

Hill of Wind Farm

Technical Appendix 4.1

EIA Scoping Report

Author	Various
Date	August 2022
Ref	

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Preface

Renewable Energy Systems Ltd. (the Developer), a subsidiary of Renewable Energy Systems Holdings Ltd, has submitted this Scoping Report to the Scottish Government’s Energy Consents Unit (ECU) under the Electricity Works (Environmental Impact Assessment) Regulations (Scotland) 2017. The purpose is to agree a scope with consultees for the Environmental Impact Assessment of a renewable electricity generating station including wind farm and battery at the Hill of Fare, Aberdeenshire.

A copy of this Scoping Report and general project information is available to view freely on the project’s website at <http://www.hilloffare-windfarm.co.uk/> and the ECU’s website <https://www.energyconsents.scot/ApplicationSearch.aspx>.

During the EIA process, public events will be held in the vicinity of Hill of Fare as part of pre-application consultation where the Developer will be on hand to provide project updates, answer questions and seek feedback from the public.

This Scoping Report consists of the following:

- Scoping Report
- Figure 1.1 Site Location
- Figure 1.2 Site Constraints
- Figure 3.1 Landscape Designations to 20km
- Figure 3.2 ZTV to 35km with Viewpoints
- Figure 3.3 Other Wind Farms to 20km
- Figure 4.1 Heritage Designations
- Figure 4.2 Barmekin of Echt
- Figure 4.3 Sunhoney
- Figure 4.4 Midmar Castle
- Figure 5.1 Ornithological Survey Areas
- Figure 5.2 Designated Sites
- Figure 7.1 Hydrological Overview
- Figure 7.2 Peat Depth Survey
- Appendix 4.1 Heritage Appraisal of Designated Heritage
- Appendix 8.1 Planned Acoustic Assessment
- Appendix 10.1 Aviation MOD Proforma

Defined Terms

Hill of Fare Wind Farm – the Proposed Development

Renewable Energy Systems Ltd – the Developer

S36 Application – an application for consent made to Scottish Ministers under the Electricity Act 1989.

EIA Regs – the Electricity Works (Environmental Impact Assessment) Regulations (Scotland) 2017.

Site Boundary – Area within which development of wind farm infrastructure such as tracks will be made.

Wind Turbine Development Area – Area within which proposed wind turbines are expected to be developed.

List of Abbreviations

ANO – Air Navigation Order	km – kilometre
ATC – Air Traffic Control	LVIA – Landscape & Visual Impact Assessment
ATCSMAC - Air Traffic Control Surveillance Minimum Altitude Chart	m – metre
BDMP – Bird Disturbance Management Plan	MOD - Ministry of Defence
CAA – Civil Aviation Authority	MW – Mega Watt
CIEEM – Chartered Institute of Ecology and Environmental Management	MWh – Mega Watt hour
CRM – Collision Risk Model	NERL – NATS En Route Ltd
ECoW – Ecological Clerk of Works	NERSG – North East Raptor Study Group
ECU – Energy Consents Unit	NHZ – Natural Heritage Zone
EHO – Environmental Health Officer	PRoW – Public Right of Way
EIA – Environmental Impact Assessment	RSPB – Royal Society for the Protection of Birds
EIAR - Environmental Impact Assessment Report	SEPA – Scottish Environment Protection Agency
GWDTE – Ground Water Dependent Terrestrial Ecosystem	SNH – Scottish Natural Heritage (now known as NatureScot)
ha – hectare	SPA – Special Protection Area
HMP – Habitat Management Plan	SSSI – Site of Special Scientific Interest
HRA – Habitats Regulations Appraisal	TO – Transmission Owner
IFP – Instrument Flight Procedure	UXO – Unexploded Ordnance
IOF – Important Ornithological Feature	ZTV – Zone of Theoretical Visibility

Table of Contents

Preface	1	Consultation	16
Defined Terms.....	1	Field Surveys	16
List of Abbreviations	1	Assessment of Impact	16
1 Introduction	4	Matters Scoped Out	19
Scoping.....	4	References and Standard Guidance.....	19
Proposed Development	4	Legislation	19
Consultation.....	6	Planning Policy	19
EIA Report	7	Guidelines and Technical Standards	20
2 Climate Change & Energy Supply.....	8	Questions	20
3 LVIA	9	Figures.....	20
Introduction	9	5 Ornithology	21
Baseline Description	9	Introduction	21
Landscape Character.....	9	Baseline Description.....	21
Landscape Designations.....	10	Baseline Surveys.....	21
Relevant Guidance and Legislation.....	10	Designated Sites.....	21
Proposed Scope of Survey and Assessment	10	Ornithological Activity (October 2020 to March 2022)	21
Distinction between Landscape and Visual Effects	10	Legislation, Policy and Guidance.....	22
Study Areas	11	Study Area	23
Visual Receptors	11	Assessment Methodology.....	23
Proposed LVIA Viewpoint Locations	11	Proposed Mitigation	24
Visualisations	12	Potential Impacts	24
Assessment of Turbine Lighting.....	12	Features/Impacts Scoped In or Out of Assessment.....	24
Cumulative Effects	12	Scoped out Features/Impacts	24
Consultation.....	13	Scoped in Features/Impacts	25
Potential Mitigation.....	13	Scoping Questions to Consultees.....	25
Potential Effects.....	13	Figures.....	25
Questions for Consultees.....	14	6 Ecology	26
Figures.....	14	Introduction	26
4 Cultural Heritage.....	15	Legislation, Policy and Guidance.....	26
Introduction	15	Preliminary Consultation with NatureScot	26
Within the Site Boundary	15	Proposed Scope of Assessment	26
Outwith the Site Boundary	15	Desk study	26
Method of Assessment and Reporting	16	Extended National Vegetation Classification (NVC) survey	27
Study Area.....	16	Bat surveys	27
		Protected mammals survey	27

Ecological Impact Assessment	27	9 Traffic & Transport	35
Baseline Description	28	10 Aviation & Infrastructure	36
Potential Effects.....	28	Introduction	36
Receptors and Impacts Scoped Out of Assessment	28	Aviation	36
Mitigation and Compensation	28	Infrastructure	37
Questions	28	Public access.....	37
References	29	Water, gas and electricity	37
7 Hydrology.....	30	Telecoms	37
Introduction	30	UXO	37
Baseline.....	30	11 Socio-economics	38
Site Location and Topography	30	12 Forestry	39
Designated Sites.....	30	13 Synergistic Effects and Summary of Mitigation and Residual Effects.....	40
Surface Water	30	14 Responding to the Scoping Report	41
Soils and Geology.....	30		
Groundwater.....	31		
Water Supplies.....	31		
Potential Impacts.....	31		
Surface Water Flow and Level Alterations	31		
Groundwater Flow and Level Alterations.....	31		
Disturbance of Peat	31		
Flooding	31		
Sediment Discharges.....	31		
Contaminant Discharges.....	31		
Restoration	32		
Potential Mitigation.....	32		
Assessment Methodology	32		
Figures.....	33		
8 Noise	34		
Introduction	34		
Legislation, Policy and Guidance	34		
Proposed Scope of Assessment	34		
Baseline Conditions	34		
Potential Mitigation.....	34		
Questions	34		

1 Introduction

Scoping

- 1.1 A Preface to this report provides a list of abbreviations and defined terms which should be referenced when reading this Scoping Report.
- 1.2 This Scoping Report aims to provide details to consultees of a proposed wind farm with the purpose of agreeing a scope of EIA which will be used to produce an EIA Report to accompany the anticipated submission of an S36 Application.
- 1.3 This section of the report will provide high level details of the site's location, preliminary site layout and associated infrastructure.
- 1.4 Subsequent sections shall identify the baseline conditions related to the relevant EIA topics and highlight any survey work undertaken to date. Elements to be covered by the EIA will be presented at a high level. Where it can be explained that certain features should be reasonably scoped out of the EIA, this will be made clear and provided in more detail. Consultees should respond to confirm agreement with the proposed scope. If there is a disagreement/difference of opinion, consultees should explain why something should be reasonably included within or excluded from the scope of the EIA.
- 1.5 The purpose of the EIA is not to assess all effects a project may have but to focus on the project's likely significant effects on the environment.
- 1.6 The above paragraphs set out the framework of this report and in doing so will satisfy the requirements of the EIA Regs.

Proposed Development

- 1.7 The Hill of Fare Wind Farm is located on the Hill of Fare, approximately 6km north of Banchory, Aberdeenshire, see Diagram 1.1. Its central co-ordinates are E 369535, N 803040.

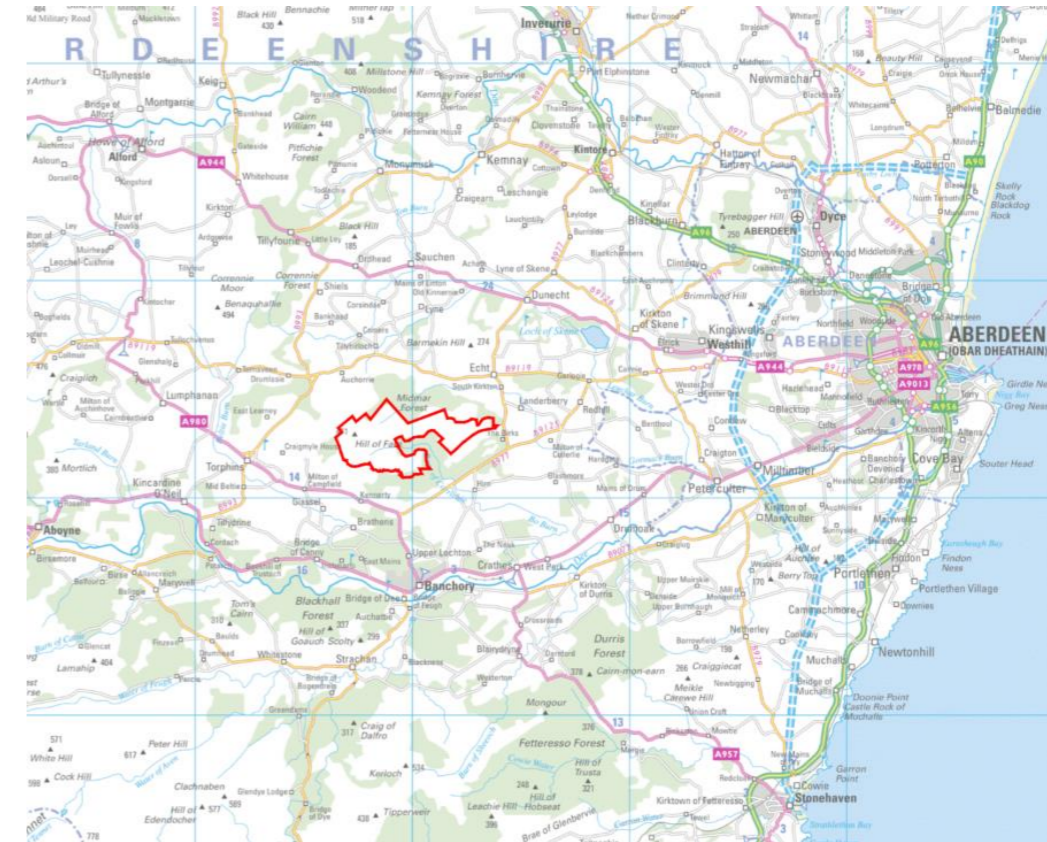


Diagram 1.1: Site Location (see full scale figure of Site Location in Figure 1.1)

- 1.8 The initial design and layout of the Proposed Development, as presented in this Scoping Report, has been developed through an iterative process which has avoided known potential impacts as far as possible. The layout will continue to be refined during the EIA process and through further consultation. Any amendments to the design scoped here are unlikely to increase the likelihood of a significant effect. However, should any changes occur that are likely to result in a significant or unknown effect on an important feature previously scoped out, then this feature will be scoped back into the EIA process. Any changes will first be discussed with the relevant consultees, to ensure that they too are in agreement before altering the inclusion or exclusion of features from the EIA.
- 1.9 The Proposed Development is **scoped** on a layout of **17 turbines at 250m in height** from the ground the blade tip. This layout is presented in Diagram 1.2 together with the primary site constraints known at this time. The layout is cognisant of these site constraints and will evolve as more constraints are understood through the ongoing EIA process.

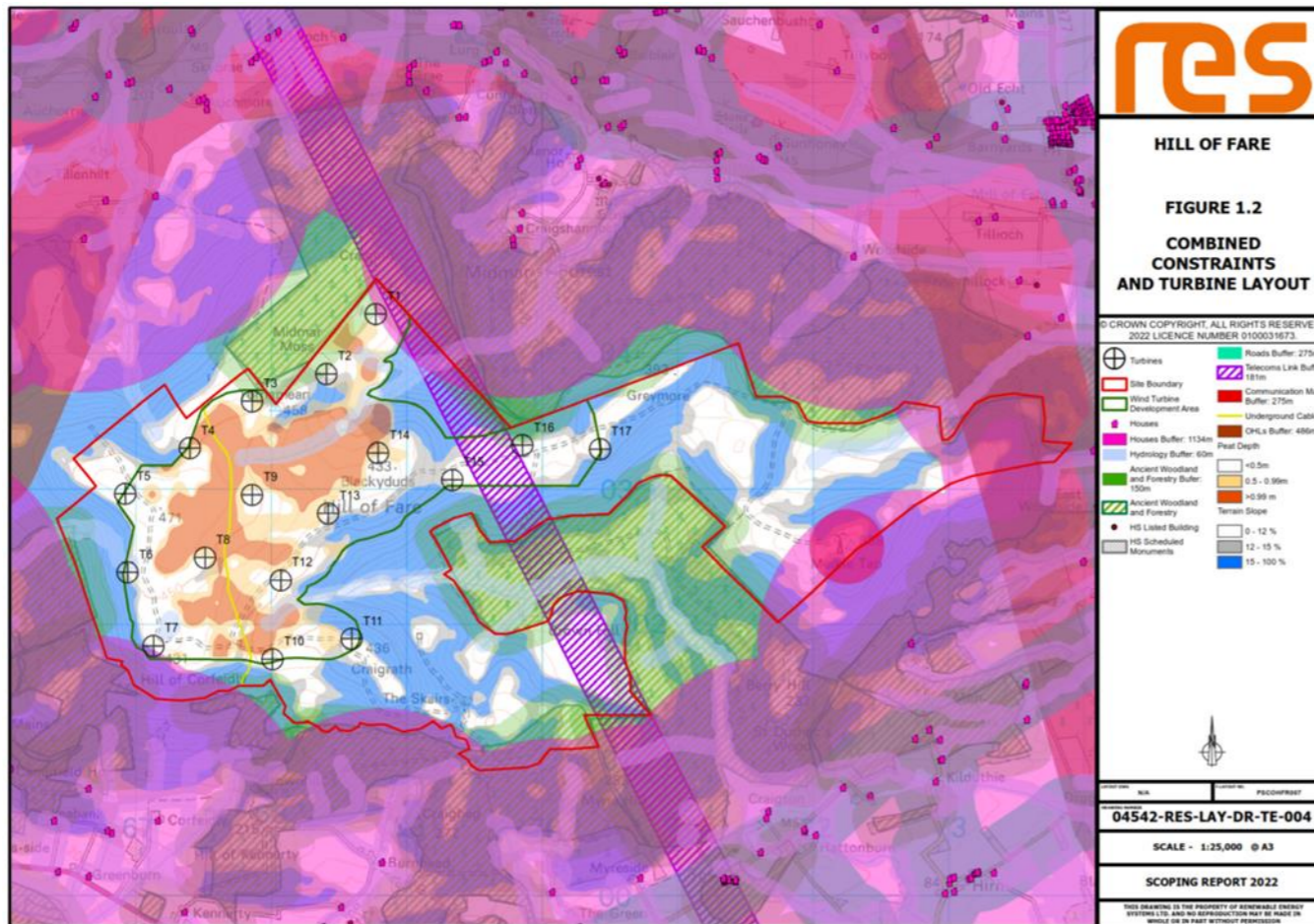


Diagram 1.2: Preliminary Site Constraints & Layout (see Figure 1.2 for full scale plan)

1.10 The Proposed Development presented in this Scoping Report comprises the largest extent of land and greatest number of turbines expected to be submitted for planning permission. It therefore represents what is likely to provide the most benefit and be the ‘worst case’ regarding potential adverse environmental effects. The Site Boundary will change to accommodate the final routing of access from the public road on to Site, which at this time is expected to be from the east. This is also touched upon in chapters 9 & 12 of this Scoping Report. Altering the Site Boundary accordingly will not change the nature or scale of the Proposed Development nor require it to be re-scoped. In any case, consultees will be consulted through the EIA process of any fundamental changes in scope of assessment.

