



Renantis UK Limited

The Repowered and Extended Ben Aketil Wind Farm

Environmental Impact Assessment Report (Volume 1)

663617



MAY 2023

RSK

RSK GENERAL NOTES

Project No.: G/P/663617/09/04/03/03/04/Vol_1 Rev04

Title: The Repowered and Extended Ben Aketil Wind Farm
Environmental Impact Assessment Report (Volume 1)

Client: Renantis UK Limited (formerly Falck Renewables Wind Limited)

Date: May 2023

Office: Glasgow

Status: Final

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PREFACE

Renantis UK Limited, formerly Falck Renewables Wind Limited, (“the Applicant”) is proposing to submit an application under Section 36 of the Electricity Act 1989 for consent of the Repowered and Extended Ben Aketil Wind Farm (hereafter referred to as “the Proposed Development”), located on the Isle of Sky, Scotland.

The site within which the Proposed Development would be located currently comprises the existing Ben Aketil Wind Farm, associated wind farm infrastructure, and upland moorland habitat sloping downwards from north-east to south-west. The existing Ben Aketil Wind Farm comprises twelve 2.3 MW turbines with a hub height of 64 m and blade diameter of 71 m.

The Applicant proposes to repower and extend the operational Ben Aketil Wind Farm. Therefore, the Proposed Development would involve the removal of the existing 99.5 m tall turbines, and the construction of nine new wind turbines, each of a maximum blade tip height of 200 m. The individual turbine generating capacity is anticipated to approximately 5.6 to 6.6 Megawatts (MW), with the total installed capacity for the Proposed Development in excess of 50 MW. The application also includes approximately 20 MW of battery storage system (BESS). The design and layout of the Proposed Development has been informed by the EIA process and key design and environmental constraints.

Information relating to the EIA Report and supporting documentation is available in four volumes:

Volume 1 – Environmental Impact Assessment (EIA) Report;

Volume 2 – EIA Report Figures;

Volume 3 – Technical Appendices;

Volume 4 – Confidential Technical Appendices.

When the Section 36 application for the Proposed Development is lodged with Scottish Government Energy Consents Unit (ECU), the Applicant will advertise the application in the Edinburgh Gazette, a national publication and the local press confirming by when representations on the application should be made. The ECU will also invite formal representations on the application, which will be taken into account before reaching a decision on the application.

Any representations to the application may be submitted via the ECU website at www.energyconsents.scot/Register.aspx; by email to the Scottish Government, Energy Consents Unit mailbox at representations@gov.scot; or by post to the Scottish Government, Energy Consents Unit, 4th Floor, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU, identifying the application and case reference number and specifying the grounds for representation. Further information on the Proposed Development can be found on the project website at: www.benaketilwindfarm.co.uk.

Hard copies of the EIA Report are subject to a charge of £2,300 and are available on written request from: **RSK Environment Ltd, 65 Sussex Street, Glasgow, G41 1DX**. Charges for specific sections of the EIA Report would be determined on a case-by-case basis.

Hard copies of the non-technical summary are available free of charge. A digital version of the EIA Report and information relating to the EIA Report can be downloaded free from the ECU portal, from www.benaketilwindfarm.co.uk, or provided on USB stick at a cost of £15 by written request as above.

EIA Quality Mark

This Environmental Statement, and the Environmental Impact Assessment (EIA) carried out to identify the significant environmental effects of the proposed development, was undertaken in line with the EIA Quality Mark Commitments.

The EIA Quality Mark is a voluntary scheme, operated by IEMA, through which EIA activity is independently reviewed, on an annual basis, to ensure it delivers excellence in the following areas:

- *EIA Management*
- *EIA Team Capabilities*
- *EIA Regulatory Compliance*
- *EIA Context & Influence*
- *EIA Content*
- *EIA Presentation*
- *Improving EIA practice*



To find out more about the EIA Quality Mark please visit: <http://www.iema.net/eia-quality-mark/>

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GLOSSARY

alternatives	different design, layout and technological possibilities that could be considered during project development that have potential to fulfil the project objectives
ambient	of or relating to the immediate surroundings of something (e.g. ambient noise level)
ancient woodland	woodland that has existed continuously since at least AD 1600
appropriate assessment	process whereby projects, either alone or in combination, are considered to see if it can be ascertained that they will not adversely affect the integrity of a European protected site
assessment	process by which information about effects of a proposed plan, project or intervention is collected, assessed and used to inform decision making
baseline conditions	environment as it appears (or would appear) immediately prior to the implementation of the project together with any known or foreseeable future changes that will take place before completion of the project
baseline studies	work done to determine and describe the environmental conditions against which any future changes can be measured or predicted and assessed
biodiversity	variety of life forms; different plants, animals and microorganisms; the genes they contain; and the ecosystems they form
catchment	drainage/basin area within which precipitation drains into a river system and eventually into the sea
committed development	development projects that are either under construction or have valid planning permissions/consents
competent authority	authority responsible for determining the application for consent, permission, licence or other authorisation to proceed with a development
construction phase	period during which the building or assembling of a Proposed Development and its infrastructure is undertaken
consultation	process by which those organisations or individuals with an interest in the area associated with the proposed development are identified and engaged as part of the EIA process
consultation bodies	organisations that the competent authority is required to consult by virtue of the EIA Regulations
Controlled Activities Regulations	Controlled Activities Regulations (CAR), also known as the Water Environment (Controlled Activities) (Scotland) Regulations 2011, apply regulatory controls over activities which may affect Scotland's water environment. SEPA risk assesses the proposed activities before granting an authorisation if it is appropriate. The type of authorisation depends on the environmental risk, and could be General Binding Rules, registration, or a licence.
culvert	pipe or box-type conduit through which water is carried under a structure

cumulative impact	impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project. A cumulative impact may arise as the result of (a) the combined impact of a number of different environmental topic-specific impacts from a single environmental impact assessment project on a single receptor/resource or (b) the combined impact of a number of different projects within the vicinity (in combination with the environmental impact assessment project) on a single receptor/resource.
decommissioning	period during which a development and its associated infrastructure are removed from active operation
design event	event such as a rainstorm or flood of given magnitude and probability (usually derived from previous records)
do-minimum scenario	also known as the 'do-nothing' scenario: the conditions that would persist in the absence of the implementation of a development
effect	term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by correlating the magnitude of the impact with the importance (or sensitivity) of the receptor or resource in accordance with defined significance criteria. For example, land clearing during construction results in habitat loss (impact), the effect of which is the significance of the habitat loss on the ecological resource.
EIA Regulations	collective term for the various statutory instruments through which the Directives on Environmental Assessment have been implemented in the UK
emission standard	maximum amount or concentration of a pollutant allowed to be emitted from a particular source
emissions inventory	collection of data relating to the characteristics of processes or activities that release pollutants into the atmosphere
Energy Consents Unit	part of the Scottish Government's Energy Division, the unit processes and administers energy infrastructure applications for Scottish Ministers under the 1989 Electricity Act; the unit is made up of two teams, the Section 36 team and the Section 37 team,
enhancement	measure that seeks to improve an environmental condition and is over and above what is required to mitigate the adverse effects of a project
environmental assessment	method and a process by which information about environmental effects is collected, assessed and used to inform decision-making. Assessment processes include strategic environmental assessment, assessment of implications on European sites, and environmental impact assessment.
environmental impact assessment	statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. Involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Regulations, including the publication of an EIA report.
Environmental Impact Assessment Report	otherwise known as an EIA report. Document produced in accordance with the EIA Regulations that reports the outcomes of the EIA process

