

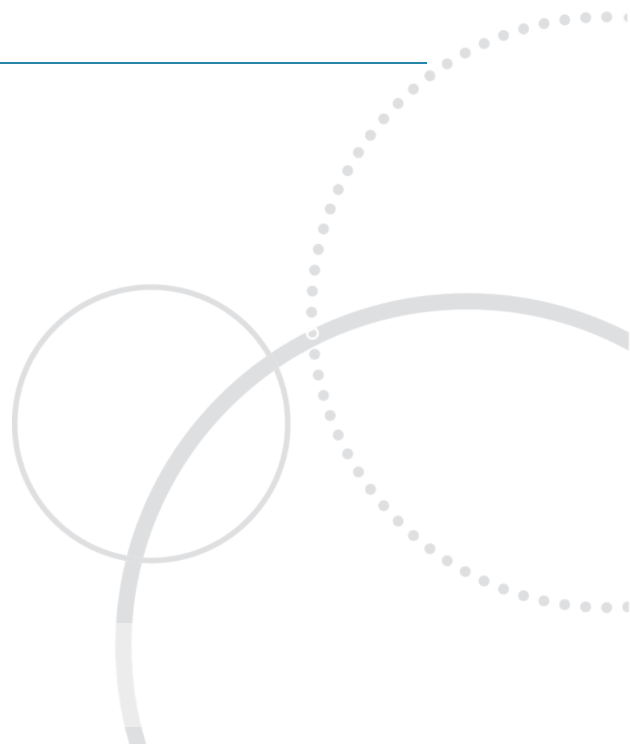


# Torfichen Wind Farm

## EIA Scoping Report

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# Abbreviations

Abbreviation	In Full
AIL	Abnormal Invisible Load
ANO	Air Navigation Order
AOD	Above Ordnance Datum
BAP	Biodiversity Action Plan
BBPP	Breeding Bird Protection Plan
BoCC	Birds of Conservation Concern
BGS	British Geological Survey
BNG	British National Grid
BTO	British Trust for Ornithology
CAA	Civil Aviation Authority
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
DfT	Department for Transport
DTM	Digital Terrain Model
DWPA	Drinking Water Protected Area
EC	European Commission
ECU	Energy Consents Unit
ECoW	Ecological Clerk of Works
ELCAS	East Lothian Council Archaeology Service
EclA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EIA Report	Environmental Impact Assessment Report
EU	European Union
GCN	Great Crested Newt
GDLs	Gardens and Designed Landscapes
GLVIA3	Guidelines for Landscape and Visual Assessment



GWDTE	Ground Water Dependent Terrestrial Ecosystem
HEPS	Historic Environment Policy for Scotland
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HMP	Habitat Management Plan
IBA	Important Bird Area
IEF	Important Ecological Feature
IEMA	Institute of Environmental Assessment
KGV	King George V Glasgow
LCT	Landscape Character Type
LBAP	Local Biodiversity Action Plan
LVIA	Landscape and Visual Impact Assessment
MC	Midlothian Council
MLDP	Midlothian Local Development Plan
MOD	Military of Defence
NCV	Nature Conservation Value
NHZ	Natural Heritage Zone
NPF3	National Planning Framework 3
NPF4	National Planning Framework 4
NRTF	National Road Traffic Forecast
NS	NatureScot
NSA	National Scenic Area
NVC	National Vegetation Classification
OFCOM	Office of Communication
OWPS	Onshore Wind Policy Statement
PAC	Pre-Application Consultation
PAN	Planning Advice Note
PHLRA	Peat Hazard Landslide Risk Assessment
PPA	Power Purchase Agreement
PRA	Preliminary Roost Assessment
PWS	Private Water Supply



RSPB	Royal Society for the Protection of Birds
RVAA	Residential Visual Amenity Assessment
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SDP	Strategic Development Plan
SEPA	Scottish Environment Protection Agency
SLA	Special Landscape Area
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPA (chapter 9)	Swept Path Analysis
SPP	Scottish Planning Policy
SPP (chapter 6)	Species Protection Plan
SSSI	Site of Special Scientific Interest
VP	Vantage Point
ZTV	Zone of Theoretical Visibility



# 1. Introduction

## 1.1 Background & Context

- 1.1.1 Renewable Energy Systems (RES) Ltd. (hereafter referred to as “the Applicant”) intends to apply to Scottish Ministers for permission to construct and operate Torfichen Wind Farm (hereafter referred to as the “Proposed Development”) at a site centred at British National Grid (BNG) 333786 654372.
- 1.1.2 The application will be supported by an Environmental Impact Assessment Report (EIA Report) as required by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (hereafter ‘the EIA Regulations’). This document forms the EIA Scoping Report submitted to the Scottish Government’s Energy Consents Unit (ECU) in order to request an EIA Scoping Opinion, on the content of the Environmental Impact Assessment (EIA) of the Proposed Development.
- 1.1.3 The Proposed Development would comprise c.19 turbines, each c.180 m from ground to blade tip when vertical. Its total generating capacity is anticipated to be in the region of 114 MW. The ancillary infrastructure is expected to include: temporary construction compound(s); crane pads; temporary laydown areas adjacent to the turbines; access tracks; watercourse crossings; underground cables between turbines; electrical switching station; on-site substation and control building; battery storage infrastructure; a gatehouse compound; telecoms mast; concrete batching plant; drainage and drainage attenuation measures (as required) and potential excavations/borrow workings.

## 1.2 Need for Development

- 1.2.1 The science behind climate change is well established and points strongly towards a need to reduce our reliance on fossil fuels in order to avoid negative economic, environmental, and social effects. International and European commitments to reducing CO<sub>2</sub> and tackling climate change have been made by all major economies. In response to these issues the UK has made significant, legally binding commitments to increase the use of renewable energy. The Proposed Development relates directly to those commitments.

## 1.3 The Applicant

- 1.3.1 The Applicant is the world’s largest independent renewable energy company, active in onshore and offshore wind, solar, energy storage and transmission and distribution. At the forefront of the industry for over 40 years, the Applicant has delivered more than 23 GW of renewable energy projects across the globe and supports an operational asset portfolio exceeding 10 GW worldwide for a large client base. Understanding the unique needs of corporate clients, the Applicant has secured 1.5 GW of power purchase agreements (PPAs) enabling access to energy at the lowest cost. The Applicant employs more than 2,500 people and is active in 11 countries. In the UK alone the Applicant is responsible for approximately 10% of the current wind energy capacity.
- 1.3.2 From its Glasgow office the Applicant has been developing, constructing, and operating wind farms in Scotland since 1993. The Applicant has developed and/or built 21 wind farms in Scotland with a total generation capacity of 597 MW and has recently finished constructing the Blary Hill Wind Farm in Argyll and Bute.

## 1.4 ITP Energised

- 1.4.1 ITP Energised (ITPE) have been commissioned by the Applicant to coordinate the EIA process for the Proposed Development.



- 1.4.2 ITPE has supported, assessed, and reported on numerous wind farm and other renewable energy technology applications across Scotland, from single turbine applications to wind farms delivering over 100 MW, solar farms, battery storage and other renewable technologies. Our team has delivered, or are currently working on, EIAs and environmental planning support for over 50 onshore wind farm sites in Scotland and our team members have collectively worked on many more in previous employment.

## 1.5 The Purpose of the EIA Scoping Report

- 1.5.1 The purpose of this EIA Scoping Report is to request that the Scottish Ministers adopt a Scoping Opinion as per Regulation 12(1) of the EIA Regulations as to the scope and level of detail of information to be provided in the EIA Report. The Scoping Opinion will be adopted following consultation with the consultation bodies and other interested public bodies.
- 1.5.2 The Applicant recognises the value of the scoping approach, and the purpose of this report is to ensure that information is provided in accordance with the EIA Regulations, Regulation 12(2).
- 1.5.3 This EIA Scoping Report:
- describes the existing site and its context;
  - describes the nature and purpose of the development;
  - identifies key organisations to be consulted in the EIA process;
  - establishes the format of the EIA Report;
  - provides baseline information; and
  - describes potential significant effects and the proposed assessment methodologies for various technical assessments to be covered in the EIA Report.
- 1.5.4 In addition, each technical chapter concludes by listing the key questions we would like the Scoping Opinion to answer.

## 1.6 Environmental Impact Assessment

- 1.6.1 The EIA Regulations require that before consent is granted for certain types of development, an EIA must be undertaken. The EIA Regulations set out the types of development which must always be subject to an EIA (Schedule 1 development) and other developments which may require EIA if there is the potential for significant environmental effects as a result of the development (Schedule 2 development).
- 1.6.2 The Proposed Development falls within Schedule 2 of the EIA Regulations and has the potential to have some significant environmental effects. Therefore, it is the opinion of the Applicant that the Proposed Development qualifies as “EIA Development” and therefore the Applicant will voluntarily submit an EIA Report, as part of a Section 36 application and has not requested an EIA Screening Opinion.
- 1.6.3 EIA is a process which includes the requirement for the preparation of an EIA Report by the developer. This, amongst other matters is required to provide a description of the potential significant environmental effects of the development proposed. The work involved in this process informs the eventual design of the proposals. The final design will seek to avoid, reduce, offset and minimise any adverse environmental effects through mitigation. The EIA Report considers the effects arising during the construction and operation phases. Decommissioning effects would be similar or less than those arising from construction. As such, it is proposed that decommissioning effects are Scoped Out of the EIA Report. Consultation is an important part of the EIA Report preparation process and assists in the identification of potential effects and mitigation measures.





- 1.6.4 The structure of the EIA Report will follow the requirements of the EIA Regulations (Schedule 4) and other relevant good practice guidance. The EIA Report will comprise six volumes:
- Volume 1 – Non-Technical Summary;
  - Volume 2 – Written Statement;
  - Volume 3 – Figures;
  - Volume 4 – Landscape and Visual Impact Assessment: Visualisations;
  - Volume 5 – Technical Appendices; and
  - Volume 6 – Confidential Annex.
- 1.6.5 Chapters 1 to 5 of Volume 2 will comprise:
- an introduction;
  - a description of the Proposed Development;
  - a description of the site selection and design iteration process;
  - information on the approach to EIA and determination of significance of effects; and
  - a summary of the relevant planning and energy policy considerations.
- 1.6.6 The remainder of Volume 2 will present a description of effects in respect of a range of environmental topics. Based on available baseline environment information and the details of the Proposed Development, the environmental topics have been scoped on the basis of the potential for significant environmental effects. This has determined the need to undertake impact assessment to investigate each potential effect. Each of the topics will be reported as a chapter of Volume 2. The EIA Report will reference figures and technical studies, which will correspond to Volumes 2 to 6. The following topics will be considered:
- Chapter 6: Landscape and Visual;
  - Chapter 7: Cultural Heritage;
  - Chapter 8: Ecology;
  - Chapter 9: Ornithology;
  - Chapter 10: Geology, Hydrology & Hydrogeology;
  - Chapter 11: Traffic and Transport;
  - Chapter 12: Noise and Vibration;
  - Chapter 13: Potential Grid Connections;
  - Chapter 14: Socio-economics Assessment;
  - Chapter 15: Climate Change Assessment;
  - Chapter 16: Other Assessments (Aviation and Shadow Flicker);
  - Chapter 17: Schedule of Mitigation; and
  - Chapter 18: Summary of Residual Effects.
- 1.6.7 A standalone Planning Statement assessing the Proposed Development against all relevant planning and energy policy, along with a Pre-Application Consultation (PAC) Report explaining the consultation carried out with the local communities about the Proposed Development will also accompany the planning application.
- 1.6.8 Early consultation is key in the development process, and throughout the Applicant will ensure that local communities and stakeholders are given the opportunity to provide feedback and are kept informed of project progress.



## 2. Proposed Development

### 2.1 Site Description

- 2.1.1 The site is located approximately 8 km south-west of Penicuik and 14 km north-east of Stow within the northern edge of the Moorfoot Hills (refer to **Figure 2.1**) in the Midlothian Council (MC) area. Gorebridge village is located approximately 4 km north of the site.
- 2.1.2 The site comprises an area of 1529 hectares (ha). The Proposed Development is set within a mixed landscape of undulating farmland, fragmented moorland and forestry / small woodlands which is populated sparsely with settlements. The elevation varies from 240 m Above Ordnance Datum (AOD) along the northern boundary of the site to 510 m AOD near the summit of Mauldslie Hill. Elevation generally decreases towards the north-west.
- 2.1.3 Moorfoot Hills Special Area of Conservation (SAC), Site of Special Scientific Interest (SSSI), and RSPB Important Bird Area (IBA) is immediately adjacent to the southern boundary of the site, more than 700 m from the closest proposed turbine. The western boundary of the site falls within the edge of the Gladhouse Reservoir SSSI, Special Protection Area (SPA), Ramsar and IBA, more than 900 m from the closest proposed turbine. There are some areas of Ancient Woodland on site, although the turbines have been positioned outwith these areas.
- 2.1.4 The site is primarily agricultural, predominately used for livestock farming.

### 2.2 Proposed Development Description

- 2.2.1 The Proposed Development will consist of 19 standalone, three bladed horizontal axis turbines. An indicative site layout, including indicative turbine locations is provided in **Figure 2.2**. The indicative turbine locations are noted in **Table 2.1**.

**Table 2.1 – Proposed Indicative Turbine Coordinates (BNG)**

Turbine Number	X Coordinate	Y Coordinate
1	331999	653946
2	332146	653507
3	332193	653028
4	332668	653392
5	333220	653351
6	333100	653797
7	332461	654371
8	332951	654230
9	333418	654677
10	333501	654221
11	333774	653787
12	334207	654237
13	333969	654666
14	334776	654789
15	334447	655405

Turbine Number	X Coordinate	Y Coordinate
16	334896	655969
17	335240	655183
18	335785	655528
19	335434	655900

- 2.2.2 The turbines will be c.180 m from ground to blade tip when vertical, each with a generating capacity of c.6 MW.
- 2.2.3 In addition to the turbines, the following ancillary elements are expected to be required:
- temporary construction compound;
  - crane pads;
  - temporary laydown areas adjacent to the turbines;
  - access tracks;
  - watercourse crossings;
  - underground cables between turbines;
  - electrical switching station;
  - onsite substation and control building;
  - battery storage infrastructure;
  - a gatehouse compound;
  - telecoms mast;
  - concrete batching plant;
  - drainage and drainage attenuation measures (as required); and
  - potential excavations/borrow workings.
- 2.2.4 The parameters of the EIA will be such that an appropriate level of assessment is undertaken for a given hub height and rotor diameter, within the envelope of a maximum tip height. The indicative turbine locations will evolve in response to the ongoing detailed assessment work, taking consideration of the environmental effects, terrain, current land use, technical and health and safety issues. The parameters of the Proposed Development will be explicitly identified in the EIA Report. The final locations of the turbines will be 'frozen' at an appropriate time in order to enable the EIA Report to describe fully the Proposed Development for which Section 36 consent is sought.
- 2.2.5 Whilst the location of the infrastructure will be determined through an iterative environmental based design process, there is the potential for these exact locations to be further optimised through micro-siting allowances prior to construction. In this regard, the Applicant proposes a micro-siting allowance of up to 50 m in all directions within the site boundary in respect of each turbine and the ancillary infrastructure in order to address any potential difficulties which may arise in the event that preconstruction surveys identify unsuitable ground conditions or environmental constraints that could be avoided.
- 2.2.6 Consent will be sought for an operational life of 50 years from the date of commissioning the turbines.
- 2.2.7 Based on the preliminary, indicative layout being considered, the Proposed Development would provide a total generating capacity of approximately 114 MW (based on 19 turbines each with a 6 MW rated capacity).



## 2.3 Cumulative Developments

- 2.3.1 The EIA Regulations state that cumulative effects should be considered as a part of the EIA. It will therefore be important to consider the cumulative effects of the Proposed Development with other developments in the area, including those that are currently operational, consented and in planning. The cumulative assessment will also consider the cumulative effects of different elements of the Proposed Development on environmental media and sensitive receptors, and in particular the cumulative effects of different effects upon individual and groups of receptors.
- 2.3.2 Operational wind farms in the immediate area include Carant, Bowbeat Hill, Toddleburn and Dun Law and Dun Law Extension.
- 2.3.3 Other operational and consented wind farms as well as those at the application stage, within 20 km of the Proposed Development, are illustrated in **Figure 4.3**. The methodology to be adopted for assessing the cumulative effects of wind energy developments will be in accordance with the Scottish Natural Heritage (SNH, 2021) Guidance '*Assessing the Cumulative Landscape and Visual Impact of Onshore Wind Energy Developments*'. The scope of the cumulative assessment will be agreed through consultation with MC and NatureScot (NS) (formerly SNH).
- 2.3.4 It should be noted that this record will be updated throughout the EIA process, up to a point prior to submission of the application. We welcome any further information from stakeholders on additional proposed wind farm developments that should be considered.



