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GOLTICLAY WIND FARM EXTENSION EIA SCOPING REPORT

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GLOSSARY

Abbreviation	Description
AD	Air Defence
AESLQ	Assessment Of Effects on Special Landscape Qualities
agl	Above Ground Level
AHSLA	Assessment Of Highland Special Landscape Areas
AIL	Abnormal Indivisible Load
AM	Amplitude Modulation
ANO	Air Navigation Order
ANSP	Air Navigation Service Provider
AOD	Above Ordnance Datum
APDO	Procedure Design Organisation
ATC	Air Traffic Control
ATS	Air Traffic Services
AWI	Ancient Woodland Inventory
BAP	Biodiversity Action Plan
BEIS	Business, Energy and Industrial Strategy
BERR	Business, Enterprise and Regulatory Reform
BESS	Battery Energy Storage System
BGS	British Geological Survey's
BoCC	Birds Of Conservation Concern
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CaSPlan	Caithness And Sutherland Local Development Plan
CEMP	Construction Environmental Management Plan
CNS	Communication, Navigation and Surveillance
CT	Character Types
CTA	Control Area
DESNZ	Department For Energy Security and Net Zero
DfT	Department For Transport
DTI	The Department of Trade And Industry
DTM	Digital Terrain Model
EHP	Environmental Health Perspectives
EHSUs	Emergency Helicopter Support Units
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Regulations
FL	Flight Level
ft	Feet
FVP	Focal Vantage Point
GDLs	Garden And Designed Landscapes
GLVIA	Guidelines For Landscape and Visual Impact Assessment
GPPs	Guidance For Pollution Prevention
ha	Hectares
HEPS	Historic Environment Policy for Scotland

Abbreviation	Description
HES	Historic Environment Scotland
HIAL	Highland And Islands Airports Limited
HRA	Habitats Regulations Assessment
HwLDP	Highland Wide Local Development Plan
IAIP	Integrated Aeronautical Information Package
IEMA	Institute Of Environmental Management and Assessment
IFPs	Instrument Flight Procedures
IUCN	Union for the Conservation of Nature
km	Kilometre
LCT	Landscape Character Types
LFA	Low Flying Area
LP	Lighting Plan
LVIA	Landscape And Visual Impact Assessment
MAA	Military Aviation Authority
Met	Meteorological
MoD	Ministry Of Defence
MW	Megawatts
NATS	National Air Traffic Services
NBN	National Biodiversity Network
NERL	NATS En-Route Plc
NGR	National Grid Reference
NHMRC	National Health and Medical Research Council
nm	Nautical Mile
NNR	National Nature Reserves
NOTAM	Notice To Aviation
NPF	National Planning Framework
NSA	National Scenic Areas
NVC	National Vegetation Classification
OHMP	Outline Habitat Management Plan
OPMP	Outline Peat Management Plan
OWESG	Onshore Wind Energy Supplementary Guidance
PAN	Planning Advice Note
PEXAs	Prohibited/Restricted/Danger Areas
PLHRA	Peat Landslide Hazard and Risk Assessment
PPGs	Pollution Prevention Guidelines
PSR	Primary Surveillance Radar
PWS	Private Water Supply
RAF	Royal Air Force
RLOS	Radar Line of Sight
RVAA	Residential Visual Amenity Assessment
SAC	Special Areas of Conservation
SAR	Search And Rescue
SEPA	Scottish Environment Protection Agency
SLA	Special Landscape Area

Abbreviation	Description
SPA	Special Protection Areas
SSSI	Sites Of Special Scientific Interest
TAG	Transport Assessment Guidance
TAN	Technical Advice Note
THC	The Highland Council
TRA	Temporary Reserved Area
UK	United Kingdom
UK Mil AIP	UK Military Aeronautical Information Publication
UKLFS	UK Low Flying System
UNESCO	United Nations Educational, Scientific and Cultural Organizations
VFR	Visual Flight Rules
WHS	World Heritage Site
WTAMR	Wind Turbine Am Review
ZTV	Zone Of Theoretical Visibility

1 INTRODUCTION

- 1.0.1 This Scoping Report is provided in support of a request to the Scottish Ministers for a Scoping Opinion under the terms of Regulation 12 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, as amended ('the EIA regulations').

1.1 Project History and Background

- 1.1.1 RWE Renewables UK Swindon Ltd ('the Applicant') proposes to construct and operate a wind farm and associated infrastructure including a Battery Energy Storage System (BESS) located on land located east of the A9 road, approximately 6 km north of Latheron and 18 km southwest of Wick, in the Highlands ('the Site'). The proposed wind farm would be known as Golticlay Wind Farm Extension (formerly Stemster Wind Farm) and is hereafter referred to as 'the Proposed Development'. The Site location is shown in **Figure 1.1 (Appendix 1)**, the Site context is shown in **Figure 1.2 (Appendix 1)**.
- 1.1.2 The Site was previously the subject of a Scoping Opinion in 2019 (ECU00001882) for a commercial scale wind energy development proposal of 11 no. turbines with maximum blade tip height 200 m (known as Stemster Wind Farm), a project developed by Innogy Renewables UK Ltd (now RWE Renewables UK Swindon Ltd). The development of this Site was subsequently placed on hold (at the scoping/pre-application stage) and no application was submitted.
- 1.1.3 A wind farm development to the southeast of the Site ('Golticlay Wind Farm', comprising 19 no. turbines with a maximum blade tip height of up to 130 m) was granted section 36 (s36) consent in 2021 following a public inquiry. A s36c Application to vary the 2021 consent to 11 no. turbines with a maximum blade tip height of up to 200 m was submitted to the Scottish Ministers in 2023 (ECU00004946). A conditional variation to the Proposed (varied) Development Description to limit all turbines up to a maximum height of 180 m was then agreed with the Highland Council (THC). THC subsequently submitted a 'no objection' consultation to the variation. A decision notice granting consent was received from the Scottish Ministers on 4th December 2024.
- 1.1.4 Following the consent of the varied Golticlay Wind Farm (2024), the Applicant has decided to re-scope the proposal formerly known Stemster Wind Farm as an extension of the varied Golticlay Wind Farm, and subsequently re-name the development as Golticlay Wind Farm Extension.
- 1.1.5 The scoping layout for the Proposed Development is presented on **Figure 1.3 (Appendix 1)** and shows the Site is currently anticipated to accommodate up to 11 wind turbine generators with a maximum tip height of up to 200 m and with a generation capacity of >50 Megawatts (MW). In addition, the Site will accommodate a BESS. The layout of the Proposed Development should be considered preliminary, as it will evolve as survey information is gathered in relation to environmental and technical constraints. The evolution of the layout will also respond to stakeholder consultation feedback from the scoping process and parallel engagement with the local community.

1.2 Consenting Regime

- 1.2.1 The Proposed Development falls under the category of a wind farm extension and at this stage would have an installed capacity > 50 MW. Therefore, an application for consent would be made to the Scottish Ministers under s36 of the Electricity Act 1989. The Applicant would also seek deemed planning permission under section 57 of the Town and Country Planning (Scotland) Act 1997.
- 1.2.2 The Proposed Development is categorised as 'Schedule 2' development (Paragraph (1) "a generating station") under the EIA regulations. An official request for a Screening Opinion was not made to the Scottish Ministers. However, considering the potential for likely significant effects on the environment by virtue of factors such as its nature, size, or location, a voluntary EIAR will be prepared in support of the s36 application.

1.3 The Purpose of this Report

- 1.3.1 This Scoping Report has been prepared by Ramboll UK Limited on behalf of the Applicant. The purpose of the report is to request a Scoping Opinion, with respect to the scope of and approach to the EIAR which will accompany the application for a s36 consent related to the Proposed Development.

1.3.2 The specific objectives of this Scoping Report are to:

- seek agreement on the potential likely significant effects associated with the Proposed Development, and confirm that all potential likely significant effects have been correctly included in the proposed scope of the EIA ('scoped in');
- seek agreement on the proposed topics to be excluded from the EIA where non-significant effects are anticipated ('scoped out'); and
- invite comment on the proposed approach to baseline data collection, prediction of environmental effects and the assessment of significance; and
- invite feedback on the design of the Proposed Development.

1.3.3 The scoping report will be provided to the consultees listed in **Appendix 2**.

1.4 The Applicant

1.4.1 The Applicant has been developing and operating onshore wind energy projects in the UK for more than two decades. RWE has a portfolio of 33 existing operational wind farms in the UK (738 MW pro rata share) and a further development pipeline of 22 projects with 1,700 MW in potential generation capacity.

1.5 Previous Assessments

1.5.1 Baseline information has been collected drawing on site visits, survey work and relevant information from existing documents including:

- Consented Golticlay Wind Farm EIAR (2016)¹.
- Varied Golticlay Wind Farm EIAR (2023)².
- Stemster Wind Farm Scoping report (2019)³
- Previous survey work completed for both wind farm sites.

1.5.2 Where appropriate, information from the above previous assessments has been used to inform the scoping process and have been referenced throughout the report, as necessary.

1.6 Structure of this Report

1.6.1 The remainder of this Scoping Report is structured as follows:

- Chapter 2: provides a brief description of the nature and purpose of the Proposed Development, typical construction activities and decommissioning proposals.
- Chapter 3: provides a summary of the topics to be scoped in and scoped out of the EIAR, provides an outline of the consultation process, and summarises the approach to the EIA.
- Chapters: 4-11 set out the baseline environment conditions, embedded mitigation, the likely significant environmental effects identified, impacts scoped out and the proposed method for further data collection and evaluation of effects.
- Chapter 12: describes the effects that are considered not to be significant, and proposes that these be excluded from the EIA, providing a rationale in each case.
- Chapter 13: provides information on the process for making representations on the Scoping Report.

1.7 Project Team

1.7.1 This report has been prepared by competent EIA experts at Ramboll UK Limited, with a select team of technical specialists providing inputs covering all the relevant environmental disciplines as set out in **Table 1.1**.

¹ Golticlay Wind Farm EIAR (2016) - <https://www.energyconsents.scot/ApplicationDetails.aspx?cr=EC00003133>

² Golticlay Wind Farm Variation Application - <https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00004946>

³ Wind Farm Scoping Request - <https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00001882>

Table 1.1 - Technical Team

Technical Specialist	EIA Topic
AXIS PED	Landscape and Visual
LUC	Ecology (non-avian)
Natural Power	Ornithology
AECOM	Cultural Heritage Transport and Access
TNEI	Noise and Vibration
Coleman Aviation	Aviation and Telecommunications
Ramboll	Shadow Flicker Hydrology and Hydrogeology, Geology and Soils (Including peat)

2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.0 Site Selection

2.0.1 The Site for the Proposed Development is considered by the Applicant to be suitable for wind farm development for the following reasons:

- it has a high wind resource;
- it is in close proximity to the existing electricity grid network and A9(T) road;
- it is located out with national and international statutory designations for landscape and nature conservation including:
 - Ramsar Sites;
 - Special Protection Areas (SPA);
 - Special Areas of Conservation (SAC);
 - Sites of Special Scientific Interest (SSSI);
 - National Nature Reserves (NNR)
 - National Scenic Areas (NSA); and
- The turbines are at an appropriate distance from residential receptors and the nearest settlement, Upper Lybster is over 2 km away.

2.1 Site Description and Context

2.1.1 The 'Site', as defined by the red line boundary on **Figure 1.1 (Appendix 1)**, is located east of the A9 road, approximately 6 km north of Latheron and 18 km southwest of Wick, in the Highlands. The Site occupies an area of approximately 995 hectares (ha) and predominantly comprises open moorland that is used by grazing cattle and sheep, along with a section of the C1053 (6.2 km) road which runs down to the A99 Junction, inclusive.

2.1.2 Loch Stemster is situated close to the centre of the Site and lies between two on-site hills:

- Stemster Hill to the southwest which is the highest point on the Site (248 m Above Ordnance Datum (AOD)); and
- Sidhean Mhor which rises to 190 m AOD to the northwest of Loch Stemster.

2.1.3 The C1053 is a single track minor road (with passing places) which runs northwest from the A99 at Lybster to the A9 at Achavanich. The C1053 is included within the Site boundary and runs from the A99 junction up to the eastern entry point of the Site. A track originates from a gated entrance on the C1053 near Loch Stemster and runs northwards, around the eastern side of Sidhean Mor. This track is also designated as a core path (CA10.11 Achavanich and Munsary) by THC. Two overhead electricity lines (132 kV and 33 kV) run approximately parallel to the A9 in the western portion of the Site.

2.1.4 In addition to Loch Stemster, a number of burns and drains are present on the Site. The Loop Burn flows westwards from Loch Stemster into Loch Rangag, located to the west of the Site. Reisgill Burn originates in the southern portion of the Site and flows southwards into Rumster Forest and into the sea at Lybster Bay.

2.1.5 The Site is situated adjacent to the Flow Country which was granted World Heritage Site (WHS) status⁴ by the United Nations Educational, Scientific and Cultural Organizations (UNESCO's) World Heritage Committee in July 2024. The Flow Country WHS is the first in Scotland inscribed purely for natural criteria⁵, and only the sixth natural site in the UK. It is the quality and extent of the blanket bog habitat that gives The Flow Country its outstanding universal value and justifies its place on the world heritage site list. The Flow Country WHS boundary is illustrated on **Figure 1.4 (Appendix 1)**.

⁴ <https://www.gov.scot/news/world-heritage-status-for-flow-country/#:~:text=UNESCO%20recognise%20global%20importance%20of%20its%20natural%20habitat.,Heritage%20Site%20Status%20by%20UNESCO%E2%80%99s%20World%20Heritage%20Committee.>

⁵ The WHS has been inscribed under criterion ix to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.

- 2.1.6 There are no residential properties within the Site boundary. Individual residential properties are located close to the western Site boundary along the A9 road; close to the east of the northern section of the Site. Individual properties are also located to the southern section of the Site which follows the C1053 to the A99 Junction.
- 2.1.7 As illustrated on **Figure 1.2: Site Context (Appendix 1)**, 2021 Golticlay Wind Farm, also located immediately east of Site was granted section 36c consent 4th December 2024.

2.2 The Proposed Development

- 2.2.1 The main elements of the Proposed Development would be as follows:

- Up to 11 wind turbines, each up to a maximum tip height of 200 m;
- Permanent foundations supporting each wind turbine;
- Associated crane hardstandings at each turbine location;
- A series of new on-site access tracks with associated watercourse crossings;
- Underground cabling within the Site;
- A control building and substation compound (including transformer and BESS);
- A temporary construction compound and laydown area;
- Up to three temporary borrow pit search areas;
- A permanent anemometer mast including associated foundations and hardstanding; and
- Temporary improvement works to the C1053 between the Site entrance and the A99 Junction.

Table 2.1: Indicative Turbine Locations

Turbine	Easting	Northing
1	319474	939780
2	319949	939850
3	319496	940253
5	320049	940321
6	319750	940678
9	320075	941512
10	320488	941297
12	320515	940318
15	319001	939606
16	318936	940040
17	318853	940467

- 2.2.2 A candidate turbine for the Proposed Development has not yet been chosen and is likely to change as the design process progresses. Indicative parameters could potentially be as shown in **Table 2.2 below**.

Table 2.2 - Indicative Turbine Parameters

Blade Tip Height	Rotor Diameter	Hub Height
200 m	149 m	122.5 m

- 2.2.3 A scoping turbine layout and the proposed location of the BESS are presented in **Figure 1.3 (Appendix 1)**. The proposed turbines would be three bladed horizontal axis turbines with tapered tubular steel towers.
- 2.2.4 A micro-siting allowance of up to 100m for the turbines and other infrastructure will be applied to anticipate possible unfavourable Site conditions or other construction constraints. These allowances will be clearly defined within the EIAR and assessed as appropriate.

Site Access

- 2.2.5 The transport route for Abnormal Indivisible Load (AIL) access to Site is likely to follow that for the varied Golticlay Wind Farm (from Wick Harbour until it reaches the A99 Junction on to the C1053).

Grid Connection

- 2.2.6 The Proposed Development has a grid connection date of December 2027. No decision has yet been made on how the connection would be delivered (e.g. overhead lines or underground cable). The grid connection itself will be subject to a separate planning process.

Site Construction

- 2.2.7 Typical construction activities and work methods will be set out in the EIAR. Information will also be provided on an indicative construction programme, construction traffic generation and construction phasing. An Outline Construction Environmental Management Plan (CEMP) will also be submitted as part of the EIAR which will contain details of appropriate environmental management measures, including pollution prevention measures (in line with Scottish Environment Protection Agency (SEPA)'s Pollution Prevention Guidelines (PPGs) and Guidance for Pollution Prevention (GPPs)), and waste minimisation and management measures.

Wind Farm Lifecycle and Decommissioning

- 2.2.8 Planning permission will be sought for the Proposed Development to have an operational life of 40 years from date of first commissioning.
- 2.2.9 Following the operational period, provided there has been no approval to extend its life, the Proposed Development would be decommissioned. The decommissioning operation will be undertaken in accordance with the relevant decommissioning guidelines prevailing at the time.

Site Biodiversity Enhancement

- 2.2.10 Biodiversity enhancement measures for the Site may include, but not be limited to, options such as peatland restoration, heathland restoration, grassland management, hedgerow creation and riparian tree planting. An Outline Habitat Management Plan (OHMP) would be developed for the operational phase and agreed with consultees.

Community Benefits

- 2.2.11 The project would bring a wealth of socio-economic benefits to the local community, including the creation of jobs and opportunities for local businesses and suppliers during the construction phase and for the lifetime of the project. The Applicant is also committed to paying a community benefit fund of £5,000 per MW of installed capacity for every year of operation. In addition, the Applicant will be offering the community a shared ownership opportunity with this wind farm. This application therefore not only complies with Scottish Government planning and energy policy but would also lead to increased benefits both in respect of climate change, as well as local economic benefits.

2.3 Design and Alternatives

- 2.3.1 Considering the history of the Site, a comprehensive design process had been undertaken to date, offering a more informed and evolved design as the starting point for this re-scoping process.
- 2.3.2 The Proposed Development design process will seek to further refine the infrastructure layout and turbine typology. This will consider visibility from the surrounding environment and the key environmental constraints on-site and in the surrounding area and deliver mitigation of adverse effects by design as far as is practicable.
- 2.3.3 Following completion of the main baseline landscape and visual assessment, design objectives will be developed and used to further refine the infrastructure layout. The layouts will be examined from key design viewpoints to assess and optimise the number, size and layout of the proposed wind turbines in relation to the landform of the Site and surrounds, as well as adjacent wind farm developments.
- 2.3.4 The design iteration process will take account of other environmental and technical factors to establish the final layout for the Proposed Development. Key sensitivities which are likely to influence the design process include:

- key views from surrounding settlements, landmark hills and transport corridors;
- the settings of designated cultural heritage assets in the surrounding area;
- sensitive ecological designated sites, priority habitats, including unmodified blanket bog, dry heath, marshy grassland and acid flushes;
- groundwater dependant ecological habitats;
- watercourses and associated fisheries, riverine mammals and invertebrates; and
- breeding birds, including raptors and waders (disturbance and collision risk).

2.3.5 The design optimisation process will be reported and illustrated in the EIAR.

3 SCOPE OF THE EIA

3.0 Summary Scope of the EIA

- 3.0.1 The EIA regulations require the EIA Report to identify, describe and assess the likely significant effect on the factors specified in Regulation 4(3) and the interaction between those factors. **Table 3.1** lists the factors and outlines how this EIA Scoping Report addresses each, including how the report describes the potential interactions between the factors.

Table 3.1: Consideration of Factors in the EIA Scoping Report

Regulation 4 (3) Factor	How this is addressed in the scoping report
Population and Human Health	Chapters 4, 8, 11 and Other Issues Chapter (Sections 12.5, 12.6, 12.8, and 12.9): Population and Human Health incorporates a consideration of potential for likely significant effects on community health and wellbeing in relation to • nuisance related to noise and vibration during construction and operation; • potential impacts associated with water supplies, traffic visual amenity; • perceived health effects related to Shadow Flicker; and • potential for impact resulting from major accidents or disasters (considered to be limited to impacts from towers being destabilised).
Biodiversity	Chapter 5 and 6: Ecology incorporates a consideration of potential for likely significant effects on biodiversity including consideration of terrestrial habitats (including priority peatland), protected mammals, reptiles and amphibians, aquatic ecology, and ornithology.
Land	Other Issues Chapter (Section 12.4): Land use incorporates a consideration of potential for likely significant effects on land use including agriculture and commercial forestry.
Soil	Other Issues Chapter (Section 12.2): Geology and Soils incorporates a consideration of potential for likely significant effects on peat soils and carbon.
Water	Other Issues Chapter (Section 12.1): Water Environment incorporates a consideration of potential for likely significant effects on the water environment including hydrology, hydrogeology, and groundwater dependent terrestrial ecosystems (GWDTE).
Air and Climate	Other Issues Chapter (Section 12.3 and 12.7): Air and Climate incorporates a consideration of potential for likely significant effects on air quality and the carbon footprint of the Proposed Development.
Material Assets	Chapter 9, 10 and Other Issues Chapter Section 12.2 and 12.5: Material Assets incorporates a consideration of the potential for likely significant effects on a wide range of social, environmental, and economic assets including: transport, waste, minerals, water, energy, industry, housing, and other public/community assets.
Cultural Heritage	Chapter 7: Cultural Heritage and Archaeology incorporates a consideration of potential for likely significant effects on cultural heritage and archaeology assets as well as the cultural setting.
Landscape	Chapter 4: Landscape and Visual incorporates a consideration of potential for likely significant effects designated landscape areas, landscape character and visual receptors.

- 3.0.2 For renewable energy projects in the UK, identification of potential impacts and assessment of those impacts to determine whether or not significant effects are likely on the above-mentioned factors is usually provided under the following specialist topic categories:

- landscape and visual amenity;
- cultural heritage;
- ecology;
- ornithology;
- hydrology, hydrogeology and geology;
- traffic and transport;
- noise;
- aviation and telecommunications;
- socio-economics;
- shadow flicker⁶; and
- climate change.