environmental information	information that must be taken into account by the decision maker (the competent authority) before granting any kind of authorisation in any case where the EIA process applies. It includes the environmental impact assessment report, including any further information, any representations made by any body required by the Regulations to be invited to make representations, and any representations duly made by any other person about the environmental effects of the development
environmental management plan	structured plan that outlines the mitigation, monitoring and management requirements arising from an environmental impact assessment
European site	sites that make up the European ecological network (also known as Natura 2000 sites). These include sites of community importance (SCIs), special protection areas (SPAs) and potential SPAs (pSPAs), special areas of conservation (SACs) and candidate or possible SACs (cSACs or pSACs), and Ramsar sites.
evaluation	determination of the significance of effects. Evaluation involves making judgements as to the value of the receptor/resource that is being affected and the consequences of the effect on the receptor/resource based on the magnitude of the impact.
existing environment	see 'baseline conditions'
Gate check	Procedure adopted by the Energy Consents Unit to review work undertaken by the Applicant for a Section 36 or Section 37 development prior to submission of their EIA report and consent application.
Habitats Regulations	The Conservation (Natural Habitats) Regulations 1994 (most recently amended in 2012), is more commonly known as the Habitats Regulations. The Habitats Regulations cover requirements for sites that are internationally important for threatened habitats and species (e.g. Natura sites), species that require strict protection (e.g. European protected species), and other aspects of the Habitats Directive.
Habitats Regulations assessment	assessment of the impacts of implementing a plan or policy on a European site, the purpose being to consider the impacts of a project against conservation objectives of the site and to ascertain whether it would adversely affect the integrity of the site
hydrodynamics	mechanical properties of fluids, such as those concerned with flow
impact	change that is caused by an action; for example, land clearing (action) during construction that results in habitat loss (impact)
invertebrates	animals without backbones
local development	development type identified as local under the Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009
major development	development type identified as major under the Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009
method statement	document that sets out intended working or survey practices
mitigation	measures intended to avoid, reduce and compensate adverse environmental effects
monitoring	continuing assessment of the performance of the project, including mitigation measures. This determines if effects occur as predicted or if operations remain within acceptable limits, and if mitigation measures are as effective as predicted.

national development	development type identified as national under the Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009
non-statutory consultee	organisations and bodies that may be consulted on relevant planning applications
non-technical summary	information for the non-specialist reader to enable them to understand the main predicted environmental effects of the proposal without reference to the main EIA report
operation	functioning of a development on completion of construction
phase 1 habitat survey	Recognised methodology used for collating information on the habitat structure of a particular site.
photomontage	superimposing of an image onto a photograph to create a realistic representation of proposed or potential changes to a view
planning authority	local authority that is empowered by law to exercise planning functions for a particular area of the United Kingdom
pollution	any increase of matter or energy to a level that is harmful to living organisms of their environment (when it becomes a pollutant)
preferred option	chosen design option that most successfully achieves the project objectives and becomes subject to further design and assessment
programme	series of steps that have been identified by the Applicant, or series of projects that are linked by dependency
project	one (or more) aspect of a programme or plan that has been identified by the Applicant and usually involves a direct physical intervention
project objectives	objectives of the project, set by the Applicant
proposed development	a plan or project that the Applicant or promoter seeks to implement
Ramsar	areas designated by the UK Government under the International Ramsar Convention (the Convention on Wetlands of International Importance)
receptor	defined individual environmental feature usually associated with population, fauna and flora with the potential to be affected by a project
resource	defined but generally collective environmental feature usually associated with soil, water, air, climatic factors, landscape, material assets, including the architectural and archaeological heritage that has potential to be affected by a project
roosting site (birds)	place where birds rest or sleep
roosting site (bats)	place where bats live (e.g. built structures and trees)
run-off	precipitation that flows as surface water from a site, catchment or region to the sea
Section 36 Application	in Scotland, the construction and operation of power stations of a certain capacity requires an application to be made to Scottish Ministers under section 36 of the Electricity Act 1989. Applications to the Scottish Ministers need to be accompanied by an EIA report. The Energy Consents Unit's Section 36 team will process applications for on-shore power station applications, including wind farms over 50MW and hydro developments over 1MW.
Schedule 1 project	plans or projects listed in Schedule 1 of the EIA Regulations
Schedule 2 project	plans or projects listed in Schedule 2 of the EIA Regulations

scoping	process of identifying the issues to be addressed by the environmental impact assessment process. It is a method of ensuring that an assessment focuses on the important issues and avoids those that are considered not significant.
scoping opinion	opinion provided by a competent authority that indicates the issues an environmental impact assessment of a Proposed Development should consider
screening	formal process undertaken to determine whether it is necessary to carry out a statutory environmental impact assessment and publish an Environmental Impact Assessment Report in accordance with the EIA Regulations
sediment	organic and inorganic material that has precipitated from water to accumulate on the floor of a water body, watercourse or trap
semi-natural	habitat, ecosystem, community, vegetation type or landscape that has been modified by human activity but consists largely of native species and appears to have similar structure and functioning to a natural type
significance	see 'significance of effect'
significance of effect	measure of the importance or gravity of the environmental effect, defined by either generic significance criteria or criteria specific to the environmental topic
significant environmental effect	environmental effect considered material to the decision-making process
site of special scientific interest	main national conservation site protection measure in Britain designated under the Wildlife and Countryside Act 1981
special area of conservation	international designation implemented under the Habitats Regulations for the protection of habitats and (non bird) species
special protection area	sites designated under EU Directive (79/409/EEC) for the conservation of wild birds
stakeholder	organisation or individual with a particular interest in the project
study area	spatial area within which environmental effects are assessed (i.e. extending a distance from the project footprint in which significant environmental effects are anticipated to occur). This may vary between the topic areas.
threshold	specified level in grading effects (e.g. the order of significance)
visual amenity	value of a particular view or area in terms of what is seen
Worst-case	principle applied where environmental effects may vary (e.g. owing to seasonal variations) to ensure the most severe effect is assessed

ABBREVIATIONS

AA	appropriate assessment
AM	amplitude/aerodynamic modulation
ANO	air navigation order
AOD	above Ordnance Datum
ATMP	abnormal load traffic management plan
BAP	biodiversity action plan
BESS	battery energy storage system
BGS	British Geological Survey
BS	British Standard
BT	British Telecommunications
CAA	Civil Aviation Authority
CAR	Controlled Activities Regulations
CEMP	construction (or contract) environmental management plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CO ₂	carbon dioxide
CRM	collision risk model
CRTN	calculation of road traffic noise
CTMP	construction traffic management plan
dB(A)	decibel (A-weighted), a unit of noise measurement
DBA	desk-based assessment
DfT	Department for Transport
DIO	Defence Infrastructure Organisation
DMRB	Design Manual for Roads and Bridges
ECU	Energy Consents Unit
EcIA	ecological impact assessment
ECow	environmental (or ecological) clerk of works
EHO	environmental health officer
EIA	environmental impact assessment
EIAR	environmental impact assessment report or EIA Report
EMP	Environmental management plan
EU	European Union
GDL	garden and designed landscapes
GHG	greenhouse gas
GIS	geographic information system
GPG	good practice guide