## 3. Planning and Energy Policy Context

### 3.1 Introduction

- 3.1.1 This chapter presents a summary of relevant policy and guidance documents that will be taken into consideration to help inform the design of the Proposed Development.
- 3.1.2 The EIA Report will set out the relevant policies that have been considered as part of the assessments undertaken throughout the EIA. A separate Planning Statement will provide a detailed appraisal of the Proposed Development against the relevant Development Plan policies, national planning and energy policy and other material considerations.
- 3.1.3 The EIA Report will also concisely reference climate change policy and the contribution of the Proposed Development to the UK and Scottish Government's climate change goals and policy targets.

### 3.2 Project Need and the Renewable Energy Policy Framework

- 3.2.1 The burning of fossil fuels to produce electricity is a major contributor to climate change through the release of atmospheric carbon dioxide (CO<sub>2</sub>) and other harmful gases known collectively as greenhouse gases.
- 3.2.2 The Proposed Development relates to the generation of electricity from renewable energy sources and comes as a direct response to national planning and energy policy objectives. The clear objectives of the UK and Scottish Governments will be summarised, in relation to encouraging increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.
- 3.2.3 The *Scottish Government's Energy Strategy* (2017) set a target for the equivalent of 50% of the energy for Scotland's heat, transport and electricity consumption to be supplied from renewable sources. As heat and transport become decarbonised, demand for electricity from renewable sources can be expected to increase.
- 3.2.4 Further deployment of renewable energy generating technology will be required throughout the 2020s in order to meet targets. As a mature technology onshore wind has a continuing and important role to play, as confirmed by national planning and energy policy and most recently in the draft NPF4.
- 3.2.5 The *Scottish Government's Energy Strategy* and *Onshore Wind Policy Statement* (2017) (OWPS) set out *inter alia* that onshore wind is to play a vital role in Scotland's future – helping to substantively decarbonise electricity supplies and the technology is expected to play a material role in growing the economy.
- 3.2.6 Scotland's overarching statutory target is to achieve a 100% reduction in greenhouse gas emissions to net-zero by 2045, with interim targets of 75% by 2030 and 90% by 2040, now provided for in the *Climate Change (Scotland) Act 2009* as amended by the *Climate Change (Emissions Reductions Targets) (Scotland) Act 2019* ("2019 Act") which came into force in March 2020.
- 3.2.7 The Scottish Government declared a climate emergency on 14 May 2019. The declaration of an "emergency" is a reflection of both the seriousness of climate change and its potential effects and the need for urgent action to cut carbon dioxide emissions. The declaration is a material consideration which will be referenced.



3.2.8 The draft Refresh OWPS was published in 2021 and key points which can be drawn from it include:

- The central requirement for a rapid transition to net zero and the crucial role of further onshore wind development in achieving legally-binding targets, especially through the 2020s.
- Unequivocal Scottish Government policy support for the future role of onshore wind.
- The urgency of the Climate Emergency and the scale of the necessary ambition – there is express recognition in the draft OWPS of the need for *‘meaningful action over the next 12 months’*, *‘further and faster’* delivery and that a *‘consistently higher rate of onshore wind, and other renewables capacity, will be required year-on-year’*. The scale of deployment required to be operational before 2030 is very considerable and way beyond what has happened in the past.
- The draft Refresh OWPS is clear (*paragraph 4.4.2*) that the *‘most cherished landscapes’* must be afforded the necessary protections, but climate change and net-zero require decisive action and this will inevitably change how Scotland looks. Combatting climate change requires modern and efficient turbines (which *paragraph 2.2.3* of the draft Refresh OWPS confirms means taller turbines).

3.2.9 A large increase in the deployment of this renewable energy technology is supported through a number of UK level policy documents including the latest *UK Energy White Paper* (2020) and *Net Zero Strategy* (2021). Scottish Government policy commitments are also clear – most recently expressed in the draft Refresh OWPS and in the draft NPF4 which will be material to the energy and national planning policy positions to be considered for the determination of the application.

### 3.3 National Planning Policy and Guidance

#### National Planning Framework for Scotland (2014)

3.3.1 The National Planning Framework 3 (NPF3) is a long-term strategy for Scotland and is the current spatial expression of the Government Economic Strategy and plans for development and investment in infrastructure. The NPF identifies national developments and other strategically important development opportunities in Scotland.

3.3.2 It is important to note that the latest version of NPF, i.e. NPF4, is soon to come into force. The revised draft NPF4 is referenced below.

#### Scottish Planning Policy (2014)

3.3.3 Scottish Planning Policy (SPP) sets out national planning policies which reflect the Scottish Ministers’ priorities for operation of the planning system and for land use and development. It aims to promote a sustainable place, supporting economic growth, regeneration and appropriately designed development.

3.3.4 The SPP principal policies include a presumption in favour of development that contributes to sustainable development, consideration of renewable energy, sustainable economic development, rural development, historic environment, landscape and natural heritage, transport, flooding and drainage and waste management. All planning policies on these topics contained in SPP will therefore be taken into account.

#### Draft National Planning Framework 4 (2021)

3.3.5 The draft NPF4 has been subject to consultation and committee scrutiny over the last year and was first laid before the Scottish Parliament in November 2021. Once approved, it will become part of statutory Development Plan. The revised NPF4 was laid before the Scottish Parliament on 8th November 2022 for approval.

3.3.6 This is the final stage of NPF4 being examined before adoption. The revised NPF4 will be before the Scottish Parliament for six weeks and the expectation is that it will come into force in December 2022.



- 3.3.7 Whilst it is before Parliament, there is the opportunity for the revised NPF4 to be debated, however, its terms will not be subject to change - it will either be approved in whole or rejected. The Scottish Government has committed to providing an opportunity for evidence to be given by the Parliament's Local Government, Housing and Planning Committee, to allow for an informed vote.
- 3.3.8 Despite the changes that have been made to the draft that is now before Parliament, the Scottish Government has confirmed that no further consultation will take place.
- 3.3.9 Annex A of the document explains how NPF4 is to be used. It states:
- 'The purpose of planning is to manage the development and use of land in the long-term public interest ... Scotland in 2045 will be different. We must embrace and deliver radical change so we can tackle and adapt to climate change, restore biodiversity loss, improve health and wellbeing, reduce inequalities, build a wellbeing economy and create great places.'*
- 3.3.10 It states that NPF4 is required by law to set out the Scottish Ministers' policies and proposals for the development and use of land. It adds:
- 'It plays a key role in supporting the delivery of Scotland's national outcomes and the United Nations Sustainable Development Goals. NPF4 includes a long-term spatial strategy to 2045.'*
- 3.3.11 Annex A adds that NPF4 is required by law to contribute to six outcomes. These relate to meeting housing needs, health and wellbeing, population of rural areas, addressing equality and also *'meeting any targets relating to the reduction of emissions of greenhouses gases, and, securing positive effects for biodiversity'*.
- 3.3.12 Page 97 of NPF4 sets out that 18 national developments have been identified. These are described as *'significant developments of national importance that will help to deliver the spatial strategy... National development status does not grant planning permission for the development and all relevant consents are required'*.
- 3.3.13 It adds that *'Their designation means that the principle for development does not need to be agreed in later consenting processes, providing more certainty for communities, businesses and investors. ...In addition to the statement of need at Annex B, decision makers for applications for consent for national developments should take into account all relevant policies'*.
- 3.3.14 Annex B of NPF4 sets out the various national developments and related statements of need.
- 3.3.15 National Development 3 (ND3) is *'Strategic Renewable Electricity Generation and Transmission Infrastructure'*.
- 3.3.16 Page 103 of NPF4 describes ND3 and it states:
- 'This national development supports renewable electricity generation, repowering, and expansion of the electricity grid.*
- A large and rapid increase in electricity generation from renewable sources will be essential for Scotland to meet its net zero emissions targets. Certain types of renewable electricity generation will also be required, which will include energy storage technology and capacity, to provide the vital services, including flexible response, that a zero carbon network will require. Generation is for domestic consumption as well as for export to the UK and beyond, with new capacity helping to decarbonise heat, transport and industrial energy demand. This has the potential to support jobs and business investment, with wider economic benefits.*
- The electricity transmission grid will need substantial reinforcement including the addition of new infrastructure to connect and transmit the output from new on and offshore capacity to consumers in Scotland, the rest of the UK and beyond. Delivery of this national development will be informed by market, policy and regulatory developments and decisions.'*
- 3.3.17 The location for ND3 is set out as being all of Scotland and in terms of need it is described as:



*'Additional electricity generation from renewables and electricity transmission capacity of scale is fundamental to achieving a net zero economy...'*

- 3.3.18 Reference is made in NPF4 to the designation and classes of development, and it states in this regard:

*'A development contributing to "Strategic Renewable Electricity Generation and Transmission" in the location described, within one or more of the Classes of Development described below and that is of a scale or type that would otherwise have been classified as "major" by "The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009", is designated a national development:*

*(a) on and off shore electricity generation, including electricity storage, from renewables exceeding 50 megawatts capacity..'*

- 3.3.19 The Proposed Development would have national development status when NPF4 comes into force.

- 3.3.20 NPF4 contains new national planning policy. Relevant policies include the following:

- Policy 1: Tackling the Climate and Nature Crisis;
- Policy 3: Biodiversity;
- Policy 4: Natural Places;
- Policy 5: Soils;
- Policy 6: Forestry, Woodland and Trees;
- Policy 7: Historic Assets and Places; and
- Policy 11: Energy.

- 3.3.21 The policies may be subject to some changes at this final Parliamentary stage. The two most relevant policies are Policy 1 and 11.

- 3.3.22 As noted, it is expected that the NPF4 will come into force in December 2022 and will therefore be a key policy consideration for the determination of the Proposed Development.

## 3.4 The Development Plan

- 3.4.1 The planning policy context applicable to the site will be taken into account in the iterative EIA design process. The relevant planning policy framework will also be described in the EIA Report.

- 3.4.2 The statutory Development Plan for the site comprises:

- The Strategic Development Planning Authority for Edinburgh and South East Scotland Strategic Development Plan (SDP) (adopted 27 June 2013) (SESplan); and
- The Midlothian Local Development Plan (adopted 7<sup>th</sup> November 2017) (MLDP).

- 3.4.3 The policies from SESplan are of limited relevance for the consideration of the Proposed Development and include:

- Policy 10 'Sustainable Energy Technologies'; and
- Policy 1B 'The Spatial Strategy: Development Principles'.

- 3.4.4 The SDP is over 5 years old. The replacement SDP known as 'SDP2' has been through the Examination process. However, following Examination the Scottish Ministers rejected the proposed SDP2 and its provisions are of no relevance.

- 3.4.5 The MLDP will soon be over five years old. The replacement MLDP (to be known as 'MLDP2') will be based on the provisions of the new NPF4. The latest Development Plan Scheme for Midlothian





indicates that MLDP2 will be adopted as soon as possible after NPF4 comes into force and states that this will be sometime in 2026.

- 3.4.6 The current MLDP also contains related Supplementary Guidance (SG) and relevant SG relates to Wind Energy Development, Special Landscape Areas and Nature Conservation.
- 3.4.7 The policies from the MLDP relevant to the consideration of the Proposed Development and for the purposes of a comprehensive policy assessment (which as noted will be contained in a separate Planning Statement) include:
- Policy RD1 'Development in the Countryside';
  - Policy ENV5 'Peat and Carbon Rich Soils';
  - Policy ENV6 'Special Landscape Areas';
  - Policy ENV7 'Landscape Character';
  - Policy ENV9 'Flooding';
  - Policy ENV10 'Water Environment';
  - Policy ENV11 'Woodland, Trees and Hedges';
  - Policy ENV12 'Internationally Important Nature Conservation Sites';
  - Policy ENV13 'Nationally Important Nature Conservation Sites';
  - Policy ENV14 'Regionally and Locally Important Nature Conservation Sites';
  - Policy ENV15 'Species and Habitat Protection and Enhancement';
  - Policy ENV18 'Noise';
  - Policy ENV19 'Conservation Areas';
  - Policy ENV20 'Nationally Important Gardens and Designed Landscapes';
  - Policy ENV22 'Listed Buildings';
  - Policy ENV23 'Scheduled Monuments';
  - Policy ENV24 'Other Important Archaeological or Historic Sites';
  - Policy ENV25 'Site Assessment, Evaluation and Recording';
  - Policy NRG1 'Renewable and Low Carbon Energy Projects'; and
  - Policy NRG2 'Wind Energy'.

## 3.5 Conclusions

- 3.5.1 The Proposed Development will clearly make a contribution to the attainment of renewable energy and electricity targets and emissions reduction at both the Scottish and UK levels and the quantification of this contribution would be described.
- 3.5.2 The EIA Report will summarise the renewable energy policy framework, but the detail will be provided in a supporting Planning Statement to accompany the Section 36 application which will also make reference to key policy documents such as the *Scottish Energy Strategy* (2017), the new NPF4, the *Onshore Wind Policy Statement* (2017) and its Refresh which proposes an onshore wind target of an additional 8-12 GW of additional onshore wind capacity to be delivered by 2030.



## 4. Landscape and Visual

### 4.1 Introduction

- 4.1.1 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 Proposed Development, including potentially some significant effects.
- 4.1.2 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.
- 4.1.3 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 and are fully familiar with the landscape in and around this part of Midlothian.
- 4.1.4 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.

### 4.2 Baseline Description

- 4.2.1 The Proposed Development site lies in Midlothian, approximately 4 km to the south-west of Gorebridge and directly to the north of the Moorfoot Hills. There are few settlements in proximity to the Proposed Development, and the road closest to the Proposed Development is the B7007, which runs to the south and east of the site. The Proposed Development is set within a mixed landscape of undulating farmland, fragmented moorland and forestry / small woodlands which is populated sparsely with settlements.
- 4.2.2 The Proposed Development lies within Midlothian, along its southern boundary, with the Scottish Borders area located immediately to the south of the site.

#### Landscape Character

##### National Landscape Character

- 4.2.3 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

- 4.2.4 The Proposed Development is located within two Landscape Character Types; Upland Fringes – Lothians (LCT 269) in the north and Plateau Moorland – Lothians (LCT 266) in the south.
- 4.2.5 The key characteristics of LCT 269 are defined as:
- *'broadly undulating, landforms forming a series of smooth rounded hills and slopes, some steep-sided and some gently sloping, shelving gradually from the Uplands northward to merge with rolling farmlands;*
  - *occasional hills where underlying geology incorporates harder strata;*
  - *varied scale, openness and land use reflecting transitional nature between upland and lowland;*



- *incised watercourses have etched v-shaped valleys into the slopes, often forming deep cleughs;*
- *occasional larger rivers flow through similar, but larger-scale, v-shaped channels;*
- *remnant heather moorland and rough grassland on high ground gives way to improved grassland and then to arable land on the lowest elevations, with a parallel transition from post and wire fence and walls to beech and hawthorn hedges;*
- *some areas of extensive coniferous forest, but tree cover is more frequent in the form of shelterbelts;*
- *deciduous woodland is restricted to steeper land in river channels, though this includes some important ancient woodlands;*
- *dispersed settlement pattern of farmsteads and clusters of cottages, with occasional small villages;*
- *distinctive character of rural road network, dense in places, including local features such as fords and bridges;*
- *quarries, overhead lines and busy A roads which have localised influence in some parts of the landscape;*
- *clearly transitional landscape between lowland and upland characters;*
- *views across the lowland, and to the coast in the east, backed by the ridge lines of the hills to the south.'*

4.2.6 The key characteristics of LCT 266 are defined as:

- *'modest hills and moors forming broad plateaux with rounded, smooth convex hill slopes dissected by a complex tracery of valley landforms which vary in scale and appearance, from minor burn narrow incised gullies to occasional wider flat-bottomed valleys of larger rivers;*
- *medium to large scale landscape;*
- *open upland character with sparse tree cover;*
- *expanses of heather moorland, with rough grasses on upper slopes, with poor rough grassland and occasional improved pasture on lower slopes;*
- *generally unenclosed, with some post and wire fences along roads and access tracks, and occasional stone sheep stells and walls around farmsteads;*
- *sparsely inhabited, with scattered farmsteads in valleys;*
- *reservoirs creating local focal points;*
- *historic human influences evident in the many enclosures, cairns, hill forts and stone circles;*
- *steep north-facing scarps with spectacular panoramic views overlooking the coastal plain of Lothian to the north with views across the Firth of Forth;*
- *forms the skyline when viewed from the lower land to the north.'*

**Regional/Local Landscape Character Types covering the Site**

- 4.2.7 At the regional level, the 'Landscape Capacity Study for Wind Turbine Development in Midlothian (2007)' defined Landscape Character Types and Areas, based on the character areas identified in the earlier 'Lothians Landscape Character Assessment (SNH 1998)'. These areas follow the same boundaries as the current National Character Types, but with the LCT 269 area known as the 'Gladhouse/Auchencorth Moorlands' and the LCT 266 area known as the 'Moorfoot Hills'.
- 4.2.8 The Capacity Study went on to further sub-divide the 'Gladhouse/Auchencorth Moorlands' area into two sections, known as the 'Moorland Fringes' and the 'Lowland Moorlands'. The 'Lowland Moorlands' were ascribed as having a 'medium-high' sensitivity to wind energy, with the 'Moorland Fringes' and the 'Moorfoot Hills' ascribed a 'medium' sensitivity.