⁶ Potential for generation of shadow flicker effects will be a design consideration and it is expected that potential for these effects can be avoided through the design process

- 3.0.3 The inclusion of an individual specialist topic category in an EIA process, and reporting of that assessment in the EIA Report, will depend on identification of a likelihood of a significant effect occurring. This is usually confirmed by the EIA scoping process. The EIA Report will set out the baseline, then assess and report on the likely significant effects, including, where applicable, direct, indirect, cumulative, short, medium- and long-term, permanent and temporary, beneficial and adverse effects. The EIA Report will also set out measures proposed to avoid, prevent, reduce, or, if possible, offset any likely significant effects (mitigation measures) and where appropriate, any proposed monitoring arrangements.

3.1 Cumulative Effects

- 3.1.1 The EIA Regulations require that, in assessing the effects of a particular development proposal, consideration is also given to the cumulative effects which might arise from the proposal in conjunction with other existing and/or approved development proposals in the vicinity.
- 3.1.2 Cumulative effects are defined as those effects arising from the addition or combination of the Proposed Development to other Proposed Developments, or those arising from synergistic effects⁷ between factors.

3.2 Topics to be Scoped Out

- 3.2.1 No significant effects are considered likely in respect to the following technical disciplines and accordingly these would be scoped out of the EIA (**Section 12**):
- Hydrology and Hydrogeology;
 - Geology and Soils (including peat);
 - Air quality;
 - Forestry and Land Use;
 - Socio-economics;
 - Ice Throw;
 - Climate change;
 - Population and human health; and
 - Major accidents and/or disasters

3.3 Consultation

- 3.3.1 In addition to the EIA scoping consultation, the Applicant intends to carry out community consultation, with public exhibitions and hold a Pre-app meeting with THC. The outcome of the consultation process will be compiled into a Pre-Application Consultation Report to accompany the application for consent, detailing the consultation undertaken and any changes made to the Proposed Development as a result of this consultation.

⁷ A synergistic effect is the result of two or more processes interacting together to produce an effect that is greater than the cumulative effect that those processes produce when used individually

4 LANDSCAPE AND VISUAL AMENITY

4.0 Introduction

- 4.0.1 Landscape and visual effects are separate, although closely related and interlinked issues. As such, the assessments of the effects of the Proposed Development upon the landscape and also upon visual amenity will be carried out under separate headings within the Landscape and Visual Impact Assessment (LVIA).
- 4.0.2 The assessment of landscape effects will consider the potential effects of the Proposed Development on the landscape as an environmental resource. Landscape effects are caused by physical changes to the landscape, which may result in changes to the distinctive character of that landscape and how it is perceived.
- 4.0.3 The visual assessment is concerned with the potential effects that may occur resulting from the Proposed Development upon the population likely to be affected. It assesses the change in visual amenity experienced by people arising from the presence of a development in the view.

4.1 Baseline

Statutory Landscape Designations

- 4.1.1 There are no statutory landscape designations located within the proposed 45km Study Area for the LVIA (refer to **Section 4.3** for details of the Study Area).

Non-statutory Landscape Designations

- 4.1.2 The THC currently maintain a local-level, non-statutory Special Landscape Area (SLA) Designation, protected by local planning policy. There are six areas within the Study Area (refer to **Section 4.3** for details of the Study Area) that are subject to the SLA designation, namely:
- SLA 3: Farr Bay, Strathy and Portskerra.
 - SLA 4: Dunnet Head.
 - SLA 5 Duncansby Head.
 - SLA 6: The Flow Country and Berriedale Coast.
 - SLA 7: Bens Griam and Loch nan Clar.
 - SLA 8: Ben Klibreck and Loch Choire.
- 4.1.3 Details of each SLA are set out in *Assessment of Highland Special Landscape Areas*⁸ (AHSLA), and locations are illustrated on **Figure 4.1** and **Figures 4.3a-b (Appendix 1)**.
- 4.1.4 The boundary of SLA 6 extends up to the A9, immediately adjacent to the Site. AHSLA identifies this area to be sensitive to change and to development that could compromise views of the exposed and striking skyline profile of the lone mountains and peatlands.
- 4.1.5 Both SLA 4 and SLA 5 are relatively distant from the Site (approximately 23 km and 32 km respectively). The key characteristics and special qualities of both areas relate chiefly to their relationship with the adjacent north/northeast coast. Furthermore, several existing commercial scale wind farms are located closer to each designation than the Proposed Development turbines would be. As such, it is considered that the Proposed Development would not have any material effect upon these SLAs. Consideration of effects upon them is proposed to be scoped out of the LVIA.
- 4.1.6 SLA 3, SLA 7 and SLA 8 are all located more than 29 km from the Site and there are very few locations within the boundaries of these three designated areas where theoretical visibility of the Proposed Development is predicted (refer to **Figure 4.1** and **Figure 4.3a, Appendix 1**). It is considered that the very localised potential visibility of the Proposed Development would not have any material effect upon these SLAs. As such, consideration of effects upon them is proposed to be scoped out of the LVIA.

⁸ Horner + MacLennan, with Mike Wood, 2011. *Assessment of Highland Special Landscape Areas*. The Highland Council

Other Designations

4.1.7 Garden and Designed Landscapes (GDLs) are heritage assets with a clear landscape-related component and can therefore legitimately be considered within an LVIA. There are two GDLs located within the Study Area as follows, (with locations indicated on **Figure 4.1** and **Figures 4.3a-b, (Appendix 1)**):

- Castle of Mey (approximately 30 km north of the Site);
- Dunbeath Castle (approximately 10.5 km southwest of the Site).

4.1.8 Both assets are located at the edge of the blade tip ZTV. In both cases, any views of the proposed turbines would be limited to glimpses of blade tip movement above the distant horizon at worst. As such, and given the distances from the proposed turbines, it is clear that they would not be materially affected by the Proposed Development. As such, consideration of effects upon them is proposed to be scoped out of the LVIA.

4.1.9 The Flow Country was inscribed as a World Heritage Site (WHS) in July 2024 (refer to **Figure 4.1** and **Figures 4.3a-b, Appendix 1**). There are several commercial scale wind energy developments located around the WHS boundary. The WHS was inscribed for its outstanding example of significant on-going ecological and biological processes, rather than for any specific visual or scenic interest. Nevertheless, whilst the WHS is not being proposed for its natural beauty, the visual impact of wind farms is something that needs to be considered:

*"Although the Site is not being proposed for its natural beauty (UNESCO WH criterion vii), the visual impact of wind farm developments needs to be considered as this can be relevant for the way people experience the Site in respect to its setting. The Outstanding Universal Value of the peatlands is not just in the value of the individual areas, but also in the way in which it is experienced and understood. In terms of the setting, whether or not large schemes are a threat to the way the Site is experienced and presented will need further exploration"*⁹

*"Requests the State Party not to approve any wind turbines that are proposed to be constructed within the property and to ensure that any proposed developments in proximity of the property that may impact on its Outstanding Universal Value are assessed for their potential impacts..."*¹⁰

Landscape Character

4.1.10 NatureScot maintains a digital, map-based national Landscape Character Assessment¹¹, which subdivides Scotland into a series of Landscape Character Types (LCT). The Proposed Development would be located within LCT134: Sweeping Moorland and Flows. Key characteristics of LCT 134 are:

- Gently sloping or undulating landform which lies generally below 350 metres.
- Occasional isolated hills of limited height form local landmark features.
- Lochs and mature, meandering rivers.
- Very distinct flora, dominated by sphagnum mosses, produced by the wetness and infertility of the flows.
- Areas of peat cuttings and haggings.
- Pockets of improved grazing, mainly within the outer fringes of sweeping moorland.
- Coniferous forest forming a dominant characteristic within some parts of this landscape character type.
- Ribbons of broadleaf woodland occasionally run along the water courses and loch edges.
- Very sparsely settled with dispersed crofts, farms and estate buildings largely found on the outer edges of this landscape or near a strath.
- Vehicular tracks within parts of the landscape.

⁹ The Flow Country, 2022. *Management Plan for the Proposed Flow Country World Heritage Site. Nomination Draft December 2022*

¹⁰ World Heritage Convention, August 2024. Decision 46 COM 8B.5 The Flow Country (United Kingdom of Great Britain and Northern Ireland).

Online <<https://whc.unesco.org/en/list/1722/>>

¹¹ Scottish Natural Heritage, 2019. *Scottish Landscape Character Types Map and Descriptions* [online] < <https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions> > [accessed 30 Jul 2024]

- Wind farms, transmission lines, the A9 and a network of minor roads are key features within the more modified outer fringes within Caithness.
- Long, low and largely uninterrupted skylines offering extensive views across this landscape and result in a feeling of huge space.
- Consistent views to the distant Lone Mountains and Rugged Mountain Massif – Caithness & Sutherland LCT.
- Great sense of exposure on areas of flat peatland on upland plateau.
- A strong sense of remoteness is associated within the largely uninhabited, inaccessible core flows and moorlands of this landscape.

Landscape Capacity

- 4.1.11 The THC *Onshore Wind Energy Supplementary Guidance*¹² (OWESG) includes a Capacity Study for the Caithness landscape. The Capacity Study makes its conclusions based on a series of Character Types (CT) which have the same boundaries as the LCTs identified by NatureScot that are referenced above.
- 4.1.12 The Proposed Development would be located within CT4: Central Caithness. The following CTs are located within approximately 10 km of the proposed turbines (**Figure 4.2, Appendix 1**):
- CT2: Hempriggs to Berriedale
 - CT4: Central Caithness
 - CT8: Rubha Bhra to Dunbeath
- 4.1.13 In relation to CT4, the Capacity Study notes that on a scale of 1-4 (with 1 being most susceptible to change), that the CT has a susceptibility of 3 to large scale turbines.
- 4.1.14 The Capacity Study goes on to set out specific constraints and guidance for development in each CT, and this will inform the iterative design of the Proposed Development.
- 4.1.15 In addition to recommendations regarding individual CTs, the OWESG also sets out a series of key criteria relating to landscape and visual matters that THC will use as a framework/ focus in the assessment of development proposals. The criteria do not represent a policy test that a development proposal must pass. The extent of compliance with the criteria can however be seen as a measure of acceptability. As such, the LVIA will include an appraisal of how the Proposed Development would perform against each criterion.
- 4.1.16 It should be recognised that the Capacity Study addresses landscape capacity in a generalised manner, and its conclusions are not specific to any individual proposal or any specific Site. The GLVIA is clear, in respect of the relationship between an LVIA and existing capacity studies, that:
- "The assessment may take place in situations where there are existing landscape sensitivity and capacity studies, which have become increasingly common. They may deal with the general type of development that is proposed, in which case they may provide useful preliminary background information for the assessment. But they cannot provide a substitute for the individual assessment of the susceptibility of the receptors in relation to change arising from the specific development proposal".¹³*
- 4.1.17 Given that the OWESG has been prepared specifically to deal with wind energy development, it is proposed that effects on landscape character are assessed against the OWESG CTs rather than against NatureScot's LCTs. Given that the boundaries of the two sets of character areas are the same, it is not considered that this would result in any loss of clarity in the LVIA and would avoid double-counting of effects. Reference would be made to the key characteristics identified by NatureScot.

¹² The Highland Council, 2016, (with addendum 2017). *Onshore Wind Energy Supplementary Planning Guidance*

¹³ Landscape Institute and Institute of Environmental Management and Assessment, 3rd edition 2013. *Guidelines for Landscape and Visual Impact Assessment*. Routledge: Abingdon. Paragraph 5.41

ZTVs

- 4.1.18 **Figure 4.1** and **Figure 4.2 (Appendix 1)** include a blade tip Zone of Theoretical Visibility (ZTV) for the Proposed Development. **Figures 4.3a-b (Appendix 1)** include the same blade tip ZTV, presented at A1 paper size using more detailed base mapping, and displaying theoretical visibility based upon numbers of turbines visible at any given location to accord with current NatureScot guidance¹⁴.
- 4.1.19 The ZTV has been produced based upon a digital model of the wind farm under consideration and the Ordnance Survey Terrain 50 bare earth digital terrain model (DTM) which takes no account of other elements in the landscape such as vegetation, buildings and other structures. As such it represents a maximum and worst-case scenario of potential visibility.
- 4.1.20 A limitation of this technique is that actual zones of visibility are not determined by topography alone. Other elements in the landscape act as screens, such as buildings, or filters such as hedgerows and woodlands. Screening and filtering of views by these elements can often be very significant. As such, actual 'on-the-ground' visibility is likely to be less than indicated by the ZTV.
- 4.1.21 The LVIA will include hub and blade tip ZTVs of the Proposed Development, based upon the final layout that will be the subject of the s36 Application.

Viewpoints

- 4.1.22 The LVIA will include a detailed assessment of visual effects from a series of predetermined viewpoint locations. Provisional viewpoint locations are illustrated on **Figures 4.3a-b (Appendix 1)**.
- 4.1.23 The LVIA will include visualisation material prepared from each Viewpoint, which will accord with the requirements of current NatureScot guidance¹⁵. A separate set of visualisations will also be prepared in accordance with THC's current visualisation guidance¹⁶ and will be appended to the LVIA.
- 4.1.24 In accordance with the guidance set out in the GLVIA, each Viewpoint falls into one (or more) of three broad categories, as follows:
- Representative viewpoints (which represent the experience of different types of receptors in the vicinity of the viewpoint).
 - Specific viewpoints (a particular view, for example a designed view, or from a well-known beauty spot).
 - Illustrative viewpoints (which illustrate a particular effect/issue, which may include limited/ a lack of visibility).
- 4.1.25 **Table 4.1** sets out details of each of the viewpoints proposed to be included in the LVIA.
- 4.1.26 The proposed Viewpoint locations are the same as those agreed with consultees in relation to the Stemster Wind Farm (same Site and same scale of turbines) as part of the 2019 scoping process. The location of Viewpoint 19 has been moved to a point further south along the A9 where views northwards are clearer than the original 2019 location. One additional Viewpoint from the Grey Cairns of Camster (which did not form part of the 2019 scoping process) is also proposed.
- 4.1.27 The majority of the proposed Viewpoints are also locations which were included in the 2023 EIAR for the varied Golticlay Wind Farm. The Applicant's LVIA team thus has photography from the majority of viewpoints (refer to **Table 4.1** for details), which was taken during 2022 and 2023. Since there have been no substantive changes in baseline conditions in the interim, this photography is proposed to be re-used in the LVIA of the Proposed Development as the images will represent a robust basis for supporting the impact assessment (the subject to consultee agreement).
- 4.1.28 Viewpoints 13, 15 and 16 were included in the 2023 EIAR for the varied Golticlay Wind Farm, but visualisations were presented as wireframes only, with no accompanying photography. A similar approach is proposed in relation to the Proposed Development.

¹⁴ Scottish Natural Heritage, 2017. *Visual Representation of Windfarms: Guidance version 2.2*

¹⁵ Scottish Natural Heritage, 2017. *Visual Representation of Windfarms: Guidance version 2.2*

¹⁶ The Highland Council, 2016. *Visualisation Standards for Wind Energy Developments*

4.1.29 New photography would be shot for the remaining Viewpoints (5, 8 and 18).

Table 4.1: Proposed Viewpoints

Viewpoint	Distance from Proposed Development (nearest turbine), and approx. British National Grid co-ordinates	Type of Receptor	Photography taken 2022-2023
1: Roster	6.28 km to the east; (NGR 326779, 939813)	Representative of views from nearby properties	Yes
2: A99, west of Lybster	5.75 km to the south east; (NGR 324486, 936151)	Representative of views from nearby properties	Yes
3: A99, Burigill	5.56 km to the south east; (NGR 322361, 934831)	Representative of views available to road users	Yes
4: Oslay, public road between Lybster and Achavanich	2.93 km to the south east; (NGR 322926, 938643)	Representative of views available to residents in the adjacent farm properties, and to users of the minor road	Yes
5: Sheppardstown Road, by Loch Stemster	1.25 km to the north (within Site Boundary); (NGR 318781, 941759)	Representative of views available to road users	No
6: Public road near Badlipster, Camster	8.01 km to the north east; (NGR 324201, 948400)	Representative of views available to users of minor road	Yes
7: A9 Tacher	5.94 km to the north west; (NGR 317656, 946941)	Representative of views available to road users	Yes
8: Track by Loch a' Cherigal	10.48 km to the north west; (NGR 311669, 948175)	Representative of views available to road users, to guests at the nearby Strathmore Lodge Hotel, and to anglers, and people accessing the Flow Country	No
9: Mybster (old garage)	15.07 km to the north; (NGR 316889, 953690)	Representative of views available to local residents and to road users	Yes
10: Watten Railway Crossing	15.07 km to the north east; (NGR 325012, 955759)	Representative of views available to the local community, road users and rail users	Yes
11: Loch Hempriggs	15.57 km to the north east; (NGR 334981, 946993)	Representative of views available to road users, and anglers at the adjacent loch	Yes
12: Tesco Car Park, Wick	18.78 km to the north east; (NGR 335958, 951952)	Specific view from exposed location at the edge of Wick	Yes
13: A99, Keiss	24.34 km to the north east; (NGR 334580, 961150)	Representative of views available to local residents and to road users	No (wireframe only proposed)
14: Lyth	22.82 km to the north east; (NGR 327913, 962948)	Representative of views available to local residents and to road users	Yes
15: Hill of Olig	24.25 km to the north; (NGR 317486, 965628)	Representative of views available to local residents and to road users	No (wireframe only proposed)
16: Ben Dorrery	19.19 km to the north west; (NGR 306300, 955050)	Specific view from hilltop at the edge of the Flow Country	No (wireframe only proposed)

Viewpoint	Distance from Proposed Development (nearest turbine), and approx. British National Grid co-ordinates	Type of Receptor	Photography taken 2022-2023
17: Ben Alisky	14.38 km to the west (NGR 304560, 938626)	Specific view from locally prominent hill top	Yes
18: Overcaig Hill	18.46 km to the south west; (NGR 302406, 931585)	Representative of views available to walkers	No
19: A9 Newport	16.46 km to the south west; (NGR 313053, 924233)	Representative of views available to road users and local residents	Yes
20: Scaraben	17.8 km to the south west; (NGR 306609, 926834)	Specific view from locally prominent hill/ ridge	Yes
21: Grey Cairns of Camster	6.31 km to the north-east; (NGR 326167, 944088)	Specific view from notable historic landscape feature (promoted access)	Yes

Cumulative Baseline

- 4.1.30 A cumulative assessment considers the cumulative effects of multiple developments upon the landscape fabric, landscape character and visual amenity. To accord with *Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Development*¹⁷, the cumulative assessment will consider two development scenarios. Firstly, the cumulative effects of the Proposed Development introduced into a baseline where existing (including schemes currently under construction) and consented wind farms are present. Secondly, the cumulative effects of the Proposed Development introduced into a baseline where existing (including schemes currently under construction), consented and other proposed wind farms are present. This approach also accords with guidance included in *Guidelines for Landscape and Visual Impact Assessment* (the GLVIA)¹⁸.
- 4.1.31 Of most importance in a cumulative context are commercial-scale wind turbines (considered to be turbines with a maximum blade tip height of 50 m or greater for the purposes of this assessment) located within the proposed 45 km Study Area. Turbines smaller than 50 m blade tip height located within approximately 6 km of the Proposed Development will also be included in the cumulative assessment (reflecting the approach adopted in the EIA Report for the Golticlay Variation). Smaller turbines, and turbines located further away, have a much lower likelihood of combining with the Proposed Development to result in significant effects, and as such it is proposed that consideration of these turbines is scoped out of the cumulative assessment.
- 4.1.32 An initial list of cumulative developments is set out in **Table 4.2**. The list was compiled in July 2024 and reflects data gathered for the 2023 EIAR for the varied Golticlay Wind Farm LVIA, along with a search for subsequent s36 applications and planning applications made to The Highland Council (THC). Locations are illustrated on **Figures 4.4a-b (Appendix 1)**. A final list will be prepared as part of the EIA process and will be based upon publicly available information obtained from THC and NatureScot, from data held by the Applicant and its consultant team, and from review of extant planning application documents.

