. Planning conditions are used to enforce compliance with specified limits.

4.236. As with the majority of wind energy developments, ground-borne vibration, low-frequency noise and amplitude modulation are not likely be an issue. It is therefore not considered necessary to carry out specific assessments of these effects. However, further supporting information on these subjects will be provided in the ES, presenting the current understanding of these effects at the time of writing.

4.237. With regard to the cumulative effect of noise due to the Proposed Development in combination with other wind turbines in the locality, there are a number of other developments which will require consideration. At the time of writing the key cumulative developments are Lochluichart, Lochluichart Extension, and Corriemoillie. For the purposes of the ES, a search will be undertaken to identify any other wind farm developments, either operational, consented or in planning, which have the potential to contribute to the cumulative noise impact, which will be assessed accordingly.

<u>Potential Mitigation</u>

Construction Noise Mitigation

4.238. Noise generated by construction traffic and on site construction activities will be temporary. Due to the large separation distances from both the site access point and site boundary to the closest residential receptor, noise impacts are anticipated to be minimal. Notwithstanding this, construction noise will be

controlled through a restriction on working hours, and the application of best practice methods in line with the requirements of BS5228 (British Standard, 2009 and 2014).

Operational Noise Mitigation

4.239. Operational noise will be controlled through noise limits applied in the Proposed Development's planning conditions. The Proposed Development will be operated in such a way that compliance with these noise limits is achieved.

Operational Noise Assessment Methodology

4.240. The assessment methodology for operational noise is described in ETSU-R-97 'The Assessment and Rating of Noise from Windfarms' (DTI, 1996). The basic aim of ETSU-R-97 is to provide…"Indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development or adding unduly to the costs and administrative burdens on wind farm developers or local authorities".

4.241. The report makes it clear from the outset that any noise restrictions placed on a development must balance the environmental impacts of the development against the national and global benefits which would arise through the development of renewable energy sources.

4.242. The specific methodologies involved in applying ETSU-R-97 will be detailed in full in the ES but, in summary, these provide recommendations for noise limits relating to the existing levels of background noise for quiet day-time and night-time periods.

4.243. To carry out a noise assessment in accordance with ETSU-R-97, the following steps are required:

- Specify the number and locations of the wind turbines;
- Identify the locations of the nearest, or most noise sensitive, neighbours;
- If necessary, determine the background noise levels as a function of site wind speed at the nearest neighbours, or a representative sample of the nearest neighbours, and derive noise limits;
- Specify the type and noise emission characteristics of the wind turbines proposed for the site;
- Calculate the noise immission[1] levels due to the operation of the wind turbines as a function of site wind speed at the closest and/or most noise sensitive properties; and
- Compare the calculated noise immission levels with the noise limits and assess accordingly.

4.244. The Good Practice Guide (GPG) was published by the Institute of Acoustics (IOA) in May 2013 and has been endorsed by the Scottish Government as current industry good practice (IOA, 2013). The guide presents current good

1 The wind turbine noise level experienced at a given receptor location

practice in the application of ETSU-R-97 assessment methodology for wind turbine developments at the various stages of the assessment, and will be followed throughout the assessment.

Cumulative Noise Assessment

4.245. ETSU-R-97 and the GPG state that the noise limits that ETSU-R-97 recommends apply to the cumulative effect of noise from all wind turbines that may affect a particular location. As previously noted a search will be undertaken in consultation with THC to identify any wind energy developments either operational, consented or in planning which may also require consideration in the assessment process.

4.246. Cumulative noise levels will be established in line with the requirements of the GPG, and assessed against the ETSU-R-97 noise limits to determine the level of headroom present (i.e. the level of noise which may be generated by the Proposed Development, after taking all relevant cumulative developments into account).

4.247. Noise due to the Proposed Development will then be assessed against the remaining headroom to determine compliance with ETSU-R-97.

Climate Change Impact Assessment

4.248. Climate Change Impact Assessment (CCIA) is a form of environmental assessment required by the amended European Commission (EC) Directive 2014/52/EU. This EC Directive is required to be transposed into UK law by May 2017. The consent application for the Proposed Development will be submitted after May 2017, and it is therefore proposed that a CCIA is included within the ES.

4.249. CCIA will determine how the Proposed Development is likely to interact with a changing climate and whether any significant effects could arise. The assessment will consider what the impacts of the Proposed Development are that could influence climate change, and also how vulnerable the Proposed Development is to changes in the future baseline environment as a result of climate change.