## Landscape Designations

- 4.2.9 The Proposed Development is not located within a nationally designated landscape. The nearest National Scenic Area (NSA) is 'Eildon and Leaderfoot' which lies 15 km to the south-west of the site.
- 4.2.10 The Proposed Development is however located within the locally designated Special Landscape Area (SLA) Gladhouse Reservoir and Moorfoots Scarp as identified within the adopted Midlothian Local Development Plan, Special Landscape Areas Supplementary Guidance, 2018. Key reasons why this area is identified as an SLA are set out in the Supplementary Guidance as follows:
- *'the open and naturalistic character of Gladhouse Reservoir and its scenic juxtaposition with the dramatic scarp of the Moorfoot Hills and the deeply incised South Esk valley;*
  - *the mix of trees and woodland, and well-managed farmland, moss and moorland surrounding Gladhouse Reservoir;*
  - *important panoramic views from the B7007 across Midlothian and the Forth Valley.'*
  - *Furthermore: 'The open and expansive landscape of Gladhouse Reservoir, viewed against the steep northern scarp of the Moorfoot Hills, forms a sparsely settled and secluded corner of Midlothian. The South Esk forms a dramatically incised valley cutting deep into the Moorfoots, strongly contrasting with the undulating basin which accommodates the reservoir and which is patterned with improved farmland, shelterbelts, moss and wetlands. The fringes of the Moorfoots scarp to the east form the foreground to important panoramic views to and from the hills'.*
- 4.2.11 Key components of this landscape are described as follows:
- *'the irregularly shaped Gladhouse Reservoir and the fringing wetlands, mixed woodlands and small wooded islands which contribute to its naturalistic qualities;*
  - *the dramatic steep scarp of the higher northern Moorfoot Hills and the deeply incised glen of the South Esk which cuts through these hills;*
  - *open and natural areas of moss and heather moorland;*
  - *well-managed farmland which is often enclosed by stone walls*
  - *the intimately scaled Rosebery Reservoir which is strongly contained by woodland and gently folded hills;*
  - *the sense of seclusion that can be experienced in this sparsely settled landscape;*
  - *open and expansive views from this landscape to both the Moorfoot Hills and the Pentland Hills and also across the Lothians to the Firth of Forth;*
  - *revelatory views from the B7007 across the open moorland and farmland of this landscape to the distant Pentland Hills.'*
- 4.2.12 Important considerations for landscape impact associated with Proposed Development are described as follows:
- *'potential for intrusion on key views to the Moorfoot Hills from the Gladhouse Reservoir area;*
  - *impacts on the openness and natural character of Gladhouse Reservoir and on areas of moss and moorland;*
  - *impacts on important views from the B7007 across Midlothian to the Pentland Hills.'*
- 4.2.13 The nearest Garden and Designed Landscape is Arniston, which is located approximately 3.8 km to the north.



- 4.2.14 The site lies outwith any Wild Land Area, with the nearest area, Area 2 Talla-Hart Fell, lying over 35 km to the south-west.
- 4.2.15 Landscape designations with 20 km of the site are illustrated on **Figure 4.1**.

## 4.3 Guidance and Legislation

- 4.3.1 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).
- 4.3.2 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.'*

- 4.3.3 The approach has therefore been developed specifically for this assessment to ensure that the methodology is fit for purpose.
- 4.3.4 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);
  - Landscape Sensitivity Assessment Guidance (Methodology), (NatureScot, 2022);
  - 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 2019); and
  - LI Technical Guidance Note 02/19 Residential Visual Amenity Assessment (RVAA), (Landscape Institute, March 2019).

## 4.4 Study Area

- 4.4.1 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 indicative turbine height of 180 m and is presented at **Figure 4.2**.
- 4.4.2 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 Proposed Development at the site.
- 4.4.3 Having reviewed the ZTV and with regard to best practice guidance, it is proposed that the LVIA will consider an initial 35 km radius Study Area. Detailed assessment will then be provided for a 20 km



section of this Study Area, which it is considered represents a proportionate extent of the Study Area and the limit within which any potential significant effects might occur.

- 4.4.4 For the cumulative assessment, consideration was initially given to a 60 km radius from the site, as recommended by NatureScot best practice guidance. Following this review, it is proposed that a 20 km Study Area be adopted to consider cumulative effects, which is considered to represent a proportionate extent of the Study Area and the limit within which any potential significant cumulative effects might occur.

## 4.5 Assessment Methodology

- 4.5.1 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

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

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

### Visual Receptors

- 4.5.3 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.
- 4.5.4 The LVIA will focus on the potential effects of the Proposed Development on different receptor groups, including settlements, road and rail users, footpath users, recognised tourist routes, long distance walking routes, cycle routes and centres for tourism.
- 4.5.5 It is also proposed to carry out a separate Residential Visual Amenity Assessment (RVAA) covering any properties located within 2 km of all proposed turbines. Properties lying within a 2 km 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.



- 4.5.6 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

- 4.5.7 It is proposed that the 15 locations set out in **Table 4.1** are included as viewpoints in the LVIA. The locations which are illustrated on **Figure 4.2** represent visual receptors and character types at a range of distances and directions from the site.

**Table 4.1 Proposed Viewpoints**

Viewpoint number	Location	OS Grid Reference
1	A7: Middleton Mains	338355, 657994
2	B7007: Broad Law corner	334861, 654323
3	B6372: Mount Lothian area	327300, 656929
4	A702: Hillend area	325141, 666436
5	A702: Junction with A766	318451, 658198
6	A702: Lawhead Farm	321975, 661466
7	A703: Layby south of Craighburn	324042, 654066
8	A7: North Middleton	335703, 658872
9	Gladhouse Reservoir	330071, 654408
10	Arniston House	332590, 659444
11	Scald Law, Pentlands	319162, 661080
12	Minor Road, near Yorkston Farm	331470, 656574
13	Whiteside Law	335816, 650984
14	Blackhope Scar	331523, 648338
15	Arthur's Seat, Edinburgh	327532, 672942

- 4.5.8 The proposed viewpoint locations are located 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. Many of the viewpoints correspond to locations with 'Key Views' as identified in Appendix E of the Landscape Capacity Study for Wind Turbine Development in Midlothian.
- 4.5.9 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.
- 4.5.10 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

- 4.5.11 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).





- 4.5.12 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.
- 4.5.13 Each of the wireframe models will then be developed further into photomontages to help illustrate the predicted impact of the Proposed Development.
- 4.5.14 In addition to the proposed wind turbines, the other project components (e.g. anemometer mast, access tracks and the substation) will be shown in photomontages for viewpoints within 5 km when they would be visible. Beyond 5 km it is considered 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

- 4.5.15 The Proposed Development will incorporate turbines greater than 150 m, some of which under Civil Aviation Authority (CAA) Regulations will required to be lit with visible aviation lighting.
- 4.5.16 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 or on visual receptors. Therefore, in accordance with '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.
- 4.5.17 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.
- 4.5.18 It is proposed that the following night-time visualisations will be produced:
  - VP 1 – A7: Middleton Mains; and
  - VP 12 – Minor Road, near Yorkston Farm.
- 4.5.19 The viewpoints will be used to inform consideration of the potential visual effects on key visual receptors in nearby residential properties and users of the road network.
- 4.5.20 Photographic examples of existing aviation lighting in similar light conditions will be presented in a separate appendix as a 'control mechanism'.

#### Cumulative Effects

- 4.5.21 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'.*
- 4.5.22 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'.*





- 4.5.23 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.
- 4.5.24 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.'*
- 4.5.25 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.
- 4.5.26 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.
- 4.5.27 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.
- 4.5.28 In order that the cumulative assessment remains focussed on other schemes that have the greatest potential to give rise to significant cumulative effects. Wind farms over 20 km away are highly unlikely to give rise to significant cumulative effects. It is also considered appropriate and proportionate to scope out turbines under 50 m within 10 km of the site, and under 80 m over 10 km distance from the site. The cumulative impact assessment will therefore focus primarily on those schemes within approximately 20 km of the Proposed Development.
- 4.5.29 The wind farms identified within **Table 4.2** and illustrated in **Figure 4.3** are therefore the schemes on which the discussion of the cumulative landscape and visual impact effects will be primarily focussed.
- 4.5.30 For the purposes of clarification, it should also be noted that other wind farms within 35 km of the Proposed Development will be shown on the supporting visualisations where relevant.

**Table 4.2 Cumulative sites within 20 km**

Site	Blade Tip Height of Turbines	Number of turbines
<i>Operational</i>		
Bowbeat Farm	80	24
Carcant	107	3
Dun Law	68	26
Dun Law Extension	75	35
Keith Hill	76	5
Longpark	100	19



Site	Blade Tip Height of Turbines	Number of turbines
Pogbie	74	6
Toddleburn	125	12
<i>Consented</i>		
Cloich Forest Wind Farm(+)	115	18
Gilston Hill Wind Farm	127	7
<i>Application Stage</i>		
Greystone Knowe Wind Farm	180	14

(+) Cloich Forest Wind Farm was consented for 18 turbines at tip height 115 metres in 2016; this would be superseded by the new and current application of 12 turbines at 149.9 metres if approved

## 4.6 Proposed Mitigation

4.6.1 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).

4.6.2 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'.

## 4.7 Potential Effects

4.7.1 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.

4.7.2 The LVIA will consider the effects at different stages in the lifetime of the Proposed Development:

- during construction of the Proposed Development; and
- during the operational lifetime of the Proposed Development.

4.7.3 Effects during construction 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, reversible effects.

4.7.4 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.

## 4.8 Scoping Questions to Consultees

- **Are there any comments on the proposed Study Areas?**



- **Are there any comments on the proposed list of viewpoint locations (including the suggested night-time viewpoints)?**
- **Are there any further wind farm sites, to those listed, to consider as part of the cumulative assessment?**
- **Do you agree that the proposed scope of assessment is appropriate?**



## 5. Cultural Heritage

### 5.1 Introduction

- 5.1.1 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.
- 5.1.2 The Cultural Heritage Impact Assessment will: identify cultural heritage assets that may be subject to significant impacts, both within the limits of the site and within 10km of the proposed turbines; establish the potential for currently unknown archaeological assets that lie within the site; 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 assets affected by the Proposed Development are also likely to be affected by other unrelated development proposals). Cumulative impacts will be considered for wind farm planning applications that have been submitted and have a decision pending and those that have been granted permission but are not yet constructed.
- 5.1.3 The proposed approach to the assessment of impacts on cultural heritage is set out below. The assessment would be undertaken by SLR Consulting Ltd.

### 5.2 Environmental Baseline and Potential Sources of Impact

#### Within the Site Boundary

- 5.2.1 Within the Site Boundary there are no designated heritage assets. An online review of Canmore and Pastmap has indicated that there are **19 non-**designated heritage assets within the Site Boundary. All of these non-designated heritage assets are of local importance. These non-designated assets can be seen in **Table 5.1**.

**Table 5.1: Historic Environment Record (HER) Sites within the Proposed Development**

Canmore or HER Ref	National Monument Record Name	Asset Description	Monument Class
53249	Sowburnrig	Enclosure and farmstead	Agriculture and domestic
53308	Wesley Cleugh Burn	Enclosures, field boundaries	Agriculture
53319	Torfichen Hill	Ring enclosure, sheepfold	Agriculture
53321	Torfichen Hill	Mound	Unknown
53322	Broad Law	Enclosure	Unknown
53323	Torfichen Hill	Ring enclosure, sheepfold	Agriculture
53324	Broad Law	Enclosure (19th century)	Domestic
53326	Torfichen Hill	Enclosure	Unknown
53284	Outerston Hill	Cremation, cinerary urn(s), unidentified flint, unidentified object (Bronze Age)	Religious and ritualistic
53272	Sowburnrig	Cairn field	Ritual/unknown

Canmore or HER Ref	National Monument Record Name	Asset Description	Monument Class
73338	Mauldslie Hill	Enclosure	Unknown
73339	Broad Law	Building and Granite quarry (19th to 20th century)	Domestic and industrial
234634	Temple, Mauldslie Hill Cottages	Farm labourers' cottages	Domestic
234635	Mauldslie West Cottages	Farm labourers' cottages	Domestic
356209	Broad Law	Worker's cottages (19th century)	Industrial, domestic
MEL12439	Sheep House	Remains of 19th century sheep house on 1st Edition OS mapping	Agriculture
MEL12441	Building	Remains of a small building and enclosures shown on 1st Edition OS mapping, labelled 'Pigsknowes'	Domestic
MEL12440	Sheep Fold	Circular sheepfold shown on 1st Edition OS mapping	Agricultural
MEL12333	Sowburnrig	Remains of a 19th (or earlier) century sheep house on 1st Edition OS mapping	Agricultural/Domestic

### Outwith the Site Boundary

5.2.2 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:

- Hirendean Castle (SM 5608)
- Moorfoot Chapel (SM5976)
- Mauldslie Farmhouse and Steading (LB45814)
- Loquariot, fort 500m SW of (SM6260)
- Falla Luggie Tower, towerhouse (SM5653)
- Corsehope Rings, fort (SM1166)
- Halltree Rings, settlement, Chapel Hill (SM1170)
- Soutra Aisle, burial aisle and medieval hospital (SM3067)

5.2.3 Due to the potential for significant impacts, preliminary wirelines for the following assets have been appended for consultee's comments:

- Hirendean Castle (SM 5608) (**Figure 5.3**)
- Moorfoot Chapel (SM5976) (**Figure 5.4**)
- Mauldslie Farmhouse and Steading (LB45814) (**Figure 5.5**)



5.2.4 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:

➤ Arniston Garden and Designed Landscape (GDL 00029) and associated assets:

- Arniston House (LB8808)
- Temple & Arniston Conservation Area (CA342)
- Arniston Policies, Grotto (LB811)
- Arniston Policies, North Lodge, And Lion And Elephant Gate, I (LB814)
- Arniston Policies, Walled Garden (LB14625)
- Arniston Policies, Ornamental Pillar (LB810)
- Arniston Policies, Sunken Garden, Rustic Bridge (LB45144)
- Arniston Policies, Sunken Garden, Stone Bench (LB45145)
- Arniston Policies, Sunken Garden, Vehicular Bridge (LB45147)
- Arniston Policies, Sunken Garden,, Rustic Bridge (LB45143)
- Arniston Policies, Arniston Gardens, House (LB45804)
- Arniston Policies, South (Cougar) Gate (LB812)
- Arniston Policies, Garden Urn (LB809)
- Arniston Policies, West Lodge (LB18977)
- Arniston Policies, Armiston mains Farmhouse (LB45130)
- Arniston Policies, East Lodge (LB45133)
- Arniston Policies, Rustic Bridge No 6 (LB45140)
- Arniston Policies, Horace's Bridge (LB45805)

➤ Crichton Castle (SM13585) and associated assets:

- Borthwick and Crichton Conservation Area

➤ Dundreich, cairn (SM2777) & Jeffries Corse, cairn (SM3527)

5.2.5 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 10 km of the proposed turbine locations are listed within **Appendix 5.1: Table 1**, the Category A Listed Buildings within 10 km and Category B Listed Buildings within 5 km of the proposed turbine locations are listed within **Appendix 5.1: Table 2**, the Inventoried Gardens and Designed Landscapes within 10 km of the proposed turbine locations are listed within **Appendix 5.1: Table 3**, and Inventoried Battlefields within 10 km of the proposed turbine locations are listed within **Appendix 5.1: Table 4**. All designated heritage assets within 10 km are depicted on **Figure 5.1**. For the benefit of consultee's, a screened ZTV **Figure 5.2**, has been provided.