¹⁷ NatureScot, 2021. *Guidance - Assessing the Cumulative Impact of Onshore Wind Energy Development*

¹⁸ Landscape Institute and Institute of Environmental Management and Assessment, 3rd edition 2013. *Guidelines for Landscape and Visual Impact Assessment*. Routledge: Abingdon

Table 4.2: Cumulative Developments

Scheme	No. of Turbines	Maximum Blade Tip Height	Distance from Proposed Development (nearest turbine)
Operational (and under construction)			
Achairn	3	100 m	12.86km
Achlachan	5	110 m	11.27km
Bad a Cheo	13	112 m	6.89km
Baillie Hill	21	110 m	28.63km
Beatrice Demonstrator (offshore)	2	110m	31.53km
Beatrice (offshore)	84	187m	25.74km
Bilbster	3	90m	12.35km
Buolfruich	15	75m	4.78km
Burn of Whilk	9	114.9m	8.06km
Cairnald House	1	27m	5.36km
Camster	25	120m	7.39km
Causeymire	21	101m	8.28km
Forss 1 and 2	5	78m	33.19km
Gordonbush	35	110m	39.56km
Gordonbush Extension	11	149.9m	42.31km
Halsary	15	120m	8.01km
Hill of Lybster	1	99.5m	32.96km
Hollandmey	10	149.9m	28.68km
Limekiln (inc. Limekiln Extension)	24	149.9m	27.19km
Lochend	4	99.5m	28.08km
Middleton Cottage	1	11.8m	5.83km
Moray East (offshore)	186	204m	33.23km
Moray West (offshore)	85	285m	23.67km
New Black Lower Smerral	1	33.6	5.66km
Strathy North	33	110m	40.57km
Strathy South	35	200m	39.03km
Stroupster	13	110m	27.35km
Sunrise Cottage	1	19.5m	6.09km
Taigh na Muir	1	79m	31.76km
Wathegar	4	101m	11.76km
Wathegar 2	9	110m	11.94km
West Clyth Farm	2	34.4m	7.57km
Weydale Farm	1	66m	24.52km
Consented			
Berriedale and Dunbeath	3	74m	7.54km
Camster 2	11	126.5m	9.67km
Dounreay Demonstration (offshore)	2	201m	43.52km
Golticlay (2021)	13	180	471m
Lower Rumster	3	35m	3.94km
Pentland (offshore)	7	300m	42.3km

Scheme	No. of Turbines	Maximum Blade Tip Height	Distance from Proposed Development (nearest turbine)
Slickly	11	9no. @ 149.9m 2no. @ 135m	26.59km
Strathy Wood	11	180m	38.7km
Tacher A, B and C	3	142.5m	6.32km
West Clyth Farm Repowering	1	69.2m	7.59km
In Planning			
Armadale	9	149.9m	44.02km
Cairnmore Hill	5	138.5m	29.74km
Kirkton	11	149.9m	36.09km
Lochend Extension	5	149.9m	26.72km
Melvich	12	149.9m	38.7km
Tormsdale	12	149.9m	7.46km
Watten	7	220m	9.26km

4.1.33 Developments that are currently at the scoping stage, with a formal planning application yet to be submitted are not typically included within assessments of cumulative effects, as there is no certainty as to the final layout of the Site (which may change significantly prior to submission), or indeed whether development will proceed at all. Hence it is proposed that scoping stage schemes are not considered in the LVIA.

4.1.34 An exception to this would be the proposed Spittal – Loch Buidhe – Beaulay 400kV Connection overhead transmission route, the preferred route for which would run along the A9 corridor adjacent to the Site. Given the proximity to the Proposed Development, and the proposed introduction of prominent vertical pylons, potential cumulative landscape and visual effects with the Proposed Development will be considered in the LVIA.

4.2 Assessment Scope and Methodology

Guidance

4.2.1 The LVIA will be undertaken in accordance with the published good practice guidelines set out in the GLVIA¹⁹. The LVIA will also have reference to the following good practice guidance documents:

- Landscape Character Assessment - Guidelines for England and Scotland²⁰.
- Landscape Sensitivity Assessment Guidance²¹.
- Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 2/19²².
- Guidance - Assessing the Cumulative Impact of Onshore Wind Energy Development²³.
- Siting and Designing windfarms in the landscape, Version 3a²⁴.
- OWESG²⁵.
- Visual Representation of Windfarms: Guidance version 2.2²⁶.
- Visualisation Standards for Wind Energy Developments²⁷.

¹⁹ Landscape Institute and Institute of Environmental Management and Assessment, 3rd edition 2013. *Guidelines for Landscape and Visual Impact Assessment*. Routledge: Abingdon

²⁰ Swanwick, C. 2002. *Landscape Character Assessment - Guidelines for England and Scotland*. Countryside Agency/Scottish Natural Heritage

²¹ NatureScot, 2022. *Landscape Sensitivity Assessment Guidance*

²² Landscape Institute, 2019. *Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 2/19*

²³ NatureScot, 2021. *Guidance - Assessing the Cumulative Impact of Onshore Wind Energy Development*

²⁴ Scottish Natural Heritage, 2017. *Siting and Designing windfarms in the landscape, Version 3a*

²⁵ The Highland Council, 2016, (with addendum 2017). *Onshore Wind Energy Supplementary Planning Guidance*

²⁶ Scottish Natural Heritage, 2017. *Visual Representation of Windfarms: Guidance version 2.2*

²⁷ The Highland Council, 2016. *Visualisation Standards for Wind Energy Developments*

Study Area

- 4.2.2 *Visual Representation of Windfarms*²⁸ recommends that, where proposed turbines have a blade tip height greater than 150 m, the ZTV should extend for a 45 km distance from the nearest turbine. As such, visual effects will be assessed within a 45 km Study Area.
- 4.2.3 Effects on landscape character diminish with distance and a clear distinction needs to be drawn between effects on the key characteristics of an area that influence its local distinctiveness and effects on specific viewpoints within a character area. A change in view does not necessarily lead to an accompanying change in character, particularly where the turbines are more distant from the viewpoint. The character of a landscape is derived from the interaction of a number of factors, of which the views available are one. Such views may or may not be important in the context of a given landscape. As such and based on both the assessor's previous experience of wind farm development in a variety of landscapes, the assessment of effects on landscape character would focus on that part of the LVIA Study Area lying within approximately 10 km of the turbines and within the blade tip ZTV of the Proposed Development (reflecting the approach adopted in the EIA Report for the Golticlay Variation scheme), with a broader overview of effects at greater distances from the Site.
- 4.2.4 In respect of cumulative effects, *Guidance - Assessing the Cumulative Impact of Onshore Wind Energy Development*²⁹ recommends that other wind farm Sites within 60 km of the proposed turbines are mapped, and that the Study Area for the cumulative assessment should typically extend to at least 35 km from the proposed turbines. It is, however, important to note that the EIA process seeks to identify likely significant effects (as opposed to all effects) and that a proportionate approach to cumulative assessment is required, as advocated in the GLVIA. To ensure consistency with the overall Study Area, the cumulative assessment would be based upon a 45 km radius from the proposed turbines (rather than 35 km).
- 4.2.5 A separate Residential Visual Amenity Assessment (RVAA) would be appended to the LVIA. The Study Area for the RVAA would cover a 2 km radius from the nearest turbine. Where residential properties are located just outside this distance, they would also be included in the residential assessment.

Method

- 4.2.6 The LVIA will provide:
- a clear understanding of the Site and its setting in respect of landscape character and visual amenity.
 - an understanding of the Proposed Development in terms of its relationship with the landscape character and visual amenity.
 - an identification of potential effects of all components of the Proposed Development upon the landscape.
 - an identification of potential effects on visual receptors.
 - an identification of any additional night-time landscape and visual effects that could occur as a result of turbine lighting.
 - an identification of potential effects upon the residential visual amenity of nearby properties.
 - an identification of any cumulative effects.
 - a description of any proposed mitigation measures.
 - a conclusion as to the potential residual effects of the Proposed Development.
- 4.2.7 The LVIA process will follow a standard approach, namely:
- the establishment of the baseline conditions i.e. the existing character and sensitivity of the landscape, and the type and sensitivity of visual receptors.
 - the prediction of the magnitude of change that the Proposed Development will bring, allowing for mitigation measures, upon the landscape, and upon visual receptors.
 - an assessment of the significance of effect that would occur, by considering the predicted magnitude of change, together with the sensitivity of the landscape or visual receptor.

²⁸ Scottish Natural Heritage, 2017. *Visual Representation of Windfarms: Guidance version 2.2*

²⁹ NatureScot, 2021. *Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Development*

- 4.2.8 A detailed methodology will be appended to the LVIA (refer to **Appendix 4.1** for the proposed methodology, which is the same as that followed for the varied Golticlay Wind Farm), which will accord with the requirements of the GLVIA, and the other relevant guidance documents listed above.
- 4.2.9 A separate methodology will also be appended to the LVIA, relating to the production of visualisation material, which will accord with the requirements of *Visual Representation of Windfarms: Guidance version 2.2*³⁰.
- 4.2.10 An assessment of the effects of the Proposed Development upon the special qualities of landscape designations (i.e. upon the SLAs discussed in Section 4.2) will be undertaken in accordance with guidance set out in *Guidance for Assessment of Effects on Special Landscape Qualities (AESLQ)*³¹. This guidance has been published in draft, but NatureScot encourage its use prior to formal adoption and publication.
- 4.2.11 An assessment of the effects of the Proposed Development upon the visual aspect of residential amenity will be undertaken separately and appended to the LVIA. This will be concerned with demonstrating how the Proposed Development would affect the residential visual amenity of people in nearby properties, and not simply with assessing change in view. The assessment will accord with current guidance set out in *Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 2/19*³².
- 4.2.12 The assessment of night-time landscape and visual effects will also be appended to the LVIA. This will follow the approach set out in *Guidance on Aviation Lighting Impact Assessment*³³. The assessment will include preparation of ZTVs that illustrate differences in lighting intensity across the Study Area. Night-time visualisations would be prepared from selected Viewpoint locations, which are proposed to be as follows (night-time visualisation from Viewpoints 1-5 and 19 were included in the EIAR for the varied Golticlay Wind Farm):
- Viewpoint 1: Roster.
 - Viewpoint 2: A99, west of Lybster.
 - Viewpoint 3: A99, Burigill.
 - Viewpoint 4: Osclay, public road between Lybster and Achavanich.
 - Viewpoint 5: Sheppardstown Road, by Loch Stemster.
 - Viewpoint 19: A9 Newport
- 4.2.13 The assessment of cumulative effects will accord with the requirements of *Guidance - Assessing the Cumulative Impact of Onshore Wind Energy Development*³⁴ and will consider cumulative effects on landscape fabric and landscape character, and cumulative visual effects in combination (i.e. where cumulative schemes are seen from the same location in the same field of view), in succession (i.e. where cumulative schemes are visible from the same location, but in different fields of view) and in sequence (i.e. where cumulative schemes are visible in sequence from along a route).

4.3 Potential Significant Effects

- 4.3.1 Potentially significant landscape and visual effects could arise from:
- The introduction of the proposed turbines and associated infrastructure, which would result indirect changes to the physical fabric of the Site.
 - Views of these from the surrounding area, potentially affecting the visual amenity of local residents in their properties, users of recreational routes, and road users.
 - The influence of these upon the character of the surrounding landscape, with potential changes in the characteristics of those CTs located within c. 10 km where visibility is predicted.
 - The introduction of hub mounted aviation lighting, which has potential to result in changes to the night-time environment.
 - Temporary activities associated with the construction and/or decommissioning of the proposed Development.
 - Cumulative interactions between the Proposed Development and other consented or proposed schemes.

³⁰ Scottish Natural Heritage, 2017. *Visual Representation of Windfarms: Guidance version 2.2*

³¹ [Guidance for Assessment of Effects on Special Landscape Qualities \(AESLQ\) | NatureScot](#)

³² Landscape Institute, 2019. *Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 2/19*

³³ NatureScot, 2024. *Guidance on Aviation Lighting Impact Assessment*

³⁴ NatureScot, 2021. *Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Development*

4.4 Potential Impacts Scoped In

4.4.1 The following issues are proposed to be scoped into the LVIA:

- Effects on the landscape fabric of the Site.
- Effects upon landscape character over a c.10 km Study Area (with an overview of effects at greater distances), based upon the CTs set out in the OWESG.
- Visual effects over a 45 km Study Area.
- Effects on SLA6: The Flow Country and Berriedale Coast.
- Night-time landscape and visual effects from aviation lighting.
- Effects on residential visual amenity over a c.2 km Study Area.
- Construction stage effects upon landscape fabric, landscape character and visual effects, including potential night-time effects from any construction lighting.
- Cumulative landscape and visual effects of the Proposed Development alongside developments with a blade tip high of 50 m or taller over a c.45 km Study Area, and developments with a blade tip height less than 50 m within a 6 km Study Area.

4.5 Issues to be Scoped Out

4.5.1 The following issues are proposed to be scoped out of the LVIA:

- Effects on SLA 3, SLA 4, SLA 5, SLA 7 and SLA 8.
- Effects on GDLs.
- Effects on WLAs, given that Policy 4(g) of *National Planning Framework 4* is clear that:

*"...Buffer zones around wild land will not be applied, and effects of development out with wild land areas will not be a significant consideration"*³⁵

- Detailed assessment of effects on landscape character beyond c.10 km from the Proposed Development and/or outside the blade tip ZTV of the Proposed Development.
- Cumulative effects with schemes at the scoping stage.
- Cumulative effects with developments over 45 km from the Proposed Development.
- Cumulative effects with developments less than 50 m max. blade tip height, further than 6 km from the proposed turbines.

4.6 Questions to Consultees

- Do consultees agree with the proposed scope and methodology of the LVIA?
- Do consultees agree that the Study Areas proposed for the LVIA are appropriate?
- Are the proposed Viewpoints acceptable (including the locations proposed for night-time visualisations)? If additional or alternative locations are suggested, can reasons please be given for this?
- Do consultees agree with the approach proposed in relation to Viewpoint photography and preparation of Viewpoint visualisations?
- Please add in order to direct the attention of consultees to particular areas e.g., Study Area(s), particularly sensitive receptors, approach to cumulative assessment, significance evaluation criteria, local consultees to contact?

³⁵ Scottish Government, 2023. *National Planning Framework 4*. Policy 4(g)

5 ECOLOGY (NON-AVIAN)

5.0 Introduction

- 5.0.1 This chapter sets out the proposed approach to the assessment of potential effects on non-avian ecology during the construction and operation of the Proposed Development.
- 5.0.2 Ecological features scoped into the assessment have been informed by key legislative and policy drivers, as they relate to nature conservation in Scotland, and include:
- 5.0.3 Sites designated for their nature conservation value via:
- the Conservation (Natural Habitats, &c) Regulations (1994)
 - the Wildlife and Countryside Act (1991)
 - National/local planning policy
 - National/local nature conservation policy (including the Ancient Woodland Inventory (AWI))
- 5.0.4 Species and habitats³⁶ offered legislative or policy protection via:
- the Conservation (Natural Habitats, &c) Regulations (1994)
 - the Wildlife and Countryside Act (1991)
 - National/local planning policy
 - National/local nature conservation policy

5.1 Baseline

Designated Sites

- 5.1.1 An initial desk study has been undertaken to inform this Scoping Report. The desk study included a review of statutory and non-statutory designated Sites within 5 km and 2 km of the Site respectively, using publicly available data sets^{37,38,39}. The desk study identified no statutory ecological designations within the Site boundary. The eastern boundary of the Site adjoins the western boundary of a section of the Caithness and Sutherland Peatlands Special Area of Conservation (SAC). This SAC covers many disparate areas and is known as one of the best examples of flow country in Europe. It is designated for otter *Lutra lutra* and marsh saxifrage *Saxifraga hirculus* and the following habitat features:
- Blanket bog.
 - Depressions on peat substrates.
 - Acid peat-stained lakes and ponds.
 - Wet heathland with cross-leaved heath *Erica tetralix*.
 - Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels.
 - Very wet mires often identified by an unstable 'quaking' surface.
- 5.1.2 A part of the Caithness and Sutherland Peatlands SAC to the east of the Site is also notified as Shielton Peatlands Site of Special Scientific Interest (SSSI) for its blanket bog and breeding bird assemblage. Areas of Caithness and Sutherland Peatlands SAC are also located to the west of the Site, as are Coire na Beinne Mires SSSI (approximately 200 m from the Site boundary) and Blar nam Faoileag SSSI (approximately 1.2 km from the Site boundary) both of which are notified for blanket bog.
- 5.1.3 Loch Stemster lies within the Site boundary and flows into the River Thurso which is designated as a SAC for Atlantic salmon *Salmo salar* (albeit beyond the desk study search area).
- 5.1.4 The spatial arrangement of designated sites within 10 km of the Site are shown in **Figure 5.1: Designated Sites (Appendix 1)**.

³⁶ For ease of reference, habitats included in these provisions are grouped and referred to as habitats of 'conservation interest'.

³⁷ Scotland's Environment Map, available at [Scotland's environment map | Scotland's environment web](#)

³⁸ NatureScot SiteLink, available at [SiteLink - Home \(nature.scot\)](#)

³⁹ Scottish Government LNCS data, available at [Local Nature Conservation Sites - Scotland - data.gov.uk](#)

- 5.1.5 In July 2024, the Flow Country received UNESCO World Heritage Site (WHS) status. The site's inscription recognises, in part, the contribution the Flow Country's blanket bog vegetation makes to nature conservation at a global level⁴⁰. The Flow Country's designation is contiguous with the SAC described above.

Habitats and Vegetation

- 5.1.6 Habitat and vegetation data was collected at the Site in June 2024. National Vegetation Classification (NVC) surveys⁴¹ were undertaken by competent ecologists within the Site and a 250 m buffer. Surveys built on existing data sets collected in 2015, 2019 and 2020 as part of previous investigations on the Site⁴².
- 5.1.7 Owing to its widespread peat deposits, of varying depths, the Site supports a complex mosaic of upland vegetation communities. Vegetation composition is strongly influenced by historic land management practices, which included peat cutting and muirburn.
- 5.1.8 Twenty identifiable NVC communities were recorded. Detailed accounts will be set out in a Technical Appendix to the EIAR, however the following NVC communities, noted as being considered 'Priority Peatland' in recently published NatureScot Guidance⁴³ were recorded:
- M1 *Sphagnum denticulatum* bog pool community.
 - M2 *Sphagnum cuspidatum/fallax* bog pool community.
 - M3 *Eriophorum angustifolium* bog pool community.
 - M17 *Trichophorum germanicum* – *Eriophorum vaginatum* blanket mire.
 - M19 *Calluna vulgaris* – *Eriophorum vaginatum* blanket mire.
 - M15 *Trichophorum germanicum*-*Erica tetralix* wet heath.
 - M20 *Eriophorum vaginatum* blanket and raised mire.
- 5.1.9 Upland vegetation communities considered being of 'conservation interest' were also recorded across the Site.
- 5.1.10 A Peatland Condition Assessment⁴⁴ was completed in parallel with habitat and vegetation data, with much of the Site identified as being 'Modified' or 'Drained'.

Protected Species

- 5.1.11 Protected species surveys were conducted at the Site in 2019 and 2020⁴². The scope of those surveys was agreed through consultation with NatureScot at the time. The following species were considered:
- Wildcat *Felis silvestris silvestris*.
 - Pine marten *Martes martes*.
 - Badger *Meles meles*.
 - Fisheries and freshwater pearl mussel *Margaritifera margaritifera*.
 - Otter *Lutra lutra*.
 - Water vole *Arvicola amphibius*.
- 5.1.12 As agreed with NatureScot, bat surveys were not undertaken as the Site offered no opportunities for roosting, while foraging and commuting opportunities were minimal in the largely homogenous habitat structure.
- 5.1.13 Surveys in 2019 and 2020 found limited habitat suitability for wildcat, pine marten, badger, fisheries and freshwater pearl mussel and no direct evidence was recorded. Suitable habitat for otter and water vole was recorded. Direct evidence of otter was limited to a single spraint, while active water vole colonies were recorded along several watercourses.

⁴⁰ <https://theflowcountry.org.uk/projects/world-heritage/about/>

⁴¹ Rodwell, J.S. 2006. NVC Users' Handbook. Further details and download available at <http://jncc.defra.gov.uk/page-3724>

⁴² Detailed ecology data was collected by the applicant for the proposed Stemster Wind Farm project, which did not progress beyond EIA Scoping.

⁴³ NatureScot, 2023. [Advising on peatland, carbon-rich soils and priority peatland habitats in development management | NatureScot](#)

⁴⁴ NatureScot, 2016> Peatland ACTION – Peatland Condition Assessment

- 5.1.14 An update protected species walkover was undertaken by competent ecologists in June 2024 and recorded similar habitat suitability for the species listed above. Comparable direct evidence of otter and water vole was recorded. In parity with previously adopted methods at the Site⁴², bat surveys were not undertaken, as the habitat suitability has not improved, with low foraging and roosting potential.
- 5.1.15 All baseline data will be presented as Technical Appendices to the EIA chapter, setting out detailed methods, findings and interpretation.

5.2 Assessment Scope and Methodology

- 5.2.1 Effects on non-avian ecology will be assessed following current best practice⁴⁵.
- 5.2.2 The 'Ecological Importance' of the Site for each scoped-in ecological feature will be identified in geographical terms, before pathways to effect are considered and assessed against a range of standardised parameters, ultimately arriving at a consideration of 'significance'. Built-in mitigation, such as a Construction Environment Management Plan (CEMP) and standard design features, will influence the assessment of significance.
- 5.2.3 Where effects are considered potentially significant in EIA terms, additional mitigation measures will be designed and applied as part of a residual significance assessment.
- 5.2.4 In relation to cumulative impact assessment, comparable in-application renewable energy generation schemes within a 5 km buffer will be considered.

5.3 Potential Significant Effects

- 5.3.1 Based on the baseline conditions described above, it is considered that habitats of conservation interest, primarily peatland habitats, may experience significant effects prior to the application of mitigation. However, subject to the design of appropriate habitat compensation and enhancement measures, within the context of the mitigation hierarchy, residual effects are unlikely to be significant.
- 5.3.2 Habitat compensation and enhancement measures will be captured in an Outline Biodiversity Enhancement Strategy, which will form a Technical Appendix to the EIAR.

5.4 Potential Impacts Scoped In

- 5.4.1 Based on the baseline conditions described above, the following potential effects will be scoped into the assessment:
- Construction Impacts
 - Effects on statutory and non-statutory designated sites due to proximity and structural and functional connectivity (including the UNESCO designation, which will be subject to UNESCO-specific assessment methods).
 - Effects on habitats of conservation interest due their prevalence across the Site.
 - Effects on otter and water vole due to their presence within the Site.

5.5 Issues to be Scoped Out

- 5.5.1 Based on the baseline conditions described above, the following issues will be scoped out of the assessment:
- Construction Impacts
 - Effects on common and widespread habitats as effects upon are unlikely to be significant in EIA terms.
 - Effects on protected species (other than otter and water vole) due to their likely absence from the Site.
 - Operational Impacts, as operational activity is unlikely to significantly interface with ecological features.