- 1.11 The Proposed Development is likely to comprise:
- 17 wind turbines, approximately 250m tall
 - associated turbine foundations
 - crane pads
 - upgraded and new access tracks
 - underground electricity cables
 - anemometry mast
 - control building and substation
 - energy storage/battery compound
 - signage
 - temporary borrow pits
 - drainage and drainage attenuation measures (as required)
 - temporary construction and storage compounds, laydown areas
 - forestry felling which may be required in limited amounts to facilitate access to the wind farm array
- 1.12 The specific turbine model has not yet been selected but it is expected to be a horizontal axis machine with three rotor blades. The turbine models being considered at this stage have rotor diameters of 162m and hub heights of 169m. Current models being investigated have 7.2MW generating capacity and therefore the Proposed Development stands to offer **in excess of 100MW of renewable electricity**. By the time the project is constructed, such machines may be capable of generating more still.
- 1.13 Current locations of proposed turbines are listed in Table 1.1 below.

Table 1.1 Scoping Layout Wind Turbine Co-ordinates

Turbine ID	Easting	Northing
T1	368773	804289
T2	368409	803846
T3	367860	803645
T4	367401	803300
T5	366925	802962
T6	366942	802382
T7	367131	801839
T8	367512	802490
T9	367861	802954
T10	368011	801741
T11	368595	801890
T12	368072	802323
T13	368422	802818
T14	368791	803264
T15	369337	803064
T16	369855	803321
T17	370428	803291



Diagram 1.3 Photograph of Minety battery storage; an example of a 100MW site

- 1.14 Crane pads will be left in-situ for use during operation to allow for maintenance and replacement of parts as required.
- 1.15 The battery is anticipated to have a storage capacity akin to the wind farm, power output of ~100MW and a stored energy capacity of ~200MWh. This size of energy storage might require a compound up to ~100m x 150m.

- 1.16 Temporary compound areas might be suitable after construction for use permanently as public car parking. This will be dependent upon both the location and need for such use and will be examined during the EIA process.
- 1.17 Any S36 Application submitted for the Proposed Development will seek permission in perpetuity as is now typical for other electricity generating power stations.
- 1.18 An application will also be made by the Developer to the Transmission Owner (TO) for connection to the national grid to export the electricity generated. This application is separate from the application for consent to develop the Proposed Development. The TO will then undertake a separate process for consent to develop the grid connection.

Consultation

- 1.19 The Developer will submit this Scoping Report to a wide range of statutory and non-statutory consultees who are encouraged to engage with the Developer and with whom the Developer will liaise and update accordingly.
- 1.20 Although there is no statutory requirement to undertake public pre-application consultation, the Developer considers it to be a crucial part of the wind farm development process and will engage with the local community throughout the application process. Public consultation will be undertaken to provide information to, and seek feedback from, interested parties and help inform the evolution of the design. This will include public exhibition events within the local community.
- 1.21 The Developer will also encourage feedback from the local community during pre-application consultation with regard to ideas for projects/suggestions for community benefits that the

Proposed Development might be able to provide such as enhanced recreational access, electric charging points etc.

EIA Report

- 1.22 The EIA process will result in production of the EIAR and is likely to follow the structure below:
- Chapter 1: Introduction
 - Chapter 2: Site Selection and Design Evolution
 - Chapter 3: Project Description
 - Chapter 4: Climate Change & Energy Supply
 - Chapter 5: Landscape and Visual Impact Assessment (LVIA)
 - Chapter 6: Cultural Heritage Assessment
 - Chapter 7: Ornithology Assessment
 - Chapter 8: Ecology Assessment
 - Chapter 9: Hydrology, Geology and Hydrogeological Assessment
 - Chapter 10: Noise
 - Chapter 11: Traffic and Transport Assessment
 - Chapter 12: Aviation and Infrastructure
 - Chapter 13: Socio-economics
 - Chapter 14: Forestry Assessment
 - Chapter 15*: Synergistic Effects and Summary of Mitigation and Residual Effects
- 1.23 *The assessment of population and human health includes consideration of noise, shadow flicker, ice throw, lightning, private water supplies and socio-economics. Such factors are assessed throughout different areas of the EIAR and will be summarised in Chapter 15.
- 1.24 The following sections of this report will discuss these chapter topics with regard to scope of the EIA.

2 Climate Change & Energy Supply

- 2.1 This chapter will present the legislative and policy context for the Proposed Development. If proposed draft Scottish policy, which categorises onshore wind projects with >50MW generating capacity as National Development, is adopted then the needs case does not require to be presented. Nonetheless relevant national and local planning and climate policies and legislation will be presented.
- 2.2 In framing the climate change context and state of climate emergency, a carbon balance assessment will be undertaken using SEPA's online carbon calculator. Results will be presented in this chapter to inform the assessment on climate change.

3 LVIA

Introduction

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

Baseline Description

- 3.5 The Proposed Development is located on the Hill of Fare, Aberdeenshire. The site lies within part of an area of open Moorland Plateau. The Midmar Forest lies to the north of the site covering much of the north facing slopes of the plateau.
- 3.6 The Plateau is ringed by a road network comprising the A980, B9125, B977, B9119 and B993. The nearest settlements are Torphins approximately 4.5km west of the proposed wind turbine development area and the village of Echt approximately 4km to the east of the proposed wind turbine development area. Aberdeen, the nearest city, lies around 20km to the east.

Landscape Character

National Landscape Character

- 3.7 In March 2019, NatureScot published an updated set of Landscape Character Type boundaries and descriptions, which includes mapping and descriptions which supersede earlier documents.

National Landscape Character Types covering the Site

- 3.8 The Proposed Development is located in the 'Outlying Hills and Ridges' Landscape Character Type (LCT 28). The key characteristics of LCT 28 are defined as:
- Long and often narrow undulating ridges, punctuated with occasional pronounced hills, which stand proud of surrounding low-lying farmland.
 - Distinctive and recognisable profiles of occasional dramatic outcrops of rock, creating local landmarks which are visible and ever-present across wide expanses of Aberdeenshire.
 - Extensive tracts of coniferous woodland cover slopes, these interspersed with varying degrees with heather moorland.
 - Green fields of pasture cover often gently folded lower slopes and this merges gradually with more intensively managed lowland farmland.
 - Communication masts and wind farms are dominant features on parts of these outlying ridges.
 - Important prehistoric and cultural heritage.
 - Spectacular views across the surrounding lowlands of Aberdeenshire from these promontories of higher ground.
 - Strong visual relationship with wider Cairngorm massif.
 - Relatively remote and wild landscape character.
- 3.9 In turn, the 2019 NatureScot document 'Landscape Character Assessment Review - Aberdeenshire Landscape Evolution and Influences' provides information on how the landscape of the local authority area has evolved. It complements the Landscape Character Type descriptions of the 2019 dataset.

Aberdeenshire Council Landscape Character Types covering the Site

- 3.10 The earlier 'Strategic Landscape Capacity Assessment for Wind Energy in Aberdeenshire' (2014), Ironside Farrar, used slightly different names to the National Assessment for the same discrete tracts of the landscape. The 'Outlying Hills and Ridges' LCT was referred to as 'Moorland Plateaux' (LCT22), with the site lying within a sub-area known as 'Grampian Outlies' (LCA22[i]).
- 3.11 The 'Grampian Outlies' are described as follows:
- 'The Grampian Outliers are moorland spurs extending out from the Cairngorm Massif into the surrounding farmland, forming promontories. They are usually smooth rolling hills of both gentle and steep relief, with occasional dramatic rocky outcrops such as Bennachie, Mither Tap and Tap O'Noth. These hills are distinctive landmarks integral to the landscape identity of Aberdeenshire and have qualities of wilderness and remoteness. They have simple bare moorland tops, extensive conifer plantations on slopes and distinctive fields at their base. Steadings lie at the base of slopes in sheltered locations. They have a high degree of integrity and many are popular for recreation providing excellent viewpoints out across Aberdeenshire'.*

3.12 The Landscape Capacity Assessment goes on to state that the ‘Moorland Plateaux’ is of a ‘high’ landscape character sensitivity. The associated analysis states that:

‘Although large in scale and simple in pattern with some of the characteristics considered suitable for wind farm development, the Grampian Outliers are distinctive landforms, integral to the identity of much of Aberdeenshire and visible from a very wide area’. It goes on to state ‘They have a high value, high visual sensitivity and high wilderness qualities, forming islands of wild land within the surrounding farmland. These areas would be unsuitable for wind turbine development beyond a domestic scale, less than 15m associated with farm buildings or tourist facilities and turbines should be sited at the base of slopes’.

3.13 It is important to recognise that the Strategic Landscape Capacity Assessment for Wind Energy in Aberdeenshire was produced before many of the wind farms and single turbines which are now operational or consented were granted permission. In this regard, elements of the Strategic Landscape Capacity Assessment may be considered to be out of date. Nonetheless, it is recognised that the Assessment remains a useful starting point in considering the nature and characteristics of the landscape, which can be used as part of a site specific appraisal of potential effects, such that which is to be undertaken by the LVIA.

Landscape Designations

3.14 The Proposed Development is not located within or adjacent to a nationally designated landscape. The nearest National Park is the Cairngorms, which lies around 20km to the west. The Proposed Development also lies outside the Candidate Special Landscape Areas, the nearest of which, Area 8 -Dee Valley, lies around 1.5km to the south-west of the site. Landscape designations in the vicinity of the site are illustrated in Figure 3.1.

Relevant Guidance and Legislation

3.15 The LVIA will be undertaken in accordance with the principles of best practice, as outlined in published guidance documents, notably the third edition of the Guidelines for Landscape and Visual Assessment (GLVIA3), (Landscape Institute and the Institute for Environmental Management and Assessment, 2013).

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

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

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

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

- General pre-application and scoping advice for onshore wind farms. Guidance. NatureScot (September 2020);
- Guidelines for Landscape Character Assessment, Countryside Agency and SNH (2002);
- Assessing the Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments (NatureScot, March 2021);
- Siting and Design of Wind farms in the Landscape, Version 3a (SNH, August 2017);
- Visual Representation of Wind farms - Version 2.2 (SNH, February 2017);
- Landscape Institute (LI) Technical Guidance Note 06/19 Visual representation of development proposals (Landscape Institute, September 2017); and
- LI Technical Guidance Note 02/19 Residential Visual Amenity Assessment (RVAA), (Landscape Institute, March 2019).

Proposed Scope of Survey and Assessment

3.19 It is proposed that the main objectives of the LVIA will be as follows:

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

Distinction between Landscape and Visual Effects

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

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

Study Areas

- 3.21 In order to assist with defining the study area, a digital Zone of Theoretical Visibility (ZTV) model has been produced as a starting point to illustrate the geographical area within which views of development on the Site are theoretically possible. This was based on a ‘bare-earth’ scenario, whereby the screening effect of areas of existing vegetation or built features in the landscape are not taken into account. The ZTV was modelled to blade tip height using the currently proposed turbine height of 250m and is presented at Figure 3.2.
- 3.22 The ZTV is a useful tool used to provide a focus on the area and receptors that are most likely to be affected by a proposed development but should always be subject to verification in the field. In this regard, site visits shall always form the primary basis in understanding the actual likely visibility of development at the Site.
- 3.23 Having reviewed the ZTV and with regard to best practice guidance, it is proposed that the LVIA will consider an initial 35km radius study area. Detailed assessment will then be provided for a 20km section of this study area, which it is considered represents a proportionate extent of the study area and the limit within which any potential significant effects might occur.
- 3.24 For the cumulative assessment, consideration was initially given to a 60km radius from the Site, as recommended by NatureScot best practice guidance. Following this review, whilst it is acknowledged there are some schemes beyond 20km of the site, it is proposed that a 20km study area be adopted to consider cumulative effects. It is considered that this represents a proportionate extent of the study area and the limit within which any potential significant cumulative effects might occur, even if there may be some intervisibility with schemes beyond this distance.
- ## Visual Receptors
- 3.25 A detailed consideration of the potential for effects to the visual amenity of receptors in the landscape surrounding the site will be set out in the LVIA. This visual assessment will be informed by a selection of representative assessment viewpoints, which are listed below, each of which will be illustrated with visualisations prepared in line with NatureScot best practice guidance.
- 3.26 The LVIA will focus on the potential effects of the Proposed Development on different receptor groups, comprising settlements, footpath users, recognised tourist routes, long distance walking routes, cycle routes and centres for tourism.
- 3.27 It is also proposed to carry out a separate Residential Visual Amenity Assessment (RVAA) covering properties located within 2km of all proposed turbines. Properties lying within a 2km radius of the design freeze layout will be identified and the list further refined by reference to both the bare earth zone of theoretical visibility and a screened zone of theoretical visibility that allows for localised screening provided by woodland and other buildings.

- 3.28 This additional assessment will be presented in an appendix to the LVIA Chapter and would complement the assessment of visual receptors within the LVIA, providing further detail in relation to the effect on the views and amenity from different parts of each property and its curtilage.

Proposed LVIA Viewpoint Locations

- 3.29 It is proposed that the 15 locations set out in Table 3.1 are included as viewpoints in the LVIA. The locations which are illustrated on Figure 3.2 represent visual receptors and character types at a range of distances and directions from the site.

Table 3.1 Proposed LVIA Viewpoints

Viewpoint Number	Location	OS Grid Reference
1	B9119 - junction with minor road to Midmar	368356, 806712
2	B9119 - Echt	373710, 805689
3	B9125 - layby west of Westerton	375829, 802671
4	A980 - near Brockton	368473, 799388
5	Torphins - Woodside Road	362775, 801854
6	B993 - near Hillend	365384, 805277
7	Minor Road near Pitcullen	364768, 802271
8	Minor Road near The Neuk	373314, 797944
9	Minor Road north of Drumoak	378944, 800123
10	Meikle Tap	372253, 802559
11	Barmekin Hill	372597, 807123
12	Sauchen - Main Street	370076, 810809
13	Benaquhallie	360649, 808698
14	Tom's Cairn	361586, 794338
15	Brimmond Hill	385672, 809091

- 3.30 The proposed viewpoint locations are at a range of distances and directions from the Proposed Development, are at varying elevations and cover a variety of different character areas and types. Some of the viewpoints are intended to be representative of the visual experience in a general location whereas other viewpoints illustrate the view from a specific or important vantage point.
- 3.31 Each of the representative viewpoints will be visited to evaluate the sensitivity of views. In addition, the Study Area will also be extensively visited to consider the visibility of the Proposed Development as receptors move through the landscape.
- 3.32 The viewpoints will be used as the basis for determining the effects on visual receptors within the Study Area. The level of effect experienced by different visual receptor groups will be determined by considering in tandem the sensitivity and view with the magnitude of impact.