5.2.6 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 5 km of the proposed turbines have been Scoped Out of any further assessment. Category C Listed Buildings have been Scoped Out of any further assessment as they are considered locally rather than nationally or regionally important, as per best practice guidance within the Scottish Natural Heritage (now NatureScot) (SNH) Environmental Impact Assessment (EIA) Handbook (2018).



- 5.2.7 All Conservation Areas within 5 km have been considered and are listed within **Appendix 5.1: Table 5**.
- 5.2.8 There are no World Heritage Sites within 10 km of the Proposed Development.

## 5.3 Guidance and Legislation

### Legislation

- 5.3.1 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

- 5.3.2 The Scottish Government and Historic Environment Scotland (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);
  - Midlothian Local Development Plan (2017);
  - 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

- 5.3.3 Relevant guidance and technical standard documents comprise:
- Historic Environment Scotland Guidance on Managing Change in the Historic Environment: Setting (2020);
  - A Guide to Climate Change Impact: On Scotland's Historic Environment (2019);
  - Scottish Natural Heritage (now NatureScot) 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).



## 5.4 Study Area

- 5.4.1 There is no guidance from HES which defines a required study area for the archaeological and cultural heritage assessment of wind farms.
- 5.4.2 For purposes of this assessment, a Study Area has been defined extending 10 km from the proposed turbines. All nationally significant designated assets (**Appendix 5.1**) 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 East Lothian Council Archaeology Service (ELCAS), acting on behalf of Midlothian Council, identify any non-designated assets that they consider to be of national/regional significance, and which they consider deriving significance from their setting, then ELCAS should make this known to the Applicant.

## 5.5 Assessment Methodology

### Consultation

- 5.5.1 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 Zone of Theoretical Visibility (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. ELCAS will be consulted for designated heritage assets of regional and local significance, and any undesigned assets they consider to be of higher significance.

### Field Surveys

- 5.5.2 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.
- 5.5.3 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

- 5.5.4 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.
- 5.5.5 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.
- 5.5.6 Assessment will be undertaken separately for direct impacts and indirect impacts.
- 5.5.7 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.
- 5.5.8 Indirect impacts on the significance of heritage assets will be identified and assessed with reference to Managing Change in the Historic Environment: Setting (HES 2020) 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 effects.

5.5.9 The settings assessment will be assisted by a ZTV calculation and presented in **Figure 5.1**. The ZTV calculation will map the predicted degree of theoretical 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 5.1** is based on the indicative height of the blade tips of the Proposed Development.

#### Heritage Sensitivity

5.5.10 The categories of heritage sensitivity to be referred to are presented in **Table 5.2**, 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.

5.5.11 The sensitivity 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 sensitivity of specific assets, where recorded within the HER, will be taken into account.

**Table 5.2: Heritage Sensitivity**

Heritage significance	Explanation
Highest	Sites of international importance, including: <ul style="list-style-type: none"><li>➤ World Heritage Sites.</li></ul>
High	Site of National importance, including: <ul style="list-style-type: none"><li>➤ Scheduled Monuments;</li><li>➤ Category A Listed Buildings;</li><li>➤ Gardens and Designed Landscapes included on the national inventory;</li><li>➤ Designated Battlefields; and</li><li>➤ Non-designated assets of equivalent significance.</li></ul>
Medium	Sites of Regional/local importance, including: <ul style="list-style-type: none"><li>➤ Category B and C Listed Buildings;</li><li>➤ Conservation Areas highlighted as of equivalent significance; and</li><li>➤ Non-designated assets of equivalent significance.</li></ul>



Heritage significance	Explanation
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

- 5.5.12 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.
- 5.5.13 Changes could potentially include direct change (e.g. ground disturbance), and indirect change (e.g. change to setting); the latter might include visual change, for example. Impacts may be beneficial, neutral, 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 5.3**.

**Table 5. 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.



Magnitude of impact	Explanatory criteria
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.

#### Significance of Effect

5.5.14 The categories of effect referred to, and the criteria used in their determination, are presented in **Table 5.4**.

**Table 5. 4: Heritage Significance of Effect**

Effect	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.
Negligible	Harm or enhancement to the asset's heritage significance and/or the ability to understand, appreciate and experience it would be indiscernible.
Neutral/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.

5.5.15 **Table 5.5** 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 effect. 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 5.5: Significance of Effect Matrix**

Magnitude of Impact	Heritage Sensitivity (excluding unknown)			
	Highest	High	Medium	Low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Very Minor
Low	Moderate	Minor	Very Minor	Negligible



Magnitude of Impact	Heritage Sensitivity (excluding unknown)			
	Highest	High	Medium	Low
Very low	Minor	Very Minor	Negligible	Negligible
Neutral/None	Neutral/Nil	Neutral/Nil	Neutral/Nil	Neutral/Nil

## 5.6 Proposed Mitigation

- 5.6.1 Where potential significant adverse effects on cultural heritage are identified, measures to prevent, reduce and/or, where possible, offset these effects, will be proposed. Potential mitigation measures can be discussed in terms of Direct and Indirect effects.
- 5.6.2 Suitable measures for mitigating direct effects 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.
- 5.6.3 Suitable measures for mitigating any indirect effects might include:
- alteration of the proposed turbine layout;
  - potential deletion of turbines;
  - reduction of proposed turbine heights; and/or
  - changing the proposed colour of select turbines.

## 5.7 Potential Effects

### Residual Effects

- 5.7.1 Residual effects are those that remain even after the implementation of suitable mitigation measures. Residual effects will be identified, and the level of those residual effects defined with reference to **Table 5.4** and **Table 5.5**.
- 5.7.2 The significance of those residual effects for purposes of EIA would then be defined as either 'Significant' or 'Not Significant'.

### Cumulative Effects

- 5.7.3 A cumulative effect is considered to occur when there is a combination of:
- an effect on an asset or group of assets due to changes resulting from the development subject of assessment; and
  - an effect on the same asset or group of assets resulting from another development (consented or proposed) within the surrounding landscape.
- 5.7.4 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.



- 5.7.5 Any effect resulting from operational wind farms would be considered as part of the baseline effect assessment. Cumulative effects would be considered in two stages:
- assessment of the combined effect of the developments, including the proposed; and
  - assessment of the extent to which the Proposed Development contributes to the combined effect.

#### Significance of Effect

- 5.7.6 Professional judgment will be used in the determination of whether any effects are 'Significant' or 'Not Significant' for purposes of EIA.
- 5.7.7 With reference to the matrix presented in **Table 5.5**, any impacts identified as 'Major' within the matrix would almost certainly be considered 'Significant', while any effects identified as 'Moderate' within the matrix might not be considered 'Significant' and will be determined using professional judgement.
- 5.7.8 A clear statement will be made as to whether any identified effects are 'Significant' or 'Not Significant' for purposes of EIA.

## 5.8 Receptors and Impacts Scoped In and Out of Assessment

- 5.8.1 On the basis of the work undertaken to date, the professional judgement of the cultural heritage team, and experience of other comparable projects, the lists of receptors and impacts to be scoped in and out are detailed in Section 5.2. These include Scheduled Monuments, Category A Listed Buildings, Inventoried Gardens and Designed Landscapes, and Inventoried Battlefields out to 10 km, and Category B Listed Buildings and Conservation Areas out to 5 km. Category C Listed Buildings have been Scoped Out of assessment, and there are no World Heritage Sites within 10 km. **Appendix 5.1** contains the appraisal of all assets to be considered for scoping.
- 5.8.2 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.

## 5.9 Scoping Questions to Consultees

- **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?**



## 6. Ecology

### 6.1 Introduction

- 6.1.1 This chapter defines the proposed methodology for the ecological assessment that will be included within the EIA Report. It also details the methods that will be used to establish the baseline conditions within the site and its surroundings, and the process used to determine the sensitivity of the habitats and species' populations present.
- 6.1.2 The ways in which habitats or species might be affected (directly or indirectly) by the construction and operation of the Proposed Development will be assessed prior to and after any mitigation measures are considered. In addition, relevant 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.
- 6.1.3 Avian ecology is covered separately in **Chapter 7: Ornithology**.

### 6.2 Baseline Description

- 6.2.1 Baseline ecological conditions have been established from the following sources:
- information from the National Biodiversity Network (NBN) Atlas (National Biodiversity Network Atlas Scotland, 2022) on ecological records within 5 km of the site within the last 15 years (since 2008);
  - information from the Carbon and Peatland Map 2016 (Scottish Government, 2016);
  - information from the Deer Distribution Survey by the British Deer Society (British Deer Society, 2016);
  - a desk study to confirm the location and qualifying features of designated sites within potential zones of influence of the Proposed Development (NatureScot, 2022); and
  - information from the EIA Reports from other nearby consented wind farm developments (Bowbeat Hill and Extension, Carcant, Cloich Forest and Toddleburn).
- 6.2.2 A search of the NBN Atlas showed that the following protected or notable species were recorded within 5 km of the site since 2008:
- badger (*Meles meles*);
  - brown hare (*Lepus europaeus*);
  - brown long-eared bat (*Plecotus auritus*);
  - common lizard (*Zootoca vivipara*);
  - common pipistrelle (*Pipistrellus pipistrellus*);
  - Daubenton's bat (*Myotis daubentonii*);
  - fallow deer (*Dama dama*);
  - great crested newt (GCN) (*Triturus cristatus*);
  - mountain hare (*Lepus timidus*);
  - Natterer's bat (*Myotis nattereri*);
  - noctule bat (*Nyctalus noctula*);
  - otter (*Lutra lutra*);

- palmate newt (*Lissotriton helveticus*);
- red deer (*Cervus elaphus*);
- red squirrel (*Sciurus vulgaris*);
- roe deer (*Capreolus capreolus*);
- sika deer (*Cervus nippon*);
- smooth newt (*Lissotriton vulgaris*); and
- soprano pipistrelle (*Pipistrellus pygmaeus*).

6.2.3 The following invasive non-native species were also returned by these search parameters:

- American mink (*Neovison vison*);
- American skunk cabbage (*Lysichiton americanus*);
- giant hogweed (*Heracleum mantegazzianum*);
- grey squirrel (*Sciurus carolinensis*);
- Himalayan balsam (*Impatiens glandulifera*);
- Japanese knotweed (*Fallopia japonica*); and
- rhododendron (*Rhododendron ponticum*).

6.2.4 The Carbon Peatland Map 2016 shows an area of Class 1<sup>1</sup> peatland on the site, which extends into the northern part of the Scoping layout. There are also some areas of Class 3<sup>2</sup> and Class 5<sup>3</sup> peatlands. The map suggests that much of the southern portion of the Scoping layout is composed of mineral soil, with a small area of Class 4<sup>4</sup> soil to the north-east (**Figure 6.1**).

6.2.5 The Deer Distribution Survey results show that the following deer species are likely to be present or have previously been recorded in the wider area of the site:

- fallow deer (recorded in 2007 and/or 2011, reconfirmed in 2016);
- red deer (confirmed only in 2016);
- roe deer (recorded in 2007 and/or 2011, reconfirmed in 2016); and
- sika deer (recorded in 2007 and/or 2011, unconfirmed in 2016).

6.2.6 There are a number of sites designated for ecological features within 5 km of the Proposed Development (**Figure 6.1**). None of these are within the site boundary. The designated ecological (non-avian) sites within 5 km are as follows:

- Moorfoot Hills SAC (0 km – lies adjacent to part of the site boundary but does not overlap with the site and is more than 700 m from the closest proposed turbine), designated for blanket bog and dry heaths, underpinned by Moorfoot Hills SSSI which is designated for blanket bog, upland assemblage and upland birch woodland;

<sup>1</sup> Class 1 – Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value.

<sup>2</sup> Class 3 – Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat.

<sup>3</sup> Class 5 – Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat.

<sup>4</sup> Class 4 – Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils.



- River Tweed SAC (1.1 km), designated for Atlantic salmon (*Salmo salar*), otter, brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), rivers with floating vegetation often dominated by water-crowfoot and sea lamprey (*Petromyzon marinus*);
  - Peeswit Moss SAC (1.8 km), designated for active raised bog and degraded raised bog, underpinned by Peeswit Moss SSSI which is designated for raised bog;
  - Dundriech Plateau SSSI (2.8 km), designated for blanket bog and subalpine flushes; and
  - Crichton Glen SSSI (4.1 km), designated for lowland neutral grassland, upland oak woodland and valley fen.
- 6.2.7 The Ancient Woodland Inventory shows four areas of ancient woodland within the site boundary, although the turbines have been positioned outwith these areas. Areas of ancient woodland within 5 km of the site are numerous, with most of these concentrated to the north (**Figure 6.1**).
- 6.2.8 Submitted application documents for other nearby wind farm applications were reviewed where available to provide further ecological context for the Proposed Development. The operational Cloiche Forest Wind Farm Environmental Impact Assessment Report (Arcus, 2021), which lies approximately 8.5 km to the south-west of the site, noted evidence of badger, pine marten and otter. Ponds suitable for GCN were identified and surveyed using eDNA analysis, but no evidence of GCN was returned by this. The bat surveys conducted for the site identified common pipistrelle, soprano pipistrelle and brown long-eared bats, with *Nyctalus* and *Myotis* spp. also recorded. This site differed to the Proposed Development at the time of the EIA Report as it was dominated by conifer plantation.
- 6.2.9 Seasonal static bat detector (Anabat) surveys following NatureScot *et al.* (2021) guidelines are currently in progress. Thirteen Anabats have been deployed around the site, with the deployments beginning in May 2022 and due to be concluded in October 2022. The locations were selected based on an indicative layout and positioned such as to cover the area in which the turbines are proposed to be located (as per NatureScot 2019).
- 6.2.10 Further baseline information will be obtained from a suite of surveys to be completed in Autumn 2022. The surveys to be conducted are summarised as follows with survey areas indicated on **Figure 6.2**:
- National Vegetation Classification (NVC) surveys, incorporating Phase 1 and potential Ground Water Dependent Terrestrial Ecosystem (GWDTE) habitats;
  - Protected species walkover surveys, including a Preliminary Roost Assessment (PRA) for bats within the site in line with guidance;
  - Habitat Suitability Index (HSI) surveys of any ponds within 500 m of the Scoping layout, in line with guidance; and
  - Electrofishing and fish habitat suitability surveys on watercourses within the site, in line with guidance and in consultation with the local fisheries trust (the Forth Rivers Trust).

## 6.3 Legislation and Guidance

- 6.3.1 The assessment will be undertaken in line with the following European and National Legislation:
- Environmental Impact Assessment Directive 85/337/EEC, as amended (“EIA Directive”), (as subsequently codified by Directive 2011/92/EU, and as amended by Directive 2014/52/EU);
  - European Union Council Directive 92/43/EEC on Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (Habitats Directive);
  - 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”)





- Nature Conservation (Scotland) Act 2004 (as amended);
- Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) 'The Habitats Regulations';
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations);
- The Protection of Badgers Act 1992;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011
- The Wildlife and Countryside Act 1981 (as amended); and
- The Wildlife and Natural Environment (Scotland) Act 2011 (WANE).

6.3.2 The assessment will be carried out in accordance with the principles contained within the following guidance and policy documents:

- Chartered Institute of Ecology and Environmental Management (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;
- Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust;
- European Commission (2020) Guidance document on wind energy developments and EU nature legislation;
- JNCC and Defra (on behalf of the Four Countries' Biodiversity Group) (2012) UK Post-2010 Biodiversity Framework. July 2012.
- Joint Nature Conservation Committee (JNCC) (2013) Guidelines for selection of biological Sites of Special Scientific Interest (SSSI);
- Midlothian Council (2019). Midlothian Local Biodiversity Action Plan 2019 – 2024;
- NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019, with minor updates 2021). Bats and Onshore Wind Turbines – Survey, Assessment and Mitigation;
- NatureScot (2020) General Pre-application and Scoping Advice to Developers of Onshore Wind Farms;
- Scottish Badgers (2018) Surveying for Badgers: Good Practice Guidelines. Version 1.
- Scottish Executive (2000) 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;
- Scottish Environment Protection Agency (SEPA) (2017) Land Use Planning System Guidance Note 4 - Planning guidance on on-shore windfarm developments;
- SEPA (2017) Land Use Planning System Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems;
- Scottish Government (2001). European Protected Species, Development Sites and the Planning Systems: Interim guidance for local authorities on licensing arrangements.
- Scottish Government (2006). European Protected Species – terms of guidance: Chief Planner letter.