GPS	global positioning system
GWDTE	groundwater dependent terrestrial ecosystem
HER	Historic Environment Record
HES	Historic Environment Scotland
HGV	heavy goods vehicle
HIAL	Highland and Islands Airports Limited
HMP	habitat management plan
HRA	Habitats Regulations assessment
HVAC	heating, ventilation and air-condition
Hz	hertz
IEMA	Institute of Environmental Management and Assessment
ILP	International Lighting Professionals
IOA	Institute of Acoustics
ISO	International Standards Organisation
JNCC	Joint Nature Conservation Committee
JRC	joint radio company
km	kilometre
kWh	kilowatt hour
LCA	landscape character area
LCT	landscape character type
LBAP	local biodiversity action plan
LDP	local development plan
LGV	light goods vehicle
LI	Landscape Institute
LRA	local road authority
LVIA	landscape and visual impact assessment
m	metre
MW	megawatt
MWh	megawatt hour
MBNL	Mobile Broadband Network Limited
MoD	Ministry of Defence
NATS	National Air Traffic Services
NIDL	Non-Inventory Designed Landscape
NNR	national nature reserve
NPF	National Planning Framework
NTS	non-technical summary
NVC	National Vegetation Classification
OS	Ordnance Survey

PA	Planning authority
PAC	pre-application consultation
PAN	proposal of application notice
PCS	power conversion system
RSPB	Royal Society for the Protection of Birds
SAC	special area of conservation
SCADA	Supervisory Control and Data Acquisition
SEPA	Scottish Environment Protection Agency
SLA	sensitive landscape area
SM	scheduled monument
SNH	Scottish Natural Heritage
SPA	special protection area
SPP	Scottish Planning Policy
SPP	species protection plan
SSSI	site of special scientific interest
SuDS	sustainable drainage system
TA	transport assessment
THC	The Highland Council
THC: HET	The Highland Council: Historic Environment Team
TMP	traffic management plan
UHF	ultra-high frequency
UK	United Kingdom
ZTV	zone of theoretical visibility

1 INTRODUCTION

1.1 Background to Proposed Development

- 1.1.1 Renantis UK Limited, formerly Falck Renewables Wind Limited, (hereafter 'the Applicant') is proposing to submit an application for consent under Section 36 of the Electricity Act 1989 for the Repowered and Extended Ben Aketil Wind Farm (the 'Proposed Development') on the Isle of Skye, Scotland.
- 1.1.2 Ben Aketil Wind Farm is an existing 27.6 MW wind farm which comprises 12 2.3 MW turbines with a hub height of 64 m and blade diameter of 71 m (i.e. 99.5 m to tip). Ten of the turbines were constructed in 2007, and another two were constructed in 2010. The first and second phase were given 26 and 23 years respectively from the first export of electricity to the grid which gives end dates of 18/10/33 and 01/11/33. In March 2021, a life extension was granted, extending the life of the operational wind farm to 2040.
- 1.1.3 The Applicant wishes to repower the existing wind farm and add an extension. The proposed Repowered and Extended Ben Aketil Wind Farm would have 9 turbines of up to 200 m to tip. Each turbine is likely to generate approximately 5.6 to 6.6 megawatts (MW) of electricity. The total installed capacity of the proposed turbines will be between 50.4 and 59.4 MW. A 20 MW battery energy storage system (BESS) will also be included as part of the Proposed Development.
- 1.1.4 The Applicant has appointed RSK Environment Limited (RSK), an experienced environmental consultancy, as lead consultant to carry out an Environmental Impact Assessment (EIA) and related assessments under the Electricity Works (Environmental Impact Assessment) (Scotland) (EIA) Regulations 2017.
- 1.1.5 EIA is a process of identifying the likely consequences on the existing biological, physical and human environment arising from development progression. An EIA is undertaken to ensure the environmental effects of certain types of development proposal are fully investigated, understood and considered in the consenting and authorisation process.
- 1.1.6 In addition to the information presented in this EIA Report (EIAR), further supporting information will accompany the Section 36 consent application, such as a planning statement which will provide an assessment of the Proposed Development in the context of the decision-making framework, a Pre-application Consultation Report, to summarise the pre-application public consultation activity undertaken by the Applicant and a Design and Access Statement. These are stand-alone documents and do not form part of the EIAR.

1.2 The Applicant

- 1.2.1 The existing Ben Aketil Wind Farm is owned by Ben Aketil Wind Energy Limited (BAWEL), which is part of Renantis UK Limited.
- 1.2.2 The Applicant develops, designs, builds and manages power production plants from renewable sources, with an installed capacity of 1,420 MW in the United Kingdom, Italy, United States, Spain, France, Norway and Sweden, using wind power, solar power, waste to energy and biomass technologies. Renantis is a global player in the renewable energy

technical advisory and asset management services business, through its wholly owned subsidiary Vector Renewables, providing asset management services to clients accounting for approximately 5,300 MW of installed capacity and with experience in more than 40 countries. The Group also provides highly specialized energy management and downstream services to both energy producers and consumers.

1.3 Repowering Explained

- 1.3.1 Repowering is the process to replace older first-generation wind turbines with more powerful models that use the latest technology and are capable of producing significantly more electricity, more efficiently. The process is carried out within a timeframe that allows replacement of older units before they come to the end of their operational life.

1.4 Terminology

- 1.4.1 The following terminology has been adopted throughout this Report.

Table 1.1: Site and Study Area Definitions

Term	Definition
Proposed Development	The Repowered and Extended Ben Aketil Wind Farm.
Site	This refers to everything within the application red line boundary.
Northern Site Access	This refers to the existing access route from the public road to the north of the Site.
Southern Site Access	This refers to the proposed Site access route from the public road to the south of the Site.
Study Area	The Site and/or Site Access plus any additional area over which desk based or field assessments have been extended. The study area varies depending on the nature of the potential effects for each environmental parameter, as informed by professional guidance and best practice regarding EIA.
Developable Area	An area within the red line boundary area defined by the Applicant as the area where the turbines and associated infrastructure would be located.

1.5 Environmental impact assessment (EIA)

- 1.5.1 EIA is a process for identifying the likely consequences on the existing biological, physical and human environment arising from development progression.
- 1.5.2 The process is undertaken to ensure that the environmental effects of certain types of development proposal are fully investigated, understood and taken account of in the consenting and authorisation process.

Statutory Context

- 1.5.3 The requirement that an EIA should be prepared by the promoters of certain types of development prior to consent being granted, and the process by which an EIA should be undertaken, was originally prescribed in 1985 within a European Council Directive.
- 1.5.4 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter 'the EIA Regulations') set out the statutory requirements. and apply where planning consent is being sought for developments under the Section 36 of the Electricity Act 1989.
- 1.5.5 Whilst not a statutory requirement, as part of the EIA process, the Applicant sought a formal scoping opinion (ECU reference: ECU00004552) from the Energy Consents Unit (ECU) on behalf of the Scottish Ministers under the EIA Regulations. This was submitted on 19th July 2022. In further recognition of the Proposed Development's potential effects, the Applicant has volunteered to undertake an EIA in support of the application.