Visualisations

- 3.33 For each of the above viewpoints, daytime visualisations will be prepared in line with the Visual Representation of Wind Farms - Version 2.2 (SNH, February 2017).
- 3.34 A digital model will be generated to enable the production of wirelines of the Proposed Development from locations throughout the study area to help identify the scale, arrangement and visibility of the proposed turbines. These images will be reviewed on site to assess how natural and built screening would affect visibility of the Proposed Development.
- 3.35 Each of the wireframe models for the viewpoints within 20km of the site will then be developed further into photomontages to help illustrate the predicted impact of the Proposed Development.
- 3.36 It is proposed that surrounding consented, but not yet constructed, schemes will be digitally added to photomontages of baseline photographs, in order to illustrate the predicted baseline situation that will be in place when the wind farms are fully constructed.
- 3.37 In addition to the proposed wind turbines, the other project components (i.e. battery storage compound, permanent anemometer mast, access tracks and the substation) will be shown in photomontages for viewpoints within 5km when they would be visible. Beyond 5km it is considered unlikely that the ancillary elements would form more than a limited element of the entire Proposed Development when compared to the turbines.

Assessment of Turbine Lighting

- 3.38 The Proposed Development will incorporate turbines greater than 150m, some of which under Civil Aviation Authority (CAA) Regulations will be required to be lit with visible aviation lighting.
- 3.39 It is recognised that in some circumstances, it may be possible for turbine lighting to result in a significant effect on the character of the surrounding landscape. For example, if the proposed wind energy development is located within or in close proximity to a designated dark sky area, or is remote from existing sources of visible lighting, such as residential areas, commercial or industrial sites, or major roads.
- 3.40 For wind energy developments which are not located in such areas, it is considered that there would be no potential for significant effects on landscape character to arise from visible turbine lighting of the type proposed. This is because in these areas the character of the landscape during low natural light levels is already in part characterised by the presence of artificial lighting. Therefore, the addition of visible turbine lighting would not have the potential to bring about a fundamental change to the characteristics of the landscape.
- 3.41 The surrounding landscape context around the Proposed Development contains some existing sources of artificial light, particularly within surrounding settlements, industrial developments and along highways. Therefore, the assessment of turbine lighting will focus solely on the additional visual effects introduced by the lights.
- 3.42 In accordance with the recently published “General pre-application and scoping advice for onshore wind farms” (NatureScot September 2020), the LVIA will assess the additional visual

effects of the aviation lighting in the main body of the LVIA chapter. The additional change introduced by the aviation lighting will form a component of the magnitude of change.

- 3.43 This consideration will be informed by a ZTV of the lit turbines and night-time visualisations from a selection of viewpoints, illustrating the proposed lighting effects. In line with NatureScot Visualisation Guidance, the viewpoints selected represent locations from where people are most likely to experience the wind farm at night.
- 3.44 It is proposed that the following night-time visualisations will be produced:
- VP 2 - B9119 - Echt;
 - VP 4 - A980 - near Brockton; and
 - VP 5 - Torphins - Woodside Road.
- 3.45 The viewpoints will be used to inform consideration of the potential visual effects on key visual receptors in nearby residential properties, settlements and users of the road network.
- 3.46 Photographic examples of existing aviation lighting in similar light conditions will be presented in a separate appendix as a ‘control mechanism’.

Cumulative Effects

- 3.47 The LVIA will also consider the potential for any cumulative effects to arise. The requirement for consideration of cumulative effects under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 is set out in Schedule 4, part 5, as follows:
- ‘A description of the likely significant effects of the development on the environment resulting from, inter alia: (e) the cumulation of effects with other existing and/or approved development, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.’*
- 3.48 This represents a change to the wording of the previous Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2010 which stated: “A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development”.
- 3.49 There is therefore no longer any requirement under the current EIA Regulations to consider the potential for cumulative impacts in relation to other developments which are yet to be awarded consent.
- 3.50 Notwithstanding this, it is acknowledged that current best practice guidance for cumulative impact assessment (Assessing the Cumulative Impact of Onshore Wind Energy Developments, (NatureScot, 2021)) still refers to a consideration of proposals which are ‘awaiting determination within the planning process with design information in the public domain’ and states that “The decision as to which proposals in the planning / consenting system should be included in an assessment is the responsibility of the determining authority.”
- 3.51 As such, it is proposed in this LVIA to consider cumulative effects caused by the development of the site in conjunction with other sites which are either operational, under construction,

consented or the subject of a full planning application. The NatureScot best practice guidelines identify two principal types of cumulative visual impact:

- Combined visibility - where the observer is able to see two or more developments from one viewpoint; and
- Sequential visibility - where two or more sites are not visible at one location but would be seen as the observer moves along a linear route, for example, a road or public right of way.

3.52 The guidelines state that ‘combined visibility’ may either be ‘in combination’ (where two or more sites are visible from a fixed viewpoint in the same arc of view) or ‘in succession’ (where two or more sites are visible from a fixed viewpoint, but the observer is required to turn to see the different sites). Each of the above types of cumulative effect will be considered in the LVIA.

3.53 The assessment will also consider the potential cumulative effects of wind turbine aviation lighting, with reference to other wind farms that are either operational, under construction, consented or the subject of a full planning application which also have visible aviation warning lighting.

3.54 In order that the cumulative assessment remains focussed on other schemes that have the greatest potential to give rise to significant cumulative effects it is necessary at the outset to decide which schemes realistically need to be considered in detail, as to consider all schemes within 35km of the Proposed Development would simply detract attention from the key issues relating to the application. In this landscape context wind farms over 20km away are highly unlikely to give rise to significant cumulative effects. It is also considered appropriate and proportionate to scope out all turbines under 50m, and any turbines between 50m and 80m which are located over 10km distance from the site. The cumulative impact assessment will therefore focus primarily on those schemes within approximately 20km of the Proposed Development.

3.55 The wind farms identified within Table 3.2 are therefore the schemes on which the discussion of the cumulative landscape and visual impact effects will be primarily focussed.

Table 3.2 - Cumulative Sites within 20km

Site	Blade tip height of turbines	Number of turbines
Operational		
Meikle Carewe	78m	12
Mid Hill I and II	110-125m	33
South Lasts Farm	74	1
South Lasts Farm T2	86.5	1
Easter Tolmauds	79.6m	2
Upper Sauchen Farm	46m	1
Consented/ Under Construction		
n/a		
In Planning		
Fetteresso	149.9m-200m	10

Consultation

3.56 Consultation with statutory authorities has not been undertaken prior to preparing this scoping chapter. However, the methodology and scope presented in this section has been guided by previous experience of working on numerous similar scale schemes in the general locality.

Potential Mitigation

3.57 Best practice guidance for EIA states that mitigation measures may include:

- avoidance of effects;
- reduction in magnitude of effects; and
- compensation for effects (which may include enhancements to offset any adverse effects).

3.58 The primary mitigation to be adopted in relation to the Proposed Development will be embedded within the design of the Proposed Development and will relate to the consideration that will be given to avoiding and minimising landscape and visual effects during the evolution of the Proposed Development layout. This is sometimes referred to as ‘mitigation by design’.

Potential Effects

3.59 The LVIA will consider the potential effects of the Proposed Development upon:

- individual landscape features and elements;
- landscape character;
- visual amenity and the people who view the landscape; and
- Landscape designations as appropriate.

- 3.60 The LVIA will consider the effects at three different stages in the lifetime of the Proposed Development:
- during construction of the Proposed Development;
 - during the operational lifetime of the Proposed Development; and
 - during decommissioning of the Proposed Development.
- 3.61 Effects during the first and third of these phases are considered to be temporary and would have a short duration. Effects associated with the operational phase of the Proposed Development are considered to be long term effects.
- 3.62 Following the judgement of the sensitivity of the landscape or visual receptor, the LVIA will provide a judgement as to the magnitude of change and the level of the effect experienced by each receptor, along with a statement to clarify whether the effect resulting from the Proposed Development is significant or not.

Questions for Consultees

- Do you agree with the proposed Study Areas?
- Do you agree with the proposed viewpoint locations?
- Do you agree that the proposed scope of the assessment is appropriate?
- Are there any other wind farms you are aware of within the 20km study area to be included in the cumulative assessment?

Figures

- Figure 3.1 Landscape Designations within 20km
- Figure 3.2 Blade Tip Zone of Theoretical Visibility to 35km with Viewpoints
- Figure 3.3 Cumulative Sites within 20km

4 Cultural Heritage

Introduction

- 4.1 The ‘cultural heritage’ of an area comprises archaeological sites, historic buildings, Inventoried Gardens and Designed Landscapes (GDLs), Inventoried Battlefields and other historic environment features. The ‘setting’ of an asset within the wider landscape may contribute to its cultural heritage significance.
- 4.2 The cultural heritage impact assessment will: identify cultural heritage assets that may be subject to significant impacts, both within the limits of the Proposed Development and within 5km of the proposed turbines; establish the potential for currently unknown archaeological assets that lie within the Site Boundary; assess the predicted impacts on these assets; and propose a programme of mitigation where appropriate. It will consider direct impacts (such as physical disturbance), indirect impacts (such as might result from change to the settings of cultural heritage assets), and cumulative impacts (where asset affected by the Proposed Development are also likely to be affected by other unrelated development proposals).
- 4.3 The proposed approach to the assessment of impacts on cultural heritage is set out below. The assessment would be undertaken by SLR Consulting Ltd.

Within the Site Boundary

- 4.4 Within the Site Boundary there are no designated heritage assets. An online review of Pastmap has indicated that there are 27 non-designated heritage assets within the Site Boundary (consisting of 10 separate HER entries). All of these non-designated heritage assets are of local importance. These non-designated assets can be seen in Table 4.1.

Table 4. 1: HER Sites within the Proposed Development

HER Ref	Name	Description	Closest Turbine	Distance
NJ70SW0042	Greymore	Destroyed Boundary Stone	T16	260m
NJ60SE0019	Hill Of Fare	Remains of Boundary Stone	T13	60m
NJ60SE0013	Midmar	Boundary Stones	Multiple - closest are T9 and T13	Varied - including 3 within 100m of a turbine location.
NJ60SE0024	Hill Of Fare	Boundary Cairn	T9	200m
NJ60SE0053	Hill Of Fare	Shielings	T4	200m
NJ60SE0021	Hill Of Fare	Destroyed Boundary Stone	T9	120m
NJ60SE0020	Hill Of Fare	Boundary Stone	T13	260m
NJ60SE0022	Hill Of Fare	Destroyed Boundary Stone	T9	120m
NJ60SE0023	Hill Of Fare	Destroyed Boundary Cairn	T9	70m
NJ60SE0005	Hill Of Fare	Hut Circles	T1	130m

Outwith the Site Boundary

- 4.5 The following key assets of historical interest in the vicinity of the Proposed Development have been highlighted for detailed setting assessments as there is the potential for the Proposed Development to have a significant impact upon them:
- Barmekin of Echt, fort, Barmekin Hill (SM57);
 - Sunhoney, stone circle 240m NW of (SM44); and
 - Midmar Castle (LB16262) and associated assets:
 - Sundial, Midmar Castle (LB16263)
 - Walled Garden, Midmar Castle (LB16264)
 - Outbuilding, Midmar Castle (LB16265)
 - Barnyards Of Midmar (LB16266)
- 4.6 Due to the potential for significant impacts, preliminary wirelines for the following assets have been produced for consultee’s comments:
- Figure 4.2: Barmekin of Echt (SM57)
 - Figure 4.3: Sunhoney (SM44)
 - Figure 4.4: Midmar Castle (LB16262)
- 4.7 Certain assets have been grouped together for purposes of setting assessment; this is due to their proximity to one another and the resulting similarity of their settings. The groupings are as follows:
- Stone circles:
 - “Cullerlie stone circle”, Standing Stones of Echt (SM90088)
 - Christchurch, stone circle and standing stone, Midmar (SM32)
 - New Wester Echt, stone circle 170m SW of (SM6074)
 - Sunhoney, stone circle 240m NW of (SM44)
 - Tamnagorn, stone circle 300m E of (SM49)
 - Dunecht House (LB3133) and Inventoried Garden and Designed Landscape (GDL00153) and associated assets:
 - Chapel, Dunecht House (LB3133)
 - Boathouse, Loch of Skene, Dunecht House (LB16505)
 - Tower Lodges and Gates, Dunecht House (LB16505)
 - Midmar Castle (LB16262) and associated assets:
 - Sundial, Midmar Castle (LB16263)
 - Walled Garden, Midmar Castle (LB16264)
 - Outbuilding, Midmar Castle (LB16265)
 - Barnyards Of Midmar (LB16266)
 - Raemoir House Hotel (LB3249) and associated assets:
 - Near Banchory, Raemoir House Hotel, Gatepiers and Quadrant Walls (LB3249)
 - Near Banchory, Raemoir House Hotel, Pair of Pillars to Garden (LB3249)

- Near Banchory, Raemoir House Hotel, Former Stables (LB3249)
 - Raemoir Hotel Annex, Raemoir Hotel (LB3247)
 - Learney House (LB9516) and associated assets:
 - Stable Block, Learney House (LB9517)
 - Potting Shed, Learney House (LB9518)
 - West Lodge, Learney House (LB9520)
 - North Lodge, Learney House (LB9521)
 - Cluny Castle (LB2949) and Inventoried Garden and Designed Landscape (GDL00103) and associated assets:
 - Fraser Mausoleum, Old Churchyard, Cluny (LB2947)
 - Old Churchyard, Cluny (LB2948)
- 4.8 A high-level heritage appraisal has been carried out in relation to all nationally significant designated heritage assets within 10km of the proposed turbine locations. The Scheduled Monuments within 10km of the proposed turbine locations are listed within Appendix 4.1: Table 1, the Listed Buildings within 10km of the proposed turbine locations are listed within Appendix 4.1: Table 2, and the inventoried Gardens and Designed Landscapes within 10km of the proposed turbine locations are listed within Appendix 4.1: Table 3. All designated heritage assets within 10km are depicted on Figure 4.1.
- 4.9 Category B Listed Buildings have been scoped out of any further assessment, with the exception of those for which specific views are considered to contribute to their significance and to the ability to understand, appreciate and experience them. For this reason, Category B Listed Buildings outwith 5km of the proposed turbines have been scoped out of any further assessment.
- 4.10 All Conservation Areas within 5km have been considered. Due to there being no conservation areas within 5km of the proposed turbine locations, conservation areas have been scoped out of further assessment.
- 4.11 Whilst the Battle of Corrichie took place around Mickle Tap in 1562, there are no Inventoried Battlefield or World Heritage Sites within 10km of the Proposed Development.

Method of Assessment and Reporting

Study Area

- 4.12 There is no guidance from HES which defines a required study area for the archaeological and cultural heritage assessment of wind farms.
- 4.13 For purposes of this assessment, a Study Area has been defined extending 10km from the proposed turbines. All nationally significant designated assets (Appendix 4.1) within this Study Area have been subject to setting appraisal in order to determine any indirect impacts. Non-Designated assets within the Site Boundary will be assessed for direct impacts. Should Aberdeenshire Council Archaeology Service (ACAS) identify any non-designated assets that

they consider to be of national/regional significance, and which they consider deriving significance from their setting, then ACAS should make this known to the Developer.