- Scottish Government (2013) Scottish Biodiversity Strategy: It's in Your Hands (2004)/2020 Challenge for Scotland's Biodiversity (2013);
- Scottish Government (2016) Draft Peatland and Energy Policy Statement;
- Scottish Government (2017) Planning Advice Note 1/2013 - Environmental Impact Assessment, Revision 1.0;
- Scottish Government (2017) Planning Circular 1/2017: Guidance on The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Scottish Government (2018) Climate Change Plan: Third Report on Policies and Proposals 2018-2032;
- Scottish Government (2020) Scottish biodiversity strategy post-2020: statement of intent;
- Scottish Government (2020) Scottish Planning Policy;
- Scottish Government (2021) Freshwater and Diadromous fish and fisheries associated with onshore wind farm and transmission line developments: generic scoping guidelines;
- Scottish Government (2022) National Planning Framework 4 (Revised Draft);
- SNH (2015) Scotland's National Peatland Plan;
- SNH (2016a) Planning for Development: What to consider and include in deer assessments and management at development sites (Version 2);
- SNH (2016b) Planning for Development: What to consider and include in Habitat Management Plans. Version 2;
- SNH (2018a). Advising on carbon-rich soils, deep peat and priority peatland habitat in development management;
- SNH (2018b) Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland; and
- Scottish Renewables, SNH, SEPA, Forestry Commission (Scotland), HES, AEECoW (2019) Good Practice During Windfarm Construction (4<sup>th</sup> Edition).

## 6.4 Study Area

6.4.1 The EIA Report will incorporate the following Study Areas which will all be buffered from the finalised turbine layout (and access tracks if relevant/required) in accordance with relevant guidance:

- designated sites: the Proposed Development and a 5 km Study Area;
- protected species: the Proposed Development and a 250 m Study Area;
- great crested newt: the Proposed Development and a 500 m Study Area;
- potential bat roost features: the Proposed Development and a 200 m plus turbine blade length (as per NatureScot 2019) Study Area;
- habitats and potential GWDTE: the site;
- bat collisions: static bat data will be processed through Ecotbat (NatureScot 2019); and
- cumulative assessment (if required): the Proposed Development and a 5 km Study Area.

## 6.5 Assessment Methodology

6.5.1 The EIA Report will include an Ecological Impact Assessment (EclA). This will consider the potential direct, indirect and cumulative effects that the construction and operation of the Proposed



Development could have on Important Ecological Features (IEFs), as per CIEEM (2018) guidance. The assessment will be supported by appendices that will include details of survey methodologies and all survey data.

6.5.2 The assessment will include the following elements:

- baseline conditions;
- scoping in/out of ecological features and impacts;
- assessment of potential impacts and effects on IEFs during the construction and operational phases;
- cumulative effects;
- mitigation; and
- summary of significant residual effects.

6.5.3 Effects on IEFs will be assessed in relation to the species' reference population or habitat extent, conservation status, range, and distribution. The assessment of potential effects will be informed by guidelines published by CIEEM (2018) and NatureScot (see Section 6.3: Guidance and Legislation).

6.5.4 The assessment involves the following process:

- identifying potential impacts of the Proposed Development;
- considering the likelihood of occurrence of potential impacts;
- defining the nature conservation value (NCV) and conservation status of relevant populations for each IEF to determine overall sensitivity;
- establishing the magnitude of the likely impact (both spatial and temporal) on each IEF;
- based on the above information, making a judgement as to whether or not the consequent potential effect would be significant with respect to the EIA Regulations;
- if a potential effect is determined to be significant, measures to avoid or reduce the significance of effects are considered;
- considering opportunities for enhancement where appropriate; and
- concluding residual potential effects after considering mitigation, compensation and enhancement.

6.5.5 An assessment of relevant cumulative effects will be undertaken following published guidance. Cumulative effects will be assessed with other wind farm projects subjects to the EIA process within a relevant search area, and their effects on a relevant reference population; for example at a watercourse, watershed or Natural Heritage Zone (NHZ) level.

6.5.6 Although the Moorfoot Hills lies directly adjacent to the site boundary and the Peeswit Moss and River Tweed SACs are within 5 km of the site, the topography of the land suggests that there is no hydrological connectivity between the Scoping layout and any European Designated Site. As a result, likely significant effects from the Proposed Development can be ruled out and the Proposed Development would not (with respect to non-avian ecology) be subject to a Habitats Regulations Appraisal (HRA) under The Habitats Regulations.

## 6.6 Proposed Mitigation

6.6.1 Significant adverse effects on ecological features will be avoided or minimised where possible within the design process. Good practice during construction and operation of the Proposed Development will be implemented as standard (and the assessment undertaken on this basis). This would include the following:

- a Species Protection Plan (SPP) 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 ecologist would take place as part of the SPP, and an ECOW would be present during all key stages of the construction period; and
- a Habitat Management Plan (HMP) would be developed for the operational phase and agreed with consultees, to mitigate or enhance habitat for IEFs, promote ecological connectivity and to provide wider significant biodiversity benefits.

6.6.2 Where unmitigated significant adverse effects on IEFs are identified, additional measures to prevent and reduce these impacts would be proposed, in order to conclude a non-significant residual impact.

## 6.7 Potential Effects

6.7.1 The assessment will consider the potential effects associated with construction and operation of the Proposed Development.

6.7.2 Construction effects that will be considered include:

- temporary and permanent habitat loss/alteration/fragmentation/drainage associated with the Proposed Development infrastructure;
- pollution effects on watercourses within the site;
- loss of shelter, breeding or foraging habitat for protected species;
- displacement of deer;
- risk of injury or death to protected species from collisions with increased construction traffic; and
- visual and noise disturbance to protected species associated with construction activities.

6.7.3 Operational effects that will be considered include:

- displacement of protected species from shelter, breeding or foraging habitats around operational turbines and other permanent infrastructure, including barrier effects; and
- risks of bats colliding with or suffering barotrauma from proximity to operational wind turbine blades.

6.7.4 Where appropriate, these construction and operational effects will also be considered in a cumulative assessment.

## 6.8 Features and Impacts Scoped In or Out of Assessment

6.8.1 A summary of the features and effects to be considered, and the phases for which they are likely to be Scoped In or Scoped Out for, are presented in **Table 6.2**.

*Table 6.2 Summary of Features and Impacts for Ecology*

Features	Scoped In		Justification
	Construction	Operation	
Protected species (including bats)	Yes	Yes	Protected species cannot be Scoped Out until the ecological baseline surveys are complete and the presence and distribution of ecological features in relation to the planned

Features	Scoped In		Justification
	Construction	Operation	
			infrastructure and activities associated with the Proposed Development are fully understood.
Habitats on Annex I of the Habitats Directive	Yes	Yes	Habitats on Annex I of the Habitats Directive cannot be Scoped Out until the ecological baseline surveys are complete and the presence and distribution of such habitats in relation to the planned infrastructure and activities associated with the Proposed Development are fully understood.
Habitats not on Annex I to the Habitats Directive and species not on Annex II to the Habitats Directive and habitats or species not protected by other legislation (e.g., The Wildlife and Countryside Act 1981 (as amended), the Nature Conservation (Scotland) Act 2004 or The Protection of Badgers Act).	No	No	On the basis of the results of the desk-based work undertaken to date, the professional judgement of the EIA team, experience from other relevant projects and policy guidance or standards, generally common and widely distributed habitats or species which do not fall within the categories listed in the feature column will be Scoped Out of the assessment.
Wild deer population	Yes	No	The desk-based study will collate relevant information on the deer populations in the locality to inform whether this should be Scoped Out or assessed further in the EIA Report.
Designated sites	No	No	The Scoping layout is topographically and hydrologically separated from the River Tweed, Moorfoot Hills and Peeswit Moss SACs, and as such there is no connectivity between the Proposed Development and any European Designated Site.
Migratory salmonids	Yes	No	Impacts on fish populations cannot be Scoped Out until the ecological baseline surveys are complete and the presence and distribution of species and suitable habitats in relation to the planned infrastructure and activities associated



Features	Scoped In		Justification
	Construction	Operation	
			with the Proposed Development are fully understood.

## 6.9 Scoping Questions to Consultees

- Do consultees agree that, subject to further information coming to light from the field surveys and desk study, the scope of IEFs to be included in the assessment is appropriate?
- Do consultees agree that the suite of field surveys undertaken in 2022 and planned for 2023 in addition to a desk study are sufficient to inform a robust impact assessment?
- Do consultees agree that the methodology and scope of assessment is appropriate?



## 7. Ornithology

### 7.1 Introduction

- 7.1.1 This chapter sets out the proposed approach to assessing the potential effects of the Proposed Development on ornithology during its construction and operation.
- 7.1.2 The assessment will be completed by Dr Steve Percival of Ecology Consulting, in accordance with relevant best practice documents. He has undertaken ornithological and ecological assessments for over 200 wind farm developments

### 7.2 Baseline Description

#### Field Surveys

- 7.2.1 A comprehensive range of bird surveys is being undertaken at this site. Specific surveys are being undertaken over two years (2021/22 and 2022/23 winters and 2021 and 2022 breeding seasons), to give two full years of baseline bird data, in line with the current NatureScot survey guidance (SNH, 2017).
- 7.2.2 **Vantage Point (VP) Surveys (year-round):** these surveys are being carried out to determine flight activity within the Proposed Development site to assess collision risk. The VP surveys will quantify the bird numbers that could potentially be at risk of collision (including roost flight observations at dawn/dusk). All flight lines of target species are being mapped, and the flight height of each flock recorded.
- 7.2.3 Three VPs are being used, to give sufficient coverage of the site. The computer-generated viewsheds are shown in **Figure 7.1**. For each VP, the following surveys are being undertaken:
  - Breeding season:
    - 2021 - April-August - 36 hours/VP.
    - 2022 - April-August - 36 hours/VP.
  - Autumn/winter:
    - 2021-22 - September - March - 72 hours/VP (36 hours plus additional to cover goose migration).
    - 2022-23 - September - March - 72 hours/VP.
- 7.2.4 **Breeding Bird Surveys:** the main breeding bird walkover survey is following the standard Brown and Shepherd (Brown and Shepherd, 1993) moorland survey method but with two additional visits as recommended in NatureScot guidance (SNH, 2017). These surveys are covering the Proposed Development plus a 500 m buffer (see **Figure 7.1**), where access was possible.
  - 2021 - four visits, April-July.
  - 2022 - four visits, April-July.
- 7.2.5 All bird locations and behaviour are being mapped to 1:10,000 scale, using the standard British Trust for Ornithology (BTO) Common Birds Census notation. All species are being recorded. In addition, the survey effort per unit area is being standardised to make the surveys as repeatable as possible, recording systematically for approximately 2 hours per km<sup>2</sup>. A route is chosen to ensure that all parts of the Study Area are covered to within about 100 m of the observer, where access is possible. The survey route is being plotted onto the survey map as it is carried out.



- 7.2.6 The surveys are avoiding strong winds, heavy rain, fog and low cloud. Birds are located by walking, listening and scanning by eye and with binoculars. Standard BTO notation is used to record the birds' activities; singing, calling, carrying nest material, nests or young found, repetitively alarmed adults, disturbance displaying, carrying food or in territorial dispute.
- 7.2.7 **Raptor and Black Grouse Breeding Surveys:** As the survey area may be used by a range of scarce raptors and black grouse, species-specific surveys were undertaken during April-August 2021, and were being repeated in 2022. Surveys were undertaken within the Proposed Development site and a 2 km buffer zone where access is possible and where potentially suitable breeding habitat for these species is present. This includes surveys for black grouse, hen harrier, short-eared owl, red kite, peregrine and merlin, following the standard methodologies given in Gilbert *et al.* (1998) and Hardey *et al.* (2009).
- 7.2.8 **Winter Walkover Surveys:** whilst the winter VP surveys provides information on key species flight activity over the site outside the breeding season, additional survey work is being undertaken to provide further information on any important bird populations using the area at this time of year. This comprises walkover mapping surveys of the wintering birds within the Proposed Development site and a 500 m buffer (see **Figure 7.1**). These include surveys at dawn and dusk to check the area specifically for roosting hen harriers and other important raptors, and are being carried out as follows:
- 2021-22 - monthly surveys, September-March;
  - 2022-23 - monthly surveys, September-March.
- 7.2.9 **Winter Waterfowl Feeding Distribution Surveys:** additional surveys are being undertaken twice-monthly of all possible habitats that could be used by wintering waterfowl as feeding/roosting sites within 2 km of the site (to give contextual information about where goose feeding flocks were located, and provide further information on possible linkage to Gladhouse Reservoir and Fala Flow SPAs, see **Figure 7.1**). The counts are being carried out as instantaneous 'look-see' counts, recording a snapshot of the birds present in each field/count sector at the time it was surveyed (Gilbert *et al.* 1998).

#### Desk Study

- 7.2.10 The ornithological assessment will include a full desk study detailing the designated sites that could be affected by the Proposed Development (as set out above), and available bird records from consultees including NatureScot, Royal Society for the Protection of Birds (RSPB), the Lothian and Borders raptor study group and the Wildlife Information Centre for Lothian and the Borders. The desk study is using a 5 km search area for nationally important sites and 20 km for internationally important sites.
- 7.2.11 There are eight statutory designated nature conservation sites with ornithological interest features in the search area around the Proposed Development (5 km for nationally important SSSI and 20 km for internationally important European Protected Special Protection Areas SPA and Ramsar Sites) (See **Figure 7.2**):
- Gladhouse Reservoir SPA/Ramsar/SSSI – overlapping the western boundary of the site, 930 m from the closest proposed turbine – designated for its wintering population of pink-footed geese (which roost on the reservoir at night and forage on the surrounding farmland, up to 15-20 km from the roost).
  - Moorfoot Hills SSSI – immediately adjacent to the southern boundary of the site, 920 m from the closest proposed turbine – notified for its breeding golden plover population, its breeding bird assemblage (including 9 species of wader, and ring ouzel), and its blanket bog, upland birch woodland and upland habitat assemblage). It is also designated as an SAC.
  - Dundreich Plateau SSSI – 2.8 km south-west – notified for its blanket bog and subalpine flush habitats. The citation also notes that the site supports a number of breeding birds including golden plover, curlew, ring ouzel and redshank.



- Fala Flow SPA/Ramsar/SSSI – 6.4 km north-east - designated for its wintering population of pink-footed geese. Blanket bog habitat is also a key feature of the SSSI.
- Firth of Forth SPA/Ramsar/SSSI – 15.9 km north – designated for range of internationally important wintering waterfowl populations, and passage Sandwich terns. The only species for which the SPA could have any connectivity given the distance is pink-footed goose.
- Westwater SPA/Ramsar/SSSI – 18.7 km west – designated for its wintering population of pink-footed geese and its wintering waterbird assemblage.

7.2.12 The following statutory designated nature conservation sites are located within the search but have no ornithological interest features:

- Peeswit Moss SAC/SSSI – 1.8 km west – notified for its raised bog habitats.
- Crichton Glen SSSI – 4.1 km north-east – notified for its lowland neutral grassland, upland oak woodland and valley fen habitats.

### Consultation

7.2.13 It is proposed that the following stakeholders will be consulted in relation to the assessment:

- NatureScot;
- Lothian and Borders Raptor Study Group;
- The Wildlife Information Centre for Lothian and the Borders; and
- RSPB.

### Baseline Survey Results

7.2.14 The 2021-22 wintering bird surveys found a range of wintering bird populations of conservation importance using the survey area. The highest conservation importance was the wintering pink-footed goose population, for which there was a clear ecological link between the site and the Gladhouse Reservoir and Fala Flow SPAs. The ornithological assessment will therefore include a Habitats Regulations Assessment (including Appropriate Assessment). As the Proposed Development site is not itself within an important goose feeding area, the main potential impact on this species would be collision risk, which will require modelling to determine the magnitude of this risk.

- Other wintering waterfowl of importance included migrant whooper swans and barnacle geese, though the overall numbers of these species were low, and therefore unlikely to result in significant collision risk (though this will need to be confirmed with collision risk modelling).
- Red and black grouse were both resident in the higher parts of the survey area, in similar areas to where they were found during the breeding season surveys. Design mitigation is recommended for black grouse (a 500 m buffer around each of the two lek sites), and that mitigation should also avoid any significant effect on this species in winter too.
- Hen harrier and goshawk were seen regularly hunting over the survey area, though no areas of particular importance were identified for either species. Collision risk modelling will be carried out to inform the impacts of the Proposed Development on these species, but no specific spatial constraints for them were identified.
- Other raptor species, including red kite, osprey, peregrine, merlin and short-eared owl, were recorded in lower numbers and less frequently.
- Three wader species were recorded in regionally important numbers, golden plover and lapwing (which both occurred regularly through the winter) and curlew (which were seen only in March). The main areas used were outside the Proposed Development site, so the main risk at this time of year would be collision (which will be assessed using collision risk modelling).