4.250. Currently only provisional guidelines exist to standardise the CCIA process in the United Kingdom. The Institute of Environmental Management (IEMA) published 'Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation' (IEMA, 2015) in November 2015 with the intention of providing an updated and finalised version when the EC Directive is transposed into UK law.

<u>Baseline Conditions</u>

4.251. The Proposed Development site encompasses areas of upland moorland, rising in height from 260 m above ordnance datum (AOD) at the site entrance to 500 m AOB at Meallan Coaruinn to the south of the Proposed Development. A review of British Geological Survey (BGS) mapping information indicates that the majority of the Site Boundary is underlain with carbon rich soils.

4.252. Climatic changes are likely to occur during the lifespan of the Proposed Development and are predicted to become more apparent over the coming decades. Future climate projections are published by the Met Office through the UK Climate Projections (UKCP09) website (UKCP09, 2016).

4.253. As an example, using the UKCP09 datasets, the medium emissions scenario for the time period between 2010 and 2039 (at the 50% probability level) for the Proposed Development site suggests that the annual mean temperature will increase by up to 2 degree Celsius (°C). The projected annual change in summer precipitation for the Proposed Development site is predicted to decrease by between 0 and 10% based on the 50% probability level with a projected increase in annual precipitation of between 0 and 10% during the winter months.

4.254. The medium emissions scenario is based on the A1B scenario as defined in the IPCC Special Report on Emissions Scenarios (SRES) (IPCC, 2000). The low (B1), medium (A1B) and high emissions (A1FI) scenarios are based on a set of assumptions about factors such as socio-economic development and technological change. For this assessment, it is proposed that the medium emissions scenario (A1B) will be utilised as the future baseline. This scenario is based on a future world of rapid economic growth and the rapid introduction of new and more efficient technologies with a balance of non-fossil and fossil intensive energy technologies. The worst case emissions scenario (A1FI), which is based on fossil fuel intensive energy technologies, would be an extremely unlikely future scenario and therefore the medium emissions scenario (A1B) is considered the most appropriate for this assessment. Comments from consultees are welcomed on this approach.

4.255. The projected change to a range of climatic conditions at the time of writing the ES will be used to predict the future baseline for the lifetime of the Proposed Development. It is proposed that projected climatic changes at the 50% probability level (central estimate) will be utilised in the CCIA.

Potential Impacts

4.256. The Proposed Development itself is likely to have a positive impact on climate change by reducing greenhouse gas emissions. As peat is present within the Development site, the carbon footprint of the Proposed Development will be assessed using the Scottish Government's online Carbon Calculator tool.

4.257. Due to the nature and location of the Proposed Development, at this stage, it is unlikely that the projected changes in climatic conditions for the site given in the example above (based on the medium emissions scenario and at the 50% probability level) will have a significant negative impact on the Proposed Development. This will be subject to consideration in the ES in the context of the findings of all of the technical assessments undertaken in the EIA, and the projections for a range of climatic effects.

Potential Mitigation

4.258. During the design process, the Proposed Development layout will seek to locate wind turbines and other associated infrastructure outside areas of deep

peat to reduce or avoid the negative impact on greenhouse gas emissions of disturbing such areas.

4.259. Where possible, the Proposed Development will utilise existing infrastructure associated with the operational Lochluichart Wind Farm and Lochluichart Wind Farm Extension I to minimise the requirements for new access tracks and compound areas.

4.260. Similarly, the Proposed Development design process will seek to locate infrastructure outside areas prone to flooding events, or any other events which may increase in frequency or severity as a result of the effects of climate change.

Assessment Methodology

4.261. IEMA guidelines (2015) have been used in order to develop an assessment methodology which will cover the following:

- The Proposed Development's impacts upon climate change to include calculation of the carbon footprint of the Development in line with good practice guidelines (Scottish Government, 2016) and to include calculation of greenhouse gas emissions relating to the construction, operation and decommissioning of the Proposed Development;
- The Proposed Development's vulnerabilities and resilience in the context of climate change; and
- A summary of the Proposed Development's potentially significant impacts upon identified environmental receptors in the context of climate change.

4.262. Each of the above will be considered and conclusions on any significant climate change effects likely to occur as a result of the Proposed Development will be reported in the ES. Consultees are invited to comment on the above proposed methodology.

4.263. It is expected that IEMA will publish an updated and finalised version of their guide to climate change resilience and adaptation when the EC Directive is transposed into UK law and this will be used to inform the above methodology.

Air Quality

4.264. This section considers the scope of the required assessment of impacts that the Proposed Development may have on air quality.