⁴⁵ CIEEM, 2018. Guidelines for Ecological Impact Assessment in the UK and Ireland available at <https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/>

5.6 Questions to Consultees

- Do consultees hold any baseline data which may be of value to the assessment?
- Do consultees support the scope of the assessment, recognising that the focus will be placed on designated sites, habitats of conservation concern, otter and water vole?
It is anticipated that the applicant's obligation to deliver biodiversity enhancement will be achieved through appropriate on-site habitat interventions. Current NatureScot guidance⁴⁶ will form the basis of discussions with consultees and stakeholders. Do consultees support this approach?
- Do consultees consider a UNESCO World Heritage Site assessment will be required in support of the EIA?

⁴⁶ NatureScot, 2023. Advising on Peatland, Carbon-rich Soils and Priority Peatland Habitats in Development Management. Available at [Advising on peatland, carbon-rich soils and priority peatland habitats in development management | NatureScot](#)

6 ORNITHOLOGY

6.0 Introduction

- 6.0.1 This chapter sets out the proposed approach to the evaluation of the ornithological interest of the Site, and to the assessment of potential effects on birds during construction and operation of the Proposed Development.
- 6.0.2 The ornithological assessment will be carried out in line with relevant legislation and standards, as well as having due regard to the following guidance:
- European Commission (2011) Wind energy developments and Natura 2000.
 - NatureScot (SNH, 2016) Assessing connectivity with Special Protection Areas (SPAs).
 - NatureScot (SNH, 2017) Recommended bird survey methods to inform impact assessment of onshore wind farms.
 - NatureScot (SNH, 2018a) Assessing significance of impacts from onshore wind farms out with designated areas, and
 - NatureScot (SNH, 2018b) Assessing the cumulative impacts of onshore wind farms on birds.

6.1 Baseline

Desk Study

- 6.1.1 A desk-based study has been undertaken to collate existing bird records/data. Results from the desk-based study have informed the field survey design. Distribution and abundance data were collected from the following published sources:
- NatureScot Sitelink (online information about designated Sites).
 - UK Biodiversity Action Plan (BAP).
 - The Birds of Conservation Concern (BoCC) (Stanbury *et al.*, 2021)⁴⁷.
 - International Union for the Conservation of Nature (IUCN, 2023)⁴⁸ Red list of threatened species.
 - Scottish Biodiversity List (Scottish Biodiversity Forum, 2013).
 - National Biodiversity Network (NBN) Gateway website (<https://data.nbn.org.uk/>).

Designated Sites

- 6.1.2 **Table 6.1** lists the sites designated for their ornithological features within 20 km of the Site, these are also shown in **Figure 6.2 (Appendix 1)**.

Table 6.1: Designated Sites within 20 km of Proposed Development

Site Name	Designation	Designated for	Distance from Site
Caithness Lochs	Special Protection Area	Greenland white-fronted goose, non-breeding Greylag goose, non-breeding Whooper swan, non-breeding	13.8 km north
Loch Watten	Site of Special Scientific Interest	Greylag goose, non-breeding	13.8 km north
Loch Scarmclate	Site of Special Scientific Interest	Greylag goose, non-breeding	17.1 km north
East Caithness Cliffs	Special Protection Area	Breeding seabird assemblage Cormorant, breeding	6.2 km south

⁴⁷ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., & Win I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747.

⁴⁸ IUCN. (2023). IUCN Red List of Threatened Species (ver. 2022-2). Available at: <http://www.iucnredlist.org>. (Accessed: July 2024).

Site Name	Designation	Designated for	Distance from Site
		Fulmar, breeding Great black-backed gull, breeding Guillemot, breeding Herring gull, breeding Kittiwake, breeding Peregrine, breeding Puffin, breeding Razorbill, breeding Shag, breeding	
Castle of Old Wick to Craig Hammel	Site of Special Scientific Interest	Breeding seabird assemblage	16.2 km east
Craig Hammel to Sgaps Geo	Site of Special Scientific Interest	Breeding seabird assemblage	9.4 km east
Dunbeath to Sgaps Geo	Site of Special Scientific Interest	Breeding seabird assemblage	6.2 km southeast
Berriedale Cliffs	Site of Special Scientific Interest	Breeding seabird assemblage	11.7 km southwest
Caithness and Sutherland Peatlands	Special Protection Area	Black-throated diver, breeding Common scoter, breeding Dunlin, breeding Golden eagle, breeding Golden plover, breeding Greenshank, breeding Hen harrier, breeding Merlin, breeding Red-throated diver, breeding Short-eared owl, breeding Wigeon, breeding Wood sandpiper, breeding	0.0 km east (borders the Site)
Shielton Peatlands	Site of Special Scientific Interest	Breeding bird assemblage	0.0 km east (borders the Site)
Strathmore Peatlands	Site of Special Scientific Interest	Breeding bird assemblage Common scoter, breeding Dunlin, breeding Golden plover, breeding Greenshank, breeding Wigeon, breeding	5.8 km west
Loch Caluim Flows	Site of Special Scientific Interest	Breeding bird assemblage Dunlin, breeding Golden plover, breeding Greenshank, breeding	15.4 km northwest
Oliclett	Site of Special Scientific Interest	Breeding bird assemblage	7.2 km east
Coire na Beinne Mires	Site of Special Scientific Interest	Breeding bird assemblage	0.2 km west

Site Name	Designation	Designated for	Distance from Site
Rumsdale Peatlands	Site of Special Scientific Interest	Breeding bird assemblage Dunlin, breeding Golden plover, breeding Greenshank, breeding	15.6 km west
Sletill Peatlands	Site of Special Scientific Interest	Breeding bird assemblage Common scoter, breeding Dunlin, breeding Golden plover, breeding Greenshank, breeding	18.9 km west
Dunbeath Peatlands	Site of Special Scientific Interest	Breeding bird assemblage	9.0 km west
Caithness Lochs	Ramsar Site	Greenland white-fronted goose, non-breeding Greylag goose, non-breeding Whooper swan, non-breeding	13.8 km north
Caithness and Sutherland Peatlands	Ramsar Site	Red-throated diver Black-throated diver Golden plover Wood sandpiper Dunlin Wigeon Common scoter Greenshank	0.0 km east

- 6.1.3 The East Caithness Cliffs SPA is located 6.2 km from the Site boundary (**Figure 6.2, Appendix 1**). The East Caithness Cliffs SPA is classified for its breeding populations of peregrine (*Falco peregrinus*), cormorant (*Phalacrocorax carbo*), common guillemot (*Uria aalge*), northern fulmar (*Fulmaris glacialis*), great black-backed gull (*Larus marinus*), herring gull (*Larus argentatus*), black-legged kittiwake (*Rissa tridactyla*), razorbill (*Alca torda*), Atlantic puffin (*Fratercula arctica*) and shag (*Gulosus aristotelis*). All these species, aside from peregrine, great black-backed gull and herring gull are exclusively coastal species and the Proposed Development is outside of the core foraging range of peregrine (SNH, 2016). For these reasons there is considered to be no prospect of any effect on the following qualifying interests: peregrine, cormorant, common guillemot, northern fulmar, black-legged kittiwake, razorbill, Atlantic puffin and shag, as a result of the Proposed Development, and effects on these SPA species are scoped out of further consideration. Potential effects on great black-backed gull and herring gull remain scoped in for further consideration.
- 6.1.4 The Caithness & Sutherland Peatlands SPA is located directly adjacent to the Site boundary to the east and west (**Figure 6.2, Appendix 1**). The Caithness & Sutherland Peatlands SPA is classified for its breeding populations of black-throated diver (*Gavia arctica*), red-throated diver (*Gavia stellata*), common scoter (*Melanitta nigra*), wigeon (*Anas Penelope*), golden eagle (*Aquila chrysaetos*), hen harrier (*Circus cyaneus*), merlin (*Falco columbarius*), short-eared owl (*Asio flammeus*), golden plover (*Pluvialis apricaria*), wood sandpiper (*Tringa glareola*), greenshank (*Tringa nebularia*) and dunlin (*Calidris alpina*). As likely significant effects cannot be ruled out at this stage further consideration of any effect on the qualifying interests of this SPA as a result of the Proposed Development will be required.
- 6.1.5 Caithness Lochs SPA is located 13.8 km from the Site (**Figure 6.2, Appendix 1**). The Caithness Lochs SPA is classified for its non-breeding populations of whooper swan (*Cygnus Cygnus*), Greenland white-fronted goose (*Anser albifrons flavirostris*) and greylag goose (*Anser anser*). As likely significant effects cannot be ruled out at this stage further consideration of any effect on the qualifying interests of this SPA as a result of the Proposed Development will be required.

Baseline Field Surveys

- 6.1.6 NatureScot guidance (SNH, 2017) was used for initial survey design. A range of baseline ornithological surveys commenced within the Site and surrounding area in September 2018 and were completed in August 2020. Between April 2022 and March 2025 additional surveys are being undertaken to ensure there are two years of current survey data. Survey data dated between September 2018 and March 2020 will be used to give context where appropriate.
- 6.1.7 Baseline data will be used to inform the assessment from the following surveys that are being undertaken:
- Moorland Bird Surveys (four visits during April to July 2020 and April to July 2024; within Site and 500 m buffer).
 - Scarce Breeding Bird surveys (April to August 2020 and April to August 2024; within Site and buffer extending up to 2 km).
 - Flight activity (vantage point) surveys (April 2022 to March 2023 and April 2024 to March 2025; within Site and 500 m buffer).
 - Goose and swan feeding distribution surveys (October 2022 to March 2023 and September 2024 to March 2025; within the Site and 2 km buffer and further outside buffer area).
 - Goose roost surveys (October 2022 to March 2023 and September 2024 to March 2025; from two simultaneous vantage point locations).
 - Migration Watch Point surveys (September 2022 to November 2022 and September to November 2024).
- 6.1.8 An additional season of wintering bird surveys is currently underway, to be completed in March 2025.
- 6.1.9 Survey methods follow contemporary best practice guidance; further details of the survey methods are provided below.

BREEDING BIRD SURVEYS

- 6.1.10 Moorland Bird Surveys were undertaken to gain a preliminary insight into the bird assemblage and possible sensitivities. The survey area for these included the Site and a 500 m buffer (**Figure 6.1, Appendix 1**).
- 6.1.11 The Brown & Shepherd (1993)⁴⁹ method for surveying upland waders was employed. The method was modified to provide reliable estimates for some breeding moorland passerines by undertaking some surveys during the first few hours of daylight. Survey visits were conducted four times and spread across each month to allow for differences in detection rates between early and late breeding species. All suitable ground within the 500 m survey boundary was approached closely, typically to within 100 m.

SCARCE BREEDING BIRD SURVEYS

- 6.1.12 Priority was given to detecting the species considered most likely to occur; red-throated diver, black-throated diver, arctic skua (*Stercorarius parasiticus*), osprey (*Pandion haliaetus*), merlin, short-eared owl and barn owl (*Tyto alba*). Surveys focused on areas or Sites suitable for nesting and foraging within a buffer of up to 2 km from the Site (**Figure 6.1, Appendix 1**). The survey methods used for each species are described below.

Red-throated Diver

- 6.1.13 The methods employed were based on those described in Gilbert *et al.* (1998)⁵⁰. All potential breeding Sites within 2 km of the Site were checked for suitability and if suitable, further checks for occupancy were made at least twice per calendar month in May-July. Wherever possible lochs were scanned from a distance to search for incubating birds or other evidence of breeding. Care was taken to record possible re-lay attempts by failed pairs.

⁴⁹ Brown, A.F. & Shepherd, K.B. 1993. A method for censusing upland breeding waders. *Bird Study* 40: 3 pp189 -195.

⁵⁰ Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird monitoring methods. RSPB Sandy, Bedfordshire.

Black-throated Diver

- 6.1.14 Survey methods in Gilbert *et al.* (1998)⁵⁰ were followed with attention given to larger waterbodies. All shorelines were checked from a distance for sitting, brooding or prospecting birds and open water watched for loafing or feeding birds.

Arctic Skua

- 6.1.15 Survey methods in Gilbert *et al.* (1998)⁵⁰ were followed. Watches over suitable habitat were combined with systematic searches of all heathland and areas of mossy vegetation.

Hen Harrier

- 6.1.16 Survey methods given in Hardey *et al.* (2013)⁵¹ were followed. Emphasis was given to searching habitats within 2 km of the Site considered potentially suitable for nesting; in this case including areas of heath/bog with stands of heather >0.4m tall, and suitable habitats within plantation forest.

Osprey

- 6.1.17 Survey methods based on Hardey *et al.* (2013)⁶ were followed. Checks were made in areas where mature trees were present (particularly where artificial nest platforms had been provided) for nests and watches made for birds carrying fish or exhibiting territorial behaviour.

Merlin

- 6.1.18 Survey methods given in Hardey *et al.* (2013)⁵¹ were followed. Suitable habitats within 2 km of the Site, including old crow nests (which could be re-used by merlin), fenceposts, hummocks, bushes and trees were checked for signs of occupation (e.g., plucked prey, moulted feathers, pellets and faeces). Emphasis was given to heath/bog habitats with stands of heather >0.4m tall.

Short-eared Owl

- 6.1.19 Survey methods in Hardey *et al.* (2013)⁵¹ were followed. Emphasis was given to stands of tall heather and other rank vegetation, with searches made for signs of occupancy and watches for territorial activity within 2 km of the Site.

Barn Owl

- 6.1.20 Survey methods based on Hardey *et al.* (2013)⁵¹ were followed. Systematic searches for potential nest and roost Sites were undertaken. Emphasis was placed on searching for birds, nests, pellets, feathers and faecal splash in potentially suitable buildings within 1 km of the Site.

FLIGHT ACTIVITY SURVEYS

- 6.1.21 Information on bird flight activity has been collected during timed watches from strategic Vantage Points using the methods described by Band *et al.* (2007)⁵². The Flight Activity Survey Area is defined by the Site boundary plus an additional 500 m buffer around the Site (**Figure 6.3, Appendix 1**).

- 6.1.22 Two Vantage Points have been selected, through a mix of GIS analysis and field trials, with the aim of maximising ground visibility within the Site using the minimum number of points. The viewshed is derived using a 20 m vertical cut-off and are truncated horizontally to 2 km (**Figure 6.3, Appendix 1**).

- 6.1.23 Watches from these Vantage Points have not exceeded three hours in length and have been timed to ensure observations are spread throughout daylight hours each month. A total of at least 36 hours of observation will be completed during two breeding seasons, where between April and August is considered the breeding season and will be completed during two non-breeding seasons where between September and March is considered the non-breeding season.

FLIGHT ACTIVITY-MIGRATION PERIOD WATCHES

- 6.1.24 Additional watches to record migratory movements of swans, geese and waders at a landscape scale were completed during two autumn periods. A single Migration Watch Point (**Figure 6.1, Appendix 1**)

⁵¹ Hardey, J., Crick, H.Q.P., Wernham, C., Riley, H. & Thompson, D. 2013. Raptors: a Field Guide to Survey and Monitoring, 2nd edn. Edinburgh: The Stationary Office.

⁵² Band, W., Madders, M. & Whitfield, D.P. 2007. Developing field and analytical methods to assess avian collision risk at wind farms. In de Lucas, M, Janss, G.F.E. and Ferrer, M. (Eds.) Birds and Wind Farms: Risk assessment and Mitigation, pp. 259 - 275. Quercus, Madrid.

was chosen which gave good broad spatial coverage of the Site in respect of birds moving on a predominantly north-south axis. Observations were made for 42 hours between September and November 2022 and will be undertaken for 36 hours between September and November 2024.

GOOSE AND SWAN ROOST SURVEYS

- 6.1.25 Due to the proximity of the Caithness Lochs SPA, and Loch Stemster being used as a roost location by geese and swans in previous years, two Focal Vantage Point (FVP) locations were established (**Figure 6.1, Appendix 1**). Commuting flights of geese and swans were recorded from these FVPs between roosting and feeding areas at dawn and dusk and were occupied simultaneously by two observers in communication with each other. The two vantage points allowed a 360 degree viewshed to be watched for arriving and leaving birds.
- 6.1.26 Surveys took place twice a month between October and March 2022/2023 and are being undertaken twice a month between October and March 2024/2025. All goose and swan species were recorded with particular focus given to Greenland white-fronted goose, greylag goose and whooper swan as the Qualifying Features of the Caithness Lochs SPA.

GOOSE AND SWAN FEEDING DISTRIBUTION SURVEYS

- 6.1.27 Surveys were carried out by car and on foot to locate feeding birds in suitable areas around the Site to a distance of 2 km with other suitable areas further afield also checked. The time, species and number of any birds observed was recorded and the location marked on a 1:25,000 scale OS map. Surveys took place on a fortnightly basis between October and March 2022/2023 and are being undertaken between October and March 2024/2025.

6.2 Assessment Scope and Methodology

Study Area

- 6.2.1 The Study Areas consist of a series of buffers of up to 2 km from the Site, with buffer size dependent on the sensitivity of key species to potential effects associated with the Proposed Development. Accordingly, between April 2022 and March 2023 and April 2024 and March 2025 surveys within the Site, plus buffers of 500 m and 2 km around this, have been carried out (**Figure 6.1, Appendix 1**).

Method of Assessment and Reporting

- 6.2.2 Effects will be assessed against the existing baseline conditions, i.e., without the Proposed Development present. This assessment will be carried out assuming that there are no existing significant adverse effects on the population, range or distribution of a species (i.e., no significant effect on the species' conservation status) and no significant interference with the flight paths of migratory birds.
- 6.2.3 The assessment will therefore first identify the possible effects of the Proposed Development and will then consider the likelihood of their occurrence. A judgement will then be made as to whether or not these effects are significant for the purposes of the 2017 EIA Regulations. In judging whether a possible effect is significant or not, two principal factors will be taken into account; the nature conservation importance of the bird populations present and the magnitude of the likely effect. In assessing the effects, emphasis will be given to the national and regional populations of the species.
- 6.2.4 Impacts will be assessed in relation to species' population, range and distribution. Key considerations will include territory occupancy, breeding success, foraging success and ranging behaviour. The assessment will:
- Evaluate the Nature Conservation Importance of the bird interest in a systematic manner; and
 - Estimate the magnitude of likely effects on each species as a result of the Proposed Development.
- 6.2.5 The significance of each potential effect will be judged by integrating scales relating to ecological value, behavioural sensitivity and effects magnitude in a reasoned way, in the context of the status of, and trends within, species' regional populations (as defined by NatureScot Natural Heritage Zones [NHZ]). If required, measures will be presented to mitigate any effects deemed to be significant for the purposes of the 2017 EIA Regulations.

Methodology for Provision of Information for Appropriate Assessment

- 6.2.6 Where the Proposed Development is considered likely to have a significant effect on an SPA, there is a requirement for the Scottish Ministers (in consultation with NatureScot) to complete an Appropriate Assessment as part of the Habitats Regulations Assessment (HRA) process.
- 6.2.7 Based on the data collected from the consultation and desk based study, together with a review of relevant data already obtained on the Site, an HRA screening assessment of the Proposed Development in relation to the potential for Likely Significant Effects on The Caithness & Sutherland Peatlands SPA and Caithness Lochs SPA will be required. A study to inform any Appropriate Assessment would be provided as part of the EIA, taking account of the potential for connectivity with the SPA.

Cumulative Effects

- 6.2.8 The effects of the Proposed Development will be assessed in isolation and in combination with predicted effects of other cumulative developments in the same NHZ. The assessment of cumulative effects will be undertaken following published guidance (SNH, 2018b).

Approach to Mitigation

- 6.2.9 Baseline results will be taken into consideration in the process of finalising the Proposed Development layout.
- 6.2.10 A number of mitigation measures will be considered to minimise the effect of the Proposed Development on bird species. Where possible, the findings of the survey work will be used to inform the detailed scheme design.
- 6.2.11 The review of construction timing and related arrangements, and land management regimes, will also be considered as appropriate, in consultation with the appropriate statutory consultees.
- 6.2.12 The need for, and scope of, further monitoring of bird activity in relation to the Proposed Development will also be defined as part of the assessment process.
- 6.2.13 All reasonable opportunities for enhancement measures to meet the policy aims of NPF4 and deliver biodiversity enhancement will be explored.

6.3 Potential Significant Effects

- 6.3.1 Particular consideration will be given in the assessment to potential effects on bird species whose populations are of moderate to high Nature Conservation Importance and that belong to taxonomic groups that are considered to be particularly susceptible to impacts from the Proposed Development. These include:
- 6.3.2 Species listed on Annex 1 of European Council Directive 2009/147/EC on the conservation of wild birds (i.e. 'Annex 1' species), in particular those that may be associated with populations of species that are qualifying interests of SPAs in the wider area.
- 6.3.3 Species listed in Schedule 1 to the Wildlife and Countryside Act 1981, as amended (i.e. 'Schedule 1' species); and
- 6.3.4 Species of national conservation concern, not included within the above categories, but that are present within the Study Area in nationally or regionally important numbers (e.g. species on the UK Red List of Birds of Conservation Concern (Stanbury *et al.*, 2021)⁵³).
- 6.3.5 Taking account of the findings of the work undertaken to date, whilst still adopting a precautionary approach, potential ornithological effects associated with construction and/or operation of the Proposed Development include:
- Disturbance and/or displacement from supporting habitats during construction works.
 - Loss/degradation of habitats through construction works permanent structures and access tracks.

⁵³ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747.

- Displacement from and disturbance to foraging, nesting, roosting habitat from the operational Development.
- Mortality from collision with wind turbine blades.
- The potential for cumulative effects arising from the combined effects of other existing and Proposed Developments within the wider area affecting the same bird populations.

6.4 Issues to be Scoped Out

6.4.1 On the basis of the desk-based work undertaken, the professional judgement of the EIA team, experience from other relevant projects and policy guidance or standards, the topic areas scoped out of this assessment are:

- Due to distance and the species for which the East Caithness Cliff SPA has been designated, significant effects can be scoped out for peregrine, cormorant, common guillemot, northern fulmar, black-legged kittiwake, razorbill, Atlantic puffin and shag.
- Species of low conservation concern (e.g., green-listed Birds of Conservation Concern), or those not considered sensitive to wind farm developments are proposed to be scoped out of the assessment, as per NatureScot guidance (SNH, 2018a).