- Four gull species occurred in regionally important numbers. As for the regionally important populations of waders, most were recorded outside the Proposed Development site to the north in the wider area, so the main potential impact would be collision (requiring modelling to inform the assessment).
- 7.2.15 The initial breeding bird surveys in 2021 found that the survey area supports a range of upland breeding species of regional importance. This included regionally important numbers of black grouse, snipe, curlew, black-headed gull, short-eared owl and long-eared owl. Most of these were found on the periphery of the site and will be buffered in the site design, though the site itself did hold high densities of breeding snipe and curlew.
- 7.2.16 Two species specially protected from disturbance under Schedule 1 of the 1981 Wildlife and Countryside Act were found breeding in the core survey area in 2021, quail and common crossbill. Both though were outside the site boundary (and outside the area where they would be likely to be affected by the Proposed Development). The quail was on the eastern edge of the core survey area, and the common crossbills were scattered in the conifer plantation in the northern part of the survey area. Two EU Annex 1 species were also breeding in the area, golden plover (2 pairs within the core area) and short-eared owl (one pair in the 2 km buffer).
- 7.2.17 The main target species at risk of collision would be the breeding waders using the site, particularly lapwing and curlew (though these did not occur at particularly high density). Raptor flight activity over the site at rotor height (other than buzzard) occurred at only a very low level. This will be assessed further using collision risk modelling (see below).
- 7.2.18 Initial spatial constraints identified within the site boundary in relation to breeding birds comprised:
  - Black grouse – 500 m buffer proposed around the two lek sites (after Ruddock and Whitfield 2007). One of these (on the SE edge of the survey area) held more grouse (peak seven males). The smaller lek within the Proposed Development site held fewer birds (peak two males) and was used less frequently - data from further surveys should help ascertain how important this lek is and whether a full 500 m buffer needs to be applied in the final site design.
  - Short-eared owl – 500 m buffer around nest site proposed (after Ruddock and Whitfield 2007), though it should be noted that this species can move between years, so further baseline surveys will assist in finalising any buffers for this species.
  - Black-headed gull (regionally important breeding colony) – 500 m buffer proposed around the main colony, both to reduce disturbance of the colony but particularly to reduce collision risk (where flight activity is more concentrated in proximity to the colony).

## 7.3 Guidance and Legislation

- 7.3.1 The ornithological assessment will be undertaken following the guidance produced by SNH (2017). Additionally, the following documents will be taken into account in the assessment:
- The Wildlife and Countryside Act 1981, as amended;
  - EU Council Directive 79/409/EEC and 2009/147/EC on the Conservation of wild birds (the 'Birds Directive');
  - EU Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive');
  - The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2004 (as amended), which translates the Birds and Habitats Directives into Scottish Law;
  - Environmental Impact Assessment Directive 85/337/EEC (the EIA Directive);
  - The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2012;
  - The Nature Conservation (Scotland) Act 2004;



- The Wildlife and Natural Environment (Scotland) Act 2011; and
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended).
- Scottish Planning Policy (2014). This sets out all of the Scottish Government's Planning Policy of particular relevance to this assessment. It replaces National Planning Policy Guidance 14: Natural Heritage which describes how policies for conservation and enhancement of flora and fauna should be reflected in land use planning;
- Planning Advice Note (PAN) 1/2013 – Environmental Impact Assessment (Scottish Government 2013);
- PAN 51: Planning, Environmental Protection and Regulation (revised 2006);
- PAN 60: Planning for Natural Heritage (Scottish Government 2000);
- Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives:
- Scottish Executive Circular 6/1995 as amended (June 2000); and
- Planning Circular 3 2011; the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011.
- 'Managing Natura 2000 Sites' (European Communities 2000), which gives guidance on the implementation of the Birds and Habitats Directives;
- Guidelines for Ecological Impact Assessment in the UK and Ireland; Terrestrial, Freshwater and Coastal (CIEEM 2018);
- Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH 2010, SNH 2014 and 2017a);
- Developing field and analytical methods to assess avian collision risk at wind farms (Band et al. 2007);
- Assessing significance of impacts from onshore windfarms on birds outwith designated areas: version 2 (SNH 2018);
- Avoidance rates for the onshore SNH collision risk model (SNH 2017b);
- Assessing the cumulative impact of onshore wind energy developments (SNH 2018);
- Assessing connectivity with Special Protection Areas (SPAs) (SNH 2016a);
- Environmental Statements and Annexes of Environmentally Sensitive Bird Information Guidance for Developers, Consultants and Consultees. Version 2 (SNH 2016b);
- Good Practice during Wind Farm Construction (Scottish Renewables et al. 2015);
- Birds of Conservation Concern (BoCC) 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man (Eaton et al. 2015);
- Midlothian Local Biodiversity Action Plan (LBAP);
- The UK Post-2010 Biodiversity Framework; and
- The Scottish Biodiversity List (SBL).

## 7.4 Proposed Scope of Assessment and Potential Impacts

7.4.1 The key issues for the assessment of potential ornithological effects relating to the Proposed Development were identified as the following (after SNH 2018):

- Direct loss of bird habitat through construction of wind farm infrastructure;



- Disturbance of birds during construction and operation (including displacement of flight activity through barrier effects);
- Mortality of birds through collision with turbine blades or towers during operation; and
- Cumulative effects of wind farm operational disturbance and collision mortality, on the national and Natural Heritage Zone (NHZ) populations of key target species.

## 7.5 Assessment Methodology

- 7.5.1 The assessment will include a full evaluation of the ornithological importance of the site's bird populations and identification of any particularly sensitive areas. Collision risk will be estimated for bird species of conservation importance regularly over-flying the Proposed Development site (based on the results of the vantage point surveys). This will be calculated using a standard modelling process, applying NatureScot-recommended avoidance rates. Possible disturbance effects will be assessed by determining the bird populations of importance within the wind farm area and its surrounds (based on the field surveys and any additional information available), and by reference to the current literature on bird-wind farm interactions. The assessment will be carried out with reference to the assessment methodologies produced by NatureScot (SNH, 2018) for the wider countryside, and the Chartered Institute for Ecological and Environmental Management (CIEEM, 2018).
- 7.5.2 The conservation value (as defined in **Table 7.1**) of the receptors present in the Study Area will be identified, then the magnitude of the possible effect on those receptors determined (as described in **Table 7.2**).

**Table 7.1: Conservation Value of bird species**

Value	Definitions
Very High	Cited interest of SPAs, SACs and SSSIs. Cited means mentioned in the citation text for those protected sites as a species for which the site is designated (SPAs/SACs) or notified (SSSIs).
High	Other species that contribute to the integrity of an SPA or SSSI.  A local population of more than 1% of the national population of a species.  Any ecologically sensitive species, e.g. large birds of prey or rare birds (<300 breeding pairs in the UK).  EU Birds Directive Annex 1, EU Habitats Directive priority habitat/species and/or Wildlife and Countryside Act (W&C Act) Schedule 1 species (if not covered above). Other specially protected species.
Medium	Regionally important population of a species, either because of population size or distributional context.  UK BAP priority species (if not covered above).
Low	Any other species of conservation interest, e.g. species listed on the Birds of Conservation Concern not covered above.
Nil	Green-listed species (Eaton et al. 2009) of favourable conservation status.



**Table 7.2: Definition of terms relating to the magnitude of ornithological impacts**

Magnitude	Definition
Very High	Total loss or very major alteration to key elements/ features of the baseline conditions such that post development character/ composition/ attributes will be fundamentally changed and may be lost from the site altogether. Guide: >80% of population/habitat lost
High	Major alteration to key elements/ features of the baseline (pre-development) conditions such that post development character/composition/attributes will be fundamentally changed. Guide: 20-80% of population/habitat lost
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/ composition/ attributes of baseline will be partially changed. Guide: 5-20% of population/habitat lost
Low	Minor shift away from baseline conditions. Change arising from the loss/ alteration will be discernible but underlying character/ composition/ attributes of baseline condition will be similar to pre-development circumstances/patterns. Guide: 1-5% of population/habitat lost
Negligible	Very slight change from baseline condition. Change barely distinguishable, approximating to the “no change” situation. Guide: <1% of population/habitat lost

7.5.3 The combined assessment of the magnitude of an impact and the value of the receptor will be used to determine whether or not an adverse effect is significant. These two criteria have been cross-tabulated to assess the overall significance of that effect (**Table 7.3**). The significance category of each combination is shown in each cell. Shaded cells indicate potentially significant effects in terms of the EIA Regulations. This gives a guide as to the determination of significance, though a final assessment should still be subject to professional judgment.

**Table 7.3: Matrix of magnitude of impact and value used to test the significance of effects.**

MAGNITUDE	CONSERVATION VALUE				
		Very high	High	Medium	Low
	Very high	Major	Major	Major-Moderate	Moderate
	High	Major	Major	Moderate	Minor
	Medium	Major	Major-Moderate	Moderate	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

7.5.4 The interpretation of these significance categories is as follows:

- Minor and Negligible are not normally of concern, though normal design care should be exercised to minimise adverse effects;

- Major and Major-Moderate represent adverse effects on bird populations which are regarded as significant for the purposes of EIA;
- Moderate represents a potentially significant adverse effect on which professional judgment has to be made, though for which it is likely that mitigation will reduce it below the significance threshold.

7.5.5 The NatureScot (SNH, 2018) wider countryside assessment guidance defines the key significance test as follows: *“An impact should be judged as of concern where it would adversely affect the favourable conservation status of a species, or stop a recovering species from reaching favourable conservation status, at international or national level or regionally.”* It notes that the key baseline population against which the assessment should be made for breeding birds is the SNH NHZ population. The site lies mainly within the ‘Border Hills’ NatureScot Natural Heritage Zone (NHZ20), though the northern edge of the survey area is within the ‘Eastern Lowlands’ (NHZ16).

7.5.6 As the survey area is likely to support specially protected species Schedule 1 of the 1981 Wildlife and Countryside Act, information on the breeding sites and associated flight activity of the species listed on that Schedule will only be provided in a Confidential Appendix. It is important that their breeding locations are kept confidential to minimise the risk of persecution and disturbance. Following NatureScot guidance, the amount of information contained in that Appendix will be kept to a minimum but will include any more detailed data that indicate breeding locations. The assessment of the effects that the Proposed Development may have on these species will be included within the Ornithology chapter (but without identifying nesting locations).

#### Cumulative Assessment

7.5.7 A cumulative ornithological assessment will be undertaken following the NatureScot (SNH 2018) guidance on ‘Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Areas’, considering impacts on the favourable conservation status of key species within the relevant Natural Heritage Zone.

## 7.6 Proposed Mitigation

7.6.1 Ornithological sensitivities will be taken into account as hard constraints when developing the wind farm layout design, with the adoption of appropriate buffers. A range of ornithological mitigation measures are likely to be required, primarily for the construction phase to reduce impacts on breeding birds. These will include the production of a Construction Method Statement to the satisfaction of NatureScot and other relevant stakeholders, timing of works to avoid more sensitive areas/times, and the development and implementation of a Breeding Bird Protection Plan (BBPP) to ensure that no Schedule 1 species are disturbed during the breeding season and to protect other nesting birds.

## 7.7 Receptors and Impacts Scoped In or Out of Assessment

7.7.1 No ornithological issues have been Scoped Out from this assessment, though, following NatureScot (SNH, 2018) guidance, the assessment will focus on the key species likely to be affected by the Proposed Development. Key species are being defined using the following criteria:

- species listed on Annex 1 of the EU Birds Directive;
- species listed on Schedule 1 of the 1981 Wildlife & Countryside Act;
- species identified by SNH (2018) as ‘Priority bird species for assessment when considering the development of onshore wind farms in Scotland’. These include (a) species that are widespread across Scotland which utilise habitats or have flight behaviours that may be adversely affected by a wind farm, and (b) as ‘restricted range’ species; and
- red-listed species on the Birds of Conservation Concern list.



## 7.8 Scoping Questions to Consultees

- The above surveys have been scoped to ensure that a robust and complete set of baseline ecological data is collected for the Proposed Development. Please can the consultees confirm if the survey and assessment methodologies are appropriate for the site and in relation to the Proposed Development.



## 8. Geology, Hydrology & Hydrogeology

### 8.1 Introduction

- 8.1.1 This chapter outlines the proposed scope of the EIA Report to assess the significant effects from the Proposed Development on soils, geology, hydrogeology, and hydrology.

### 8.2 Baseline Description

- 8.2.1 The site is located approximately 4 km south of Gorebridge within the northern edge of the Moorfoot Hills. Elevations on the site vary between 510 m Above Ordnance Survey (AOD) near the summit of Mauldslee Hill to 240 m AOD along the northern boundary of the site. Elevations generally decrease towards the north-west. The site and its surrounds receive a relatively high annual rainfall (c. 900 mm/a).

#### Geology and Hydrogeology

- 8.2.2 The Proposed Development is shown by the British Geological Survey (BGS) to be underlain by several units of Ordovician to Carboniferous aged sedimentary rocks, predominately comprising limestones, mudstones, siltstones, wacke, and sandstones. Inferred faults generally trending north-east to south-west are noted between the sedimentary units.
- 8.2.3 BGS indicate that the majority of the site is underlain by superficial deposits of till and glaciofluvial deposits (sand and gravels). Peat is noted within the centre of the site with alluvium noted along the banks of the larger watercourses. The southern extent of the site, near the summits of the local hills, is shown to be absent of any superficial deposits. No made ground deposits are recorded on site.
- 8.2.4 The glaciofluvial and alluvium superficial deposits recorded and the bedrock beneath the site have the potential to contain groundwater. The bedrock has been classified by BGS as a moderately productivity aquifer which is defined as a multi-layered aquifer with low to moderate flow of up to 10 l/s.

#### Soils and Peat

- 8.2.5 Soil mapping indicates that the soils at the site comprise mineral gleys, brown earths, and small area of peaty soils.
- 8.2.6 Published priority peatland mapping by NatureScot indicates that the majority of the site is not located within an area designated as priority peatland. A small area of Class 1, which is considered to be of high conservation value, is recorded within the centre of the site. Areas of lower conservation value (Class 3, 4 and 5) are also noted within the centre of the site.

#### Hydrology and Designated Sites

- 8.2.7 The site lies entirely within the surface water catchment of the River South Esk, in particular sub catchments of the Gladhouse Reservoir to the south-west, Gore Water / Middleton South Burn to the east, and River South Esk (Gladhouse Reservoir to Redside Burn confluence) to the north-west.
- 8.2.8 The Gladhouse Reservoir sub catchment has been designated as a Drinking Water Protected Area (DWPA). The DWPA designation is likely to be linked to the Gladhouse Reservoir which is maintained by Scottish Water for public water supply.
- 8.2.9 Watercourses and groundwater may support other local private and public water supplies.
- 8.2.10 SEPA flood mapping confirms flood extents within the site are typically confined to the watercourse corridors.





8.2.11 Review of NatureScot SiteLink website confirms that one designated site is within the site boundary (albeit more than 900 m from the closest proposed turbine):

- Gladhouse Reservoir has been designated as a SSSI, SPA and Ramsar site for non-breeding pink-footed goose.

## 8.3 Guidance and Legislation

8.3.1 The hydrology and soil chapter will be prepared with reference to best practice guidance and legislation, including (but not limited to):

### Legislation

- EC Water Framework Directive (2000/60/EC).
- Water Environment and Water Services (Scotland) Act 2003.
- Water Environment (Controlled Activities) Regulations 2011.
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017.

### Policy

- Scottish Planning Policy (SPP) (Scottish Executive, 2020).
- Midlothian Council Local Development Plan.

### Guidance

- Good Practice during Windfarm Construction, 4th Edition (Scottish Renewables, Scottish Natural Heritage (now NatureScot), Scottish Environment Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science and AEECoW, 2019).
- Land Use Planning System – SEPA Guidance Note 31 (Guidance on Assessing Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems), Version 3, (SEPA, 2017).
- Control of Water Pollution from Linear Construction Projects – Technical Guidance, C648 (CIRIA, 2006).
- The SuDS Manual C753 (CIRIA, 2015).
- Environmental Good Practice on Site C741 (CIRIA, 2015).
- Developments on Peat and Offsite Uses of Waste Peat (Scottish Environment Protection Agency, 2017).
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, 2017).
- Developments on Peatland - Guidance on the assessment of peat volumes, re-use of excavated peat and the minimisation of waste (Scottish Renewables & SEPA, 2012).
- Floating Roads on Peat - Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with particular reference to Wind Farm Developments in Scotland (Forestry Commission Scotland & Scottish Natural Heritage, 2010).
- Managing Geotechnical Risk: Improving Productivity in UK Building and Construction (Institution of Civil Engineers, 2001).
- Ground Engineering Spoil: Good Management Practice CIRIA Report 179 (CIRIA, 1997).
- Scottish Roads Network Landslides Study Summary Report (Scottish Executive, 2005).