Consultation

- 4.14 Based on the results of the baseline study, constraint mapping will be generated using GIS software to show mapped heritage assets in relation to the ZTV. This will filter out those assets that do not require further assessment. It will be used to identify and agree with consultees what the most potentially sensitive assets are and which may require computer-generated visualisations as part of their assessment. Consultation will be undertaken with HES with respect to the method of assessment employed and those heritage assets within their remit, including; Scheduled Monuments, Category A Listed Buildings, Inventoried Gardens and Designed Landscapes (GDL's), and Inventoried Battlefields. ACAS will be consulted for designated heritage assets of regional and local significance, and any undesignated assets they consider to be of higher significance.

Field Surveys

- 4.15 A targeted Site inspection will be carried out to identify the recorded assets likely to be impacted by the Proposed Development, and the readily accessible elements of the proposed infrastructure. The aim of this would be to establish the condition of any recorded assets and identify the potential for the existence of additional assets not currently identified.
- 4.16 Asset mapping would also be compared with ZTV and satellite imagery in order to identify designated heritage assets for which the Proposed Development might cause indirect impacts in relation to setting. This would be followed by a detailed analysis of those sites identified as potentially sensitive to such impacts, including a targeted field inspection.

Assessment of Impact

- 4.17 The Proposed Development has the potential to result in impacts upon the significance of heritage assets where it changes their baseline condition and/or their setting.
- 4.18 In accordance with the EIA Regulations, this assessment will identify any development impacts as either direct or indirect, adverse or beneficial, and short-term, long-term or permanent.
- 4.19 Assessment will be undertaken separately for direct impacts and indirect impacts.
- 4.20 Direct impacts upon the significance of heritage assets will take into account the level of their heritage significance (where known) and the magnitude (extent) of the identified impacts.
- 4.21 Indirect impacts on the significance of heritage assets will be identified and assessed with reference to Managing Change in the Historic Environment: Setting (HES 2016b) and the guidance set out in SNH (2018) and HES (2018). Assessment will be carried out in the following stages:
 - initial consideration of intervisibility and other factors leading to the identification of potentially affected assets;
 - assessment of the heritage significance of potentially affected assets;

- assessment of the contribution of setting to the heritage significance of those assets;
- assessment of the extent to which change to any contributing aspects of the settings of those assets, as a result of the Proposed Development, would affect their significance (magnitude of impact); and
- determination of the significance of any identified impacts.

4.22 The settings assessment will be assisted by a ZTV calculation, prepared principally for the Landscape and Visual Impact Assessment and presented in Figure 4.1. The ZTV calculation will map the predicted degree of visibility of the Proposed Development from all points within a proportionate, defined study area around the Proposed Development, as would be seen from an observer’s eye level (two metres above ground level). The ZTV model presented in Figure 4.1 is based on the maximum height of the blade tips of the Proposed Development.

Heritage Significance

4.23 The categories of heritage significance to be referred to are presented in Table 4.2, which will act as an aid to consistency in the exercise of professional judgement and provide a degree of transparency for others in evaluating the conclusions drawn.

4.24 The significance categories have been defined with regard to factors such as: designation, status and grading. For undesignated assets, consideration will be given to their inherent heritage interests, intrinsic, contextual, and associative characteristics as defined in Annex 1 of HEPS (2019b). In relation to these assets, this assessment will focus upon an assessment of the assets’ inherent capability to contribute to our understanding of the past; the character of their structural, decorative and field characteristics as determined from the HER and Canmore records and / or site visits; the contribution of an asset to their class of monument, or the diminution of that class should an asset be lost; how a site relates to people, practices, events, and/or historical or social movements. Assessments of the significance of specific assets, where recorded within the HER, will be taken into account.

Table 4. 2: Heritage Significance

Heritage significance	Explanation
Highest	Sites of international importance, including: <ul style="list-style-type: none"> • World Heritage Sites.
High	Site of National importance, including: <ul style="list-style-type: none"> • Scheduled Monuments; • Category A Listed Buildings; • Gardens and Designed Landscapes included on the national inventory; • Designated Battlefields; and • Non-designated assets of equivalent significance.
Medium	Sites of Regional/local importance, including: <ul style="list-style-type: none"> • Category B and C Listed Buildings; • Some Conservation Areas; and • Non-designated assets of equivalent significance.
Low	Sites of minor importance or with little of the asset remaining to justify a higher importance.
None	Sites that are of no heritage significance.
Unknown	Further information is required to assess the significance of these assets.

Magnitude of Impact

4.25 Determining the magnitude of any likely impacts will include consideration of the nature of the activities proposed during the construction and operational phases of the Proposed Development.

4.26 Changes could potentially include direct change (e.g. ground disturbance), and indirect change (e.g. change to setting); this latter might include visual change for example. Impacts may be beneficial or adverse, and may be short term, long term or permanent. The magnitude of any impacts will be assessed using professional judgment, with reference to the criteria set out in Table 4.3.

Table 4. 3: Magnitude of Impact

Magnitude of impact	Explanatory criteria
High Beneficial	The Proposed Development would considerably enhance the heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Medium Beneficial	The Proposed Development would enhance, to a clearly discernible extent, the heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Low Beneficial	The Proposed Development would enhance, to a minor extent, the heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Very Low Beneficial	The Proposed Development would enhance, to a very minor extent, the heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Neutral/None	The Proposed Development would not affect (or would have harmful and enhancing impacts of equal magnitude upon) the heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Very Low Adverse	The Proposed Development would erode, to a very minor extent, the heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect impact would not be considered to affect the integrity of the asset's setting.
Low Adverse	The Proposed Development would erode, to a minor extent, the heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect impact would rarely be considered to affect the integrity of the asset's setting.
Medium Adverse	The Proposed Development would erode, to a clearly discernible extent, the heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect impact might be considered to affect the integrity of the asset's setting.
High Adverse	The Proposed Development would considerably erode the heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect impact would probably be considered to affect the integrity of the asset's setting.

Level of Impact

4.27 The categories of Impact referred to, and the criteria used in their determination, are presented in Table 4.4.

Table 4. 4: Significance of Impact

Impact	Criteria
Major	Severe harm or enhancement, such as total loss of significance of the asset or of the integrity of its setting, or exceptional improvement of the heritage significance of the asset and/or the ability to understand, appreciate and experience it.
Moderate	Harm or enhancement, such as the introduction or removal of an element that would affect the heritage significance of the asset and the ability to understand, appreciate and experience it to a clearly discernible extent.
Minor	Harm or enhancement to the asset's heritage significance and/or to the ability to understand, appreciate and experience it to a modest extent, such that the majority of the asset's inherent interests and aspects of setting would be preserved.
Very Minor	Harm or enhancement to the asset's heritage significance and/or to the ability to understand, appreciate and experience it, that is barely discernible.
Nil	The development would not affect the heritage significance of the asset and/or the ability to understand, appreciate and experience it, or would have harmful and enhancing impacts of equal magnitude.

4.28 Table 4.5 provides a matrix that relates the heritage significance of the asset to the magnitude of impact on its significance, to produce the overall level of impact. This assessment will be undertaken separately for direct impacts and indirect impacts, the latter being principally concerned with impacts resulting from change to the setting of heritage assets.

Table 4. 5: Significance of Impact Matrix

Magnitude of Impact	Heritage Significance (excluding unknown)			
	Highest	High	Medium	Low
High beneficial	Substantial	Substantial	Moderate	Slight
Medium beneficial	Substantial	Moderate	Slight	Very slight
Low beneficial	Moderate	Slight	Very slight	Very slight
Very low beneficial	Slight	Very slight	Negligible	Negligible
Neutral/None	Neutral/Nil	Neutral/Nil	Neutral/Nil	Neutral/Nil
Very low adverse	Slight	Very slight	Negligible	Negligible
Low adverse	Moderate	Slight	Very slight	Very slight
Medium adverse	Substantial	Moderate	Slight	Very slight
High adverse	Substantial	Substantial	Moderate	Slight

Mitigation

4.29 Where adverse impacts on cultural heritage are identified, measures to prevent, reduce and/or, where possible, offset these impacts, will be proposed. Potential mitigation measures can be discussed in terms of Direct and Indirect impact.

4.30 Suitable measures for mitigating direct impacts might include:

- the micro-siting of Proposed Development infrastructure away from sensitive locations;

- the fencing off or marking out of heritage assets or features in proximity to construction activity in order avoid disturbance where possible;
- a programme of archaeological work where required, such as an archaeological watching brief during construction activities in or in proximity to areas of archaeological sensitivity, or excavation and recording where impact is unavoidable; and/or
- a working protocol to be implemented should unrecorded archaeological features be discovered.

4.31 Suitable measures for mitigating any indirect impacts might include:

- alteration of the proposed turbine layout;
- reduction of proposed turbine heights; and/or
- changing the proposed colour of select turbines.

Residual Impact

4.32 Residual impacts are those that remain even after the implementation of suitable mitigation measures. Residual impacts will be identified, and the level of those residual impact defined with reference to Tables 4.4 and 4.5.

4.33 The significance of those residual impacts for purposes of EIA would then be defined as either ‘Significant’ or ‘Not Significant’.

Cumulative Impact

4.34 A cumulative impact is considered to occur when there is a combination of:

- an impact on an asset or group of assets due to changes resulting from the development subject of assessment; and
- an impact on the same asset or group of assets resulting from another development (consented or proposed) within the surrounding landscape.

4.35 Consideration of the other developments will be limited to:

- wind farm planning applications that have been submitted and have a decision pending; and
- wind farm planning applications which have been granted permission but not yet constructed.

4.36 Any impact resulting from operational wind farms would be considered as part of the baseline impact assessment. Cumulative impact would be considered in two stages:

- assessment of the combined impact of the developments, including the proposed; and
- assessment of the extent to which the Proposed Development contributes to the combined impact.

Significance of Impact

4.37 Professional judgment will be used in the determination of whether any impacts are ‘Significant’ or ‘Not Significant’ for purposes of EIA.

4.38 With reference to the matrix presented in Table 4.5, any impacts identified as ‘Substantial’ within the matrix would almost certainly be considered ‘Significant’, while any impacts identified as ‘Moderate’ within the matrix might be considered ‘Significant’.

4.39 A clear statement will be made as to whether any identified impacts are ‘Significant’ or ‘Not Significant’ for purposes of EIA.

Matters Scoped Out

4.40 On the basis of the work undertaken to date, the professional judgement of the cultural heritage team, and experience of other comparable projects, it is considered that indirect and cumulative impacts of the Proposed Development on Category C Listed Buildings can be scoped out of the EIA in relation to cultural heritage. As per best practice guidance within SNH EIA Handbook (2018), Category C Listed Buildings are of local rather than national or regional importance, unless in the opinion of an assessor the designation should be higher.

4.41 It is also considered that any assets that fall outwith the ZTV (and where those assets’ approaches also fall outwith the ZTV) can be scoped out of the EIA in relation to cultural heritage.

References and Standard Guidance

Legislation

4.42 The assessment will be undertaken in accordance with the following principal relevant legislation:

- The Ancient Monuments and Archaeological Areas Act 1979;
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997;
- The Historic Environment (Amendment) (Scotland) Act 2011; and
- Scottish Statutory Instrument No. 101 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

Planning Policy

4.43 The Scottish Government and HES have issued a number of statements of policy with respect to dealing with the historic environment in the planning system:

- National Planning Framework 3 (NPF3; 2014);
- Scottish Planning Policy (SPP; 2014);
- Onshore Wind Turbines: Planning Advice (2014);
- Planning Advice Note 2/2011: Planning and Archaeology;
- Our Place in Time (OPiT; 2014); and
- Historic Environment Policy for Scotland (HEPS 2019).

Guidelines and Technical Standards

- 4.44 Relevant guidance and technical standard documents comprise:
- Historic Environment Scotland Guidance on Managing Change in the Historic Environment: Setting (2016);
 - A Guide to Climate Change Impact: On Scotland's Historic Environment (2019);
 - Scottish National Heritage and Historic Environment Scotland Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment Process in Scotland (2018); and
 - Chartered Institute for Archaeologists Standard and Guidance for Historic Environment Desk Based Assessment (2014, updated 2017).

Questions

- Do consultees agree with the methodology set out?
- Do consultees agree with assets and matters scoped out?
- Are there any assets, not listed in the appraisal, that key consideration should be given to?
- Do consultees have any specifications on visualisations and their locations?

Figures

- Figure 4.1 Heritage Designations
- Figure 4.2 Barmekin of Echt (SM57)
- Figure 4.3 Sunhoney (SM44)
- Figure 4.4 Midmar Castle (LB16262)

5 Ornithology

Introduction

- 5.1 This section describes the baseline conditions, relevant guidance and legislation, proposed scope of assessment and methodology, mitigation, and identified potential impacts of the Proposed Development in relation to ornithological features.
- 5.2 The ways in which ornithological features might be affected (directly or indirectly) by the construction, operation and decommissioning of the Proposed Development will be assessed prior to and after any mitigation measures are considered. In addition, any cumulative effects will be considered, taking together effects of other wind farm projects in the area, whether operational, consented or at application stage, along with the significance of any predicted effects associated with the Proposed Development.

Baseline Description

- 5.3 Baseline ornithology conditions have been/will be established from the following sources:
- Results of ornithology surveys undertaken between October 2020 and August 2022;
 - Information provided by the North East Raptor Study Group (NERSG);
 - Greylag goose (Icelandic) and pink-footed goose feeding distributions (Mitchell 2012¹); and
 - A desk study to confirm the location and qualifying features of designated sites within 20km of the Proposed Development.

Baseline Surveys

- 5.4 The following surveys have been undertaken to date (March 2022) or will be completed by the end of August 2022. All surveys are undertaken in line with the appropriate guidance (SNH 2017², Hardey *et al.* 2013³, Gilbert *et al.* 1998⁴) and survey areas are detailed below. All survey areas were created using survey-specific buffers based on the Proposed Development boundary provided at the time of survey commencement.
- Flight activity surveys: two Vantage Point (VP) locations (Figure 5.1), October 2020 to August 2022 (two breeding seasons and two non-breeding seasons; minimum of 36 hours per season as per SNH 2017¹). It is acknowledged that the scoping layout contains three turbines that are just outwith the current viewshed area (T2, T4 and T11) and should any turbines remain outwith the viewshed area in the final design, this will be taken into consideration in the collision risk assessment;

- Scarce⁵ breeding bird surveys: 2km survey area (Figure 5.1), monthly from March to August 2021 and 2022;
- Black grouse surveys: 1.5km survey area (Figure 5.1), April and May 2021 and 2022;
- Breeding wader surveys: 500m survey area (Figure 5.1), monthly from April to July 2021 and 2022.
- Winter walkover surveys: 500m survey area (Figure 5.1), three visits between November 2020 and March 2021 and monthly between September 2021 and February 2022.

Designated Sites

- 5.5 There are no statutory designations with ornithological features within the Proposed Development, however the Proposed Development is within 20km of three Special Protection Areas (SPA) and associated Sites of Special Scientific Interest (SSSIs) and Ramsars, as listed below and shown in Figure 5.2.
- Loch of Skene SPA (underpinned by Loch of Skene SSSI and Loch of Skene RAMSAR) - 9.8km to the north-east and designated for non-breeding goldeneye, goosander and greylag goose;
 - Cairngorms Massif SPA - 17.1km to the south-west, designated for breeding golden eagle; and
 - Glen Tanar SPA (underpinned by the Glen Tanar SSSI) - 19.2km to the west and designated for breeding capercaillie, hen harrier, osprey and Scottish crossbill.
- 5.6 On the basis of the foraging ranges provided by NatureScot's SPA connectivity guidance (SNH 2016a⁶) there is considered to be no connectivity between the Proposed Development and the Glen Tanar SPA (and associated SSSI) or the Cairngorms Massif SPA. Whilst the Proposed Development does lie within the foraging range of the designated greylag goose (20km, SNH 2016a⁶), considering the upland nature of the site and limited greylag goose flight activity recorded within the vicinity of the site (paragraph 5.11) there is considered to be limited to no connectivity between the Proposed Development and the Loch of Skene SPA.