6.5 Questions to Consultees

- Do the consultees agree that the following qualifying species for the East Caithness Cliff SPA can be scoped out of the EIA given the lack of connectivity: peregrine, cormorant, common guillemot, northern fulmar, black-legged kittiwake, razorbill, Atlantic puffin and shag?
- Are the consultees content with and / or have any comments on the baseline survey methods and level and timing of survey effort, taking into consideration current guidance, the proposed scale and location of the Proposed Development?
- Are the consultees content with and / or have any comments on the list of potential effects and impact assessment methods?

7 CULTURAL HERITAGE

7.0 Introduction

7.0.1 Cultural heritage in this context refers to the above and below-ground archaeological resource, built heritage, the historic landscape and any other elements which may contribute to the historical and cultural heritage of the area. The aim of this chapter is to:

- Describe the cultural heritage assets within the Study Area and the surrounding vicinity;
- Identify the potential cultural heritage issues that may arise as a result of the construction, operation and decommissioning of the Proposed Development; and
- Outline the methods and assessment to be undertaken for inclusion within the EIAR.

Legislation, Planning Policy, and Guidance

7.0.2 Legislation and guidance relating to cultural heritage and pertinent to the Proposed Development includes:

- Town and Country Planning (Scotland) Act 1997 (as amended by the Planning (Scotland) Act 2019)⁵⁴;
- The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 (as amended by the Town and Country Planning (Historic Environment Scotland) Amendment Regulations 2015)⁵⁵;
- Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997⁵⁶;
- Ancient Monuments and Archaeological Areas Act 1979⁵⁷;
- National Planning Framework 4 (NPF)⁵⁸;
- Historic Environment Policy for Scotland ("HEPS")⁵⁹;
- Our Past, Our Future – The Historic Environment Strategy for Scotland⁶⁰;
- Highland Wide Local Development Plan (HwLDP)⁶¹;
- Caithness and Sutherland Local Development Plan (CaSPlan)⁶²;
- The Highland Council Historic Environment Strategy⁶³;
- Planning Advice Note ("PAN") 2/2011 – Planning and Archaeology⁶⁴;
- PAN 71 – Conservation Area Management⁶⁵; and
- The HES 'Managing Change in the Historic Environment' series of guidance notes (particularly *Managing Change in the Historic Environment: Setting*⁶⁶).

7.1 Baseline

Study Area

7.1.1 The EIA baseline will cover all heritage assets, designated and non-designated, within 1 km of the Site. A larger Study Area of 10 km from the main permanent above ground infrastructure (i.e. the proposed turbines) will be used for the assessment of changes to the setting of designated assets. Some assets beyond this distance may also be considered where elements of their setting extend within the 10 km Study Area.

⁵⁴ Scottish Government (1997) *Town and Country Planning Act*, Edinburgh: Scottish Government.

⁵⁵ Scottish Government (2013) *The Town and Country Planning (Development Management Procedure) (Scotland) Regulations*, Edinburgh: Scottish Government.

⁵⁶ Scottish Government (1997) *Planning (Listed Buildings and Conservation Areas) (Scotland) Act*, Edinburgh: Scottish Government.

⁵⁷ UK Government (1979) *Ancient Monuments and Archaeological Areas Act*, Edinburgh: HMSO.

⁵⁸ Scottish Government (2023) *National Planning Framework 4*, Edinburgh: Scottish Government.

⁵⁹ Historic Scotland (2019) *Historic Environment Policy for Scotland*, Edinburgh: Historic Environment Scotland.

⁶⁰ Historic Environment Scotland (2023) *Our Past, Our Future*, Edinburgh: Historic Environment Scotland.

⁶¹ The Highland Council (2012) *Highland-wide Development Plan*, Inverness: The Highland Council.

⁶² The Highland Council (2018) *Caithness and Sutherland Local Development Plan*, Inverness: The Highland Council.

⁶³ The Highland Council (2013) *Historic Environment Strategy*, Inverness: The Highland Council.

⁶⁴ Scottish Government (2011) *Planning Advice Note 2/11 – Planning and Archaeology*, Edinburgh: Scottish Government.

⁶⁵ Scottish Government (2004) *Planning Advice Note 71 – Conservation Area Management*, Edinburgh: Scottish Government.

⁶⁶ Historic Environment Scotland (2016) *Managing Change in the Historic Environment*, Edinburgh: Historic Environment Scotland.

Desk Study

7.1.2 As part of this scoping exercise, a high-level search of relevant data has been undertaken with material collected from online sources for the Site and a Study Area of 1 km from the red line boundary. These sources include:

- PastMap (www.pastmap.org.uk);
- Historic Environment Scotland website (www.historicenvironment.scot);
- Historic mapping on the National Library of Scotland website ([Map images - National Library of Scotland \(nls.uk\)](http://Map%20images%20-%20National%20Library%20of%20Scotland%20(nls.uk))); and
- Other available online sources.

7.1.3 A search of designated assets of the wider 10 km Study Area from the main northern element of the Site where the proposed turbines will be located has also been undertaken to allow consideration of setting issues.

7.1.4 All heritage assets are listed in the gazetteers provided in **Appendix 7.1** and are shown on **Figures 7.1** and **7.2 (Appendix 1)**. Assets are referred to in the text by their HES number, with the SM prefix signifying scheduled monuments, and LB prefix signifying a listed building. Non-designated assets from the Canmore database⁶⁷ have no prefix.

Land Use and Topography

7.1.5 The solid geology of the Site is dominated by siltstones, mudstones, and sandstones of the Berriedale Sandstone Formation formed in the Devonian Period, with some siltstones, mudstones, and sandstones of the Lybster Formation recorded in the north eastern limits of the Site⁶⁸. The drift geology largely consists of peat, although some areas of till have been recorded in the northern limits of the Site.

7.1.6 Dominated by semi-improved moorland, the Site is largely used for pastoral activities, with some areas of improved pasture near the farmstead of Achkinloch on the eastern side of Loch Stemster.

Designated Assets

7.1.7 A review of designated assets within the Study Area identified a total of seven scheduled monuments and 34 listed buildings (**Figure 7.1 (Appendix 1)** and **Appendix 7.1a**).

7.1.8 Three designated assets, all of which are scheduled monuments, have been identified within the Site (**Figure 7.1** and **Appendix 7.1a**). All date to the prehistoric period and include Achkinloch chambered cairn (SM419) and stone setting (SM420), both of which are located near the southern end of Loch Stemster, and Ballachly Broch (SM520) which is located on more open moorland in the northeast corner of the Site.

7.1.9 A further four scheduled monuments are recorded within the 1 km Study Area (**Figure 7.1** and **Appendix 7.1a**). Two of these date to the prehistoric period and consist of Greysteill Castle Broch located to the west of the Site on the shore of Loch Rangag (SM555), and Rangag standing stone located to the north of the Site (SM473). The remaining two scheduled monuments date to the post-medieval period and consist of Lybster Church (SM613) and Reisgill Bridge (SM624).

7.1.10 The majority of the 34 listed buildings recorded within the Study Area are located within the settlement of Lybster (which is also a Conservation Area) near the southern end of the C1053 which has been included to accommodate any road improvements that might be required. These assets consist of 12 Category B listed buildings and 22 Category C listed buildings and include private dwellings (e.g. LB7999; LB7996; LB7966) as well as public buildings such as the Church of Scotland (10951), the Commercial Hotel (LB7965), the Portland Arms (LB7997), and the Post Office (LB7963).

7.1.11 No Gardens and Designed Landscapes, Registered Battlefields, or World Heritage Sites designations relevant to the heritage assessment were recorded within the 1 km Study Area.

⁶⁷ National Record of the Historic Environment; Canmore - <https://portal.historicenvironment.scot/apex/f?p=PORTAL:HOME>

⁶⁸ British Geological Viewer: [BGS Geology Viewer \(BETA\)](https://www.bgs.gov.uk/geology-viewer) accessed 26th July 2024

- 7.1.12 A search of the wider 10 km Study Area identified a further 175 designated assets, of which 119 are scheduled monuments and 56 are listed buildings (**Figure 7.2, Appendix 1 and Appendix 7.1c**).
- 7.1.13 The majority of these scheduled monuments are located at least 4 km from the Site and date to the prehistoric period. These include a number of burials mounds/cairns, most of which are located to the south and southeast and are positioned near watercourses or lochs nearer the coast (examples include SM507; SM508; SM612; SM90056). Other prehistoric scheduled monuments include possible defensive sites such as brochs (e.g. SM519; SM550; SM573; SM575), as well as standing stones (SM457; SM461; SM5301) and settlement remains (SM610).
- 7.1.14 A number of scheduled monuments dating to the medieval and post-medieval periods have also been identified in the 10 km Study Area. Most of the assets dating to the medieval period are religious and include cross slabs (SM613; SM614), as well as former churches/chapels and associated cemeteries (SM721; SM2704; SM3295). Post-medieval assets are largely linked to settlement remains and include Achastle fishing station (SM13642), as well as abandoned crofting settlements including a concentration near Loedebest on the Dunbeath Water to the south (e.g. SM5152; SM5198; SM5145; SM5189; SM5199), as well as possible shielings (SM5170).
- 7.1.15 The listed buildings include four Category A listed buildings, 30 Category B listed buildings, and 22 Category C listed buildings, with most dating to the post-medieval period. As with the scheduled monuments, the majority of the listed buildings are also located to the south and southeast of the Site, with most being over at least 4 km from the Site. The majority are located in the settlements that exist along the coastline and include a large concentration in Lybster, which is also a Conservation Area.
- 7.1.16 The Category A listed buildings consist of The Corr (LB7935), Force House Dovecote (LB7949), Laidhay Croft (LB7951), and Achingale Mill (LB14976). The Category B and C listed buildings are largely residential properties, but also include a bell tower (LB10950), churches (LB7952; LB7953; LB14977), and bridges (LB7805; LB7930; LB7940).
- 7.1.17 No Gardens and Designed Landscapes, Registered Battlefields, or World Heritage Sites were recorded within the 10 km Study Area.

Non-Designated Assets

- 7.1.18 A review of Canmore data identified a further 84 non-designated assets within the 1 km Study Area, of which 15 are located within the Site (**Figure 7.1, Appendix 1 and Appendix 7.1b**). While assets dating from the prehistoric period onwards have been recorded within the Study Area, the majority of non-designated assets within the Site date to the post-medieval period and are linked to agricultural activities. These include clearance cairns (8719; 97880), farmsteads (97817; 97877; 97882; 97883), and enclosures/head dykes (97878), and sheepfolds (364905; 365768), as well as possible shielings (367318), all of which point to the area being used for both permanent and seasonal agriculture.
- 7.1.19 A single non-designated asset dating to the prehistoric and early-medieval period was recorded near the northern limits of the Site near Ballachly farmstead and consists of a possible prehistoric broch along with a potential early medieval chapel and cemetery (8276).
- 7.1.20 A similar pattern is observed in the landscape of the 1 km Study Area, with non-designated assets largely representative of post-medieval pastoral agriculture in the inland area, and the development of the fishing village of Lybster near the coast. A rapid review of historic mapping on the National Library of Scotland website also suggests that the Site has largely consisted of unimproved or semi-improved grazing from at least the 18th century, with the focus of settlements being the coastline.

7.2 Assessment Scope and Methodology

- 7.2.1 An assessment of the impacts of the Proposed Development on heritage assets will be carried out and included in the EIAR. It will be undertaken in line with legislation, planning policy and good practice guidance and methodologies, and in agreement with THC Archaeology Unit and Historic Environment Scotland (HES).

Study Area

- 7.2.2 A Study Area of 1 km from the Site will be used to provide baseline information for the assessment. A wider Study Area will be used to identify designated assets where there is the potential for changes to their setting. The Study Area for the assessment of setting will be limited to 10 km for the main above ground infrastructure (i.e. the turbines) and a 2km Study Area for other elements such as the access tracks and battery storage facility. The setting assessment will be guided by assets which fall within the ZTV along with professional judgement. Some assets beyond this distance may also be considered where elements of their setting extend within the 10 km Study Area.
- 7.2.3 Desk-based research will be undertaken as part of the EIA. Additional information will be gathered from the following sources:
- Highland Council Historic Environment Record;
 - Highlands Archives, Wick;
 - Local Libraries;
 - PastMap website and database (www.pastmap.co.uk) for the National Monuments Record, Scheduled Monuments, listed buildings, Inventory of Designed Landscapes and Registered Battlefields;
 - Historic Environment Scotland;
 - National Library of Scotland for plans and maps of the Study Area and its environs; and
 - Geotechnical data and other assessments as appropriate and available.
- 7.2.4 Information collected from these sources will be used to describe the known archaeology and built heritage within the 1 km Study Area. The results of the desk-based research and the emerging design will be discussed with THC Archaeological Advisor to agree any requirement for additional field evaluation that may be required prior to determination to support the application.

Impact Assessment

- 7.2.5 The impact assessment will consider any impacts to the significance (heritage value) of an asset, either physically or through changes to its setting.
- 7.2.6 The significance (heritage value) of a heritage asset is determined by professional judgement, guided by but not limited to any designated status the asset may hold. The value of an asset is also judged upon a number of different factors, including the special characteristics the asset might hold, which can include evidential, historical, aesthetic, communal, archaeological, artistic and architectural interests. This value of a heritage asset is assessed in accordance with the guidance set out in NPF4 and the Historic Environment Policy for Scotland (HEPS) (HES, 2019). The value (significance) is defined by the sum of its heritage interests. Taking these criteria into account, each identified heritage asset can be assigned a level of value (significance) in accordance with a four-point scale as set out in **Table 7.1** below.
- 7.2.7 **Table 7.1: Heritage Value (Sensitivity) Criteria**

Asset value	Description
High	World Heritage Sites Scheduled Monuments Category A listed buildings Registered battlefields Gardens and Designed Landscapes Conservation areas of demonstrable high value Non-designated heritage assets (archaeological sites, historic buildings, monuments, parks, gardens or landscapes) that can be shown to have demonstrable national or international importance Well, preserved historic landscape character areas, exhibiting considerable coherence, time-depth or other critical factor(s)

Asset value	Description
Medium	Category B and C listed buildings Conservation areas Non-designated heritage assets (archaeological sites, historic buildings, monuments, park, gardens or landscapes) that can be shown to have demonstrable regional importance Averagely preserved historic landscape character areas, exhibiting reasonable coherence, time-depth or other critical factor(s) Historic landscapes with historic integrity in that the assets that constitute their make-up are clearly legible
Low	Locally listed buildings Non-designated heritage assets (archaeological sites, historic buildings, monuments, park, gardens or landscapes) that can be shown to have demonstrable local importance Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade Historic landscape character areas whose value is limited by poor preservation and/ or poor survival of contextual associations
Very Low (Not significant)	Assets identified on national or regional databases, but which have no archaeological, architectural, artistic or historic value Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade Landscape with no or little significant historical merit

- 7.2.8 When professional judgement is considered, some sites may not fit into the specified category in Table 7.1. Each heritage asset will be assessed on an individual basis and take account of regional variations and their individual qualities.
- 7.2.9 Having identified the value of the heritage asset, the next stage in the assessment will be to identify the level and degree of impact to an asset arising from the Proposed Development. Impacts may arise during construction or operation and can be temporary or permanent. Impacts can occur to the physical fabric of the asset or affect its setting.
- 7.2.10 The level and degree of impact (magnitude of impact) will be assigned with reference to a four-point scale as set out in Table 7.2. In respect of cultural heritage, an assessment of the level and magnitude of impact is made in consideration of any scheme design mitigation (embedded mitigation).

Table 7.2: Magnitude of Change Criteria

Magnitude of Impact	Description of impact
High	Changes such that the value of the asset is totally altered or destroyed. Comprehensive change to, or total loss of, elements of setting that would result in harm to the asset and our ability to understand and appreciate its value.
Medium	Change such that the value of the asset is significantly altered or modified. Changes such that the setting of the asset is noticeably different, affecting significance and resulting in changes in our ability to understand and appreciate the value of the asset.
Low	Changes such that the value of the asset is slightly affected. Changes to the setting that have a slight impact on significance resulting in changes in our ability to understand and appreciate the value of the asset.
Very Low	Changes to the asset that hardly affect value. Changes to the setting of an asset that have little effect on significance and no real change in our ability to understand and appreciate the value of the asset.

- 7.2.11 An assessment of the significance of effect, having taken into consideration any embedded mitigation, will be determined by cross-referencing between the value of the asset (**Table 7.1**) and the magnitude of impact (**Table 7.2**). The resultant significance of effect (**Table 7.3**) can be negligible, minor, moderate or major and neutral, adverse or beneficial.

Table 7.3: Assessment of Significance of effect

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

- 7.2.12 Effects of major or moderate significance are considered to be 'significant'.
- 7.2.13 An assessment of the predicted significance of effect will be made both prior to and following the implementation of mitigation measures to identify the residual effects. This first highlights where mitigation may be appropriate, and then demonstrates the effectiveness of that mitigation, providing a framework for the assessment of the significance of effect which takes mitigation measures into consideration.
- 7.2.14 All archaeological work will be undertaken in line with guidance published by the Chartered Institute for Archaeologists⁶⁹. The setting assessment will follow the Historic Environment Scotland Guidance on Managing Change in the Historic Environment: Setting⁷⁰.

7.3 Potential Significant Effects

Construction

- 7.3.1 Due to the nature of construction works, the potential for significant effects from the construction of the Proposed Development on heritage assets is thought to be minimal. This is due to the limited potential for assets to survive within the Site main works areas (i.e. the area proposed for turbines and access tracks), and the ability to micro-site works to avoid physical impacts on non-designated assets. Designated assets within the Site will also be avoided thus removing the potential for physical impacts. However, given the limited detailed design information available at this stage (see **Figure 1.3 (Appendix 1)** for current provisional design), the potential impacts resulting from construction could include:
- Permanent physical impacts on previously unrecorded heritage assets; and
 - Temporary impacts through change to the setting of designated assets due to the introduction of elements such as machinery and lighting.

Operation

- 7.3.2 The Proposed Development also has the potential to result in permanent (for the lifetime of the Proposed Development) impacts on the setting of assets due to the introduction of the new above ground infrastructure, and primarily the introduction of turbines to the landscape. While a large number of designated assets have been recorded within the 10 km Study Area taken from the Site, the large nature of the Site to include the C1053 means that a significant number of the assets are located over 10 km from the proposed turbines, with the turbines being the element of the Proposed Development most likely to result in impacts to the setting of heritage assets. The distance between the majority of designated assets and the Proposed Development, as well as other elements such as topography and screening from buildings in places like Lybster, means that the potential for significant impacts to setting is considered to be limited.

⁶⁹ Chartered Institute for Archaeologists (2020) *Standard and Guidance for Historic Environment Desk-Based Assessment*, Reading: CIfA.

⁷⁰ Historic Environment Scotland (2016) *Managing Change in the Historic Environment*, Edinburgh: Historic Environment Scotland

- 7.3.3 Assets for which there is the potential for a significant effect currently identified include:
- Chambered Cairn 755m South West of Achkinloch, Loch Stemster (SM419);
 - Stone Setting South West of Achkinloch, Loch Stemster (SM420); and
 - Greysteil Castle Broch, Loch Rangag (SM555).
- 7.3.4 A ZTV showing designated assets within 10 km of the Proposed Development is provided in **Figure 7.3 (Appendix 1)**.
- 7.3.5 Works required to upgrade the C1053 are considered to be minimal and will not result in a significant impact to the setting of assets. As a result, the setting assessment will be limited to potential setting impacts arising from the permanent above ground infrastructure.
- 7.3.6 A full assessment will form part of the EIAR and will be based on the final design as well as an appropriate ZTV based on the final turbine layout.

Decommissioning

- 7.3.7 It is assumed that any heritage assets that were extant in the footprint of works, such as turbines, access tracks, and laydown areas, will have been removed during the construction phase, and as a result will have been subject to appropriate mitigation.
- 7.3.8 It is also assumed that any assets that were avoided during construction through micro-siting etc., will be fenced off and protected during decommissioning, avoiding physical impacts.
- 7.3.9 While there is the potential for impacts on setting during decommissioning, these are considered to be temporary in nature, and therefore not significant.

7.4 Potential Impacts Scoped In

- 7.4.1 Based on current information, the following potential impacts have been scoped into the assessment:
- Physical impacts on non-designated assets (construction);
 - Physical impacts on previously unrecorded heritage assets (construction);
 - Impacts through change to the setting of designated and non-designated assets (construction and operation); and
 - Cumulative impacts on the setting of designated assets resulting from the proximity to other schemes.

7.5 Issues to be Scoped Out

- 7.5.1 While three designated assets have been recorded within the Site, the Proposed Development will not result in physical impacts to any of these assets as they will be avoided through careful design. Based on current information, the following impacts have been scoped out of the assessment:
- Physical impacts on designated assets.

7.6 Questions to Consultees

- 7.6.1 Could Stakeholders please:
- Confirm that the three assets included are the important receptors for consideration of likely significant effects, and should be taken forwards to full assessment; and
 - Indicate agreement of the Study Area as appropriate to the assessment.

8 NOISE AND VIBRATION

8.0 Introduction

- 8.0.1 Noise will be emitted during the construction, operation, and decommissioning phases of the Proposed Development. This section provides a summary of the potential noise effects anticipated for each phase and, where appropriate, details the proposed assessment work.