- Guidelines for the Risk Management of Peat Slips on the Construction of Low Volume/Low Cost Roads on Peat (Forestry Commission, 2006).

## 8.4 Study Area

- 8.4.1 The Study Area will include all the proposed site infrastructure and a 1 km buffer from the Proposed Development boundary.
- 8.4.2 The Study Area for potential cumulative effects will use the catchments within the Study Area, with a maximum downstream distance of 5 km from the Proposed Development. Beyond this 5 km distance, any effect is considered to be so diminished as to be undetectable and therefore not significant.

## 8.5 Assessment Methodology

- 8.5.1 The potential effects from the Proposed Development on ground conditions and the water environment will be assessed by completing a desk study and field investigation followed by an impact assessment, the processes of which are detailed below.

### Desk Study

- 8.5.2 An initial desk study will be undertaken to determine and confirm the baseline characteristics by reviewing available information relating to soils and peat, geology, hydrology, and hydrogeology such as groundwater resources, licensed and unlicensed groundwater and surface water abstractions, public and private water supplies, surface water flows, flooding, rainfall data, water quality and soil data. This will include review of published geological maps, Ordnance Survey maps, aerial photographs and site-specific data such as site investigation data, geological and hydrogeological reports, digital terrain models (slope plans) and geological literature.
- 8.5.3 The desk study will identify sensitive features which may potentially be affected by the Proposed Development and will confirm the geological, hydrogeological and hydrological environment.

### Field Surveys

- 8.5.4 The hydrological assessment specialists will liaise closely with the project ecology and geology / geotechnical specialists to ensure that appropriate information is gathered to allow a comprehensive impact assessment to be completed.
- 8.5.5 A detailed site visit and walkover survey will be undertaken, to:
  - verify the information collected during the desk and baseline study;
  - undertake a visual assessment of the main surface waters and identify private water supplies;
  - identify drainage patterns, areas vulnerable to erosion or sediment deposition, and any pollution risks;
  - visit any identified GWDTEs (in consultation with the project ecologists);
  - visit Private Water Supply and DWPA sources that might be affected by the Proposed Development to confirm details of the location of the abstraction, its type and use, as required;
  - prepare a schedule of potential watercourse crossings;
  - assess the site geomorphology and conduct peat depth probing as required; and
  - inspect rock exposures, establish by probing an estimate overburden thicknesses (a probe is pushed vertically into the ground to refusal and the depth is recorded).
- 8.5.6 The desk study and field surveys will be used to identify potential development constraints and be used as part of the site design.



- 8.5.7 Once the desk study is completed and sensitive soil and peat, geological and water features are confirmed an impact assessment will be undertaken to assess the potential effects on soils and peat, geology and the water environment as a result of the construction and operation of the Proposed Development.

#### Assessment of Effects

- 8.5.8 The purpose of this assessment will be to:

- identify any areas susceptible to peat slide, using peat thickness and DTM data to analyse slopes;
- assist in the micro-siting of turbines and tracks in areas of no peat or shallow and least hydrogeologically and hydrologically sensitive areas by applying buffer zones around watercourses and other hydrological features;
- assess potential effects on soils, peat and geology;
- determine what the likely effects of the Proposed Development are on the hydrological regime, including water quality, flow and drainage;
- allow an assessment of potential effects on identified licensed and private water supplies;
- assess potential effects on water (including groundwater) dependent habitats;
- determine suitable mitigation measures to prevent significant hydrological and hydrogeological effects; and
- develop an acceptable code for working on the site that will adopt best practice procedures, effective management and control of on-site activities to reduce or offset any detrimental effects on the geological, hydrogeological and hydrological environment.

- 8.5.9 It is anticipated that the impact assessment might include the following technical appendices:

- peat landside hazard and risk assessment;
- peat management plan;
- schedule of watercourse crossings;
- private water supply risk assessment; and
- groundwater dependent terrestrial ecosystems risk assessment.

- 8.5.10 A qualitative risk assessment methodology will be used to assess the significance of the potential effects. Two factors will be considered: the sensitivity of the receiving environment and the potential magnitude should that potential impact occur.

- 8.5.11 This approach provides a mechanism for identifying the areas where mitigation measures are required, and for identifying mitigation measures appropriate to the risk presented by the Proposed Development. This approach also allows effort to be focused on reducing risk where the greatest benefit may result.

- 8.5.12 The sensitivity of the receiving environment (i.e. the baseline quality of the receiving environment as well as its ability to absorb the effect without perceptible change) and the magnitude of impacts will each be considered through a set of pre-defined criteria.

- 8.5.13 The sensitivity of the receiving environment together with the magnitude of the effect defines the significance of the effect, which will be categorised into level of significance.

- 8.5.14 A review of other existing and proposed developments near the Proposed Development will be undertaken and potential impacts on hydrology, hydrogeology and geology will be assessed to identify cumulative impacts. With regard to the Proposed Development, it is likely that mitigation measures will be proposed that will have a neutral effect or provide betterment compared to



baseline conditions. It is considered unlikely that there will be any significant residual or cumulative impact to report.

#### **Peat Management Plan & Peat Landslide Hazard and Risk Assessment**

- 8.5.15 Phase I peat depth data will be obtained to inform the emerging site design and impact assessment as required by current best practice. As part of the programme of field work the following will be undertaken:
- a geomorphological mapping exercise to link the topographic features with the underlying geology and to visit those areas of the site that may be identified as potentially 'at risk from peat slide';
  - the thickness of the peat will be established by probing and the underlying sub-strata confirmed by inspections of watercourses; and
  - signs of existing or potential peat instability will be recorded.
- 8.5.16 If required, further, or Phase II peat depth probing, will be undertaken as part of the site design in accordance with best practice and will include peat probing along the infrastructure at 50 m centres and at 10 m interval crosshair at turbine locations.
- 8.5.17 Output from the field surveys will comprise a record of investigation locations and summary of peat depths recorded.
- 8.5.18 If significant peat depths are proven a preliminary Peat Landslide Hazard and Risk Assessment (PLHRA) will be completed using the site survey data and slope analysis (using DTM data), highlighting areas that may be impacted by a peat slide so that appropriate mitigation measures can be identified and included in the site design.

#### **Borrow Pit Assessment**

- 8.5.19 A review of suitability of materials on the site will be undertaken and borrow pit search areas will be identified as part of the Borrow Pit Assessment. If appropriate areas are identified a description of likely materials, borrow pit size and the ability to supply appropriate materials for the construction of the wind farm will be included.

## **8.6 Proposed Mitigation**

- 8.6.1 The Proposed Development will undergo design iterations and evolution in response to constraints identified as part of the baseline studies and field studies so as to avoid and/or minimise potential effects on receptors where possible.
- 8.6.2 For example, it is expected that the following potential mitigation measures will be included in the design of the Proposed Development:
- a buffer of up to 50 m will be applied to watercourses;
  - site specific peat probing will be used to identify areas of potential deep peat and these will be avoided where practical;
  - a site-specific peat landslide and hazard risk assessment will be prepared and areas of potential increased peat slide risk will be avoided;
  - if required, a peat management plan will be prepared to show how the integrity of peat will be safeguarded; and
  - impacts on private water supply sources and areas of GWDTE will be avoided.
- 8.6.3 There is much best practice guidance available to assist developers minimise the risks associated with wind farm construction and operation, and this will be used to develop site specific mitigation measures. Measures will be proposed to control and mitigate, for example, pollution risk (from



anthropogenic and geogenic sources), flood risk, watercourse crossings, impacts on surface and groundwater flow paths, and management of peat soils.

- 8.6.4 Good practice measures will be applied in relation to pollution risk, and management of surface run-off rates and volumes. This will form part of the final CEMP to be implemented for the Proposed Development.

## 8.7 Potential Effects

- 8.7.1 Without mitigation or adherence to best practice, effects on soils and peat, geology, hydrology and hydrogeology could occur during the two main stages of development (construction and operation). A summary of the potential effects on ground conditions and the water environment resulting from construction, and operation of a wind farm is provided below. These will be considered in the EIA Report.

### Potential Effects During Construction

- disturbance and loss of peat deposits;
- ground instability (inc. peat slide risk);
- effects on surface water and groundwater quality from pollution from fuel, oil, concrete or other hazardous substances;
- discharge of sediment-laden runoff to drainage system and watercourses;
- increased flood risk to areas downstream of the site during construction through increased surface run-off;
- changes in groundwater levels from dewatering excavations;
- potential change of groundwater flow paths and contribution to areas of peat and GWDTEs;
- disturbance of watercourse bed and banks from the construction of culverts;
- potential pollution impacts to public and private water supplies; and
- disturbance and or pollution resulting from borrow pit formation and use.

### Potential Effects During Operation

- increased runoff rates and flood risks, resulting from increases in areas of tracks and hardstanding at turbines;
- changes in natural surface water drainage patterns (which may affect water contribution to areas of peat and GWDTE);
- changes to groundwater levels and groundwater movement;
- longer term impacts on abstraction for water supplies, particularly any supplies dependent on groundwater; and
- pollution effects on surface water quality from maintenance work.

## 8.8 Receptors and Impacts Scoped In or Out of Assessment

- 8.8.1 It is proposed that the potential effects outlined above will be assessed as part of the EIA Report.
- 8.8.2 At this stage, it is proposed that the following can be Scoped Out of detailed assessment:

- It is proposed to Scope Out effects on geology. While there will be effects arising from rock extraction for borrow pits, track construction and for turbine and crane pad areas, these are limited in area and do not extend beyond the immediate development footprint. No particularly sensitive geological features have been identified within the Study Area.



- Detailed Flood Risk Assessment. Published mapping confirms that the site is not located in an area of fluvial or coastal flood risk. It is proposed, therefore, that a simple screening of potential flooding sources (fluvial, coastal, groundwater, infrastructure etc.) is presented in the EIA Report and measures that would be used to control the rate and quality of runoff will be specified in the EIA Report.
- Water Quality Monitoring. Classification data is available from SEPA for the watercourses at site and there are no known sources of potential water pollution at site that might give rise for the need for water quality monitoring.

## 8.9 Scoping Questions to Consultees

- **Published mapping confirms that most of the site area is not identified as being at flood risk. It is proposed, therefore, that a simple screening of potential flooding sources (fluvial, coastal, pluvial, groundwater etc.) is presented in the EIA Report. Is this approach acceptable?**
- **It is not proposed to prepare a detailed drainage design. Rather measures that would be used to control the rate and quality of runoff will be specified in the EIA Report. Again, is this acceptable?**
- **Site investigations, including detailed peat probing and private water survey, will be undertaken as part of the proposed assessment. Should any additional investigation or data sources be considered when assessing baseline conditions?**
- **It is not proposed to undertake any water quality sampling, establish groundwater monitoring points, surface water monitoring points or undertake leachability trials of any rock as there is published data that can be used to characterise baseline conditions and complete the impact assessment. Is this acceptable?**
- **Please advise if there is any specific information or methodology that should be used / followed as part of the Private Water Supply risk assessment?**
- **Do you agree that the scope of the proposed assessment is appropriate?**



## 9. Traffic and Transport

### 9.1 Introduction

- 9.1.1 This chapter sets out the proposed approach to the assessment of potential effects of the Proposed Development in relation to access, traffic and transport during construction and operation of the Proposed Development.

### 9.2 Guidance and Legislation

- 9.2.1 The following policy and guidance documents will be used to inform the Transport and Access Chapter:
- The Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993).
  - Transport Assessment Guidance (Transport Scotland, 2012).
  - Scottish Planning Policy (Scottish Government, 2014).

### 9.3 Study Area

- 9.3.1 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 three Ports of Entry; King George V (KGV) in Glasgow, Leith and Rosyth.
- 9.3.2 The preferred route is from KGV, and the route to site (and hence the anticipated Study Area) is outlined below:
- Exit KGV onto King Inch Dr.
  - Turn left onto M8 slip road and merge into m8.
  - At junction 1 (Hermiston Gait Roundabout) take the 3rd exit and merge into the City of Edinburgh Bypass (A720).
  - Take the 3rd exit to continue onto A720.
  - On A1 – The City of Edinburgh bypass (A720) roundabout take the 4th exit towards A720.
  - Take the slip road towards A68 and turn left onto A68.
  - Turn right onto B6458/B6367.
  - Turn right onto A7.
  - Continue on A7 and before North Middleton turn left onto B7007 towards site access.

### 9.4 Assessment Methodology and Reporting

- 9.4.1 The preferred route to site shall be presented and assessed in the EIA Report as part of any S36 Application.
- 9.4.2 The Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993) sets out of methodology for assessing potentially significant environment effects. In accordance with this guidance, the scope of assessment will focus on:
- Baseline conditions on the adjacent public highways including suitability for construction traffic, estimated or recorded current traffic flows of ordinary and Heavy Goods Vehicles (HGV) traffic and identification of bottlenecks.

- Traffic movements generated during construction and operation.
  - Potential impacts (of changes in traffic flows) on local roads and the users.
  - Potential impacts (of changes in traffic flows) on land uses and environmental resources fronting these roads, including the relevant occupiers and users.
  - Abnormal loads assessment identifying key pinch points, SPA, including any need for road improvements and/or traffic management.
  - Magnitude and significance of effects of traffic movements and traffic management.
  - Management or mitigation measures, as applicable.
- 9.4.3 The following rules taken from the guidance will be used as a screening process to define the scale and extent of the assessment:
- Rule 1: Include public road links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%).
  - Rule 2: Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.
- 9.4.4 Consultation will be undertaken with the following statutory consultees.
- Transport Scotland (for trunk roads matters).
  - Scottish Borders Council (for local roads matters).
- 9.4.5 Further consultation will be undertaken via the Electronic Service Delivery for Abnormal Loads (ESDAL) weight review for structures on the proposed AIL access route from KGV in Glasgow to the site via the strategic trunk road and local road networks.
- 9.4.6 Further traffic data for the local road network will be obtained from UK Government Department for Transport (DfT) traffic count data, the Traffic Scotland database or from specifically commissioned traffic surveys. National Road Traffic Forecast (NRTF) Low Traffic Growth assumptions will be used to provide a common future year baseline to coincide with the expected construction traffic peak.

## 9.5 Proposed Mitigation

- 9.5.1 Standard mitigation measures that are to be included in the assessment are:
- Production of a Construction Traffic Management Plan.
  - Design of suitable access arrangement with full consideration given to the road safety of all road users.
  - A Framework Abnormal Load Transport Management Plan.
  - Consultation with stakeholders in relation to the assessment.
  - The consideration of appropriate and practical mitigation measures to offset any temporary effects.

## 9.6 Potential Effects

- 9.6.1 The key potential effects to be considered in the assessment will be:
- The temporary change in traffic flows and the resultant temporary effects on the study network during the construction phase.
  - The physical mitigation associated with the delivery of abnormal loads.
  - The design of new access infrastructure.





## 9.7 Receptors and Impacts Scoped In or Out of Assessment

- 9.7.1 Where effects 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.
- 9.7.2 Once operational, it is envisaged that the level of traffic associated with the Proposed Development would be minimal. Regular monthly or weekly visits would be made to the wind farm for maintenance checks. The vehicles used for these visits are likely to be 4x4 vehicles and there may also be the occasional need for an HGV to access the wind farm for specific maintenance and/or repairs. It is considered that, given the occasional and small-scale nature of operational traffic, the effects would be negligible and therefore no detailed assessment of the operational phase of the Proposed Development is proposed.

## 9.8 Scoping Questions to Consultees

- 9.8.1 It is proposed that the following stakeholders will be consulted in relation to the assessment:
- **Transport Scotland and their network agents.**
  - **Scottish Borders Council (for local roads matters).**
  - **Network Rail.**
  - **Do the consultees agree that the proposed methodology is acceptable?**
  - **Do the consultees agree that the use of Low National Road Traffic Forecasts (NRTF) is acceptable for the whole of the study?**
  - **Can the consultees suggest what cumulative traffic flows from committed developments should be included in the assessment?**
  - **Can the consultees confirm which developments should be committed developments within the baseline traffic flows in the assessment, noting that these should have planning consent at the time of scoping?**
  - **Can the consultees confirm details of any upgrades or network changes that may be undertaken to the study area network within the next five years?**



# 10. Noise

## 10.1 Introduction

- 10.1.1 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.