Ornithological Activity (October 2020 to March 2022)

- 5.7 Flight activity surveys between October 2020 and March 2022 recorded eight target species (golden plover, goshawk, greylag goose, hen harrier, herring gull, peregrine falcon, pink-footed goose and red kite), collectively accounting for 75 flights which may be included in the Collision Risk Model (CRM), depending on their location in relation to the final turbine layout.

¹ Mitchell, C. (2012). Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge.

² Scottish Natural Heritage (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms.

³ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2013). Raptors: a field guide for surveys and monitoring (3rd edition). The Stationery Office, Edinburgh.

⁴ Gilbert, G., Gibbons, D. W. and Evans, J. (1998). Bird Monitoring Methods. RSPB, Sandy.

⁵ Scarce breeding birds are those listed on Annex 1 of the EU Birds Directive or Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and in the case of the Development consists of any raptor and owl species listed on either Annex 1 or Schedule 1.

⁶ Scottish Natural Heritage (2016a). Assessing connectivity with Special Protection Areas (SPAs).

- 5.8 Surveys during the 2021 breeding season recorded curlew (single bird on two occasions), however no breeding activity was identified within the 500m survey area. Wader activity was generally low across the 2021 breeding season with a single golden plover recorded flying over the site and a single woodcock in mid-March 2021. Woodcock (single birds), snipe (single birds) and golden plover (a single bird during winter walkover surveys and two flocks of 16 and 20 birds during flight activity surveys) were also infrequently recorded during the 2020/2021 and 2021/2022 non-breeding seasons.
- 5.9 Scarce breeding bird surveys in 2021 located one peregrine falcon territory (breeding success unknown) and two goshawk territories (breeding success confirmed at one with the presence of an immature bird, breeding success unknown at the second). Red kite and osprey were recorded during the 2021 breeding season but were not identified to be breeding within the 2km survey area. Golden eagle, goshawk, hen harrier, peregrine falcon and red kite were recorded during the 2020/2021 and 2021/2022 non-breeding seasons. Winter walkovers included monitoring suitable areas for potential hen harrier roosts, however no evidence of roosting hen harrier was recorded.
- 5.10 No lekking black grouse were recorded within the 1.5km survey area during 2021, and as of March 2022, no black grouse have been recorded during any survey.
- 5.11 No geese or whooper swan were recorded foraging within the 500m winter walkover survey area during the 2020/2021 or 2021/2022 non-breeding seasons but were recorded flying over/by the site. Pink-footed geese were the most frequently recorded across both non-breeding seasons with a total of 26 flights (flock sizes ranging between six and 500 birds), predominately during the autumn migratory period. Greylag geese were only recorded between November and December 2020 (six flights, flock sizes between 14 and 110 birds) and whooper swan were recorded on two occasions during October 2021 (two flocks of six and 13 birds).

Legislation, Policy and Guidance

- 5.12 Relevant European legislation has been reviewed and taken into account as part of this ornithological assessment. Of particular relevance is the following European legislation:

- EU Directive 2009/147/EC on the Conservation of Wild Birds⁷ ('Birds Directive');
 - EU Directive 92/43/EEC on Conservation of Natural Habitats and of Wild Fauna and Flora⁸ (as amended) ('Habitats Directive'); and
 - EU Environmental Impact Assessment Directive 2014/52/EU⁹.
- 5.13 The following national legislation, which has recently been amended as a consequence of EU exit (Scottish Government 2019¹⁰, 2020¹¹), is also considered as part of the ornithology assessment:
- The Wildlife and Countryside Act 1981¹² (as amended);
 - The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (The Habitats Regulations);
 - The Nature Conservation (Scotland) Act 2004¹³ (as amended); and
 - The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017¹⁴ (as amended).
- 5.14 The ornithological assessment will also consider the relevant aspects of Scottish Planning Policy, Planning Advice Notes and other relevant guidance. Of relevance to ornithology are the following policies:
- UK Post-2010 Biodiversity Framework (2012¹⁵);
 - Scottish Biodiversity Strategy: It's in Your Hands (2004¹⁶)/2020 Challenge for Scotland's Biodiversity (2013¹⁷);
 - Scottish Government (2000¹⁸). Planning Advice Note 60: Planning for Natural Heritage;
 - Scottish Government (2017¹⁹). Planning Advice Note 1/2013-Environmental Impact Assessment, Revision 1.0;
 - Scotland's Third National Planning Framework (2014²⁰);
 - Scotland 2045 - fourth National Planning Framework - draft consultation (November 2021²¹);
 - Aberdeenshire Council: Planning Advice Number 4/2015 - Biodiversity and Development²²; and

⁷ Directive 2009/147/EC of the European Parliament and of the Council. Available at: <https://www.legislation.gov.uk/eudr/2009/147/contents> (accessed April 2022)

⁸ Scottish Government (1992). Council Directive 92/43/EEC. Available at: <https://www.legislation.gov.uk/eudr/1992/43/contents> (accessed April 2022)

⁹ Scottish Government (2014). Directive 2014/52/EU of the European Parliament and of the Council. Available at: <https://www.legislation.gov.uk/eudr/2014/52> (accessed April 2022)

¹⁰ Scottish Government (2019). The Town and Country Planning and Electricity Works (EU Exit) (Scotland) (Miscellaneous Amendments) Regulations 2019. Available at: <https://www.legislation.gov.uk/ssi/2019/80/introduction/made> (accessed April 2022)

¹¹ Scottish Government (2020). EU Exit: The Habitats Regulations in Scotland. Available at: <https://www.gov.scot/publications/eu-exit-habitats-regulations-scotland-2/> (accessed April 2022)

¹² Scottish Government (1981). Wildlife and Countryside Act 1981. Available at: <https://www.legislation.gov.uk/ukpga/1981/69> (accessed April 2022)

¹³ Scottish Government (1994) The Conservation (Natural Habitats, &c.) Regulations 1994. Available at: <https://www.legislation.gov.uk/uksi/1994/2716/contents> (accessed April 2022)

¹⁴ Scottish Government (2017). The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at: <https://www.legislation.gov.uk/ssi/2017/101/contents> (accessed April 2022)

¹⁵ JNCC and Defra (on behalf of the Four Countries' Biodiversity Group) (2012). UK Post-2010 Biodiversity Framework. JNCC, Peterborough.

¹⁶ Scottish Executive (2004). Scottish Biodiversity: It's In Your Hands. Scottish Executive, Edinburgh.

¹⁷ The Scottish Government (2013). 2020 Challenge for Scotland's Biodiversity. The Scottish Government, Edinburgh. <https://www.gov.scot/publications/pan-60-natural-heritage/> (accessed April 2022)

¹⁹ Scottish Government (2017). Planning Advice Note 1/2013 – Environmental Impact Assessment, Revision 1.0. Scottish Government, Edinburgh.

²⁰ <https://www.gov.scot/publications/national-planning-framework-3/> (accessed April 2022)

²¹ <https://www.gov.scot/publications/scotland-2045-fourth-national-planning-framework-draft/>

²² https://www.aberdeenshire.gov.uk/media/8127/2015_04biodiversityanddevelopment.pdf (accessed April 2022)

- The Scottish Biodiversity List²³.

5.15 The following guidance will also be considered as part of the assessment:

- CIEEM (2018²⁴). Guidelines for Ecological Impact Assessment;
- NatureScot guidance on assessment of effects of wind farms on birds (SNH 2000²⁵, 2014²⁶, 2016a⁶, 2016b²⁷, 2016c²⁸, 2017², 2018a²⁹, 2018b³⁰, 2018c³¹, 2018d³², 2019³³; NatureScot 2020a³⁴, 2020b³⁵);
- Scottish Executive Rural Affairs Department (SERAD) (2000³⁶). Habitats and Birds Directives;
- Band *et al.* (2007³⁷); and
- Stanbury *et al.* (2021³⁸).

Study Area

5.16 The EIA Report will incorporate the following study areas which will all be buffered from the finalised turbine layout (and access track if relevant/required):

- Designated sites: the Proposed Development and a 20km study area (SNH 2016a⁶);
- Collision risk modelling: the results of the flight activity surveys will be used to inform collision risk modelling. A Collision Risk Analysis Area (CRAA) will be created using GIS Delaunay triangulation³⁹ from the proposed turbine locations to create a wind farm area which will then be buffered by 500m (as per SNH 2017²);
- Scarce⁴⁰ breeding birds: Proposed Development and a 2km study area (800m for access tracks) (SNH 2017²);
- Black grouse: Proposed Development and a 1.5km study area (750m for access tracks) (SNH 2017²);
- Breeding waders and wintering waders, raptors, owls and wildfowl: Proposed Development and a 500m study area (SNH 2017²);

- Cumulative assessment: as per SNH (2018d³²), the Natural Heritage Zone (NHZ) level is considered practical and appropriate for breeding species not connected to designated sites (for the Site, the NHZ will be the North East Glens, NHZ 12); and
- In-combination assessment: should an in-combination assessment be required as part of the Habitats Regulations Appraisal (HRA), the study area extent will be buffered from the relevant SPA with the species-specific buffer distance taken from NatureScot guidance (SNH 2016a⁶) on foraging ranges and SPA connectivity.

Assessment Methodology

5.17 The assessment will consider the potential direct, indirect, and cumulative impacts that the construction and operation of the Proposed Development could have on Important Ornithological Features (IOFs, as per CIEEM 2018²⁴ guidance). The assessment will be supported by a technical appendix that will include details of survey methodologies, all survey data and outputs from any collision risk modelling.

5.18 The assessment will include the following elements:

- Baseline conditions;
- Scoping in/out of ornithological features and impacts;
- Assessment of potential impacts during construction, operational and decommissioning phases;
- Mitigation;
- Residual impacts;
- Cumulative impact assessment; and
- Summary of impacts.

²³ <https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scottish-biodiversity-list> (accessed April 2022)

²⁴ CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester

²⁵ Scottish Natural Heritage (2000). Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action.

²⁶ Scottish Natural Heritage (2014). Assessing impacts to pink-footed and greylag geese from small-scale wind farms in Scotland.

²⁷ Scottish Natural Heritage (2016b). Environmental Statements and Annexes of Environmentally Sensitive Bird Information; Guidance for Developers, Consultants and Consultees. Version 2.

²⁸ Scottish Natural Heritage (2016c). Dealing with construction and birds.

²⁹ Scottish Natural Heritage (2018a). Assessing significance of impacts from onshore windfarms on birds out with designated areas. Version 2.

³⁰ Scottish Natural Heritage (2018b). Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland.

³¹ Scottish Natural Heritage (2018c). Avoidance Rates for the onshore SNH Wind Farm Collision Model. Version 2.

³² Scottish Natural Heritage (2018d). Assessing the cumulative impacts of onshore wind farms on birds.

³³ Scottish Natural Heritage joint publication (2019). Good Practice during Wind Farm Construction. 4th Edition.

³⁴ NatureScot (2020a). General pre-application and scoping advice for onshore wind farms.

³⁵ NatureScot (2020b). The Effect of Aviation Obstruction Lighting on Birds at Wind Turbines, Communication Towers and Other Structures.

³⁶ SERAD (Scottish Executive Rural Affairs Department) (2000). Habitats and Birds Directives, Nature Conservation; Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds (“the Habitats and Birds Directives”). Revised Guidance Updating Scottish Office Circular No 6/1995.

³⁷ Band, W., Madders, M., and Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. In: Janss, G., de Lucas, M. & Ferrer, M (eds.) Birds and Wind Farms. Quercus, Madrid. 259-275.

³⁸ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win, I. (2021). Birds of Conservation Concern 5: The population status of birds in the UK, Channel Islands and Isle of Man and second ICUN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747.

³⁹ Delaunay triangulation is a form of mathematical/computational geometry where a given set of points (in this case the turbine locations) are all joined to create discrete triangles. Further information is available here:

<https://uk.mathworks.com/help/matlab/math/delaunay-triangulation.html>

⁴⁰

- 5.19 Consideration of SPAs will be undertaken within an HRA context, with information to inform an appropriate assessment being included, should any likely significant effects to any qualifying features be identified.
- 5.20 Impacts on IOFs will be assessed in relation to the species' reference population, conservation status, range and distribution. The assessment of potential impacts will follow guidelines published by CIEEM (2018²⁴) and NatureScot (SNH 2018a²⁹, 2018b³⁰).
- 5.21 The assessment will involve the following process:
- Identifying potential impacts of the Proposed Development;
 - Considering the likelihood of occurrence of potential impacts;
 - Defining the nature conservation importance and conservation status of relevant populations for each IOF to determine overall sensitivity;
 - Establishing the magnitude of the likely impact (both spatial and temporal) on each IOF;
 - Based on the above information, making a judgement as to whether or not the consequent impact is significant with respect to the EIA Regulations;
 - If a potential impact is determined to be significant, suggesting measures to mitigate or compensate the impact where required;
 - Considering opportunities for enhancement where appropriate; and
 - Concluding residual impacts after mitigation, compensation, or enhancement.
- 5.22 Where appropriate, the assessment will take into consideration specific measures of analysis, most likely collision risk modelling using the Band *et al.* (2007³⁷) model.

Proposed Mitigation

- 5.23 Significant impacts on birds will be avoided/minimised where possible during the design layout process, based on the locations of known nest, roost and lek sites, key foraging areas, and likely sensitivities of IOFs. Good practice during construction and operation of the Proposed Development will also be implemented (and the assessment undertaken on this basis). This would include the following:
- A Bird Disturbance Management Plan (BDMP) would be implemented as part of a Construction Environmental Management Plan (CEMP) or similar during the construction phase, to ensure that all reasonable precautions are taken to adhere to the relevant wildlife legislation;
 - Pre- and during-construction surveys carried out by an Ecological Clerk of Works (ECoW) or suitably qualified ornithologist would take place as part of the BDMP; and
 - A Habitat Management Plan (HMP) would be developed for the operational phase and agreed with consultees, to mitigate or enhance habitat for IOFs and to provide wider biodiversity improvements.
- 5.24 Where unmitigated significant impacts on IOFs are identified, additional measures to prevent, reduce and where possible offset these adverse impacts will be proposed, in order to conclude a non-significant residual impact.

Potential Impacts

- 5.25 The assessment will consider the potential impacts associated with construction, operation and decommissioning of the Proposed Development as detailed below. Where appropriate, these construction and operational impacts will also be considered in a cumulative assessment.
- 5.26 Construction/Decommissioning Impacts:
- Temporary and permanent habitat loss/alteration/fragmentation associated with the Proposed Development infrastructure, including loss of nesting, lekking, roosting or foraging habitat; and
 - Visual and noise disturbance associated with construction activities.
- 5.27 Operational Impacts:
- Displacement from nesting, lekking, roosting or foraging habitats around operational turbines and other permanent infrastructure, including barrier effects;
 - Risk of collisions with operational wind turbine blades or any other permanent infrastructure; and
 - Impacts relating to turbine lighting.