8.1 Baseline

- 8.1.1 The Proposed Development is located within a rural location where existing background noise levels are fairly low. The main noise sources are:
- Road traffic on the A9 road, immediately west of the site.
 - Wind induced noise through the surrounding trees and vegetation.
 - Livestock and bird song.
- 8.1.2 There are a number of residential properties scattered around the Site, with the closest properties being approximately 1 km to the west and southwest of the proposed turbines.
- 8.1.3 There are a number of operational, consented and proposed wind farm developments surrounding the Proposed Development (see **Figure 4.4a** and **Figure 4.4b, Appendix 1**).
- 8.1.4 The nearest noise-sensitive receptors surrounding the Proposed Development will be considered within the noise assessment, as well as receptors located in proximity to cumulative wind farm developments, as required. **Figure 8.1 (Appendix 1)** Shows the Noise Assessment Locations.

8.2 Assessment Scope and Methodology

Key Terms of Reference

- 8.2.1 A construction noise assessment will be undertaken in accordance with BS5228-1: 2009+A1:2014 'Code of practice for noise and vibration control on construction and open Sites - Noise'⁷¹.
- 8.2.2 An operational noise assessment will be undertaken in accordance with ETSU-R-97 'The Assessment of Rating of Noise from Windfarms'⁷² and the Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise'⁷³ (IOA GPG).

Assessment Methodology

Construction Noise

- 8.2.3 A construction noise assessment will be undertaken to determine the potential noise impacts during the construction of the Proposed Development and ancillary infrastructure. The construction noise assessment will be undertaken in accordance with BS5228. The assessment will consider the temporary noise effects of construction on the nearest identified Noise Sensitive Receptors. Specifically, the assessment will consider noise arising from the use of cranes, borrow pits, concrete batching, construction compounds and laydown areas, vehicle movements within and accessing the Site, and activities occurring at the base of the turbines.

Operational Noise

- 8.2.4 The Onshore Wind Policy Statement 2022 web-based planning advice states:
- 'The Assessment and Rating of Noise from Wind Farms' (Final Report, Sept 1996, DTI), (ETSU-R-97) provides the framework for the measurement of wind turbine noise, and all applicants are required to follow the framework and use it to assess and rate noise from wind energy developments.'*

⁷¹ BS 5228-1:2009 (amended 2014) 'Code of practice for noise and vibration control on construction and open Sites – Part 1: Noise'

⁷² The Working Group on Noise from Wind Turbines (1996). ETSU-R-97, the Assessment and Rating of Noise from Windfarms. Final Report for the Department of Trade & Industry.

⁷³ Institute of Acoustics (2013). A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise.

- 8.2.5 The web-based document then refers to the Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97' (IOA GPG) stating that it supports:
- 'the use of ETSU-R-97 when designing potential windfarm schemes, and the monitoring of noise levels from generating sites. The Scottish Government recognises this guide as a useful tool which developers can use in conjunction with ETSU-R-97.'*
- 8.2.6 The web-based document concludes that:
- 'The Scottish Government is aware that the UK Government has been considering the extent to which ETSU-R-97 may require updating to ensure it is aligned with the potential effects from more modern turbines. The Scottish Government supports this work, and we anticipate the results of a short-term review project in due course.'*
- 'Until such time as new guidance is produced, ETSU-R-97 should continue to be followed by applicants and used to assess and rate noise from wind energy developments.'*
- 8.2.7 In February 2023, WSP published 'A review of noise guidance for onshore wind turbines'⁷⁴ (the WSP / BEIS Report). The report, which was subsequently re-issued as Revision 4 in May 2023, was commissioned by the (former) UK Government Department for Business, Energy and Industrial Strategy (BEIS). The primary aim of the review was to make a recommendation on whether, in view of Government policies on noise and Net Zero, and available evidence, the existing guidance requires updating. The report concluded that current guidance would benefit from further review and recommended updates in a number of areas.
- 8.2.8 The UK Government Department for Energy Security and Net Zero (DESNZ) has issued a tender seeking support to update ETSU-R-97. At the present time there are no set timescales for such an update to be published or adopted. Therefore, in line with the recommendations contained within the Onshore Wind Policy Statement, operational wind farm noise from the Scheme will be assessed in line with ETSU R 97 and the IOA GPG.
- 8.2.9 ETSU-R-97 details a methodology for establishing noise limits for proposed wind farm developments and these limits should not be exceeded. ETSU-R-97 states that noise limits should be set relative to existing background noise levels at the nearest receptors and that these limits should reflect the variation in both turbine source noise and background noise with wind speed. Separate noise limits apply for quiet daytime and for night-time periods. Quiet daytime limits are chosen to protect a property's external amenity, and night-time limits are chosen to prevent sleep disturbance indoors, with windows open. The daytime noise limit is derived from background noise data measured during so-called 'quiet periods of the day', which comprise weekday evenings (18:00 to 23:00), Saturday afternoons and evenings (13:00 to 23:00) and all day and evening on Sundays (07:00 to 23:00). The night-time noise limit is derived from background noise data measured during the night-time periods (23:00 to 07:00), with no differentiation being made between weekdays and weekends.
- 8.2.10 ETSU-R-97 recommends that wind farm noise for the quiet daytime periods should be limited to 5 dB(A)⁷⁵ above the prevailing background or a fixed minimum level within the range 35 - 40 dB LA90,10min, whichever is the higher. The precise choice of criterion level within the range 35 - 40 dB(A) depends on a number of factors, including the number of dwellings in the neighbourhood of the wind farm (relatively few dwellings suggest a figure towards the upper end), the effect of noise limits on the number of kWh generated (larger Sites tend to suggest a higher figure) and the duration and level of exposure to any noise. These factors will be taken into account with justification for deriving suitable noise limits included in the noise assessment.

⁷⁴ WSP (2023). *A Review of Noise Guidance for Onshore Wind Turbines* [Online] Available at: Report for BEIS: A review of noise guidance for onshore wind turbines [Accessed: August 2023]

⁷⁵ A logarithmic scale is used in noise level measurements because of this wide range. The scale used is the decibel (dB) scale which extends from 0 to 140 decibels (dB) corresponding to the intensity of the sound level. The correction factor is called 'A Weighting' and the resulting measurements are written as dB(A). The dB(A) is internationally accepted and has been found to correspond well with people's subjective reaction to noise.

- 8.2.11 An exception to the setting of both the quiet daytime and night-time fixed minimum limit occurs where a property occupier has a financial involvement with the Proposed Development. In that case the fixed minimum limit can be increased to 45 dB $L_{A90,10min}$ or the prevailing background noise L_{A90} plus 5 dB, whichever is the greater for both the quiet daytime and night-time periods.
- 8.2.12 The noise assessment for the Proposed Development will be undertaken in three stages:
- Determine the 'Total ETSU-R-97 Noise Limits' which are applicable to the operation of all schemes in the area;
 - Undertake a cumulative assessment (where required) to determine whether predictions from all cumulative schemes meet the 'Total ETSU-R-97 Noise Limits'; and
 - Derive a set of Site Specific Noise Limits (for the Proposed Development) and undertake predictions to determine whether the Proposed Development can operate within the Site Specific Noise Limits.
- 8.2.13 Background noise monitoring was undertaken at a number of properties proximate to the Proposed Development in 2019 (as part of the noise assessment work undertaken for the proposed Stemster Wind Farm which was located at the site). The monitoring locations are shown on **Figure 8.1**. The previously collected datasets will be re-used and therefore additional noise monitoring will not be required.
- 8.2.14 Given the existing noise limits allocated to others schemes in the area, it is proposed that the 'Total ETSU-R-97 Noise Limits' for the assessment will be based on the upper end of the 35-40 dB noise limit range during the daytime period and a 43 dB noise limit during the night-time period.
- 8.2.15 The guidance contained in the IOA GPG will be used to establish suitable Site Specific Noise Limits which fully take account of the proportion of the Total ETSU-R-97 Noise Limits which has been allocated too, and can realistically be used by, existing operational and consented wind farms in the area.
- 8.2.16 Detailed consultation will be undertaken with the Council's Environmental Health Department in order to agree the overall assessment methodology.
- 8.2.17 The noise assessment will include predictions of likely wind turbine noise levels across a range of wind speeds to demonstrate compliance with the Total ETSU-R-97 and Site Specific Noise Limits. A cumulative noise assessment will also be undertaken in order to consider the consented, operational and proposed (in planning) wind farms within the vicinity of the Proposed Development. The assessment will be undertaken in accordance with ETSU-R-97 and the IOA GPG.

Battery Storage Noise

- 8.2.18 In respect to operational noise from non-wind developments, such as battery energy storage Sites, PAN 1/2011 refers to Assessment of Noise: Technical Advice Note (TAN)⁷⁶. The TAN identifies BS 4142:2014+A1:2019 'Methods for Rating and Assessing Industrial and Commercial Sound'⁷⁷ and BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'⁷⁸ as appropriate methodologies for the assessment of environmental noise from proposed new developments or activities.
- 8.2.19 Noise from the operation of a BESS is generated from the use of multiple inverter units, transformers and battery cooling requirements. Careful placement and mitigation measures can minimise noise impacts from BESS plant.
- 8.2.20 Depending on the final location of the BESS, an operational noise assessment may be required. Where necessary, an assessment will be undertaken in line with BS 4142:2014+A1:2019 and BS 8233:2014.

⁷⁶ Scottish Government, Planning Advice Note 1/2011: Planning and Noise - Assessment of noise: technical advice note

⁷⁷ British Standards Institute. Methods for Rating and Assessing Industrial and Commercial Sound. UK : BSI, 2014. BS4142:2014 + A1:2019.

⁷⁸ British Standards Institute. Guidance on Sound Insulation and Noise Reduction for Buildings. UK : BSI, 2014. BS8233:2014.

8.3 Potential Significant Effects

- 8.3.1 As detailed above an assessment of construction and operational noise will be undertaken in order to assess the potential impacts during the construction and operational phases of the Proposed Development.
- 8.3.2 Where noise levels resulting from the construction or operation of the Proposed Development are likely to be above the relevant limit levels, there is the potential for significant effects to occur.
- 8.3.3 Careful site design which considers the potential for noise impacts to occur will be implemented throughout all stages of the design of the Proposed Development.

Issues to be Scoped Out

Decommissioning Noise

- 8.3.4 The potential noise impacts from the decommissioning phase will be no greater than those predicted during the construction phase. On that basis, it is not proposed to undertake an assessment of decommissioning noise and that it should be scoped out.

Vibration

- 8.3.5 Given the nature of construction activities proposed and the relative distances from residential receptors, the risk of ground borne vibration impacting on residential receptors is considered very low, as such it is not proposed that a vibration assessment be undertaken and that a vibration assessment is scoped out.

Low Frequency Noise

- 8.3.6 A study, published in 2006 by acoustic consultants Hayes McKenzie on the behalf of the Department of Trade and Industry (DTI)⁷⁹, investigated low frequency noise from wind farms. This study concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines.
- 8.3.7 Bowdler et al., (2009)⁸⁰ concluded that:
"...there is no robust evidence that low frequency noise (including 'infrasound') or ground-borne vibration from wind farms generally has adverse effects on wind farm neighbours".
- 8.3.8 During a planning Appeal (PPA-310-2028, Clydeport Hunterston Terminal Facility, approximately 2.5 km southwest of Fairlie, 9 Jan 2018), the health impacts related to low frequency noise associated with wind turbines were considered at length by the appointed Reporter (Mr M Croft). The Reporter considered evidence from Health Protection Scotland and the National Health Service. In addition, he also considered low frequency noise surveys undertaken by the Appellant and the Local Authority both of which demonstrated compliance with planning conditions and did not identify any problems attributable to the turbine operations; some periods with highest levels of low frequency noise were recorded when the turbines were not operating.
- 8.3.9 The Reporter concluded that:
- The literature reviews by bodies with very significant responsibilities for the health of local people found insufficient evidence to confirm a causal relationship between wind turbine noise and the type of health complaints cited by some local residents.
 - The NHS's assessment is that concerns about health impact are not supported by good quality research.
 - Although given the opportunity, the Community Council failed to provide evidence that can properly be set against the general tenor of the scientific evidence.
- 8.3.10 Low-frequency noise and infrasound is considered in the WSP BEIS report. The report considered a number of studies which investigated claimed links between adverse health symptoms and infrasound emissions from wind turbines.

⁷⁹ Department of Trade and Industry. The Measurement of LFN at three UK Wind Farms. 2006

⁸⁰ Institute of Acoustics Bulletin. Prediction and assessment of wind turbine noise. 2009

8.3.11 The report notes on page 116 that:

'It has been demonstrated in controlled experiments, including the involvement of participants self-reporting to be sensitive to wind turbine infrasound, that exposure to infrasound at levels representative of wind turbine immissions at dwellings is not associated with physiological or psychological health effects, whereas the expectation of effects from being exposed to wind turbine infrasound, and positive or negative messages influencing that expectation, can affect health symptom reporting.

Overall, the findings from the existing evidence base indicate that infrasound from wind turbines at typical exposure levels has no direct adverse effects on physical or mental health, and reported symptoms of ill-health are more likely to be psychogenic in origin.

It is expected that further evidence from ongoing studies into wind turbine infrasound effects will emerge soon, in particular from the NHMRC studies in Australia. However, based on the existing scientific evidence, it does appear probable that the above findings will not be contradicted by newer evidence.'

8.3.12 Since the publication of the WSP BEIS report, the study that was granted funding by NHMRC (the National Health and Medical Research Council of Australia) was published in the Environmental Health Perspectives (EHP) journal which is published by the United States National Institute of Environmental Health. The study⁸¹ aimed to test the effect of exposure to 72 hours of infrasound (designed to simulate a wind turbine infrasound signature) exposure on human physiology, particularly sleep. The study concluded that:

'Our findings did not support the idea that infrasound causes WTS⁸². High level, but inaudible, infrasound did not appear to perturb any physiological or psychological measure tested in these study participants.'

8.3.13 It is therefore not considered necessary to carry out specific assessments of low frequency noise and that it should be scoped out.

Amplitude Modulation

8.3.14 In its simplest form, Amplitude Modulation (AM), by definition, is the regular variation in noise level of a given noise source. This variation (the modulation) occurs at a specific frequency, which, in the case of wind turbines, is defined by the rotational speed of the blades, i.e. it occurs at the rate at which the blades pass a fixed point (e.g. the tower), known as Blade Passing Frequency.

8.3.15 A study was carried out in 2007 on behalf of the Department for Business, Enterprise and Regulatory Reform (BERR) by the University of Salford⁸³, which investigated the incidence of noise complaints associated with wind farms and whether these were associated with AM. The study defined AM as aerodynamic noise from wind turbines with a greater degree of fluctuation than normal at blade passing frequency. Its aims were to ascertain the prevalence of AM on UK wind farm Sites, to try to gain a better understanding of the likely causes, and to establish whether further research into AM is required.

8.3.16 The study concluded that AM had occurred at only a small number (4 of 133) of wind farms in the UK, and only for between 7% and 15% of the time. It also stated that, the causes of AM are not well understood, and that prediction of the effect was not currently possible.

8.3.17 This research was updated in 2013 by an in-depth study undertaken by Renewable UK⁸⁴, which has identified that many of the previously suggested causes of AM have little or no association to the occurrence of AM in practice. The generation of AM is based upon the interaction of a number of factors, the combination and contributions of which are unique to each Site. With the current state of knowledge,

⁸¹ The Health Effects of 72 Hours of Simulated Wind Turbine Infrasound: A Double-Blind Randomized Crossover Study in Noise-Sensitive, Healthy Adults. Available at The Health Effects of 72 Hours of Simulated Wind Turbine Infrasound: A Double-Blind Randomized Crossover Study in Noise-Sensitive, Healthy Adults - PMC (nih.gov)

⁸² WTS stands for Wind Turbine Syndrome which is a term for adverse human health effected related to the proximity of wind turbines.

⁸³ Research into aerodynamic modulation of wind turbine noise, Report by University of Salford for Department for Business, Enterprise and Regulatory Reform, URN 07/1235, July 2007, Contract NANR233

⁸⁴ Wind Turbine Amplitude Modulation: Research to Improve Understanding as to its Cause & Effect

it is not possible to predict whether any particular Site is more or less likely to give rise to AM, and the incidence of AM occurring at any particular Site remains low, as identified in the University of Salford study. The report includes a sample planning condition to address AM, however that has not yet been validated or endorsed by UK Government.

8.3.18 In 2016, the IOA proposed a measurement technique to quantify the level of AM present in any particular sample of wind farm noise. In August 2016 a report written by WSP/Parsons Brinkerhoff was published by the Department of Business, Energy & Industrial Strategy (BEIS, formerly The Department of Energy & Climate Change). The report sought to build on the conclusions of the IOA study in order to define an appropriate assessment method for AM, including a penalty scheme and an outline planning condition.

8.3.19 In November 2017, an article entitled 'A planning condition for wind farms' was published in Vol 42 No 6 of the Acoustics Bulletin magazine. The article was written collaboratively by a number of noise consultants and suggested a noise planning condition which included consideration of AM. The authors noted in the article that:

'Whilst local authorities and developers have waited for a planning condition that could be applied to newly consented wind farms, or to those already consented but with a suspensive condition, the report Wind Turbine AM Review (WTAMR) by WSP/Parsons Brinckerhoff for DECC arguably did not provide that. In addition, there have been a number of comments on WTAMR that we consider should be addressed.'

8.3.20 The article then went on to propose a draft condition but noted that: 'This approach is proposed based on the current state of understanding but may be subject to modification in light of new research and further robust information.' and 'As various people before us have discovered, the derivation of a penalty is not easy. There is not sufficient reliable research to be confident that a penalty system would always provide a fair indication of the impact of AM.'

8.3.21 At the time of writing there has been no official response to those recommendations from the IOA Noise Working Group and, as yet no endorsement from any Scottish Government Minister or Department. The recommendation to impose a planning condition and the associated penalty scheme is at odds with the advice from the IOA GPG which currently states (paragraph 7.2.10):

'7.2.1 The evidence in relation to "Excess" or "Other" Amplitude Modulation (AM) is still developing. At the time of writing, current practice is not to assign a planning condition to deal with AM.'

8.3.22 The WSP BEIS report discusses AM, and on page 119 states that:

'At present, it seems evident that reliable predictions of AM in the context of development planning and noise assessment guidance are unlikely to be practically feasible in the near future.'

8.3.23 At time of writing there is no agreed methodology which can be used to predict the occurrence of AM or an agreed methodology which can be used to determine whether the effects of AM, should it occur, are likely to be significant. On that basis it is considered therefore that amplitude modulation should be scoped out.

8.4 Questions to Consultees

- Can the consultees confirm that they agree with the proposed assessment methodologies, specifically the use of ETSU-R-97 and the IOA GPG to assess operational wind turbine noise, BS4142 and BS8233 to assess BESS noise and BS5228 to assess decommissioning and construction noise?
- Can consultees agree that assessment of decommissioning noise, vibration, low frequency noise and amplitude modulation be scoped out of the EIA?
- Can consultees confirm that they are happy with the re-use of the background noise and meteorological data collected at receptors around the proposed development in 2019 (for the former project – Stemster Wind Farm) to set noise limits for the proposed development?

9 TRANSPORT AND ACCESS

9.0 Introduction

- 9.0.1 This chapter examines the potential effects of the Proposed Development on traffic and access. It describes the methodology for completing the transport assessment for the EIAR and outlines the mitigation that may be required to alleviate environmental effects.
- 9.0.2 Site access will follow the road route to be used by the varied Golticlay Wind Farm (2024). The construction programme for the Proposed Development is not anticipated to generate cumulative traffic with the varied Golticlay Wind Farm (2024).

9.1 Baseline

- 9.1.1 The Site is accessed directly from the C1053. This road connects the A99 at Lybster to the A9 at Achavanich. The C1053 is a single-track road with passing places along which national speed limits apply. There are no pedestrian facilities or street lighting on the C1053, and the road is rural in character with some local properties present along the road.
- 9.1.2 The C1053 connects with the A99 at Lybster. The A99 is a single carriageway two-way road connecting the town of Wick with the A9. The A99 is a trunk road under the control of Transport Scotland and is subject to national speed limit except for settlement areas. Pedestrian infrastructure and street lighting are not present along the A99 other than local provision within settlements.
- 9.1.3 The C1053 connects with the A9 at Achavanich. The A9 connects Thurso in the north with Helmsdale in the south, via Latheron. The A9 is subject to national speed limit, except for settlement areas. The A9 is a single carriageway two-way road that is predominantly rural with no pedestrian infrastructure or street lighting outside of settlements.
- 9.1.4 Wind turbine components will arrive by boat at Wick Harbour. They will be transported as Abnormal Indivisible Load (AIL) from Wick Harbour to Site via the A99 and C1053. All other construction traffic will use the A9, A99 and C1053 for Site access. The C1053 between Achavanich and the Site access will not be used by any construction traffic. Wind turbine blades will be transported by a blade lifter between Wick Harbour and a transshipment site on the A99 south of Wick. At the transshipment site blades will be moved onto a Superwing transporter for the remainder of the journey to Site.
- 9.1.5 A Study Area for the environmental effects of traffic encompasses the A9, A99 and C1053. Roads to be used by construction traffic in the Study Area are shown in **Figure 9.1 (Appendix 1)**.

Surveys

- 9.1.6 Baseline traffic surveys were undertaken on Study Area roads during May 2023 for the varied Golticlay Wind Farm (2024). This traffic data is considered to remain valid as it is less than three years old, and there are no obvious changes to infrastructure in the Study Area to indicate traffic conditions have materially changed. Baseline vehicle traffic for the environmental assessment will be established by using the May 2023 traffic counts and an appropriate Low Growth factor from Department for Transport TEMPro. **Figure 9.2 (Appendix 1)** shows the location of 2023 traffic surveys.
- 9.1.7 The baseline traffic surveys indicate that Study Area roads are relatively lightly trafficked. The C1053 currently carries an average of less than 200 vehicles per day. The A9 and A99 currently carry an average of less than 3,500 vehicles and 2,500 vehicles per day respectively. The predominantly rural character of Study Area roads means it is unlikely that pedestrian, cycle and public transport traffic would be sufficiently material to warrant specific surveys of these modes of transport. A commentary on active travel and public transport provision in the Study Area will be provided within the baseline traffic narrative of the EIAR.
- 9.1.8 Recorded injury accident data will be obtained for the most recent period available from a publicly available Department for Transport (DfT) source.