Potential Impacts

4.265. The main source of impact on air quality would be increased traffic flows on local roads during construction and emissions from construction activities including exhaust fumes and dust generated from potential quarrying and from unmade ground in dry conditions.

Potential Mitigation

4.266. At this stage it is not considered that the effects of these activities would be significant provided mitigation measures including adopting recognised best practice management strategies are implemented. Dust is considered unlikely to be a significant impact, but the contractor would be required to douse access roads with water if dust emissions became significant during construction.

Assessment Methodology

4.267. There would be no routine emissions to air during operation with the only source being occasional vehicles accessing the site for maintenance purposes. Operation of the wind farm would displace alternative sources of power generation, mainly fossil fuels, and therefore would result in reduced emissions of carbon dioxide and other pollutant gases (NOx and PM10 etc.).

4.268. Air Quality is therefore scoped out from further assessment.

Aviation and Radar

4.269. Wind turbines reflect radio waves and can therefore interfere with radar. The reflections from the turbines show up on radar as 'clutter' and radar operators are often concerned that wind farm clutter might affect aviation safety. Due to their height, wind turbines could also potentially present a collision risk to low flying aircraft, interfering with military low-level training flights.

Baseline Conditions

4.270. The Defence Infrastructure Organisation (DIO) is responsible for safeguarding Ministry of Defence (MoD) radar, airfields, communications and low flying zones. Consultation has been undertaken with the MoD and they raised no objection to the Proposed Development.

4.271. The Civil Aviation Authority (CAA) has also been consulted and has stated they will only respond if they have an objection, it is not their practice to issue a letter of no objection. The CAA also informs National Air Traffic Services (NATS) of the proposal and they too are yet to raise an objection to the Proposed Development.

Potential Impacts

4.272. It is not expected the development will have any negative impact on military or civil aviation, or radar operations.

Potential Mitigation

4.273. If an objection is raised by consultees, Infinergy will consult with the operator directly to work towards a mitigation solution agreeable to both parties.

Assessment Methodology

4.274. In order to assess any potential impacts on aviation or radar, Infinergy has consulted the MoD, CAA and NATS to advise them on the layout of the proposed development.

4.275. If any significant impacts are expected, further studies such as radar impact assessments will be carried out, if required.

Key Issues for Consideration

4.276. The EIA will take into consideration any potential impacts on military, civil aviation, or radar operations.

Telecommunications

4.277. This section considers potential issues associated with telecommunication and television reception as a result of the Proposed Development during the construction, operation and decommissioning phases.

Policy Context

4.278. There are no planning policies or guidance directly relevant to potential telecommunication or television reception impacts associated with wind farm developments.

Baseline Conditions

Links

4.279. In order to establish a detailed baseline of relevant telecommunication issues at the site, a formal consultation process with Spectrum Licensing (previously known as Ofcom) and all relevant link operators will be conducted to identify any communication links onsite. Where possible, the wind farm will be designed to avoid links identified onsite and take into account any minimum separation distances required.

Television Reception

4.280. The closest television transmitter for nearby properties is the Rosemarkie transmitter. This transmitter has switched to digital transmission only. Currently there is no widely accepted method of determining the potential effects of wind turbines on digital television, however digital television signals are better at coping with signal reflections, and do not suffer from ghosting that may occur with analogue signals.

Potential Impacts

4.281. The rotating blades of wind turbines have the potential to cause interference and reflectance impacts to microwave links (i.e. mobile telephones) and UHF scanning telemetry communications and television broadcasting.

Links

4.282. In consultation with relevant link operators the significance of potential operational effects will be established and where appropriate, suitable mitigation measures will be determined.

Television Reception

4.283. Digital transmitter powers increase to around ten times previous levels at digital switchover. At the same time, digital signals will have been added to the relay transmitter network. These improvements greatly increase the availability and robustness of digital terrestrial reception. To date, there are no known cases of wind turbine interference with digital television reception post digital switchover.

4.284. Digital UK is the independent, not-for-profit organisation leading the process of digital TV switchover in the UK, and provides coverage predictions for digital television. A general rule of thumb indicates that the better the predicted reception, the better the protection against interference. This is currently the most reliable information on signal strength, and hence vulnerability to interference.

4.285. Given the strength of the digital signal in the area and the inherently resilient nature of digital television reception, we consider there is a low risk of any interference from a wind energy development at this location on domestic television reception

4.286. Due to the low risk of interference with television reception, and as the requirement to address any reception issues once the Proposed Development were operational could be conditioned in planning consent it is not proposed to carry out a detailed assessment of potential effects on television reception.