## 10.2 Baseline Description

- 10.2.1 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.
- 10.2.2 It is proposed to undertake background noise measurements at representative properties close to the site. The survey locations shall be selected in consultation with Midlothian Council's Environmental Health department, although are subject to permission being granted by the residents.

## 10.3 Guidance and Legislation

- 10.3.1 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' (BSI, 2009a). 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' (Scottish Government, 2011b).
- 10.3.2 If blasting is required, vibration levels 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' (BSI, 2009b) and assessed in accordance with BS 6472-2: 2008 'Guide to evaluation of human exposure to vibration in buildings - Part 2: Blast-induced vibration' (BSI, 2008).
- 10.3.3 Operational noise shall be assessed in accordance with ETSU-R-97, 'The Assessment and Rating of Noise from Wind Farms' (DTI, 1997), and the Good Practice Guide to its application issued by the Institute of Acoustics (Institute of Acoustics, 2013). The proposed methodology is consistent with 'Planning Advice Note 1/2011: Planning and Noise' (Scottish Government, 2011a) and the further guidance provided in the web-based planning advice on renewable technologies for onshore wind turbines (Scottish Government, 2014).

## 10.4 Study Area

- 10.4.1 The Study Area shall be determined by the proximity of nearby properties to the Proposed Development and the location of any neighbouring wind farms being considered in the cumulative assessment.
- 10.4.2 The acoustic assessment shall include the nearest residential properties to the Proposed Development. Any residential properties that are in planning or consented shall be considered alongside those already existing.
- 10.4.3 The cumulative assessment shall consider any neighbouring wind farms that are close enough that there is potential for a significant cumulative impact at the identified properties. Again, any wind farms that are in planning shall be considered along with those that are already operational or consented.



## 10.5 Assessment Methodology

- 10.5.1 The assessment will consider the potential effects associated with construction and operation of the Proposed Development as detailed below.
- 10.5.2 An assessment of the potential effects due to construction noise, including associated traffic, at the nearest residential properties will be undertaken. Vibration levels at the nearest residential properties shall be assessed should blasting be required to extract material from any proposed borrow pits.
- 10.5.3 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.

## 10.6 Proposed Mitigation

- 10.6.1 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 (Her Majesty's Stationary Office, 1974). Additional mitigation measures could include a reduction in construction activities or traffic during certain periods if appropriate.
- 10.6.2 The potential operational 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.
- 10.6.3 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.
- 10.6.4 Modern turbines can be operated in reduced noise mode should this be necessary to meet noise limits derived according to ETSU-R-97.

## 10.7 Potential Impacts

- 10.7.1 The potential impact on residential amenity due to operational noise and construction noise shall be assessed. Where necessary appropriate mitigation shall be proposed and any residual impacts identified.

## 10.8 Receptors and Impacts Scoped In or Out of Assessment

- 10.8.1 The nearest planned, consented or existing residential properties are Scoped In to the assessment.
- 10.8.2 Impacts due to operational and construction noise are Scoped In to the assessment. A specific assessment of low frequency noise, amplitude modulation or vibration due to the operation of the Proposed Development is Scoped Out.

## 10.9 Scoping Questions to Consultees

- **Do the consultees agree with the proposed acoustic assessment methodology?**



# 11. Other Assessments

## 11.1 Aviation

- 11.1.1 The EIA Report will include a description of military and civilian aeronautical and radar issues relating to the Proposed Development.
- 11.1.2 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.
- 11.1.3 Radar systems can be susceptible to interference from wind turbines as the blade movement can cause intermittent detection by radars within their operating radius. This is particularly relevant where there is a line of sight between the radar and the wind turbine development. Initial indications are that there are no radars with line-of-sight visibility to the turbines.
- 11.1.4 Due to their height, wind turbines can also impact upon airports and airfields if they protrude into the safeguarding distance above and around them. It is possible that the turbines might impact the Instrument Flight Procedures at Edinburgh Airport.
- 11.1.5 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 150 m or more above ground level. As the proposed turbines are above 150 m, visible aviation lighting will be required, and an appropriate scheme will be agreed with the Civil Aviation Authority (CAA). The Ministry of Defence (MOD) is likely to request an infra-red lighting scheme for low flying military aircraft in the area. This will be agreed through consultation with the MOD.
- 11.1.6 While not an aviation impact, the Eskdalemuir Seismic Measurement Facility, is safeguarded by the MOD. The closest turbine in the Proposed Development is 48 km north of the Measurement Facility. As some of the turbines are within 50 km of the facility, there may be an impact. As such, an assessment of potential issues will be undertaken and will include consultation with the relevant organisations.

## 11.2 Telecommunication

- 11.2.1 Wind farm developments have the potential to interfere with electromagnetic signals passing above ground. Consultation will be carried out with OFCOM, television, telecommunication, and other utility providers to clarify that there are no links crossing the site that will be impacted by the Proposed Development. The turbine layout will be designed to avoid direct impact on any identified links, and where this has been a consideration, it will be identified as part of the design evolution of the scheme within the EIA Report. On the basis that a technical mitigation solution can be implemented, likely significant telecommunications effects are not anticipated and a specific chapter on this topic has been Scoped Out of the EIA.

➤ **Do you agree that a specific chapter on telecommunications can be Scoped Out of the EIA?**



## 11.3 Shadow Flicker

### Introduction

11.3.1 Shadow flicker is an effect that can occur within buildings situated in relatively close proximity to wind turbines when the shadow from rotating blades passes over a window opening. Shadow flicker intensity is defined as the difference or variation in brightness at a given location in the presence and absence of a shadow. Shadow flicker can be a nuisance to nearby human receptors, and its effects therefore must be considered during the design of the Proposed Development. It only occurs when the turbine is in operation (i.e. sufficient wind speed is present), the sun is low in the sky (dawn, dusk, winter days), there is limited cloud cover, and the turbine lies between the direction of the sun and the building in question.

11.3.2 Planning advice (Scottish Government, 2014)<sup>5</sup> sets out the potential affected area which may fall under assessment: *“Where this (shadow flicker) could be a problem, Applicants should provide calculations to quantify the effect. In most cases however, where separation is provided between wind turbines and nearby dwellings (as a general rule ten rotor diameters), ‘shadow flicker’ should not be a problem.”*

### Study Area and Proposed Scope of Assessment

11.3.3 An assessment will be undertaken of the likely significant effects of the Proposed Development on all residential receptors within the shadow flicker study area.

11.3.4 In line with the guidance set out in paragraph 11.3.3 above, the Study Area will encompass all of the properties located within ten times the maximum rotor diameter, in this case, 1.5 km.

### Assessment Methodology

11.3.5 For an accurate assessment of shadow flicker, complex modelling is required taking into account the turbine’s dimensions and the movement of the sun throughout the year. Data will be input into the modelling as follows:

- The locations of properties within ten rotor diameters of each proposed wind turbine;
- The locations and dimensions of the proposed turbines;
- The local topography (Ordnance Survey Digital Terrain Model); and
- The estimated dimensions of windows.

11.3.6 The modelling calculates the position of the sun throughout the day in accordance to the curvature of the earth, the time of year and the site’s position. The software calculates the occurrences of shadow flicker at each identified receptor. Analysis will be conducted to represent a worst case scenario, namely:

- The sun is shining all day, from sunrise to sunset;
- The rotor plane is always perpendicular to the line from the wind turbine to the sun;
- There are no obscuring features such as trees and vegetation;
- The analysis looks at shadow casting over the building from all directions rather than over vertical orientated windows only; and
- The wind turbine is always operating.

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<sup>5</sup> Available online: <https://www.gov.scot/publications/onshore-wind-turbines-planning-advice/> (last accessed 18/10/2022)



### Proposed Mitigation

- 11.3.7 If required, the Applicant will implement a shadow flicker protocol during construction and for the operational life of the Proposed Development to mitigate shadow flicker impacts. A range of measures could be incorporated, including planting tree belts between the affected residential property and the responsible wind turbine or installing blinds at the affected residential property.

### Receptors and Impacts Scoped In and Out of Assessment

- 11.3.8 **Table 11.1** details the receptors Scoped In to the EIA Report.

*Table 31.1 Receptors Scoped In to EIA Report*

Receptor	Effects	Scoped In
Residential properties within the Study Area	Nuisance and disturbance to humans due to the operation of the turbine blades.	✓

## 11.4 Scoping Questions to Consultees

- Do you agree that the proposed scope of assessment is appropriate?



## 12. Potential Grid Connections

- 12.1.1 The specific configuration of the grid connection between the wind farm and the grid network is not yet finalised. It is hoped that all grid connection infrastructure will be within the red line boundary of the Proposed Development's S36 application. If this is the case, the potential grid connection options will be described in the EIA Report and consideration of the environmental effects of the indicative grid connection included within the assessment.
- 12.1.2 If the grid connection between the wind farm and the grid network is not within the red line boundary of the S36 application, the grid connection will be subject to a separate application under Section 37 of the Electricity Act 1989.
- 12.1.3 The detailed environmental studies and reporting associated with the grid connection shall accompany that application. However, if sufficient detail is available from the Network Operator the EIA Report for the Proposed Development will include consideration of the environmental effects of an indicative grid route corridor.

➤ **Do you agree that the approach with respect to the potential grid connection is appropriate?**



## 13. Socio-Economics Assessment

- 13.1.1 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.
- 13.1.2 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 and local businesses – details of accommodation stayed in by construction workers.
  - electricity generated annually (MWh).
  - investment in transport infrastructure.
- 13.1.3 There are natural crossovers in this assessment with elements of other chapter topics such as LVIA.
- 13.1.4 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.
- 13.1.5 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.
- 13.1.6 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.
- 13.1.7 A do-nothing scenario will be included in the assessment to demonstrate what effects may occur without the Proposed Development.
- **Do you agree that the scope of the proposed assessment is appropriate?**





## 14. Climate Change Assessment

### 14.1 Introduction

- 14.1.1 This chapter of the document sets out the proposed approach to the assessment of potential effects of the Proposed Development on carbon balance as a result of the construction and operation of the Proposed Development.
- 14.1.2 Calculation of the carbon footprint will be based on best practice guidelines including the Scottish Government Carbon Calculator Tool.

### 14.2 Proposed Scope of Assessment

- 14.2.1 A wind farm has the potential to displace electricity generated from fossil fuels during its operational lifespan and consequently prevent carbon dioxide (CO<sub>2</sub>) from being released. The EIA will provide an estimate of the potential amount of CO<sub>2</sub> savings that can be made, based on assessing the electricity generation mix that the Proposed Development is displacing at any given time and the carbon released due to the construction of the Proposed Development.

### 14.3 Assessment Methodology

- 14.3.1 A wind farm constructed on peatland habitat has the potential to generate CO<sub>2</sub> emissions as a result of the excavation and/or degradation of peat. The current best practice guidance available on the Scottish Government website provides a method to calculate carbon emission savings associated with wind farm developments on Scottish peatlands utilising a full life cycle analysis approach using a web-based application. The tool was originally published in 2008 and the latest version published in December 2018 (Scottish Government, 2018b). The tool compares the carbon costs of wind farm developments with the carbon emissions savings attributable to the wind farm. The calculation is summarised as the length of the time (in years) it will take the carbon savings to amount to the carbon costs also referred as the “payback period”. An assessment of effect of significance will not be undertaken but the volumes of CO<sub>2</sub> savings and emissions will be provided in the chapter.

### 14.4 Proposed Mitigation

- 14.4.1 During the design process, the turbines, access tracks and other infrastructure will be sited to avoid areas of deep peat as far as possible and measures to minimise peat disturbance especially during excavation will be taken into consideration. Best practice measures will also be considered to minimise peat disturbance during construction. These measures will be set out in the Construction Environment Management Plan (CEMP).

### 14.5 Scoping Questions to Consultees

- **Do you agree with the above methodology for assessing carbon emissions and savings of the Proposed Development?**



## 15. Ice Throw

- 15.1.1 Icing in Scotland is likely to be a rare occurrence, with the Icing Map of Europe (WECO, 2000) showing Scotland to be within a light icing area with an annual average of only 2-7 icing days per year.
- 15.1.2 The risk associated with ice throw affecting members of the public is considered to be very low given the remote rural location of the Proposed Development.
- 15.1.3 This is reduced further as turbines are fitted with vibration sensors which shut the turbines down should any imbalance that might be caused by icing be detected.
- 15.1.4 To further minimise the risk, the following mitigation measures will be taken:
  - Service crews will be trained regarding the potential for ice throw.
  - Ice risk conditions will be monitored by the wind farm operator.
  - Public notices will be displayed at access points alerting members of the public and staff accessing the site of the possible risk of ice throw under certain weather conditions.
- 15.1.5 It is therefore proposed that ice throw is Scoped Out of the EIA.
  - **Do consultees agree that it is appropriate to Scope Out ice throw from the EIA?**



## 16. Population and Human Health

- 16.1.1 The assessment of potential population and human health effects will be undertaken in the context of residential amenity (i.e. visual impact, noise and shadow flicker where Scoped In to the EIA).
- 16.1.2 It is therefore proposed that a specific assessment on potential effects on population and human health is Scoped Out of the EIA.
  - **Do consultees agree that it is appropriate to Scope Out a specific assessment of potential effects on population and human health from the EIA?**



## 17. Risk of Major Accidents and/or Disaster

- 17.1.1 Given the nature of the Proposed Development, and its remote location, the risk of a major accident or disaster is considered to be extremely low. The Principal Designer will ensure a Design Risk Assessment process is followed during the design phase to ensure designers fully assess risks and mitigate to a level deemed as low as reasonably practicable during the design stage as part of the requirements of the Construction (Design and Management) Regulations (2015).
- 17.1.2 During the operational phase of the Proposed Development, routine maintenance inspections will be completed in order to ensure the safe and compliant operation of all built infrastructure.
- 17.1.3 It is therefore proposed that risk of major accidents and or disaster is Scoped Out the EIA.
  - **Do consultees agree that it is appropriate to Scope Out risk of major accidents and/or disaster from the EIA?**



## 18. Air Quality

- 18.1.1 The air quality at this site is expected to be good due to the rural location, with few pollution sources. The main pollution source is likely to be local emissions from traffic on the A7 and B7007, and from Broad Law Quarry rocket engine testing facility located adjacent to the eastern boundary of the site.
- 18.1.2 During the construction of the wind farm the movement of vehicles and on-site plant would generate exhaust emissions. Given the short-term nature of the construction period, and the limited area to be developed within the context of the large-scale nature of the site, effects on air quality are likely to be negligible.
- 18.1.3 Construction activities (such as borrow pit works) have the potential to generate dust during dry spells, which may adversely affect local air quality. Given the scale and nature of construction activities and given the distance between construction areas and the nearest residential properties, it is considered that dust from construction is unlikely to cause a nuisance.
- 18.1.4 An operational wind farm produces no notable atmospheric emissions. The operation of the wind farm would therefore have no discernible adverse effects on local or national air quality.
- 18.1.5 Relevant mitigation measures for air quality and pollution control during construction will be captured within the site-specific CEMP.
- 18.1.6 It is therefore proposed that an assessment of air quality is Scoped Out of the EIA.
  - **Do consultees agree that it is appropriate to Scope Out air quality (including potential dust impacts) from the EIA?**



## 19. Forestry

- 19.1.1 There is limited tree coverage on the site.
- 19.1.2 Measures to avoid or mitigate potential impacts upon the small pockets of woodland will be embedded in the design of the Proposed Development through consideration of the siting of the wind turbines.
- 19.1.3 Given that the area of forestry on site is small and can be avoided, the effects on forestry will be negligible.
- 19.1.4 It is therefore proposed that an assessment of forestry is Scoped Out of the EIA.
  - **Do consultees agree that it is appropriate to Scope Out forestry from the EIA?**



## 20. Waste Strategy

- 20.1.1 Construction activities have the potential to generate waste. Relevant mitigation measures and strategies for waste management encompassing the minimisation of waste and the removal of waste from site will be captured within the site-specific CEMP. The CEMP will be agreed with Midlothian Council prior to the commencement of works on site.
- 20.1.2 It is therefore considered that waste strategy does not warrant its own chapter in the EIA.
- **Do consultees agree that it is appropriate to Scope Out waste strategy from the EIA?**



## 21. Summary

- 21.1.1 This EIA Scoping Report outlines the proposed technical and environmental assessments that will be included within the EIA Report for the Proposed Development. The proposed scope and methodologies for each assessment have been provided and the guidance to be followed set out. Should any further information be required in order that a full EIA Scoping Opinion can be provided we would be happy to provide further information and/or discuss any further requirements.





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# Appendices

Provided separately.





# Figures

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