Features/Impacts Scoped In or Out of Assessment

Scoped out Features/Impacts

- 5.28 On the basis of baseline data, experience from other relevant projects and policy guidance or standards (e.g., CIEEM 2018²⁴, SNH 2018b³⁰), the following species will be 'scoped out' since significant impacts are unlikely:
- Common and/or low conservation species not recognised in statute as requiring special conservation measures (i.e., not listed as Annex 1/Schedule 1 species);
 - Common and/or low conservation species not included in non-statutory lists (i.e., not listed as Amber or Red-listed BoCC species), showing birds whose populations are at some risk either generally or in parts of their range; and
 - Passerine species, not generally considered to be at risk from wind farm developments (SNH 2017²), unless being particularly rare or vulnerable at a national level.
- 5.29 Subject to the results of the collision risk modelling, effects relating to any target wader, raptor or owl species not identified to be breeding within the relevant study area will be scoped out of the assessment.
- 5.30 Considering the review of designated sites within 20km of the Proposed Development (paragraph 5.6), there is considered to be no potential for a likely significant effect on the Glen Tanar SPA, Cairngorms Massif SPA, or Loch of Skene SPA as a result of the Proposed Development and it is proposed to scope these designated sites out of the assessment.

- 5.31 Considering the NatureScot guidance regarding non-SPA population pink-footed goose avoidance rates and collision risk (SNH 2014²⁶), and lack of suitable habitat within the site, it is proposed to scope pink-footed goose out of the assessment.

Scoped in Features/Impacts

- 5.32 Whilst it is not possible to definitively scope out specific target species from the assessment prior to undertaking collision modelling and a review of the ornithological baseline against the final design, considering the information available regarding the species assemblage and distribution at the Proposed Development and on the basis of professional experience, it is considered that goshawk, peregrine falcon and red kite are likely to be the species considered as IOFs and therefore scoped into the assessment.

Scoping Questions to Consultees

- Do consultees agree that the methodology and scope of the assessment is appropriate?
- Are there any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the ornithology assessment?
- Do consultees agree with the features proposed to be scoped out of the assessment?

Figures

- Figure 5.1 Baseline Surveys
- Figure 5.2 Designated Sites

6 Ecology

Introduction

- 6.1 The non-avian Ecological Impact Assessment (EclA) will assess the potential for likely significant effects on features above a certain value during the construction, operational and decommissioning phases of the Proposed Development.
- 6.2 The assessment of the avian baseline and potential impacts will be presented in a separate ornithological chapter (see Chapter 5).
- 6.3 The EclA will be presented within the Ecology and Nature Conservation chapter of the EIA Report, which will also include the following:
- The legislative, planning and good practise framework of the assessment;
 - A summary of consultation responses from key stakeholders;
 - Methodology;
 - A description of the existing ecology baseline for the Proposed Development and wider ecological study area, including habitat types and evidence of any protected or otherwise notable species, e.g. national and European Protected Species as well as priority species and habitats listed on the Scottish Biodiversity List (Scottish Government, 2013) or locally important species (North East Scotland Biodiversity Partnership, no date);
 - An assessment of the potential significant ecological effects of the Proposed Development in the presence of standard mitigation;
 - Proposals for any additional mitigation or compensation to ameliorate identified potential effects (where appropriate); and
 - An assessment of residual effects following the implementation of mitigation.

Legislation, Policy and Guidance

- 6.4 The ecology assessment will be carried out in accordance with the following legislation:
- European Union Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora;
 - European Union Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (“Water Framework Directive”);
 - Environmental Impact Assessment Directive 2014/52/EU;
 - The Wildlife and Countryside Act 1981 (as amended);
 - The Protection of Badgers Act 1992 (as amended);
 - The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (“The Habitats Regulations”);
 - The Nature Conservation (Scotland) Act 2004 (as amended); and
 - The Wildlife and Natural Environment (Scotland) Act 2011 (as amended).

- 6.5 In terms of policy, the assessment will review the local, regional and national planning framework including:
- National Planning Framework 3 (Scottish Government, 2014a);
 - Scottish Planning Policy (SPP; Scottish Government, 2014b);
 - Relevant authority and local structure plans; and
 - The Scottish Biodiversity List (Scottish Government, 2013).
- 6.6 In terms of guidance, the assessment will be undertaken in line with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018), which represent current best practice and are endorsed by key stakeholders. It will also give due regard to other relevant guidance, such as the SEPA (2017) guidance on the assessment of Groundwater Dependent Terrestrial Ecosystems (GWDTE) and the NatureScot et al. (2021) guidance on bats and onshore wind turbines.

Preliminary Consultation with NatureScot

- 6.7 We have undertaken consultation with NatureScot regarding the scope of the bat assessment. The scope presented in sections 6.17 to 6.19 is the one agreed with NatureScot. It focuses on remote detector surveys in line with the NatureScot et al. (2021) guidance and excludes transect surveys.
- 6.8 With respect to bats, key weather data are rainfall, wind and air temperature. NatureScot advised that a weather station with a rain gauge ideally within 2-3 km of the site and not more than 10 km away would be required for the surveys, and they advised that the number of nights that detectors are recording may need to be extended if weather conditions are not suitable for bats during the survey period.
- 6.9 Further details on the approach to bat assessments are provided in sections 6.17 to 6.19.

Proposed Scope of Assessment

Desk study

- 6.10 A comprehensive desk study will be undertaken to collate existing information on international and national statutory ecological designations (listed for non-avian biological features), such as Special Areas of Conservation (SACs), Special Sites of Scientific Interest (SSSIs) and National Nature Reserves (NNRs) within 5 km of the Site boundary but extended to 10 km for any designations listed for bat interests. Local Nature Reserves (LNRs) as well as non-statutory designations, such as Local Wildlife Sites (LWS), Sites of Interest for Nature Conservation (SINCs) or woodland areas included on the Ancient Woodland Inventory (AWI), will be identified within a 2 km distance from the Site boundary.
- 6.11 The desk study will also include collation of records of protected or otherwise notable species dating from within the last 10 years and located within 2 km of the site boundary, although this distance will be extended to 5 km for any low to medium-risk roosting bat species and 10

km for any high-risk roosting bat species. As part of this exercise we will contact the Bat Conservation Trust and North East Scotland Biological Records Centre (NESBReC).

Extended National Vegetation Classification (NVC) survey

- 6.12 A botanical survey, carried out to National Vegetation Classification (NVC) standard, will be completed within the footprint of proposed development and a minimum 250 m buffer (access permitting) to identify habitats that may be of conservation importance or have groundwater dependence. The survey will follow the standard methodology set out in the NVC Users' Handbook (Rodwell, 2006) and plant communities will be identified from representative quadrat samples with reference to the standard community descriptions and constancy tables in Rodwell (1991 et seq.). The survey will exclude highly modified habitats, such as conifer plantations and agricultural areas, which will be mapped using the Joint Nature Conservation Committee (JNCC) Phase 1 habitat survey method (JNCC, 2010).
- 6.13 Communities will be evaluated in terms of their nature conservation interest, e.g. through inclusion on the Scottish Biodiversity List (SBL) (Scottish Government, 2013), as well as in terms of potential groundwater dependence (SEPA, 2017).
- 6.14 If the layout of the wind farm results in turbines or borrow pits being proposed within 250 m of a potential GWDTE, or other wind farm infrastructure being proposed within 100 m of a potential GWDTE, then further assessment will be undertaken to verify if the potential GWDTE is indeed groundwater dependent.
- 6.15 The results of the survey will be shown as both an NVC map of plant communities and a Phase 1 habitat map.
- 6.16 The NVC survey will be 'extended' to assess the potential need for ecological surveys in addition to those described below. For example, although aquatic or fisheries surveys are not included within the scope of assessment, this will be re-evaluated during the NVC survey.

Bat surveys

- 6.17 Even though the Site is largely open habitat, the wind turbine development area will be assessed for habitat suitability and the potential presence of roosting sites and key foraging and commuting habitats identified. An initial Site walkover will be undertaken across the wind turbine development area (200 m buffer to turbine locations) with the aim of identifying key areas or structures that may support roosting bats, e.g. buildings, bridges or trees, and require subsequent investigation in line with the guidelines issued by the Bat Conservation Trust (BCT) (Collins, 2016). If potential roost sites are identified, then additional emergence/re-entry surveys will be undertaken. In addition, areas that may provide suitable foraging or commuting areas will also be identified and used to inform the activity surveys.
- 6.18 The NatureScot et al. (2021) bat survey guidance places more emphasis on static surveys than previous guidance. It is now requested that static detectors need to be deployed for a minimum of 10 consecutive nights per season (spring, summer and autumn), and this approach

is being followed. Detectors will be deployed to enable collection of representative data across the Site's habitats. Static surveys are required to capture a sufficient number of nights with appropriate weather conditions for bat activity (ideally above 8°C at dusk), low wind speeds and no or only very light rain. Static detectors will be set to commence monitoring half an hour before sunset and finish half an hour after sunrise to ensure all bat activity is captured. In general it is recommended that each deployment period (a single deployment period in this case) is for a minimum of 10 nights. However, due to the likelihood of poor weather during the proposed deployment periods, at least 15 nights will be recorded. In line with the NatureScot et al. (2021) guidance, survey effort will be focused on proposed (or likely) turbine locations. The preliminary layout suggests up to 17 turbines within the wind turbine development area, and a total of 13 statics will therefore be deployed in line with the guidance. As the Site is located in an open upland landscape it will be necessary to mount the detectors on short posts with the microphone located approximately 1.0m above ground. Anabat Swift full spectrum detectors will be used.

- 6.19 Given the open moorland habitats surrounding the proposed array, with no woodland present, we are not proposing to undertake static detector deployment at height.

Protected mammals survey

- 6.20 A combined survey investigating for signs of protected mammals, including but not restricted to badger (*Meles meles*), otter (*Lutra lutra*), water vole (*Arvicola amphibius*), red squirrel (*Sciurus vulgaris*) and pine marten (*Martes martes*), will be carried out across the potential development area and a 100 m buffer, although the survey buffer will be increased to 250 m for otter due to the larger distance over which this species may potentially be disturbed. The survey will be based on the standard methods described in Scottish Badgers (2018), Chanin (2003), Strachan et al. (2011) and Gurnell et al. (2009). The methods involve searching for field evidence, such as feeding signs, latrines and individual droppings, burrows/resting places, footprints, runways in vegetation and sightings of the animals themselves.
- 6.21 If potential badger setts, otter holts, red squirrel dreys or pine marten dens are recorded, or if evidence is recorded of wildcat (*Felis sylvestris*), then further targeted survey work could be required (such as camera trapping) to confirm the level of usage of a given feature and to provide the necessary information needed in support of a future protected species licence application, should one be required. The scope of any such further surveys would depend on the nature of the evidence recorded and its location within the survey area relative to the layout of the Proposed Development.

Ecological Impact Assessment

- 6.22 In accordance with the CIEEM (2018) guidelines, the Ecology and Nature Conservation chapter for the Proposed Development will summarise the non-avian ecology baseline, with the findings of the survey work detailed in technical reports, which will be appended to the EIA Report. Features then will be evaluated using the CIEEM (2018) criteria, and features of local or higher value that may be susceptible to development at the site will be brought forward

for an assessment of impacts during the construction, operational and decommissioning phases, assuming the presence of standard mitigation measures. Additional mitigation may then be identified where any significant impacts are predicted. The potential for cumulative ecological effects will also be assessed, which we consider will include other wind farm schemes within 10km of the site boundary. Any significant (beneficial or adverse) residual effects will be clearly presented and discussed appropriately.

Baseline Description

- 6.23 Aerial photography suggests that the wind turbine development area comprises upland habitats, including dry heath, acid grassland, bracken and regenerating conifers. Grouse butts are present and indicate that the Site was formerly under grouse moor management. Conifer plantation abuts the Site. A number of properties, mainly associated farm buildings, are interspersed across the local area, but none are present within 200 m of the wind turbine development area.
- 6.24 No statutory nature conservation designation overlaps with or abuts the Site. No national nature conservation designation is present within 5km of the Site.
- 6.25 Only a single international nature conservation designation listed for non-avian features is present within 5 km of the Site. This is the River Dee SAC, which is located c.2.5km southwest of the wind turbine development area, and designated for Atlantic salmon (*Salmo salar*), freshwater pearl mussel (*Margaritifera margaritifera*) and otter.
- 6.26 The site and /or wider local area is likely to support a range of protected or otherwise notable species, such as badger, otter, water vole, red squirrel and reptiles.

Potential Effects

- 6.27 The key ecology and nature conservation issues to be considered with respect to the Proposed Development are likely to include the following:
- direct mortality of fauna during construction, operation and decommissioning;
 - behavioural changes of fauna during operation;
 - habitat loss through land-take;
 - fragmentation of existing habitats;
 - disturbance during construction and decommissioning; and
 - pollution via road drainage and runoff during all development phases.
- 6.28 Additionally, for species relying on aquatic resources potentially affected by watercourse crossing and surface water runoff, the following potential significant effects are also considered:
- point source and diffuse pollution;
 - increased sediment loading;
 - decreased habitat complexity;
 - habitat fragmentation; and

- changes to discharge regime.

Receptors and Impacts Scoped Out of Assessment

- 6.29 Scoping ecological features in or out of the assessment will be determined through the EclA process, following standard guidance (CIEEM, 2018). However, due to their locations, the level of habitat connectivity and their qualifying features, we consider that the following can be scoped out of the assessment:
- Nature conservation designations outwith 5km of the Site, except any statutory designation within 10 km that is listed for roosting bats.
- 6.30 The River Dee SAC is located c.2.5km southwest of the wind turbine development area at its nearest point and is separated from the Site by woodland and agricultural habitats. Significant effects on the qualifying features, i.e. Atlantic salmon, freshwater pearl mussel and otter, are therefore very unlikely, and we do not consider that a Habitats Regulation Assessment (HRA) will be required.

Mitigation and Compensation

- 6.31 If it is considered that mitigation is necessary to reduce any adverse ecological effects, then an integrated mitigation and enhancement package will be proposed which will address ecological effects and which reflects local objectives in terms of biodiversity and the enhancement of environmental character. During the Proposed Development design and EIA process, mitigation measures will follow the recognised hierarchy of avoidance, reduction, enhancement, and compensation.
- 6.32 Proposals will also be outlined for a Habitat Management Plan (HMP) to be implemented during the operational phase of the Proposed Development if required. The scope of an outline HMP will be defined once baseline surveys are complete and the EclA has been undertaken.

Questions

- Do you agree that the proposed scope of assessment is appropriate?
- Do you agree that it is appropriate to scope out HRA?

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7 Hydrology

Introduction

- 7.1 The Proposed Development has the potential to cause changes to the baseline hydrological and hydrogeological conditions at the Development Site and the receiving water environment.
- 7.2 The assessment will identify impacts with potential to result in significant effects in the absence of mitigation by establishing the current baseline and considering the Proposal design.

Baseline

Site Location and Topography

- 7.3 The Development Site is located within areas of upland heather moorland with six distinct hill tops present on the site.
- 7.4 The Development Site is characterised by upland plateaus and surrounding hillslopes. In the west and centre of the site, five distinct hill tops are present with associated flatter plateaus (Hill of Fare, Hill of Corfiedly, Tornamean, Craigrath and Blackyduds), the highest of which being Hill of Fare in the west of the Development site (peak of 470 metres Above Ordnance Datum (mOAD)). The ground gradually slopes towards the Burn of Lythebauds in the north, and towards the Burn of Corrichie in the south-east. Relatively flatter upland moorlands are present in the centre, west, and to the east along the proposed access route, before the steeper slopes of the sixth hilltop, Greymore. Ground levels in the Development Site range between approximately 312 mAOB to 470mAOB.

Designated Sites

- 7.5 The Development Site is located within the catchment of the River Dee Special Area of Conservation (SAC), with the River Dee located approximately 2.3km southwest of the Development Site at its closest point.
- 7.6 No other designated sites related to the water environment are located within 3km of the Development Site.