Key Issues for Consideration

4.287. The EIA will take into consideration any construction or operational effects on telecommunication systems. It is proposed to scope out any further assessment of effects on television reception.

Shadow Flicker

4.288. This section considers shadow flicker which can occur in sunny weather when the blade of a moving wind turbine cuts through the sunlight passing into a small opening (window) of a property. This effect briefly reduces/blocks the intensity of light within a room, and causes a flickering or strobe like effect. It can be distracting and disturbing for people who are affected.

4.289. Shadow flicker is generally not a disturbance in the open, as light outdoors is reflected in all directions. In order for shadow flicker to occur, the receptor must be directly in line with a wind turbine when the sun is low in the sky.

Policy Context

4.290. There are at present no formal guidelines available on what exposure would be acceptable in relation to shadow flicker. There are no standards for the

assessment of shadow flicker. The specific advice sheet from Scottish Government, Onshore Wind Turbines a web-based guidance (Scottish Government, 2013) sets out the potential geographic area which may fall under assessment: "Where this (Shadow Flicker) could be a problem, developers should provide calculations to quantify effect. In most cases however, where separation is provided between wind turbines and nearby dwellings (as a general rule ten rotor diameters), 'shadow flicker' should not be a problem."

4.291. Published research by the Department of Energy and Climate Change (DECC) Update of UK Shadow Flicker Evidence BASE (DECC, un-dated), evaluates the current international understanding of shadow flicker and confirms an acceptable study area for assessment is ten rotor diameters from each turbine and within 130 degrees either side of north.

Baseline Conditions

4.292. No properties with the potential to be affected by shadow flicker have been identified within 10 rotor diameters of the current turbine layout.

Potential Impacts

4.293. Shadow flicker only occurs during the operational phase of a wind farm and as no properties are within 10 rotor diameters of a wind turbine, no potential impacts are anticipated as a consequence of the operation of the proposed development.

4.294. However, to ensure no potential impacts are overlooked, following design freeze, a detailed assessment of shadow flicker will be undertaken which will identify if shadow flicker may be an issue. Initially the assessment will ascertain any sensitive receptors within ten rotor diameters and 130 degrees either side of north of the final turbine locations. If any sensitive receptors are identified, a formal shadow flicker assessment will be conducted using a recognised computer software package to quantify the potential effects. If required, the results of the assessment will be reported in the ES which will also consider potential mitigation options if necessary.

Key Issues for Considerations

4.295. If properties are identified within ten rotor diameters and 130 degrees either side of north of the final turbine locations a full shadow flicker assessment will be undertaken.

Socio-Economics, Land-Use and Recreation

4.296. Socio- economic, land-use and recreation effects will be assessed based on the guidance presented in 'Guidelines for Environmental Impact Assessment' (IEMA, 2004) and 'A Handbook for EIA' (Scottish Natural Heritage (SNH), 2003) and considered against:

- The economic profile of the surrounding area;
- Tourism and Recreation receptors;

- Land-use and ownership; and
- Public attitudes to wind farms.

Baseline Conditions

4.297. The Proposed Development is located within a rural upland location, approximately 19 km northwest of Strathpeffer within the Ross and Cromarty area of the Highland Council region.

4.298. The following information is taken from The Highland Council's Key Facts and Figures website page (The Highland Council, accessed 1st February 2017). There is a resident population of 54,124 in Ross and Cromarty and recent population growth in this area has been significantly higher than the Scottish average, with an increase of 8% between 2003 and 2013 (compared with 5.1% in Scotland). The largest employment sectors for the Highland region include wholesale and retail trade, human health and social work and accommodation and food services. In 2014, the unemployment rate for the Highland region (6.2%) was slightly lower than the Scottish average (7.2%).

4.299. The Proposed Development is located within the Loch Luichart Estate and is north of the currently operational Lochluichart Wind Farm and Lochluichart Extension. The Estate is primarily managed for farming, forestry and as a sporting estate (sporting activities include deer stalking, pheasant shooting and fishing). At present, the Loch Luichart Estate employs 7 full time and 2 part time staff members. Deer stalking forms the main recreational use of the estate and culling is regularly undertaken to control deer numbers.

4.300. Due to the rural location of the Proposed Development, there are limited tourism and recreational receptors within 5 km of the site, however the Aultguish Inn, a popular hotel with hillwalkers, is located downstream of the Glascarnoch Dam, approximately 1.4 km east of the entrance to the Proposed Development.