Environmental Impact Assessment Report

- 1.5.6 It is a requirement of the EIA Regulations that an EIA Report (EIAR) be prepared to describe the likely significant effects of a proposed development on the environment.
- 1.5.7 This EIAR accompanies the planning application and reports the formal process and outcomes of the EIA undertaken for the Proposed Development. Its purpose is to present the Proposed Development and its predicted environmental effects in a concise, objective and non-promotional manner in order to provide the Scottish Ministers, statutory consultees, interested bodies and the general public with sufficient information to assess its likely environmental effects.
- 1.5.8 This EIAR has been prepared under the supervision of, and reviewed by, persons having suitable competency in environmental impact assessment, which is also a requirement of RSK's continued registration on IEMA's 'EIA Quality Mark' scheme. Amongst other things, we define 'suitable competency' as sufficient relevant qualifications and experience (e.g. a minimum of 5 years) in working on EIA projects and suitable professional standing as recognised by, for instance, accreditation as a Chartered Environmentalist or equivalent.

1.6 Structure of Environmental Impact Assessment Report

- 1.6.1 The EIA Report is presented in four volumes:
 - **Volume 1:** Environmental Impact Assessment (EIA) Report;
 - **Volume 2:** EIA Report Figures;
 - **Volume 3:** Technical Appendices; and
 - **Volume 4:** Confidential Appendices.
- 1.6.2 A non-technical summary of the Environmental Impact Assessment Report has been prepared as a separate document, in accordance with the requirements of the EIA Regulations.

Volume 1

- **Volume 1** consists of 17 Chapters, which are structured in the following manner.

- **Chapter 1 Introduction** introduces the Proposed Development and explains the underlying objectives of the proposals, describes the statutory basis for the EIA, outlines the structure adopted in this Environmental Impact Assessment Report and identifies the team of competent experts responsible for undertaking and reporting the EIA.
- **Chapter 2 Proposed Development** identifies the location of the project and characterises the site and its surroundings; establishes the need for the Proposed Development; summarises the reasonable alternatives that have been considered in the development of a preferred design solution; provides a detailed description of the key design components and characteristics of the Proposed Development and associated land take; and outlines the planned timescales for construction and implementation.
- **Chapter 3 Consultation** summarises stakeholder consultation undertaken during the EIA and the development of the Proposed Development.
- **Chapter 4 Environmental Assessment Process** summarises the scoping process undertaken to establish the scope of the EIA, the adopted approach to the EIA and format of the individual technical assessments, and modifications made to the EIA scope that have arisen during the development and assessment of the Proposed Development.
- **Chapter 5 to 16 Technical Assessments** report the findings of the detailed environmental assessments and the residual effects on the environment predicted to occur as a result of implementation of the Proposed Development.
- **Chapter 17 Schedule of Mitigation** provides a schedule of the environmental commitments (i.e. design and mitigation measures that are agreed and deliverable) identified in each technical assessment.

Volume 2

- 1.6.3 **Volume 2** comprises a series of plans, figures and photographs (referenced in **Volume 1**) that illustrate the relationship between the existing environment and the Proposed Development.

Volume 3

- 1.6.4 **Volume 3** comprises technical appendices (referred to in **Volume 1**) containing detailed reports of the individual environmental assessments and other relevant supporting documentation.

Volume 4

- 1.6.5 **Volume 4** comprises confidential technical appendices (referred to in **Volume 1**) and confidential figures.

1.7 Topics Addressed in the EIA process

- 1.7.1 Schedule 4 “Information for Inclusion in Environmental Impact Assessment Reports” section 5 of the EIA Regulations states that EIARs need to include the following:

“A description of the likely significant effects of the development on the environment resulting from, inter alia:

- *the construction and existence of the development, including, where relevant, demolition works;*

- the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
- the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
- the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
- the cumulation of effects with other existing and/or approved development, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
- the impact of the development on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the development to climate change;
- the technologies and the substances used.”

1.7.2 These have been addressed in this EIAR as shown in **Table 1.2** below.

Table 1.2: Requirements of Schedule 4, Section 5 of the EIA Regulations

Requirement	Topic/Chapter of this Report
<i>a) the construction and existence of the development, including, where relevant, demolition works;</i>	Project Description (Chapter 2).
<i>b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;</i>	Land, soil and water: Hydrology, Geology, Hydrogeology and Peat (Chapter 9); and Biodiversity: Ecology (Chapter 7) and Ornithology (Chapter 8).
<i>c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;</i>	Pollution: Hydrology, Geology, Hydrogeology and Peat (Chapter 9); Noise and vibration: Noise and Vibration (Chapter 12); and Nuisance, disposal and recovery of waste: Project Description (Chapter 2).
<i>d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);</i>	Risks to human health and potential for major accidents and disasters were scoped out of the assessment. Risks to cultural heritage are discussed in Chapter 10 .
<i>e) the cumulation of effects with other existing and/or approved development, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;</i>	Addressed in each technical chapter (Chapters 5 to 16).
<i>f) the impact of the development on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the development to climate change;</i>	Climate Change Mitigation (Chapter 15).
<i>g) the technologies and the substances used.</i>	Project Description (Chapter 2).

1.8 EIA team

- 1.8.1 RSK Environment Ltd (RSK) has undertaken the EIA and preparation of this EIAR on behalf of the Applicant.
- 1.8.2 The relevant expertise and qualifications of the experts involved in the preparation of this EIAR are detailed in **Table 1.3**.

Table 1.3: EIA Team Responsibilities

Name	Qualifications & Professional Memberships	Company	Role
EIA Project Management Team			
Joe Somerville	MA(Hons), MSc MCIfA FSA Scot PIEMA	RSK	EIA Project Director
Donnette Briggs	BSc (Hons); MSc	RSK	EIA Project Manager
Spyridonas Angeli	BSc (Hons), MSc GIEMA	RSK	EIA Project Support
EIA Technical Specialists			
David Bell	BSc DipUD MCIHT MRTPI BSc Town & Country Planning Diploma in Urban Design. Chartered Town Planner, Corporate Member of the Royal Town Planning Institute. Chartered member of the Institute of Highways & Transportation.	David Bell Planning	Technical Lead - Planning
Pippa Gardner	BLE DipTCP MRTPI BLE Land Economy. Diploma in Town and Country Planning. Chartered Town Planner, Member of the Royal Town Planning Institute.	David Bell Planning	Technical Support - Planning
Kelly Anderson	BLA, CMLI	RSK Stephenson Halliday	Technical Lead - Landscape and Visual Impact Assessment
Ken Halliday	BSc, Mphil, CMLI	RSK Stephenson Halliday	Landscape and Visual Impact Assessment Reviewer
Claudia Garratt	PhD BSc (Hons)	Avian Ecology Ltd	Technical Lead - Ecology

Name	Qualifications & Professional Memberships	Company	Role
Nicole Robinson	MSc BSc (Hons) ACIEEM	Avian Ecology Ltd	Technical Lead - Ornithology / Reviewer / Technical Support
Howard Fearn	MSc MCIEEM	Avian Ecology Ltd	Ecology and Ornithology Reviewer / Technical Support
Catherine Isherwood	MA, MSci, MSc, PhD Chartered Geologist, Fellow of the Geological Society of London. Member, Institute of Materials, Minerals and Mining.	RSK WRc	Technical Lead – Hydrology, Geology, Hydrogeology and Peat
Emma Barrie	BSc, GradIEMA	RSK WRc	Technical Support – Hydrology, Geology, Hydrogeology and Peat
Lucy McCulloch	BSc, MSc GradIEMA	RSK WRc	
Rhys Lithgow	BSc, GradIEMA	RSK WRc	
Etisang Abraham	LLB, BL, LLM, GradIEMA	RSK WRc	
George Mudie	MA((Hons) MCIfa FSA Scot	CFA Archaeology	Technical Lead - Archaeology and Cultural Heritage
Linn Glancy	MA(Hons), MA, ACIfA	CFA Archaeology	Technical Support - Archaeology and Cultural Heritage
Jon Hassel	BEng (Hons); Chartered Institution of Highways and Transportation (Member) Transport Planning Society (Member)	RSK SCP	Technical Lead - Traffic and Transport
Jan Wasilewski	BEng, BSc, MSc Chartered Institution of Highways and Transportation (Member) Transport Planning Society (Member)	RSK SCP	Technical Support - Traffic and Transport
Linsey Scott	BSc	RSK SCP	