Surface Water

- 7.7 The headwaters of two watercourses originate in the site which drain in an easterly direction. The Burn of Lythenbauds is present in the north-east of the site which confluences with the Gormack Burn approximately 400m north-east of the site. The Burn of Corrichie originates in

the south-east of the site and confluences with the Rae Burn approximately 1,600m east of the site.

- 7.8 To the north-west of the site the headwaters of an unnamed burn drain northwards towards Upper Tillenhilt. To the east of the site the proposed access route runs adjacent to the Landerberry Burn. To the south-west of the site there are a series of smaller drains and tributaries which confluence with the Blacklinn Burn, however these do not extend into the Development Site.
- 7.9 Within the site there are a series of smaller hydrological features (small ponds or depressions) primarily within the west of the site. A larger gully has been identified in the west of the site. During a site walkover a series of manmade ditches were observed, which are believed would have historically drained the areas to the south into the gully feature. Additionally some gullies were identified draining off the Burn of Lythenbauds, and some natural drainage areas were observed draining towards the two burns.
- 7.10 Surface water features are shown in Figure 7.1: Hydrological Overview.

Soils and Geology

Bedrock Geology

- 7.11 BGS mapping⁴¹ shows that the bedrock geology underlying the majority of the Development Site is underlain by the Hill of Fare Intrusion Leucogranite. Within the east and west of the site there are small areas underlain by Hill of Fare Microgranite.

Superficial Deposits

- 7.12 BGS mapping shows that peat deposits are present across the majority of the centre and west of the site. There are large areas in the east of the Development Site, surrounding Burn of Lythenbauds and at the base of the hillslopes where there is no record of superficial deposits.
- 7.13 The carbon and Peatland map identifies 5 classes of soil present across the Development Site⁴². Surrounding the Burn of Corrichie and Burn of Lythenbauds class 0 soil is present which indicates the presence of mineral based soils. Within the centre and north of site class 1 soil is present which is comprised of peat soil and peatland vegetation. In the south and north-east of the site there are small patches of class 3 soil which indicates the presence of predominantly peaty soil with some peat soil, and peatland vegetation with some heath. To the east of the site and along the proposed access track, class 4 soil is present. This comprised of predominantly mineral soil with some peat soil and heathland vegetation. Within the remainder of the site (west, north and central area) class 5 soil is present which is comprised of peat soils with no peatland vegetation.
- 7.14 EnviroCentre⁴³ conducted a peat depth survey and assessment in order to inform the Proposed Development design. The peat survey highlighted that peat is present up to 5m depth in the

⁴¹ BGS (n.d.). GeoIndex Onshore Viewer. British Geological Society

⁴² SNH (2016). Carbon and Peatland Map. Retrieved from <http://www.snh.gov.uk/planning-and-development/advice-for-planners-and-developers/soils-and-development/cpp/>

⁴³ EnviroCentre (2022). Peat Instability Hazard Assessment

vicinity of the Burn of Lythenbauds and southeast of the summit of the Hill of Fare. The peat survey results informed the production of a Peat Instability Hazard Assessment (EnviroCentre, 2022) which concluded that the areas of highest risk are present within the vicinity of the Burn of Corrichie and the Burn of Lythenbauds, and recommended that where possible infrastructure avoid areas of peat >1m in depth.

7.15 Peat depth survey results are shown in Figure 7.2: Peat Depth Survey.

Groundwater

7.16 BGS 1:625,000 hydrogeological mapping⁴⁴ indicates that the bedrock underlying the Development Site consists of low productivity aquifer with limited groundwater occurring in the near surface weathered zone, secondary fractures and rare springs.

7.17 Saturated ground and areas of peatland vegetation were encountered during the site walkover with potential for Groundwater Dependent Terrestrial Ecosystems (GWDTE) to be present. GWDTE are protected under the Water Framework Directive and NVC data will be assessed for groundwater dependency as part of the EIA.

Water Supplies

7.18 Consultation will be undertaken with Aberdeenshire Council throughout the EIA process. It is requested that the Council provides the Developer with records of any private water supplies (PWS) within 2km of the Site Boundary.

7.19 Consultation will be undertaken with SEPA throughout the EIA process. It is requested that SEPA provide the Developer with details of licenced abstractions within 2km of the Site Boundary.

Potential Impacts

Surface Water Flow and Level Alterations

7.20 Construction of new access tracks, turbine hard standings and other impermeable infrastructure, has the potential to affect the infiltration rates across the site, generating increased surface water run-off, and to alter flow paths producing both upstream and downstream impacts. Increased or altered surface water runoff has the potential to cause increased erosion and sedimentation.

Groundwater Flow and Level Alterations

7.21 The Proposed Development would have the potential to alter the existing drainage pattern through the stripping of vegetation and the creation of open voids into which surface and groundwater can collect. Access track and turbine foundations also have the potential to alter groundwater flow paths.

7.22 Groundwater flow and levels providing baseflow to watercourses and potential abstractions have the potential to be impacted through dewatering of turbine foundations and temporary borrow pits, although given the nature of the low productivity aquifer and the presence of peat deposits this impact would likely be limited to the Development Site.

7.23 The Proposed Development would also have the potential to impact any GWDTE at the Development Site and within the receiving water environment.

Disturbance of Peat

7.24 Previous survey work has established that areas of the site are underlain by peat. The proposals therefore have the potential to result in the disturbance, loss or instability of soils, particularly peat, including its compaction, oxidation and landslide risk.

Flooding

7.25 SEPA's Indicative Flood Maps (SEPA, 2014) do not indicate any risk of pluvial flooding or fluvial flooding within the Development Site. However the mapping does show a High risk of fluvial and Pluvial flooding in the vicinity of the Development Site corresponding to the channel and floodplains of watercourses draining from the Development Site.

7.26 In order to fully inform the EIA, flood risk will be considered in further detail in the Hydrology and Hydrogeology EIA Report chapter.

Sediment Discharges

7.27 There would be the potential for an increased release of sediment to surface water and groundwater receptors as a result of the following activities:

- Stripping of soil;
- Excavation of turbine and access track foundations and ancillary infrastructure; and
- Felling of forestry.

7.28 The level of risk to drainage ditches at the Development Site and nearby watercourses will be assessed further in the Hydrology and Hydrogeology EIA chapter.

7.29 Erosion and run-off from exposed excavations and soil and overburden stockpiles could increase sediment loading and degrade the surface and groundwater quality. It could also potentially change the substrate characteristics. If uncontrolled, such effects may adversely affect water quality downstream of the Development Site.

Contaminant Discharges

7.30 The Proposed Development could also increase risk from accidental pollution incidents affecting surface water or groundwater, within the receiving water environment.

⁴⁴ BGS (n.d.). GeolIndex Onshore Viewer. British Geological Society

- 7.31 Oils, fuels and hydraulic fluids are hazardous (List I) substances under the Groundwater and Priority Substances (Scotland) Regulations 2009 and their ingress to groundwater must be prevented. Oil and fuel spillages would also have a detrimental impact on surface water quality and could affect fauna and flora. The most likely sources of oils, fuels and other hydraulic fluids are:
- Spillage or leakage of oils, fuels or hydraulic fluids from site vehicles and machinery; and
 - Spillage of oil or fuel from refuelling apparatus.

Restoration

- 7.32 Potential impacts include contamination from oil, fuels and sediment mobilisation during restoration activities.

Potential Mitigation

- 7.33 Mitigation seeks, first, to avoid adverse impacts and, where impacts are unavoidable, to reduce the significance of residual effect to an acceptable level. It also seeks enhancement and compensation, where possible, to provide the best practicable option. As part of the Development Design a 60m buffer to watercourses has been incorporated, and peat >1m in depth has been avoided where possible as shown in Figure 1.2.
- 7.34 The magnitude and extent of effects identified will inform and influence the type of mitigation suitable for the Development Site. Mitigation will be discussed and agreed with the Developer and a summary of the residual impacts following mitigation will be provided.
- 7.35 For a project such as this, typical mitigation includes adopting best practice throughout, implementing and maintaining a suitable drainage and settlement system, locating stockpiles on level ground where possible, ensuring all personnel are aware of and understand the risks of water contamination and adopting specific measures as required in line with the SEPA Pollution Prevention Guidelines (PPGs) and Guidance for Pollution Prevention (GPPs).
- 7.36 Sustainable Drainage Systems (SuDS) principles will be followed to manage water on site, with a construction SuDS and pollution prevention plan outlined in the Construction Environmental Management Plan (CEMP) prior to construction and put in place throughout construction works.

Assessment Methodology

- 7.37 The assessment will follow standard Environmental Impact Assessment (EIA) procedures which include:
- Desk based study;
 - Consultation with key stakeholders;
 - Establishing the existing baseline conditions;
 - Identifying potential environmental impacts including cumulative and in-combination impacts;
 - Assessment of potential environmental impact magnitude;

- Identification and assessment of mitigation measures; and
 - Statement of residual effects.
- 7.38 The assessment will be conducted in accordance with current legislation and good practice guidance including:
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide (SEPA);
 - Control of water pollution from construction sites. Guidance for consultants and contractors (CIRIA C532);
 - Guidelines for Water Pollution Prevention from Civil Engineering Contracts;
 - Pollution Prevention Guidelines and Guidelines for Pollution Prevention 1 - 26 (as appropriate);
 - Development of a groundwater vulnerability screening methodology for the Water Framework Directive (WFD28), SNIFFER (2004);
 - SEPA Policy No.19: Groundwater Protection Policy for Scotland;
 - Drainage assessment; A guide for Scotland (SUDS Working Party);
 - Planning for SuDS - making it happen (CIRIA);
 - SuDS for roads (SUDS Working Party);
 - The SUDS Manual (CIRIA); and
 - Technical flood risk guidance for stakeholders (SEPA).
- 7.39 The assessment will involve a review of published documents and planning policies relating to receptors scoped into the assessment. Hydrology, water quality, groundwater, PWS/abstractions and peat have been scoped into the assessment. The surface water drainage catchments of the site will also be established. Specifically, baseline work will include a review of OS, SEPA, NatureScot, soils and geology maps; the Flood Estimation Handbook; consultation with stakeholders; an assessment of site hydrology; an assessment of flood risk; an assessment of soil type and sensitivity; and the identification of nearby abstractions including private water supplies.
- 7.40 A summary of the potential water environment effects to be considered within the Hydrology and Hydrogeology EIA Chapter are outlined in Table 7.1 below.

Table 7.1: Summary of Potential Effects.

Receptor	Effects	Scoped In
Hydrology	Flow alterations, flooding, increased sediment discharges and contaminant discharges	Yes
Groundwater	Flow and level alterations, increased sediment discharges, contaminant discharges	Yes
PWS and Abstractions (up to 2km from Site Boundary)	Flow and level alterations, increased sediment discharges, contaminant discharges	Yes (records of PWS are requested from Aberdeenshire Council and details of licenced abstractions are requested from SEPA)
GWDTE	Flow and level alterations (groundwater draw-down / alteration of flow paths)	Yes
Peat	Disturbance and/or loss, peat instability	Yes

Figures

- Figure 7.1 Hydrological Overview
- Figure 7.2 Peat Depth Survey.

8 Noise

Introduction

- 8.1 This chapter sets out the proposed approach to the assessment of potential effects of the Proposed Development in relation to noise during construction and operation.

Legislation, Policy and Guidance

- 8.2 Operational noise shall be assessed in accordance with ETSU-R-97, 'The Assessment and Rating of Noise from Wind Farms', and the Good Practice Guide to its application issued by the Institute of Acoustics in 2013. The proposed methodology is consistent with 'Planning Advice Note 1/2011: Planning and Noise' (PAN 1/2011) and the further guidance provided in the web-based planning advice on renewable technologies for onshore wind turbines.
- 8.3 Construction noise will be assessed in accordance with the procedures recommended by BS 5228-1: 2009, 'Code of practice for noise and vibration control on construction and open sites - Part 1: Noise'. This is consistent with the web-based Scottish Government technical advice on construction noise assessment in 'Appendix 1: Legislative Background, Technical Standards and Codes of Practice'.
- 8.4 Vibration levels due to blasting shall be predicted in accordance with BS 5228-2:2009 'Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration' and assessed in accordance with BS 6472-2: 2008 'Guide to evaluation of human exposure to vibration in buildings - Part 2: Blast-induced vibration'.

Proposed Scope of Assessment

- 8.5 The assessment will consider the potential effects associated with construction and operation of the Proposed Development as detailed below.
- 8.6 An assessment of the potential effects of operational wind farm noise at the nearest residential properties will be undertaken. The operational noise assessment will be carried out on the basis of the broadband noise level with penalties applied for tonality if applicable. It is not proposed to carry out an assessment of the potential effects of noise at specific frequencies, e.g. low frequency noise, the potential effects of other characteristics of the noise e.g. amplitude modulation, or potential effects due to vibration. Further reasoning for the scoping out of these potential effects will be provided as part of the EIA Report.
- 8.7 An assessment of the potential effects due to construction noise, including associated traffic, at the nearest residential properties will also be undertaken. Vibration levels at the nearest residential properties shall be assessed should blasting be required to extract material from any proposed borrow pits.

Baseline Conditions

- 8.8 The noise character of the area is expected to be typical of a rural environment and consist of wind generated noise along with noise from traffic, farm machinery, birds and the occasional overhead aircraft.
- 8.9 Initial design work has taken account of residential properties in the surrounding area with buffers applied which has resulted in the layout presented for scoping. Survey work is required to understand the background noise and assess noise in greater detail to inform the iterative design process.
- 8.10 It is proposed to undertake background noise measurements at representative properties around the site. The survey locations are presented in Appendix 8.1 'Planned Acoustic Assessment' for consultation with Environmental Health although are subject to permission being granted by the residents.

Potential Mitigation

- 8.11 The potential noise effects on nearby residential receptors is being considered in the layout design process by the application of appropriate buffers within which turbines should not be placed.
- 8.12 The baseline noise monitoring results will also feed into the layout design with greater separation distances potentially being required for locations with lower background noise levels and corresponding lower noise limits.
- 8.13 Modern wind turbines can be operated in reduced noise mode should this be necessary to meet noise limits derived according to ETSU-R-97.
- 8.14 Standard good practice measures to reduce noise during construction will be implemented in line with the concept of 'best practicable means' defined by the Control of Pollution Act 1974. Additional mitigation measures could include a reduction in construction activities or traffic during certain periods if appropriate.

Questions

- Do the consultees agree with the proposed assessment methodology?

9 Traffic & Transport

- 9.1 Work has been undertaken to determine that wind turbine components can be delivered to site. Turbine components including towers, nacelle and blades are not currently manufactured in Scotland and so must be delivered initially by sea. Swept Path Analysis (SPA) based on a Vestas V150 turbine has been undertaken for the transport route to site for Abnormal Indivisible Loads (AIL) from two Ports of Entry; Aberdeen and Dundee (see Diagram 9.1). The preferred route is from Aberdeen South Harbour where current expansion work is due to be completed in 2022. This new port has been built to enable the energy transition to renewables in this region and whilst focussed on offshore development, it is an ideal location for facilitating onshore wind too such as the Proposed Development.
- 9.2 Due to construction of the port the specific route is yet to be confirmed, but it is expected that the exit will be via Hareness road. The remaining AIL route to site is outlined below:
- Loads would exit the port onto Hareness road before turning south onto the A956
 - Loads would continue southwest joining the A90 northbound
 - Loads would proceed north on the A90 before joining the A944 westbound,
 - Loads would exit the A944 at Dunecht and proceed south on the B977
 - Loads would continue on the B977 south for approx. 6km to the proposed site access
- 9.3 The preferred route to site shall be presented and assessed in the EIAR as part of any S36 Application. This will include access from the public road to the Wind Turbine Development Area which will be included within an updated Site Boundary (Diagram 12.2 illustrates an indicative route).
- 9.4 An assessment of traffic and transport will consider:
- Baseline conditions on the adjacent public highways including suitability for construction traffic, estimated or recorded current traffic flows of ordinary and HGV traffic and identification of bottlenecks
 - Traffic movements generated during construction, operation and decommissioning
 - Abnormal loads assessment identifying key pinch points, SPA, including any need for road improvements and/or traffic management
 - Magnitude and significance of impact of traffic movements and traffic management
 - Management or mitigation measures, as applicable
- 9.5 Where these are not considered significant or effects can be limited through embedded mitigation including adherence to a Traffic Management Plan, then further detailed assessment will be scoped out.