9.2 Assessment Scope and Methodology

- 9.2.1 The assessment will follow the Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Traffic and Movement, July 2023. Reference will also be made to the Scottish Government's, 'Transport Assessment Guidance (TAG) 2012' which outlines the necessary considerations in the preparation of a Transport Assessment.
- 9.2.2 The IEMA Guidelines state that the following criteria are adopted to assess whether road links in the Study Area are to be subject to environmental assessment:
- Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%), and
 - Rule 2: Include any other specifically sensitive areas where traffic flows have increased by 10% or more.
- 9.2.3 The IEMA Guidance is based upon knowledge and experience of environmental effects of traffic and acknowledges that traffic forecasting is not an exact science. The 30% threshold is based upon research and experience of the environmental effects of traffic, with less than a 30% increase generally resulting in imperceptible changes in the environmental effects of traffic apart from within specifically sensitive areas. The guidance considers that forecast changes in traffic flow of less than 10% create no discernible environmental effect, hence the second threshold set out in Rule 2.
- 9.2.4 Road traffic generated by the Proposed Development will principally occur during the construction phase. Although construction traffic movements will only be temporary, any increase in traffic could adversely affect users of Study Area roads and any land uses along them. Operational traffic is unlikely to be material in terms of daily vehicle movements. Decommissioning traffic cannot be robustly forecast at this time but is likely to be less than construction traffic. As such, environmental effects for operational and decommissioning traffic are proposed to be scoped out of the assessment.
- 9.2.5 The sensitivity of receptors on Study Area roads used by construction traffic will be established in accordance with IEMA Guidelines.

Study Area

- 9.2.6 The Study area for traffic and access assessment will be same as previous Golticlay assessments.

9.3 Potential Significant Effects

- 9.3.1 HGV construction traffic generated by the Proposed Development is most likely to trigger the inclusion of Study Area roads in the environmental assessment, as the 30% increase in HGV traffic as stipulated by IEMA Guidelines Rule 1 will likely occur.
- 9.3.2 Weight should be given to wording within the IEMA Guidance that high percentage increases in traffic on Study Area roads due to development should be treated with caution as environmental effects are unlikely to materialise if baseline traffic is very low. 2023 traffic survey data shows very low traffic numbers using the C1053.

9.4 Potential Impacts Scoped In

- 9.4.1 Environmental effects will be considered in accordance with IEMA Guidelines for the construction phase of Proposed Development as follows:
- Severance of communities.
 - Road vehicle driver and passenger delay.
 - Non-motorised user delay.
 - Non-motorised amenity.
 - Fear and intimidation on and by road users.
 - Road user and pedestrian safety.
 - Large loads
- 9.4.2 These potential effects will be considered and reported in accordance with the IEMA Guidelines.

9.5 Issues to be Scoped Out

- 9.5.1 Operational traffic is unlikely to be material in terms of daily vehicle movements. Decommissioning traffic cannot be robustly forecast at this time but is likely to be less than construction traffic. As such, environmental effects for operational and decommissioning traffic are proposed to be scoped out of the assessment.
- 9.5.2 There are also unlikely to be any materially significant hazardous loads transported to Site (according to Carriage of Dangerous Goods Regulations) and so Hazardous Loads are proposed to be scoped out of the assessment.
- 9.5.3 Turbine components will be AIL. Swept-path analysis will be presented for the route to Site from Wick Harbour to demonstrate its viability. A detailed AIL report would be prepared post-planning when an appropriate heavy haulage contractor is appointed, and all relevant AIL approvals would be secured in due course.

9.6 Questions to Consultees

- Do the roads authority accept use of traffic survey data from May 2023 for use as a Baseline in this assessment?
- Will an appropriate Low Growth factor applied to 2023 traffic data to produce a forecast development year be acceptable to the roads' authorities?
- Will the requirement to produce a detailed AIL study be Conditioned?

10 AVIATION AND TELECOMMUNICATIONS

10.0 Introduction

- 10.0.1 This chapter considers the potential impacts on aviation from the construction, operation and decommissioning phases of the Proposed Development.
- 10.0.2 The potential effects of wind turbines on aviation are widely publicised, but the primary concern is one of safety. Despite innumerable subtleties in the actual effects, there are three dominant scenarios that lead to potential impacts:
- Physical obstruction: Wind turbines can present a physical obstruction to aircraft;
 - Impacts on aviation Primary Surveillance Radar (PSR) systems and the provision of radar-based Air Traffic Services (ATS): Wind Turbines can create unwanted radar clutter which appears on radar displays and can affect the provision of ATS to pilots. Radar clutter (or false radar returns) can make it difficult for air traffic controllers to differentiate between aircraft and those radar returns resulting from the detection of wind turbines. Furthermore, the appearance of multiple false targets in close proximity can generate false aircraft tracks and seduce those returns from 'real' aircraft away from their true positions. It should be noted that impacts on radar systems are only possible if the wind turbine blades are moving, therefore this impact is generally applicable to the operation phase, or at the time of blade tip installation; and
 - Communication, Navigation and Surveillance (CNS) equipment: A wide range of systems, together with air-ground communications facilities, can be adversely affected by development of infrastructure projects; specifically, when located within the physical safeguarding zones of CNS equipment.

10.1 Legislation and Policy Context

Legislation

- 10.1.1 Civil Aviation Publication (CAP) 393 – Air Navigation, The Order and the Regulations, 2016 (Version 6, 12 February 2021) (Civil Aviation Authority (CAA), 2021a): Contains the Air Navigation Order (ANO) 2016 and Regulations made under the order; and defines the Rules of the Air regarding civil aviation in the United Kingdom (UK).

Policy

- 10.1.2 CAP 670 – Air Traffic Services Safety Requirements (Issue 3, 7 June 2019) (CAA, 2019): Sets out the safety regulatory framework and requirements associated with the provision of ATS.
- 10.1.3 CAP 764 – CAA Policy and Guidelines on Wind Turbines (Version 6, February 2016) (CAA, 2016): Provides CAA policy and guidance on a range of issues associated with wind turbines and their effect on aviation that need to be considered by aviation stakeholders, wind energy developers and Local Planning Authorities when assessing the viability of wind turbine developments.
- 10.1.4 CAP 774 – The UK Flight Information Services (Version 4, 15 December 2021) (CAA, 2021b): Details the suite of ATS which (excluding aerodrome services) are the only services provided in Class G airspace within the UK Flight Information Region. This document is equally applicable to civilian and military pilots and air traffic controllers.
- 10.1.5 Military Aviation Authority (MAA) Regulatory Publication 3000 Series: Air Traffic Management Regulations (last updated 15 April 2024) (MAA, 2024): Provides the regulatory framework and instructions to military personnel for provision of military Air Traffic Control (ATC).
- 10.1.6 MAA Manual of Military Air Traffic Management (last updated 30 September 2019) (MAA, 2019): Provides regulations for military ATC and emergency procedures and utilisation of military designated airspace.

Guidance

- 10.1.7 CAP 032 - UK Integrated Aeronautical Information Package (IAIP) (CAA, 2024a): Provides comprehensive information on UK civilian aerodromes and aviation procedures within UK airspace.
- 10.1.8 CAA 1:500,000 Visual Flight Rules (VFR) Aviation Chart (CAA, 2024b): Designed to assist in the navigation of aircraft. Enables pilots to determine their position, safe altitude and route to a destination, highlighting navigation aids along the way, alternative landing areas in case of an in-flight emergency, and other useful information such as radio frequencies and airspace boundaries.
- 10.1.9 Ministry of Defence (MoD) Obstruction Lighting Guidance (1 January 2020) (MoD, 2020): Sets out the MoD's minimum requirements and standards for installation of aviation lighting of onshore and offshore wind turbine developments.
- 10.1.10 National Air Traffic Services (NATS) Self-Assessment Maps (2024): Assists wind farm developers to understand where interference with NATS infrastructure is likely.
- 10.1.11 UK Military Aeronautical Information Publication (UK Mil AIP) (MoD, 2024): Provides comprehensive information on UK military aerodromes and guidance to military aircrew on in-flight navigation procedures.

10.2 Baseline

Study Area

- 10.2.1 A Study Area has been devised that takes into account the immediate vicinity of the Proposed Development, the consultation criteria for aviation assets as described in CAP 764 (Policy and Guidelines on Wind Turbines) and a wider Study Area determined by the range of potentially affected PSR systems; both ATC and AD PSR systems. A pictorial representation of the Site location and potential aviation receptors (airports and radar locations) is depicted on an aviation chart and shown at **Figure 10.1 (Appendix 1)**.

Airspace

- 10.2.2 The Proposed Development is situated in an area of Class G uncontrolled airspace which is established from the surface up to Flight Level (FL) 75 (7,500 feet (ft)). Above FL 75, the airspace is Class E controlled airspace up to FL 195 (19,500ft) and forms the Moray Control Area (CTA). Class C controlled airspace extends from FL 195 to FL 245 (24,500 ft) and forms Temporary Reserved Area (TRA) 008B which exists to aid and provide flexibility to military training and operations. Class C controlled airspace the continues above FL 245 (24,500 ft) and contains upper air routes mainly utilised by aircraft routing between Europe and North America. In Class C, E and G airspace, the following ATS rules apply:
 - Class C airspace – all aircraft operating within Class C controlled airspace (i.e. above FL195) must be in receipt of an ATS from NATS En-Route PLC (NERL) or a separate authorised military service provider;
 - Class E airspace is airspace in which VFR flight without ATC clearance is permitted, although the VFR aircraft must carry and operate a transponder to operate without ATC clearance. Controllers will separate aircraft at the request of the pilot but to limits decided by the controller or if information has been received which indicates that an aircraft is lost or experiencing radio failure; and
 - Class G airspace - any aircraft can operate in this area of uncontrolled airspace without mandatory requirement to be in communication with, or receive a radar service from, an ATC unit. Pilots of aircraft operating under VFR in Class G airspace are ultimately responsible for seeing and avoiding other aircraft and obstructions.

Civil airport IFPs (including CNS equipment)

- 10.2.3 Wick Airport is located approximately 15 km to the northeast of the Site (see **Figure 10.1**) and operated by Highland and Islands Airports Limited (HIAL). The Site is close enough to the airport that HIAL are likely to request that a formal Instrument Flight Procedure (IFP) assessment be carried out to confirm whether, or not, there will be an impact on existing IFPs (i.e. published departure and arrival

procedures). Consultation will be carried out with HIAL in order to confirm any impact and full details will be provided in the EIAR.

Military aerodrome IFPs (including CNS equipment)

- 10.2.4 The Proposed Development is not within the 30 nautical mile (nm) (56 kilometre (km)) safeguarding zone of any military aerodrome.

Civil ATC PSR

- NERL uses ATC PSRs to support their provision of navigational services to aircraft operating between the UK and mainland Europe and to those overflying UK airspace. Surveillance data from NERL PSRs is also used by other ATS providers such as Aberdeen Airport.
- The Proposed Development is within operational range of NERL's Allanshill PSR located 57 nm (106 km) to the southeast of the Site and the Perwinnes PSR located 85 nm (157 km) also to the southeast. The Proposed Development's wind turbines will be potentially visible to the Allanshill PSR but not the Perwinnes PSR. Consultation will be carried out with NERL in order to confirm any impact and full details will be provided in the EIAR.

Military ATC PSR

- The nearest military ATC PSR to the Proposed Development is located at RAF Lossiemouth 39 nm (72 km) to the south. The Proposed Development's wind turbines are unlikely to be detectable to the RAF Lossiemouth PSR. The MOD will be requested to carry out a pre-planning assessment in order to determine whether the proposed wind turbines will be within Radar Line of Sight (RLOS) of the Lossiemouth PSR. Full details will be provided in the EIAR.

Military AD PSR

- The Proposed Development will not be in RLOS of any military AD PSRs.

Low flying (military and civilian EHSUs)

- The Proposed Development is located in Low Flying Area (LFA) 14, a strategically important LFA within the UK Low Flying System (UKLFS). Military aircraft can fly down to a minimum of 250 feet (ft) above ground level (agl) and, helicopters normally operate down to 100 ft agl but due to the nature of their task, and for specific training purposes, are occasionally permitted to fly lower. However, the airspace in the vicinity of the Proposed Development is considered by MoD to be of low priority in terms of the UKLFS.
- When conducting operational missions, UK Search and Rescue (SAR) helicopters and other emergency helicopter operators, such as Air Ambulance and Police Air Support units, are not constrained by the normal rules of the air, which allows them flexibility to manoeuvre, as required, for the particular mission being carried out.
- There is a statutory CAA requirement to provide visible aviation warning lights for structures of a height of 150 m agl or more; MoD however are likely to request that all turbines are fitted with MOD-accredited infra-red lighting which is not visible to the naked eye but is visible to aircrews using night vision equipment. The turbines will be erected with a mixture of visible and infra-red lighting installed that will remain operational throughout the duration of any consent.
- The Applicant intends to commission an aviation lighting report which will identify the minimum number of visible lights that will be required to satisfy CAA requirements. Full details will be provided in the EIA Report.

Local minor aerodromes

- The Proposed Development is located outside the relevant consultation distances of any local minor aerodromes.

Local airspace restrictions (Prohibited/Restricted/Danger Areas and Military PEXAs)

- The Proposed Development is outside the lateral boundaries of any Prohibited/Restricted/Danger Areas and military PEXAs.

Meteorological (Met) Office radars

- The Proposed Development is outside the 20 km safeguarding zone of any Met Office radars.

10.3 Assessment Scope and Methodology

Scope

- 10.3.1 A detailed desk-top review has been undertaken to characterise existing and future aviation baseline conditions in the vicinity of the Proposed Development. This has been undertaken by reviewing the relevant aviation legislation, policy and guidance documents outlined in Section 10.1 **Error! Reference source not found.**, in particular the UK IAIP, and will be augmented by consultation with the relevant aviation stakeholders during the Environmental Impact Assessment (EIA) phase. The potential aviation receptors that need to be considered include:

- Civil airport Instrument Flight Procedures (IFPs) (including CNS equipment);
- Military aerodrome IFPs (including CNS equipment);
- Civil ATC PSR;
- Military ATC PSR;
- Military Air Defence (AD) PSR;
- Low flying (military and civilian Emergency Helicopter Support Units (EHSUs));
- Local minor aerodromes;
- Local airspace restrictions (Prohibited/Restricted/Danger Areas and Military Practice and Exercise Areas (PEXAs); and
- Meteorological (Met) Office radars.

10.4 Methodology

- 10.4.1 Defining categories of receptor sensitivity and magnitude of impact is not appropriate for aviation as baseline aviation activities and equipment are highly sensitive to impacts and any magnitude of restriction on, or compromise to, activities or equipment (without embedded mitigation) is considered to be high. Therefore, the sensitivity of receptor and magnitude of impact will be explained via professional reasoning and judgement rather than via definitions of different categories. These judgements will then feed into the determination of significance.

- Major: a significant restriction on the ability of the Air Navigation Service Provider (ANSP) to continue to ensure safety and/or provide unrestricted ATS;
- Moderate: a possible restriction on the ability of the ANSP to continue to ensure safety and/or provide unrestricted ATS but which might be mitigated by changes to operating procedures or technical mitigation;
- Minor: a possible restriction on the ability of the ANSP to continue to provide unrestricted ATS but which is manageable with little change to existing operating procedures;
- Negligible: any effect should be completely manageable within current operating practices and without any requirement for change to procedures.

- 10.4.2 Any anticipated impact upon aviation stakeholders which results in restricted operations will be considered to be significant, prior to implementation of suitable mitigation measures.

- 10.4.3 The aviation chapter within the EIA Report will conclude with a high-level summary of potential effects, an overview of any radar, technical or operational mitigation requirements, together with mitigation options.

Potential Cumulative Effects

- 10.4.4 In terms of cumulative impact, any potential impact on an aviation receptor is generally treated as a standalone effect. Whilst other wind farm developments may be located in close proximity, the effect on each receptor is considered on a case-by-case basis. Although mitigation may have been agreed for other developments, discussion and agreement with aviation stakeholders will be carried out under separate arrangement specific to the Proposed Development. As such, no specific cumulative effects on aviation stakeholders are expected.

10.5 Potential Impacts

Construction

- 10.5.1 Potential impact on HIAL Wick Airport IFPs;
10.5.2 Potential impact on low flying operations (military and civilian EHSUs).

Operation

- 10.5.3 Potential interference with NERL's Allanshill ATC PSR.

Decommissioning

- 10.5.4 No effects on aviation are expected during the decommissioning phase further to those impacts identified for the construction phase.

10.6 Potential Mitigation

- 10.6.1 As part of the project design process, a number of best practice and designed-in mitigation measures (referred to collectively as embedded mitigation) are either present or will be included to reduce the potential for effects relating to aviation. Current embedded mitigation measures relevant to aviation are described in Table 10.1 as follows:

Table 10.1: Embedded Mitigation Measures

Embedded Mitigation Measures	Justification
Approval and implementation of a Lighting Plan (LP), which will set out specific requirements in terms of aviation lighting to be installed on the wind turbines, as required under CAA (2016) CAP 393, Air Navigation: The Order and the Regulations 2016.	An LP will be prepared in consultation with CAA and MoD and will take into account requirements for aviation lighting as specified in Article 222 of the UK ANO, 2016 and changes to International Civil Aviation Organisation Annex 14 Volume 2, Chapter 6, Paragraph 6.2.4 promulgated in November 2016. The production of an LP will be a condition of any planning consent. Measures will be adopted to ensure that the potential for risk of aircraft collision with the Proposed Development's infrastructure is minimised.
All structures of more than 91.4 m in height will be charted on aeronautical charts and reported to the Defence Geographic Centre, which maintains the UK's database of tall structures (Digital Vertical Obstruction File) at least ten weeks prior to construction.	Aeronautical charting requirements will be a condition of any planning consent. Measures will be adopted to ensure that the potential for risk of aircraft collision with the Proposed Development's infrastructure is minimised.
Any temporary obstacles associated with wind farms which are of more than 91.4 m in height are to be alerted to aircrews by means of the Notice to Aviation (NOTAM) system.	Consultation with the CAA will be required to ensure that temporary obstacles of more than 91.4 m are identified to aircrews by NOTAM. Notification of temporary obstacles would be a condition of the planning consent. Measures will be adopted to ensure that the potential for risk of aircraft collision with the Proposed Development's infrastructure is minimised.

Embedded Mitigation Measures	Justification
CAA will be informed of the locations, heights and lighting status of the wind turbines including estimated and actual dates of construction and the maximum heights of any construction equipment to be used, prior to the start of construction.	Consultation with the CAA will be required. Inclusion of locations, heights and lighting status of the wind turbines on aviation charts and in the UK IAIP would be a condition of the planning consent. Measures will be adopted to ensure that the potential for risk of aircraft collision with the Proposed Development's infrastructure is minimised.

Construction

- 10.6.2 The embedded mitigation measures outlined in Table 10.1 will need to be implemented prior to the construction phase of the Proposed Development to ensure that any potential effects caused by the presence of obstacles (e.g. cranes and stationary wind turbines) are mitigated successfully.
- 10.6.3 In addition, if any changes are required to any civil airport IFPs (such as Wick Airport), these procedures will need to be amended and re-published in appropriate aviation documentation ahead of the construction phase of the Proposed Development.

Operation

- 10.6.4 It should be noted that adverse effects on PSR systems are only possible if the wind turbine blades are moving, therefore this impact is applicable to the operation phase only. NERL has proven processes and techniques to mitigate the adverse impact of wind turbines on their PSRs. The Applicant will commence discussions with NERL about potential mitigation solutions and it is likely that the proposed solution will be use of infill radar or Multi-Radar Tracker blanking; technical mitigation solutions routinely offered by NATS that removes wind turbine returns from the ATC radar display. It is expected that mitigation negotiations will take place ahead of submission of the formal planning application and full details will be provided in the EAIR.

Decommissioning

- 10.6.5 No mitigation measures are anticipated for the decommissioning phase of the Proposed Development other than the embedded mitigation measures outlined in Table 10.1.

10.7 Potential Significant Effects

Construction

- 10.7.1 The likely significant effects for the construction phase have been identified as potential impacts on:
- Wick Airport IFPs; and
 - Low flying operations (military and civilian EHSUs).
- 10.7.2 Effects on Wick Airport IFPs will be identified through an IFP assessment which the Applicant will commission from a CAA Approved Procedure Design Organisation (APDO). Any identified impact is likely to be alleviated by amending the affected IFPs and re-publishing the procedures prior to commencement of the construction phase of the Proposed Development. Once mitigation measures have been identified and implemented, the residual impact on civil airport IFPs is expected to be non-significant.
- 10.7.3 Effects on low flying operations (military and civilian EHSUs) will be alleviated by installation of appropriate aviation lighting. The Applicant will commission an Aviation Lighting Assessment which will produce an LP aimed at reducing the impact of visible lighting on local communities while ensuring that low flying aviation operations can continue safely. The aviation LP will be provided to CAA and MoD for approval and full details will be included in the EIA Report. Once the aviation LP has been accepted and implemented, the residual impact on low flying operations is expected to be non-significant.

Operation

- 10.7.4 The likely significant effects for the operation phase have been identified as potential interference on NERL's Allanshill ATC PSR.
- 10.7.5 It has been identified that any potential impact on the Allanshill ATC PSR can be mitigated by means of existing mitigation solutions routinely utilised by NERL. The Applicant will consult with NERL in order

to identify any effects and the mitigation options required to alleviate any impact. Once mitigation measures have been identified and implemented, the residual impact on the Allanshill ATC PSR is expected to be non-significant.

Decommissioning

- 10.7.6 No significant effects are expected for the decommissioning phase above those already identified for the construction phase.