Name	Qualifications & Professional Memberships	Company	Role
Rob Shepherd	MEng, MIOA	Hayes McKenzie Partnership	Technical Lead - Noise
David Hoare	Society for the Environment (Chartered) Chartered Institute of Ecology and Environmental Management (Full) Institute of Environmental Management and Assessment (Practitioner)	RSK	Technical Lead - Socio-Economics, Recreation and Tourism Lead
Kristy Leeds	MA (soc/sci) (Hons), GIEMA	RSK	Technical Support - Socio-Economics, Recreation and Tourism
Ian Fletcher	BEng	Wind Business Support	Technical Lead - Aviation
Joe Somerville	MA (Hons), MSc Chartered Institute for Archaeologists (Member) Institute of Environmental Management and Assessment (Practitioner)	RSK	Technical Lead - Telecommunications
Spyridonas Angeli	BSc (Hons), MSc GIEMA	RSK	Telecommunications, Shadow Flicker, GIS and design support
Libby Robinson	PhD, BSc, FGS	RSK Carbon and Sustainability	Technical Lead - Climate Change Mitigation
John Buick	B.Sc. Civil Engineering MBA Member of the Institution of Civil Engineers Member of the International Institute of Risk, and Safety Management	Lechwe Renewables	Borrow Pit Assessment
Shonese Amin	BTech: Civil: Water; National Diploma: Civil Engineering	Nicholas O'Dwyer	BIM CAD Technician
Debra Lewis	BSc (Hons) FRGS CGeog(GIS)	RSK	Geographic Information Systems (GIS) Lead

Name	Qualifications & Professional Memberships	Company	Role
Carl Hamer	BSc Phys. Geog/Geol. / MSc Eng. Geol / FGS	Kiloh Associates	Infracore design lead

1.9 References

Scottish Government (2017). The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

The UK Government (1989). Electricity Act 1989.

2 PROPOSED DEVELOPMENT

2.1 Proposed Development location and setting

- 2.1.1 The Proposed Development is located north-west of the highest point of Ben Aketil within the north western part of the Isle of Skye in the Highland Council area. The Proposed Development red line boundary (the Site) is shown in **Figure 2.1**.
- 2.1.2 The Site is located approximately:
- 15 km west of Portree;
 - 3.5 km south of Edinbane;
 - 5 km east of Dunvegan;
 - 1.5 km east of Roskhill;
 - 1 km north of Feorlig; and
 - 0.3 km north of Caroy.
- 2.1.3 The Site sits within broadly undulating upland moorland, gently sloping downwards from north-east to south-west. The elevations of the Site range from 20 m AOD near the crossing of the A863 over the Caroy River, to the peak of Ben Aketil at 266 m AOD (**Figure 2.1**). Ben Sca, which peaks at 283 m, is located approximately 1.1 km to the north-east of the Site.
- 2.1.4 The existing twelve turbines of the operational Ben Aketil Wind Farm are arranged in a single array, at elevations ranging from 90 m AOD to 200 m AOD – see **Photograph 2.1**, below.



Photograph 2.1: View of the operational Ben Aketil Wind Farm

- 2.1.5 Site access is currently gained via a track running southwards through forestry from the A850 in the north.
- 2.1.6 As well as being used for the generation of renewable energy, the Site is currently utilised by crofters, predominantly for sheep grazing. They generally access the site by 4x4 vehicle using the access track that extends northwards from the Upper Feorlig public road. Surrounding land uses include upland grazing, commercial forestry located immediately north and the operational Edinbane Wind Farm lies approximately 2.3 km to the east.
- 2.1.7 The Site is relatively remote, with the closest residences being crofters' cottages located near, but outside of, the south-western red line boundary along a public road in Upper Feorlig.

2.2 Need for the Proposed Development

Climate Change

- 2.2.1 Scotland's current policy ambitions for addressing the impact of climate change are amongst the highest in Europe. The Scottish Government declared a climate emergency in May 2019 and passed the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 which has passed into law the requirement for a 100 % reduction in CO₂ emissions by 2045 and an interim target of 70 % reduction in emissions by 2030.
- 2.2.2 In addition, the Scottish Energy Strategy has set a target for 50 % of total energy demand (including from heat and transport) from renewable sources by 2030, which implies a further substantial increase in delivery of renewable energy. As such, the Scottish Government has encouraged all forms of renewable and low carbon solutions for meeting these energy targets.
- 2.2.3 Furthermore, the Scottish Government's Onshore Wind Policy Statement 2022 recognises the continuing important role of onshore wind and the challenges it now faces in a subsidy-free environment, as detailed in **Chapter 5: Planning Policy Context**.

Energy Security

- 2.2.4 Onshore wind is the cheapest form of renewable energy and Scotland has some of the best wind resource in Europe. Although renewable capacity has grown significantly, there are times when, for example, there are periods of low wind, gas generators are often required to fill demand. This comes at a cost, especially in recent times, with wholesale gas prices at a record high. The Office of National Statistics states that gas is used to fuel approximately 42.6 % of the UK's electricity generation, so rising gas prices have, in turn, led to rising electricity prices.
- 2.2.5 The design of electricity systems still needs to catch up with the role of renewable energy, and this is recognised by the UK Government and Scottish Government, who plan to make the grid 'renewable ready' to ensure more renewables can go into the grid.
- 2.2.6 With recent world conflicts affecting energy supply to the UK, the transition of the UK to becoming 'energy independent' has increased in urgency.
- 2.2.7 **Chapter 5: Planning Policy Context** also outlines the international, UK and Scottish climate change, renewable energy and planning policies considered to be relevant to the Proposed Development. Legislation, planning policy and guidance specific to each

technical discipline is set out in the relevant technical chapters (**Chapters 6 - 16**) of the EIAR.

2.3 Proposed Development objectives

- 2.3.1 The main aim of the Proposed Development is two-fold: (1) to enable the Ben Aketil Wind Farm to continue generating renewable energy beyond the operational life of the existing turbines on the site, and (2) to increase the capacity of the wind farm to generate renewable energy. The overarching objectives of the Proposed Development are to:
- replace the existing turbines at Ben Aketil Wind Farm, which will soon be nearing the end of their operational life, with new, more efficient turbines;
 - extend the wind farm to increase electricity generation capacity;
 - potentially continue generating electricity throughout the construction period; and
 - minimise where practicable additional disturbance or environmental impacts by reusing existing infrastructure on the Site.
- 2.3.2 Design objectives of the Proposed Development included the minimisation of potentially significant environmental impacts through primary mitigation during design, while also taking into consideration technical and economic aspects. The main objective of the reiterative design process was to attain an outcome that is feasible for the Applicant, acceptable to the consultees and will benefit the local community while minimising potential adverse environmental impacts as far as practicable.
- 2.3.3 Design objectives relative to each technical discipline are discussed in **Chapters 6 to 16**.