Diagram 9.1: Potential AIL routes to site

10 Aviation & Infrastructure

Introduction

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

- Civil aviation
- Military interests including aviation and radar
- Public access including Public Rights of Way (PRoW)
- Water, gas and electricity services
- Telecommunications (Telecoms)
- Unexploded Ordnance (UXO)

Aviation

10.2 The EIA Report will include a description of military and civilian aeronautical and radar issues relating to the Proposed Development. Consultation will be undertaken once the locations of the turbines have been finalised with appropriate interested parties. The EIA Report will present the findings of these consultations and all responses received, as well as any predicted impacts on aviation and mitigation required.

10.3 Radar systems can be susceptible to interference from wind turbines as the blade movement can cause intermittent detection by radars within their operating range. This is particularly relevant where there is a line of sight between the radar and the wind turbine development. Due to their height, wind turbines can also impact upon airports and airfields if they protrude into the safeguarding areas above and around them.

10.4 There are a number of aviation interests in the area which could potentially be affected by the Proposed Development (see Diagram 10.1). Initial assessments indicate that the military Air Defence Radar at Buchan, situated approximately 56km from the site, has radar line of sight visibility to the Proposed Development and, Allans Hill, a NATS En Route Ltd (NERL) operated long-range radar, at approximately 62km from the Proposed Development, also has visibility of some of the turbines. NATS also operates the Air Traffic Control (ATC) radar, at Perwinnes, near Aberdeen Airport approximately 20km from the Proposed Development, which also has radar line of sight visibility. Consultation will be undertaken with civil and military aviation stakeholders to agree appropriate mitigation measures.

10.5 A populated Aviation MoD Proforma is provided in Appendix 10.1 for MOD's reference.

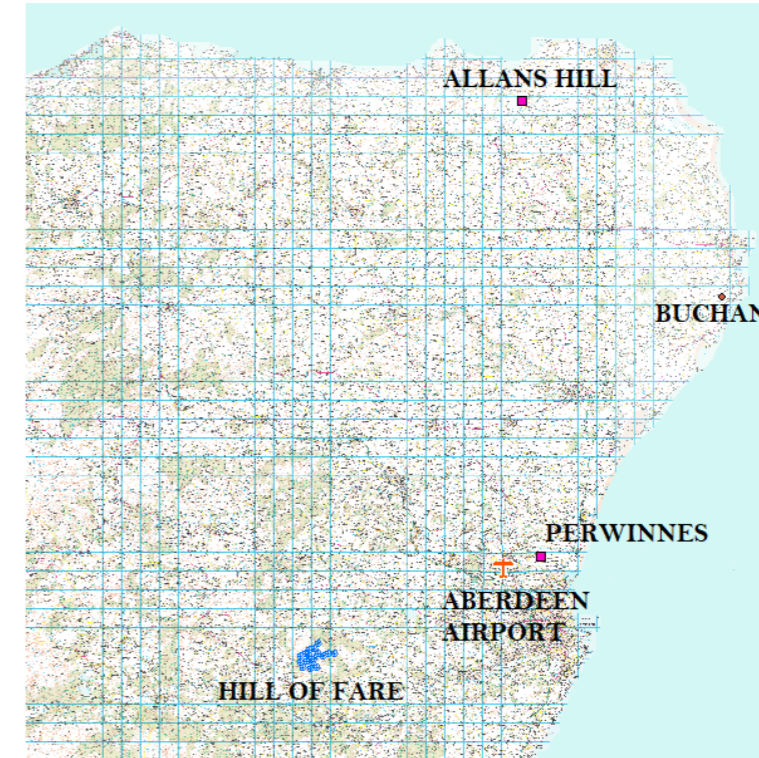


Diagram 10.1: Potential aviation impacts, receptor locations

10.6 The Proposed Development is located in an area where it could cause a physical breach of some of the Instrument Flight Procedures (IFPs) of Aberdeen Airport. An independent assessment has been commissioned by Osprey Consulting to investigate any potential impacts. The conclusion is that the Air Traffic Control Surveillance Minimum Altitude Chart (ATCSMAC) might need to be raised from its existing level. Engagement is being sought directly with Aberdeen Airport to discuss the mitigation options.

10.7 The UK Air Navigation Order (ANO) 2016, Article 222, sets out the statutory requirement for the lighting on en-route obstacles, which applies to structures of 150 m or more above ground level. A visible lighting scheme will be agreed with the Civil Aviation Authority (CAA). The MOD is likely to request an infra-red lighting scheme for low flying military aircraft in the area and this will be agreed through consultation with the MOD.

Infrastructure

Public access

- 10.8 A desk-based study including review of the ScotWays Scottish Hill Tracks and the Aberdeenshire South Core Path Plan indicates there are no PRoW or Core Paths on site.
- 10.9 Nonetheless, it is understood that the area within the site boundary is popular with people for hillwalking and mountain biking, albeit predominately to the eastern portion of the site, away from the Wind Turbine Development Area for which this is partly located.
- 10.10 Whilst there are options in the area for public access to the Hill of Fare, current parking facilities for recreational access to the site are limited. On the east side for example parking is situated on the public roadside (see Diagram 10.2 and also 12.2 for reference). The re-use of temporary construction compounds and site entrance widening will be considered for permanent use as public car parking facilities where appropriate and if deemed to be required post-construction. Associated effects on habitat, GWDTE, watercourses, peat would be assessed.



Diagram 10.2: Site entrance viewing public car parking on road side

Water, gas and electricity

- 10.11 Desk studies indicate there are no public water supplies on site.
- 10.12 There are Private Water Supplies to the eastern area of the site and these will be assessed in the EIAR. Details are being sourced from Dunecht Estates and if necessary further details will be requested from Aberdeenshire Council.
- 10.13 Desk studies indicate no gas network traversing the site.
- 10.14 There is an underground cable running through the Hill of Fare in a north-south direction which is being buffered for peat survey work. However, the landowner has a contractual agreement with the network operator to relocate this cable if required therefore design work is being progressed on the assumption it is moved before construction.
- 10.15 There is an overhead line that crosses over the eastern end of the site and is distant enough not to be affected from the proposed turbines.

Telecoms

- 10.16 A private radio mast is located on Meikle Tap on the eastern side of the site.
- 10.17 Additionally, a telecoms link is understood to bisect the site and has been afforded a buffer to prevent potential interference from turbines. The owner of the link passing through the site has already been consulted and an appropriate buffer agreed for use.

UXO

- 10.18 The general area surrounding Hill of Fare was subject to artillery testing during World War Two. A UXO study has been undertaken by 1stLineDefence to determine the risk of discovering UXO on site. It is also understood that the Hill of Fare has been actively managed by Dunecht Estates including muirburning and nothing of this UXO nature has been found to date. Appropriate risk controls will be implemented during the EIA and more so through construction during intensive groundworks. No further assessment of UXO is required in the EIA.

11 Socio-economics

- 11.1 It is proposed that the socio-economic assessment would be based upon three economic boundaries (local, regional and national economy) and assess the following:
- existing economic environment using official data on population, industrial structure, unemployment and economic activity levels, income and earnings
 - the potential economic effects during the development and construction phase of the project including direct employment, supplier effects and income effects
 - the potential economic effects during the operation of the wind farm including direct employment, infrastructure improvements, business rates, and potential community benefits
 - consider and report on mitigation and management measures which could be employed to minimise any negative impacts and maximise potential positive impacts
- 11.2 As part of the proposed socio-economic assessment, the social and economic effects associated with the Proposed Development will be identified and likely to include the following:
- direct and supply chain impacts
 - the total amounts predicted to be spent in terms of construction and operation
 - predicted numbers of jobs supported in the operational phase
 - predicted spending on accommodation & local businesses - details of accommodation stayed in by construction workers
 - electricity generated annually (MWh)
 - investment in transport infrastructure
- 11.3 There are natural crossovers in this assessment with elements of other chapter topics including LVIA and Infrastructure. The Hill of Fare is an area where people enjoy outdoor recreational activities and there are opportunities to enhance these through the Proposed Development as noted elsewhere in this report. The Developer will liaise with the landowner and consult the public with ideas welcomed for improving recreation and what might be classed tourism related activities in this area.
- 11.4 An audit of tourism activities, patterns, trends, and facilities locally and the wider region will be prepared. The audit covers aspects which make up the tourism product in the area, act as a focus or attraction for visitors, and lead to expenditure by tourists and visitors. A summary of the key factors affecting tourism trends and the key drivers influencing the market will also be provided.
- 11.5 A review of research elsewhere into the impacts and effects of wind farms on tourism and recreational visitors/users will be completed to provide a comparative assessment of impact from previous experience. This will be drawn from a wide range of research sources across the UK, but mostly from Scottish experience, including ex-ante (before the event) appraisals of potential impact and ex-post (after the event) assessments of observed impacts.

- 11.6 A do-nothing scenario will be included in the assessment to demonstrate what effects may occur without the Proposed Development.

12 Forestry

- 12.1 There are plots of commercial forestry adjacent to the site boundary owned by the same landowner as the Proposed Development and by other third parties. However, the Wind Turbine Development Area is not forested.
- 12.2 The Hill of Fare is largely bereft of trees. Further east on the site, there are some young sporadic trees on the site, some of which might need removed to facilitate upgrading the existing access track, see Diagram 12.1.



Diagram 12.1: View east of Hill of Fare looking east towards Greymore

- 12.3 There is existing commercial forestry surrounding the existing access track adjacent to the eastern end of the Site Boundary where the site entrance is expected to be. This area of forestry is managed by the Proposed Development's landowner. There would be some felling required to develop the tracks here and extraction volume will be dependent upon extent of construction activity required there.

- 12.4 Diagram 12.2 provides a Google Earth view of a potential access route from the B977 on existing access track through the forest, shown as a green line.

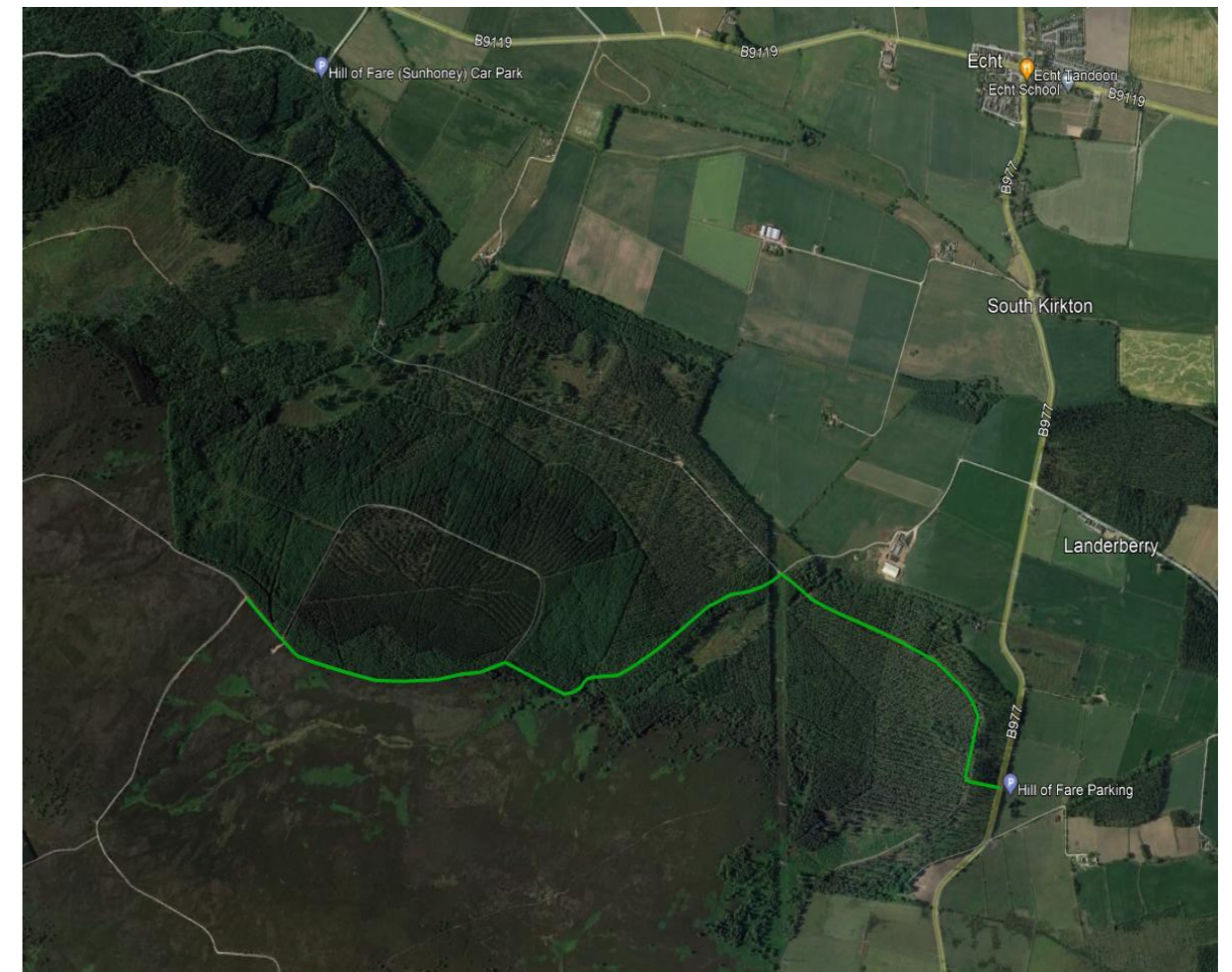


Diagram 12.2 Satellite view of potential access through existing forestry following existing access tracks

- 12.5 A map will be provided in the EIAR detailing the areas where tree management is required and quantifying the expected tree removal needed.

13 Synergistic Effects and Summary of Mitigation and Residual Effects

- 13.1 This chapter will present the synergistic effects associated with the Proposed Development. An assessment of synergistic effects ensures that the assessments provided in the EIAR for each topic are not considered in isolation. Such effects are those which are a result of the combination of independent impacts.
- 13.2 The EIAR will consider potential synergistic effects upon the:
- physical environment (e.g. LVIA, Hydrology, Cultural Heritage, Forestry),
 - population and human health (e.g. LVIA, Noise, Shadow Flicker, Traffic, Socioeconomics, Aviation, Infrastructure)
 - biological environment (Ecology, Ornithology).
- 13.3 The EIAR chapter will also identify all mitigation, including the mitigation by design that will be undertaken to reduce any adverse effects and summarise the residual effects regarding all of the proposed work in relation to the construction, operation and decommissioning of the Proposed Development.

14 Responding to the Scoping Report

- 14.1 This document has been prepared in anticipation of an application under Section 36 of the Electricity Act 1989 for a renewable electricity generating station including wind farm and battery at the Hill of Fare in Aberdeenshire.
- 14.2 Consultee responses to this report should be directed to the Energy Consents Unit which will form a Scoping Opinion.
- 14.3 The Developer will welcome such input and undertake further consultation as needs be with each consultee as the EIA progresses.