4.301. There are no core paths within the Proposed Development, although a Public Right of Way (The Fish Road) is located approximately 500 m to the east of the site access (Scotways, no date). This Public Right of Way is approximately 10 km in length and starts at the Aultguish Inn and heads south-eastwards towards the settlement of Little Garve where the path finishes. There is also an access track to the south of the Proposed Development site leading northwards from Lochluichart Lodge to the crags to the south west of the Proposed Development site (Beinn Liath Bheag and Meall na Speireig). The tracks associated within operational Lochluichart Wind Farms could also be utilised by walkers to access the surrounding hills.

4.302. Hill climbing is one of the key tourist activities within the wider area, the key receptors include Ben Wyvis (a Munro approximately 12 km to the east of the Proposed Development site) and the Fannich Mountain Range (approximately 9 km to the west of the Proposed Development site).

Potential Impacts

4.303. It is considered unlikely that any significant negative socio-economic effects will occur as a result of the Proposed Development. Indeed, wind farms can

have positive socio-economic impacts on local communities by contributing to community benefit funds as well as providing employment and income to the local economy by employing local contractors and the associated local expenditure.

4.304. It is also considered unlikely that any direct or indirect significant effects on tourism and recreation will occur as a result of the Proposed Development due to the distance between the site and potential key receptors. Visual impacts from key tourism and recreation receptors (including Ben Wyvis and the Fannich Mountain Range) will be assessed in the landscape and visual impact assessment.

4.305. Construction activities may temporarily limit certain activities on site such as deer stalking and hill walking.

Potential Mitigation

Should any potential effects occur, the following mitigation measures may be required:

- Temporary closure of the on-site access tracks to public users. Any closures will be clearly signposted; and
- Discussions with landowners to minimise impacts on land-use through the construction and operation of the Proposed Development.

Assessment Methodology

4.306. A desktop socio-economic assessment will consider the potential direct and indirect effects of the Proposed Development. During the construction of the Proposed Development, local sourcing will be preferred where possible, bringing direct economic benefits. An estimate of economic benefits will be provided in the ES.

4.307. An assessment of effects upon key tourism receptors will also be undertaken and will take into account published data on visitor numbers and the value of tourism to the economy of the Highland region.

4.308. In line with recommendations made by The Highland Council during pre-application discussions, consultations will take place to assess the effects to users of Public Rights of Ways, in particular The Fish Road route, cycle routes and bridleways. This will include consultations with the Highland Council Access Officer and organisations such as the British Horse Society, Ramblers Association, Scotways, Sustrans, The Mountaineering Council, local tourism providers and other relevant organisations.

4.309. Various existing surveys and assessments of socio-economic and visitor profiles, land use and ownership, and public attitudes to wind farms will be collated to provide background information against which to assess the potential for significant effects.

Health and Safety

Potential Impacts

4.310. The indicative turbine locations are located outwith the topple height distance from any dwelling. Modern turbines are also fitted with sensors that can shut the turbine down in icing conditions to prevent ice throw from the turbine blades.

Potential Mitigation

4.311. Health and safety considerations during construction of the Proposed Development would be subject to relevant legislation and best practice, for example, appropriate risk assessments and method statements need to be in place for various aspects of the construction and de-commissioning works. The Proposed Development would operate in line with best practice guidelines from Renewable UK 'Guidelines for Health and Safety in the Wind Energy Sector' published in August 2010.

Assessment Methodology

4.312. The EIA will take into account health and safety considerations relevant to the construction, operation and de-commissioning of the Proposed Development including safety of structures in extreme weather conditions and health and safety procedures including the Construction (Design and Management) (CDM) Regulations 2007. There is no further requirement for an additional assessment of the operational health and safety impacts, so health and safety is scoped out from the EIA.

5. Proposed content of the environmental statement

5.1. A contents list (subject to change) for the ES is set out below:

- Non-Technical Summary
- Chapter 1 outlines the proposed development and the structure of the ES
- Chapter 2 describes the EIA process undertaken for the proposed development, including this Scoping exercise and its outcomes
- Chapter 3 provides a detailed description of the proposed development and includes an overview of the construction methodology
- Chapters 4 - 14 provide the EIA, i.e. the assessment of impacts on the various environmental parameters
    - Chapter 4: Landscape and Visual Impact Assessment
    - Chapter 5: Ecology
    - Chapter 6: Ornithology
    - Chapter 7: Noise and Vibration
    - Chapter 8: Hydrology, Hydrogeology
    - Chapter 9: Climate Change Impact Assessment
    - Chapter 10: Traffic and Access
    - Chapter 11: Cultural Heritage
    - Chapter 12: Socio-Economics, Recreation and Land Use
    - Chapter 13: Shadow Flicker
    - Chapter 14: Infrastructure
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