2.4 Consideration of alternatives

- 2.4.1 According to the EIA regulations, the EIAR should include: “a description of the reasonable alternatives studied by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment.”
- 2.4.2 With respect to the Proposed Development the main alternatives considered were as follows:
- different turbine and infrastructure layouts/locations within the Site;
 - different turbine heights/dimensions; and
 - different Site Access routes connecting the Proposed Development to the public roads.
- 2.4.3 The Proposed Development design and layout was adapted and altered in response to environmental constraints and consultation feedback.
- 2.4.4 Each of these layouts is shown on **Figure 2.2** and a summary of the layout iterations is included below. The work that was undertaken to inform the design and achieve the design objectives of the Proposed Development is discussed in **Section 2.5**.

Do nothing/do minimum scenario

- 2.4.5 As mentioned previously, the existing Ben Aketil Wind Farm will reach its end of life by 2040. If the Proposed Development were not to be implemented, the existing wind farm would be decommissioned and the site reinstated, as per the applicable planning

conditions albeit with some pending changes to increase the sustainability of the project. This would have the following consequences:

- the current contribution of the existing wind farm to the national grid (c.28 MW) would cease;
- the community benefits received during the operational life of the wind farm would cease;
- the operational phase environmental impacts of the wind farm would cease;
- the surface would be reinstated as far as practicable to align with the conditions of the rest of the Site;
- the land currently used to generate renewable energy would become available for alternative land uses.

Alternative designs

2.4.6 The Proposed Development has undergone eight iterations in response to various factors including:

- environmental constraints information based on desktop studies followed by detailed site investigations;
- pre-application consultation responses received from consultees (discussed in more detail in Chapter 3);
- feedback received through public consultation; and
- technical design constraints relating to the proposed infrastructure to be used.

2.4.7 The various iterations of the site layout are presented on **Figure 2.2** and discussed in more detail in **Section 2.5**.

2.4.8 Two alternative tip height options for the turbines were considered and were compared to one another using wireline drawings from various viewpoints to determine whether a reduction in tip height from 200 m to 180 m would make a significant difference to sensitive receptors. Having compared the two tip heights from the same viewpoints around the Site, it was concluded that whether the turbines would be 180 m to tip or 200 m to tip would make little difference to the view of the Proposed Development. Since the 200 m to tip turbines would be more efficient and generate more energy than the 180 m to tip turbines, it was decided that the candidate turbines would be up to 200 m to tip.

Alternative technologies

2.4.9 The Site has proven to be suitable for use as a wind farm and acceptable from a planning perspective. The Site's location offers good conditions to continue the use of wind generation technology.

2.4.10 Some consideration was given to the potential co-location of alternative technologies such as solar energy generation within the wind farm, but this is not currently economically feasible.

2.4.11 However, the Applicant has considered different technological options pertaining to the design, construction and operation of the Proposed Development, such as:

- candidate wind turbines which have different specifications (e.g. tip heights and rotor diameters);
- turbines which house transformers within the tower or within an external transformer house;

- grid connection options (e.g. overhead line vs. cable);
- remote operation technologies (e.g. satellite link vs. ultra-high frequency (UHF) link);
- alternative technical design and construction options for infrastructure elements such as hardstandings, watercourse crossing types, etc.;
- use of alternative infrastructure components such as floating track over areas of deep peat; and
- the inclusion (or not) of energy storage technology.

Alternative Construction Phasing Options

- 2.4.12 The Applicant is considering two alternative construction phasing options, as follows:
- Scenario 1 proposes that the construction of the extension turbines and the construction of the repowering turbines is undertaken at the same time.
 - Scenario 2 proposes that the four extension turbines are constructed first, followed by the decommissioning of the existing, operational Ben Aketil Wind Farm, followed by construction of the five repowering turbines.
- 2.4.13 It is estimated that construction would take the following approximate times to complete:
- Scenario 1: 18 months;
 - Scenario 2: Construction of the four extension turbines (approximately 1 year), followed by decommissioning and removal of the existing wind turbines and associated infrastructure (approximately 1 year), followed in turn by construction of the five repowering turbines (approximately 1 year) – Total of 3 years. There would be a delay between the completion of construction of the first four turbines and the start of construction of the second five turbines of no more than 5 years.
- 2.4.14 The main advantage of scenario 1 is a shorter construction phase which may contribute to the mitigation of some of the anticipated impacts on some environmental aspects such as ecology, ornithology and hydrology. The main advantages of scenario 2 are the continued, uninterrupted contribution of renewable energy to the national grid and continued, uninterrupted community benefits.
- 2.4.15 At the time of writing, the Applicant was still considering both scenarios as potential options. The Applicant's decision as to which construction phasing scenario to implement will be informed by considerations such as economic factors, practicality of implementation, social responsibility and legal aspects.

Alternative Access Routes

- 2.4.16 Two alternatives were considered to gain access to the Site. Prior to the design of the Proposed Development, a study was undertaken to identify potential options to gain access to the Site. The options were identified bearing in mind the requirement to transport materials to site, in particular the turbine components which will require transport via abnormal load heavy goods vehicles (HGVs).
- 2.4.17 Both options included the transport of materials from the port at Kyle of Lochalsh to the east of the Isle of Skye on the mainland. Both routes share the A87 to Sligachan then split up, with one route providing access to the Site from the A850 in the north (using the existing northern access track), and the other route providing access to the Site from the A863 in the south.

- 2.4.18 Following consideration of both alternatives, it was decided that both options would be used – see paragraph 2.6.60 and **Chapter 11: Traffic and Transport** for more detail.

Alternatives Pertaining to Construction Material Sources

- 2.4.19 In contrast to an undeveloped site, parts of the Site have been previously disturbed by the construction of the existing wind farm for the purpose of establishing infrastructure such as turbine hardstandings, buildings (e.g. on-site substation building) and access tracks. In response to various factors, including consultation responses received from statutory consultees (particularly the Scottish Environment Protection Agency, hereafter referred to as SEPA), potential options to reuse the existing infrastructure on the site were considered during design. One of the options taken into consideration was whether or not any of the existing hardstandings areas could be reused, or if not, whether the materials from the existing hardstandings could be reused on the Site rather than being removed from Site and disposed of which would require new hardstanding materials to be imported to Site.
- 2.4.20 Other options that were considered included whether or not to source aggregate from within the Site or to import rock from off-site.

Alternative Decommissioning Waste Management Options

- 2.4.21 Various options are under consideration as to how to manage the waste that will be generated as a result of decommissioning the existing turbines. Metal waste will be scrapped for recycling, and as mentioned previously, hardstanding material will be reused as far as practicable on Site during construction of the new turbines. The treatment of the fibreglass-reinforced polyester blades in accordance with the waste management hierarchy is a relatively new industry challenge that is currently being investigated by several parties, but as of yet, beyond the repurposing of the blades for alternative uses such as bus stops and playground equipment, for example, the potential to reuse, recycle or recover materials from the blades is subject to emerging technologies. Potentially viable options for the treatment of turbine blade waste will be considered in detail prior to the commencement of the decommissioning of the existing turbines. It is anticipated that at that point, technological options for the management of blade waste will have advanced sufficiently to enable the avoidance of disposal of turbine blades to landfill. These options would also be a consideration for the decommissioning of the existing Ben Aketil Wind Farm if the Do Nothing / Do Minimum Scenario were to be implemented.