10.8 Potential Impacts Scoped In

- 10.8.1 The potential impacts scoped into the EIA Report together with justification are outlined in Table 10.2 as follows:

Table 10.2: Aviation elements scoped into Environmental Impact Assessment

Element	Phase	Justification
Wick Airport IFPs	Construction	The Proposed Development is within the IFP safeguarding area for a civil airport of this nature. Consultation will be required with HIAL Wick Airport. A formal IFP assessment will need to be carried out by a CAA APDO.
Low flying operations (military and civilian EHSUs)	Construction	Installation of wind turbines pose physical obstructions to aviation operations carried out in the vicinity of wind farms. Wind turbines can be difficult to see from the air, particularly in poor meteorological conditions, leading to a potential increase in obstacle collision risk.
NERL's Allanshill ATC PSR	Operation	Operating wind turbines can result in reflected energy appearing as clutter on controllers' radar screens, which can represent, or mask, actual aircraft radar returns. Consultation will be required with NERL.

10.9 Issues to be Scoped Out

- 10.9.1 The potential impacts scoped out of the EIAR together with justification are outlined in Table 10.3 as follows:

Table 10.3: Aviation elements scoped out of Environmental Impact Assessment

Element	Phase	Justification
Military aerodrome IFPs (including CNS equipment)	Construction	The Proposed Development is outside the designated 30 nm (56 km) IFP safeguarding zone for military aerodromes. Consequently, there will be no impact on military aerodrome IFPs.
Military ATC PSR	Operation	The Proposed Development is not within radar coverage of any military ATC PSR systems. Consequently, there will be no impact on military ATC PSR operations.
Military AD PSR	Operation	The Proposed Development is not within radar coverage of any military AD PSR systems. Consequently, there will be no impact on military AD PSR operations.
Local minor aerodromes	All Phases	The Proposed Development is outside the designated consultation distances of any minor aerodromes. Consequently, there will be no impact on local minor aerodrome operations.
Local airspace restrictions (Prohibited/ Restricted/ Danger Areas and Military PEXAs)	All Phases	The Proposed Development is outside the lateral boundaries of any Prohibited/ Restricted/Danger Areas and Military PEXAs. Consequently, there will be no impact on restricted airspace.
Met Office radars	All Phases	The Proposed Development is outside the designated 20 km safeguarding zone of any Met Office radar. Consequently, there will be no impact on Met Office radar operations.

10.10 Questions to Consultees

- Do you agree with the Study Areas defined for aviation?
- Do you agree with the data sources which are suggested for the assessment of aviation?
- Do you agree with the suggested embedded mitigation measures and is this mitigation appropriate?
- Do you agree that all receptors and impacts have been identified for aviation?
- Do you agree with the impacts which have been scoped out of the EIAR?
- Do you agree with the proposed approach to assessment?
- Do you agree with the proposed approach to cumulative effect assessment for aviation?
- Do you have any useful data sources that should be used as part of the aviation assessment?

11 SHADOW FLICKER

11.0 Introduction

- 11.0.1 This chapter sets out the proposed approach to the assessment of Shadow Flicker associated with the operation of the Proposed Development.
- 11.0.2 Under certain combinations of geographical position, times of day and year, the sun may pass behind the turbine rotor and cast a shadow flicker over the windows of neighbouring buildings. When the blades rotate and the shadow passes a window, to a person within that room, the shadow appears to flick on and off; this effect is known as 'shadow flicker'. This effect occurs only within buildings where the flicker appears through a window aperture and in the UK typically occurs only in buildings within 130 degrees either side of north relative to a turbine.

11.1 Baseline

- 11.1.1 A desk-based analysis confirms that based on the Scoping Layout, there are three dwellings (all inhabited), located within a distance of 11 rotor diameters of the Proposed Development.

11.2 Assessment Scope and Methodology

- 11.2.1 Scottish Government web-based advice on onshore wind turbines⁸⁵ (previously known as PAN45) states that "where separation is provided between wind turbines and nearby dwellings (as a general rule 10 rotor diameters), 'shadow flicker' should not be a problem."
- 11.2.2 Further guidance is available in the Onshore Wind Energy Supplementary Guidance (The Highland Council, 2017)⁸⁶ which states:

'Wind energy schemes should always be designed to avoid causing shadow flicker, blade glint, glare and light effects to any regularly occupied buildings not associated with the development. Where this cannot be achieved, the Council will expect wind energy developments to be located a minimum distance of 11 times the blade diameter of the turbine(s) from any regularly occupied buildings not associated with the development. Within a distance less than 11 times the blade diameter, a shadow flicker assessment will be required. The Council may support a scheme that relies on mitigation, where it is deemed to be effective. In such instances turbine shutdown systems will be the required mitigation. The increase in distance from the widely accepted 10 times rotor diameter to 11 is to account for the northern latitudes of Highland - this is in line with the conclusions of the DECC Update of UK Shadow Flicker Evidence Base, 2011.'

- 11.2.3 On this basis, the assessment Study Area was defined as the area over which shadow flicker effects could impact residential properties (i.e., within 11 rotor diameters of each turbine).
- 11.2.4 Proprietary software (either Resoft WindFarm or WindPro) will be used to identify the potential areas susceptible to shadow flicker. The software identifies the Study Area for the assessment based on proposed turbine dimensions and orientations.
- 11.2.5 The shadow flicker modelling will provide details of the predicted occurrence frequency of shadow flicker at each window location.

11.3 Potential Significant Effects

- 11.3.1 As the turbine blades rotate, it causes the shadow of the turbine to flick on and off at the receptor property. This may have a negative effect on residents in affected properties. If shadow flicker cannot be avoided through design, technical mitigation solutions are available, and a shadow Flicker Mitigation Protocol would be proposed and agreed if required.

⁸⁵ Onshore wind turbines: planning advice. Scottish Government. 2014. Available at: <https://www.gov.scot/publications/onshorewind-turbines-planningadvice/>

⁸⁶ The Highland Council (2017). Onshore Wind Energy Supplementary Guidance, November 2016 (with addendum, December 2017).

Issues Scoped In

- 11.3.2 During the operation of the Proposed Development there are three properties that have the potential to be affected by shadow flicker. This is due to their proximity and orientation to the Proposed Development.

Issues to be Scoped Out

- 11.3.3 Where moving shadows are cast over the ground, rather than through the windows of a building, this is known as 'shadow throw'. There are no guidelines to quantify the effect and no requirement to assess 'shadow throw'. Therefore, 'shadow throw' has not been considered further in this assessment.
- 11.3.4 Shadow flicker can only occur during the operation of a wind turbine, therefore effects during construction and decommissioning have been scoped out.
- 11.3.5 The effect from shadow flicker on pedestrians and horse riders is likely to be negligible due to the intervening distance between the closest turbine and the receptors, therefore this issue has been scoped out.

11.4 Questions to Consultees

- Q11.1: Can consultees confirm they are happy with the proposed scope of the Shadow Flicker Assessment?

12 ISSUES SCOPED OUT OF IMPACT ASSESSMENT

12.0 Hydrology and Hydrogeology

Baseline Conditions

- 12.0.1 The Proposed Development is drained by a number of small burns, including Burn of Aultachlevan, Burn of Clashcrebie and Golticlay Burn, as well as numerous smaller, unnamed burns. The Burn of Clashcrebie flows into the Burn of Aultachlevan, which flows across the Site from Loch Stemster into Loch Rangag then northwards as Loop Burn, to form a tributary of the River Thurso. The Golticlay Burn flows southwards out of the Site and into Rumster Forest, forming part of the catchment of Reisgill Burn. According to the SEPA's Water Environment Hub², the Loop Burn and the Reisgill Burn were both classified in 2014 as having an overall status of Good. The main surface water features are shown on **Figure 12.1 (Appendix 1)**.
- 12.0.2 A review of the SEPA's Flood Risk Maps³ shows that areas at risk of flooding within the Site and its vicinity are confined to the areas around Loch Stemster, Loop Burn and Loch Rangag.
- 12.0.3 There is one private water supply (PWS) located approximately 250 m southwest of the Site, PWS Benechiel which is a well serving a domestic property, this location is approximately 675 m southwest of the nearest proposed turbine location (T15). No further PWS abstractions have been identified within 2 km of the proposed turbines.
- 12.0.4 According to the 1:625,000 UK Digital Hydrogeological Data, the Site is located over a moderately productive aquifer comprising old red sandstone. As a moderately productive aquifer, flow is virtually all through fractures and other discontinuities. According to the Geology of Britain viewer (online), the Site is underlain by sandstone, siltstone and mudstone sedimentary bedrock of the Devonian period. In terms of superficial deposits, areas of peat are located across the southern and eastern parts of the Site.

Potential Impacts

- 12.0.5 In the absence of mitigation, it is acknowledged that the Proposed Development would have the potential for an increase in the rate of runoff from the Site, and /or accidental events including the discharge of silt contaminated surface water or hydrocarbon/chemical spill from construction areas into the Wick coastal catchment.
- 12.0.6 However, the Proposed Development would be designed to incorporate good practice measures to control surface water runoff rates and water quality, and to implement good practice pollution prevention and environmental management measures.
- 12.0.7 As a result, there would be no likely significant direct or indirect effects. As such, we would seek to scope out a detailed impact assessment chapter for Hydrology and Hydrogeology from the EIA Report.

Consultation

- 12.0.8 Consultation would be carried out with SEPA with regards to for the Proposed Development to impact GWDTE, and following confirmation of the status of GWDTE at the Site (which have previously been found to rely on surface water) Ramboll would also seek to scope out hydrological assessment of GWDTE habitats in the EIAR.
- 12.0.9 A Technical Appendix would be prepared to assess the suitability of likely watercourse crossing locations and the likely regulatory requirements for their construction.

12.1 Geology and Soils

- 12.1.1 This section assesses the potential impact on soils and geology associated with the construction and operation of the Proposed Development with a focus on the sensitivity of peat soils with respect to its physical properties and its role in carbon storage and soil stability. The impacts on peatland as a habitat resource are assessed in the Ecology impacts chapter (refer to **Chapter 5**).

Baseline

- 12.1.2 According to the British Geological Survey's (BGS) 'Geology Viewer' website (1:625,000)⁸⁷, the superficial deposits underlying the Site predominantly comprise extensive, likely deep, peat deposits (blanket bog) possibly overlying glacial deposits (glacial till).
- 12.1.3 The James Hutton Institute⁸⁸ provision soil map (**Figure 12.3, Appendix 1**) for the area shows superficial deposits, within the development area, to primarily comprise of Blanket Peat >1.0 m thick. Around Badharigo, Clashmore and Clashcraggan (central south of the development area) poorly drained drift deposits (likely glacial till) are indicated to be present, interfingering with the blanket peat. These deposits are derived from sandstones, mudstones, calcareous flags, and limestones of the Middle Old Red Sandstone Caithness Flagstone series. At Cnoc Vigas, a small area of peaty podzols is shown.
- 12.1.4 The underlying bedrock across the Site comprises of Devonian Berriedale Sandstone Formation, with the Lybster Flagstone Formation in the north-central area, with both formations consisting of interbedded siltstone, mudstone, and sandstone.
- 12.1.5 A review of the SNH Carbon and Peatland Map (2016)⁸⁹, an extract of which is shown on **Figure 12.2 in Appendix 1**, confirms that the Site is predominantly overlain by 'Class 2 Peat', with the remainder being 'Class 1' peat. Class 1 and 2 peat is designated as being 'nationally important carbon rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value'.
- 12.1.6 No nationally important environmental designations for peat or geological conservation are located at the Site. However, the Site is bounded to the east by the Caithness and Sutherland Peatlands Special Area of Conservation, which is also classified as a Special Protection Area and Ramsar site, as well as the Shielton Peatlands Site of Special Scientific Interest.
- 12.1.7 No Local Geodiversity Sites are located at the Site, the closest of which is approximately 1 km to the north.
- 12.1.8 The Site is located adjacent to the Flow Country World Heritage Site, which was designated in 2024 and is Scotland's only UNESCO World Heritage Site. The World Heritage Site has been inscribed for its international value of its peatlands. The potential impacts of the Proposed Development on the Flow Country World Heritage Site will be assessed under ecological impacts (refer to Section 5.2.5).
- 12.1.9 A review of aerial imagery and OS mapping indicates that there are quarries and potential historic peat cuttings present within the Site and general vicinity. No mining features or historic contaminative land uses were identified within the Site based on BGS and Coal Authority information⁹⁰.
- 12.1.10 A number of peat depth surveys have been undertaken at the Site (refer to Section 5.2.5 which details the peatland condition assessment) These indicate that the majority of the Site either has no peat present or is shallow in depth (<0.5 m depth). The maximum depth of peat recorded was 4.2 m, located in the south-eastern part of the Site.

A higher resolution peat probing survey will be undertaken (if required) once the design of the Proposed Development has been advanced, in line with good practice set out in the Scottish Government's Peatland Survey Guidance 2017⁹¹. This survey will ensure that all infrastructure locations have sufficient peat depth information to support relevant studies on peat instability, peat excavation and reuse, and carbon calculations.

⁸⁷ <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/> [Accessed September 2024]

⁸⁸ <https://www.hutton.ac.uk> [Accessed September 2024]

⁸⁹ <https://map.environment.gov.scot/sewebmap/> [Accessed September 2024]

⁹⁰ <https://datamine-cauk.hub.arcgis.com/> [Accessed September 2024]

⁹¹ The Scottish Government, 2017, Peatland Survey Guidance, Available at [Guidance+on+developments+on+peatland+-+peatland+survey+-+2017.pdf](#) [Accessed November 2024].

Potential Impacts

- 12.1.11 In the absence of mitigation, it is acknowledged that the Proposed Development would have the potential for the following:
- Altering in-channel or overland flow regimes through excavations, disruption to artificial drains, exposure of bare earth or rock, alteration to field drains and the construction of watercourse crossings, which could result in changes to the hydrology and hydrogeology and subsequently affect the condition of peat at the Site;
 - Loss/ disturbance to peat and carbon rich soils as a result of excavations for wind farm infrastructure, and construction activities; and
 - Erosion of peat and carbon rich soils following disturbance and may also be exacerbated as a consequence of localised drying of the peat and resultant oxidation.
- 12.1.12 The EIA Report will address how the Proposed Development would be constructed in order to minimise or avoid potential impacts on areas of Class 1 and 2 peatland, which are considered nationally important. Opportunities to mitigate these impacts through siting, design and other measures will be considered in the EIA Report.
- 12.1.13 It is proposed that the EIA Report will not include a separate peat chapter/section but will be provided as technical appendices to the hydrology, hydrogeology, geology and soils chapter.
- 12.1.14 As stated above, the primary assessment of peatland habitat loss (in particular priority peatland habitat) will be addressed within **Chapter 5: Ecology**.

Geology and Soils Assessment Scoped In

- 12.1.15 It is proposed that the following technical information on geology and soils would be provided in the EIA Report to the extent necessary to satisfy SEPA's requirements. This information would include:
- An outline CEMP will be included as a Technical Appendix to the EIA Report which will include mitigation measures, environmental management requirements, outline method statements and environmental monitoring requirements.
 - Peat survey results;
 - Peat landslide hazard and risk assessment (PLHRA); and
 - Outline Peat Management Plan (OPMP).
- 12.1.16 An OPMP will be produced in accordance with SEPA guidance which will include information on the peat characteristics, extent, details of proposed excavation, surplus and re-use options based on peat probing data and desk-based baseline data. This will include an estimation of peat volumes and will outline measures necessary to minimise peat and habitat disturbance and provide a clear description of mitigation measures to minimise potential adverse impacts on peat and peatland functioning, and ensure best practice and effective excavating, moving and re-using / reinstating of peat. This may include integration of peat reuse measures with habitat management proposals. The OPMP will be developed using the peat mitigation hierarchy.
- 12.1.17 A PLHRA will be undertaken (if required, subject to the design) in accordance with the Scottish Government guidance and included as a Technical Appendix to the EIA Report. The assessment will assess the potential stability risks associated with the Proposed Development and will incorporate:
- desk study information supplemented by site reconnaissance information;
 - review of peat depth survey data including peat characteristics, identification of areas of potential or past instability, flow pathways for potential peat slide events and identification of down gradient environmental receptors;
 - preliminary stability analysis and hazard ranking; and
 - reporting to include the assessment, identification of hazards, mitigation measures and recommendations for further assessment to be included during post-consent detailed design and construction phases.

- 12.1.18 The potential effects on the Flow Country World Heritage Site will be assessed using the UNESCO World Heritage Site Toolkit. This will be reported as part of the cultural heritage assessment but will be based on information derived as part of the geology and soils, including potential impacts on peat, in relation to the conservation values of the Flow Country World Heritage Site.

12.2 Air Quality

- 12.2.1 The Proposed Development is not considered likely to give rise to significant impacts on air quality. The main activities would be limited to construction works (dust from soil stripping and earthworks, from excavation, potentially including occasional blasting, and from vehicles running over unsurfaced ground) and exhaust emissions from fixed and mobile construction plant and construction vehicles. Construction works would be localised, short term, intermittent and controllable through the application of good construction practice.
- 12.2.2 The contributions of exhaust emissions (NO₂ and PM₁₀) from construction vehicles would likely be low, and orders of magnitude below current Air Quality Objectives. Therefore, it is proposed that the EIA will not address air quality impacts. An Outline CEMP will be included in the EIA Report which will include general pollution control measures for air quality.

12.3 Forestry and Land Use

- 12.3.1 There is an area of commercial forestry plantation located immediately southeast of the site. However, it is anticipated that no areas of sensitive woodland or commercial forestry plantation would be affected by the Proposed Development; therefore, there will be no requirement for the development of forestry felling and re-stocking proposals in accordance with The Scottish Government's Control of Woodland Removal Policy⁹² 51. Any woodland re-planting on-site could be subject to future management control options (e.g. felling, coppicing etc.) to prevent such woodland from affecting the performance of the Proposed Development.

12.4 Socio-Economics

- 12.4.1 The Site is located in a remote area, approximately 18 km west of Wick and 24 km south of Thurso. Existing local socio-economic issues are likely to include a narrow local business base and limited access to services, while local tourism / leisure activity is likely to be primarily related to outdoor activities such as walking, cycling, fishing, etc.
- 12.4.2 The potential effects on visual amenity for tourism and recreational locations will be fully assessed in the EIA Report as part of the landscape and visual assessment. However, it should be noted that there is no evidence to support the suggestion that the presence of a wind farm would result in a significant adverse effect on tourism or recreation resources and no relationship has been identified between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at local authority level nor in the areas immediately surrounding wind farm development.
- 12.4.3 The construction of the Proposed Development would not entail significant road works, closures or diversions which would have potential to adversely affect access to tourism assets and no potential for significant effects is identified. An Outline Access Management Plan will be prepared and submitted with the planning application.
- 12.4.4 A separate statement on the socio-economic benefits will be provided as part of the application documents, and the community benefit potential of the Proposed Development will be set out.

12.5 Ice Throw

- 12.5.1 The maximum potential distance of ice falling from turbines can be approximated using the formula $1.5 \times (\text{blade diameter} + \text{hub height})$. For the Proposed Development, the maximum distance from a turbine where ice could be expected to fall is therefore in the region of 420 m to 430 m. As such, the risk to public safety is considered to be very low because the distance from the turbines to the nearest public road, residential property or core path would be greater than 430 m.

⁹² <https://www.forestry.gov.scot/publications/285-the-scottish-government-s-policy-on-control-of-woodland-removal>

- 12.5.2 However, in line with current guidance a permanent warning sign at the Site's main entrances is proposed to alert the public to this issue. No detailed assessment is proposed as part of the EIA Report.

12.6 Climate Change

- 12.6.1 The EIA Regulations 2017 include for consideration of potentially significant effects on climate which includes greenhouse gas emissions. As a renewable energy project, the Proposed Development is likely to result in a significant saving in carbon and therefore benefit to the UK climate.
- 12.6.2 A carbon balance assessment will be undertaken for the Proposed Development using guidance Calculating Potential Carbon Losses and Savings from Wind Farms on Scottish Peatlands.

12.7 Human Health

- 12.7.1 The EIAR will consider "human health" in terms of amenity through the assessment of potential likely significant effects associated with water supplies, noise, traffic and on visual amenity. No other sources or pathways for effects on human health have been identified. The potential for likely significant effects on "population" will be considered through the socioeconomics, recreation and tourism assessment (as described above). As such, a separate human health impact assessment chapter and population impact assessment chapter will not be presented. Appropriate control measure to ensure potential effects on air and water quality are managed appropriately in the construction phase will be addressed through an outline CEMP.

12.8 Risk of Major Accidents and/or Disasters

- 12.8.1 Due to the nature of the Proposed Development, the risk of a major accident or disaster is considered to be extremely low. In addition, the Site is located in a remote area, with few nearby receptors. A risk assessment process will be followed by the Principal Designer during the design stage as part of the requirements of the Construction (Design and Management) Regulations 2015. This will ensure that all potential risks are identified at an early stage and appropriate mitigation is implemented.
- 12.8.2 During the operational stage of the Proposed Development, routine maintenance inspections will be completed in order to ensure compliant operation of the Proposed Development.
- 12.8.3 No further assessment of the risk of major accidents and/or disasters is proposed.

13 NEXT STEPS

- 13.0.1 This report is provided to support a request under Regulation 12 of the EIA Regulations for a 'Scoping Opinion' regarding the information to be provided within the EIAR which will accompany the Application.
- 13.0.2 Informing its opinion, the Scottish Ministers will seek the views of various organisations with an interest in the Proposed Development, inviting comments on the proposed scope of and approach to the EIAR proposed herein.

APPENDIX 1 - FIGURES

APPENDIX 2 – CONSULTEE LIST

APPENDIX 4.1 – LVIA METHODOLOGY

APPENDIX 7.1 GAZETTEERS