2.5 Design Evolution and Development of the Proposed Option

Design process

- 2.5.1 The design of the Proposed Development was an iterative one, informed by the EIA process. Baseline information obtained through desktop studies and field surveys was fed back into the design at various stages, and consultee feedback also influenced the design and layout of the Proposed Development. This led to key decisions being made resulting in primary mitigation of as many of the potential environmental impacts of the Proposed Development as possible.

Approach to design

- 2.5.2 The Applicant opted for transparency and incorporated both the repowering and the extension of the existing wind farm into the Proposed Development. This is in contrast to the alternative sequential approach of designing the repowering of the wind farm separately to the extension of the wind farm. The chosen inclusive approach has enabled the design of the Proposed Development and the assessment of its potential environmental impacts to be holistic and take account of the worst-case scenario. It has also enabled best practice principles to be incorporated into the design such as the reuse of materials arising from the decommissioning of the operational scheme in the construction of the proposed repowering turbines.

Design principles

- 2.5.3 The overarching principles influencing the design of the Proposed Development included maximising the amount of renewable energy generation, while:
- Minimising the additional land take to construct the repowering and extension infrastructure as far as possible;
 - Minimising the potential impacts on sensitive receptors, wherever possible;
 - Minimising the number of watercourse crossings required as far as practicable;
 - Applying the waste management hierarchy (e.g. through reuse of materials on Site rather than removal and disposal to landfill); and
 - Identifying potential opportunities for environmental enhancement.

Design iterations

- 2.5.4 As mentioned previously, the design of the Proposed Development has evolved from the initial layout presented in the Scoping Report, dated July 2022, through eight iterations, as presented in **Figure 2.2**.
- 2.5.5 Current operational layout (Layout A) The current operational layout of the Ben Aketil Wind Farm consists of 12 turbines in a single array, connected by a single wind farm access track, as shown on **Figure 2.2**. Access to the operational site is gained via the existing northern access track leading southwards from the A850. Turbine 11 is fitted with a maximum 25 candela omni-directional red aviation lighting at the highest practical point, in compliance with the relevant planning condition.

Layout B (scoping stage)

- 2.5.6 Layout B was presented at scoping stage and consisted of 10 turbines, the existing northern access track and a proposed new southern access track. The turbines were distributed in two arrays similar in geometry to the original single 12-turbine array, although located lower down the slope. The design principles and objectives of the wind turbine arrays are described in more detail in **Chapter 6**.
- 2.5.7 The turbines were spaced in such a manner as to ensure technical compliance with the candidate turbine manufacturer's specifications. The minimum required spacing between the turbines is referred to as the separation ellipses.
- 2.5.8 The orientation of the crane pads (hardstandings) were initially designed to best suit transport and access requirements.

- 2.5.9 The existing crofter's track is represented on **Figure 2.2** as a brown dashed line extending from the A863 in the south, along the track providing access to the houses in Upper Feorlig, and into the Site. From there, the crofter's track runs in an approximate north-south direction before turning eastwards and then north-eastwards towards the existing wind farm track between the operational wind turbines near the northern Site boundary line. The crofter's track did not form part of the initial layout.
- 2.5.10 The southern access track was routed to make use of an existing access point and short, informal access track before following a gradual incline to reach the access track between the two southernmost proposed new turbines.
- 2.5.11 In short, the design of Layout B was based primarily on technical requirements relating to turbine specifications, access requirements, topography and the arrangement of, and access to, the existing wind farm infrastructure.

Layout C

- 2.5.12 Following the feedback given by stakeholders and community consultation events and the completion of detailed site-specific surveys, including a phase 1 peat depth survey, Phase 1 habitat survey, national vegetation classification (NVC) survey, protected species and bird surveys, as well as desk-based studies, the site layout was revised.
- 2.5.13 The location and sensitivity of all identified environmental receptors were mapped and appropriate buffers around them were agreed between the technical specialists and project engineers. The following design principles and buffers were applied during this design iteration:
- Potential groundwater dependent terrestrial ecosystems (GWDTEs) – 250 m avoidance buffer applied to excavations deeper than 1 m, 100 m from excavations less than 1 deep;
 - Habitats identified as Annex 1 habitat of high conservation concern were treated as constraints of high sensitivity with a 10 m avoidance buffer applied to each of these units;
 - Bat roost features and bat stand-off buffers along watercourses and from the trees to the north of the Site boundary. The bat stand-off buffer applied along watercourses was 71 m, and from the trees was 105 m (based on a likely maximum height of the plantation trees of 30 m);
 - Buffers were applied for ornithological constraints;
 - Hydrology avoidance buffer of 50 m applied to watercourses except at watercourse crossings;
 - Watercourse crossings were orientated at 90° to the watercourse;
 - 100 m avoidance buffer from deep peat (deeper than 2.5 m);
 - 500 m minimum (1 km optimal) avoidance buffer from scheduled monuments;
 - 30 m avoidance buffer from non-designated heritage assets;
 - 220 m (maximum tip height plus 10% - topple distance) avoidance buffer from core paths, rights of way, existing overhead lines and the proposed Skye Reinforcement overhead line;
 - For telecommunications, a buffer of up to 100 m + rotor radius clearance with a minimal avoidance buffer of the Fresnel Zone plus 25 m; and
 - Oversail buffers along Site boundaries of 85 m.
- 2.5.14 The application of these constraints to the site layout resulted in the removal of Turbine 6 in order to avoid impacts on telecommunications assets.

- 2.5.15 Eight of the remaining nine turbines were moved slightly from their original locations to account for key environmental constraints while still meeting the turbine separation distance requirements. Turbine 8 (T8) was highly constrained and could not be moved significantly without encroaching into deep peat or a watercourse avoidance buffer.
- 2.5.16 Crane pads were orientated for ease of access for turbine component delivery vehicles from the access track and to account for topography.
- 2.5.17 The southern access track was adjusted to account for the removal of a turbine. The curved section of the existing wind farm access track which allows vehicles to safely traverse a steep slope was adjusted to allow for track geometry required for the HGV indivisible abnormal loads.
- 2.5.18 Two potential borrow pit search areas were identified, one of which was a circular search area 1 km radius along the southern access track.
- 2.5.19 The red line boundary was extended to include the northern access track, as it was determined that in order to accommodate the HGVs required to transport the larger turbine components to site the existing track structure may need to be upgraded in some places.
- 2.5.20 Suitable locations for a proposed BESS and a substation compound were identified to the south-west of T3.
- 2.5.21 Four construction compound locations were identified, one at each entrance, one near the extension turbines and one near the repowering turbines and BESS.

Layout D

- 2.5.22 A design review of Layout C was held between key environmental technical specialists, the Applicant and the design engineer. Each of the turbines, the access tracks and other ancillary infrastructure was examined against the technical and environmental constraints to ensure that the infrastructure had avoided sensitive constraints as far as possible.
- 2.5.23 During the review workshop, the locations of the tracks and the orientation of the crane pads were altered particularly to avoid deep peat. This was achieved for most of the crane pads except for the crane pad of T8:
 - Two options were identified for the orientation of the crane pad for T8 – one which was located in deeper peat, and one which encroached within a 50 m watercourse avoidance buffer (see **Illustration 2.2** below).

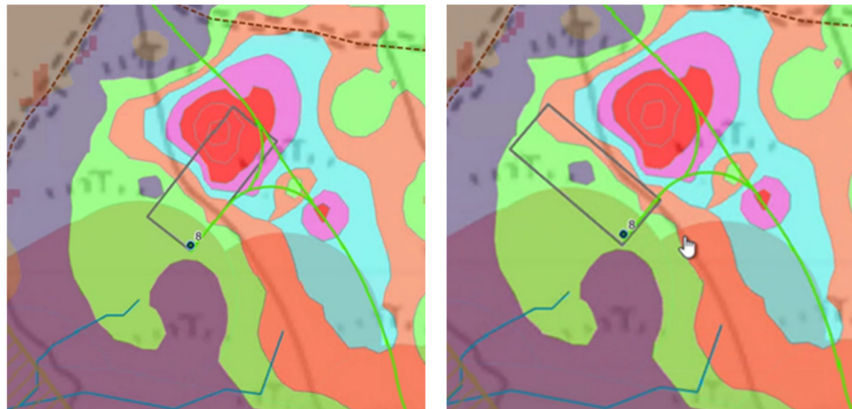


Illustration 2.2: Crane pad orientation options for T8

- Following brief consultation with SEPA, the choice was made to avoid the deep peat and encroach within the 50 m watercourse avoidance buffer since the topography sloped gently towards the watercourse and mitigation measures to prevent pollution from entering the watercourse during construction could be implemented. Potential consequences of locating the crane pad within deep peat would likely be more significant than those of locating the crane pad slightly within the watercourse avoidance buffer.
- 2.5.24 Parts of the access tracks between the turbines of Layout C were located over / within area of deeper peat. Where practicable, for Layout D the track was rerouted to avoid deeper areas of peat. Rather than being a straight line from the existing access track to T5, the track has instead been shaped to avoid deeper pockets of peat as far as practicable. However, the deep peat was still not entirely avoidable, and so the location of the track was modified slightly to follow the topography in such a manner as to potentially allow the use of floating track in this area.
- 2.5.25 The circular borrow pit search area was narrowed down substantially and altered in shape to enable maximum search area outside of sensitive environmental receptors and associated avoidance buffers.
- 2.5.26 The result at the end of the design review workshop was a modified layout which avoided the most sensitive environmental receptors but which still required further refinement, as follows:
 - the shapes of some of the tracks needed to be modified to account for the geometric requirements for the HGVs delivering wind turbine components and other plant such as cranes;
 - the location of the borrow pit search area opposite a construction compound at the northern entrance would not meet health and safety standards and needed to be reconsidered;
 - T5, T8 and T9 required turning points for HGVs to be included in their design; and
 - The orientation of T4's crane pad required reconsideration due to its partial location within an area of deep peat.

Layout E (southern access track)

- 2.5.27 Consultation responses from SEPA during scoping and the pre-application meeting held with the Highland Council (see Chapter 3 for more details on consultation to date) indicated that it would be preferable to reuse the existing infrastructure within the site, even if this required some modifications to the existing infrastructure, to try to reduce the additional surface area that would be impacted compared to the initial proposed layout (Layout B). Since a large portion of the Site is covered in Class 1 and 2 peatland, SEPA suggested conducting a quantitative analysis of the peat volumes that would need to be excavated and managed for each of three potential access options:
 - The northern access track;
 - The crofters track; and
 - The southern access track.
- 2.5.28 The Applicant considered this seriously and consulted some Upper Feorlig home owners on its potential use, but it was not welcomed. This was due to the fact the track turns into the metalled single tracked Upper Feorlig road to the south of the red line boundary of the Site where there are a number of residences. However, a fourth option was identified that would make use of the same Site entrance as the Southern Access Track, but as

soon as possible within the red line boundary area, the access track would change course to follow the crofters' track as far as practicable. This would require sections of the existing track to be widened in places but would likely require less peat to be excavated overall than if the southern access track were to be selected. The fourth option is a hybrid between the southern and crofters' tracks and, following additional phase 2 peat probing, has been selected as the preferred access route. There are some areas where the hybrid track deviates slightly from the crofters track; this is to take account of the required track geometry and also to avoid situations such as being within 50 m of a watercourse.

- 2.5.29 While the change to the Southern Access Track would reduce the volume of peat that would require excavation and management, the borrow pit search area in the south of the Site was no longer near the access track, which would likely result in borrow pit access difficulties.

Layout F (construction compounds)

- 2.5.30 This layout is very similar to Layout E but instead of having one larger construction compound at the Northern Access Track entrance to the Site, the Applicant opted for the use of four smaller compounds located on the existing hardstanding areas of the existing turbines. This will enable the construction materials and plant for the decommissioning of the existing turbines and construction of the repowering turbines to be located in close proximity to the repowering turbine locations (T1 to 5) and will also enable the location of the construction compounds away from the northern borrow pit search area. The location of the four construction compounds on existing hardstanding areas is in line with the design principle of minimising additional surface disturbance.

Layout G (borrow pit refinement 1)

- 2.5.31 In Layout F, the southern borrow pit search area was relocated to be closer to the Southern Access Track, and its area was refined, in order to reduce the amount of ground-breaking and disturbance associated with it. In addition, the junctions of the northern access track with the A850 and the southern track with the A863 were modified to take the formation of a bell mouth to facilitate access for turbine component deliveries.

Layout H (Proposed Site Layout)

- 2.5.32 The location of the southern borrow pit in Layout G was close to the proposed Skye-Fort Augustus reinforcement overhead line. The Applicant selected to relocate the borrow pit within the site to remove the risks of locating a borrow pit close to an overhead line. The borrow pit was located further northwards in the only alternative location with suitable topography and peat depths, which also complied with other environmental constraint avoidance buffers, e.g. 50 m away from a watercourse.
- 2.5.33 Following a borrow pit assessment, the shape of the smaller, northern borrow pit was altered to include an arced face, for practical reasons.
- 2.5.34 The final Site layout which is to be put forward for consent is based on Layout G. Opportunities to reduce impacts on locally deep areas of peat by the adoption of floating track techniques were identified, and the turbines were re-numbered 1 to 9 in sequence. An enlarged version of the Proposed Development layout is presented on **Figure 2.3**.

2.6 Proposed Development

Key Components

2.6.1 The Proposed Development infrastructure would include:

- decommissioning and removal of the twelve existing turbines and related infrastructure including hardstandings and the existing operational control building;
- erection of nine new turbines of approximately 5.6 to 6.6 MW each, with a maximum tip height of 200 m, a rotor diameter of approximately 140 m to 155 m and hub height of approximately 122.5 m;
- hardstanding areas at the base of each turbine, each 3,820 m², with a maximum total area of 34,380 m².
- approximately 9 km of new track, of which 1.5 km will consist of floating track;
- approximately 2.3 km of upgraded track;
- two substations and associated compounds including parking and welfare facilities;
- an energy storage facility;
- up to six construction compounds;
- two potential borrow pits, to provide suitable rock for access tracks, turbine bases and hard standings; and
- underground cabling linking the turbines with the substations.

Wind Turbines

2.6.2 Consent is being sought for the installation and operation of 9 turbines, with a maximum blade tip height of 200 m and maximum rotor diameter of 155 m. The detailed design specification for each foundation would depend on the type of turbine procured, and the specific ground conditions at the location of each turbine. Each turbine has an expected capacity of 5.6 – 6.6 MW; however, it should be noted that a turbine with a different capacity could be used depending on availability at the time the Proposed Development is constructed. Proposed turbine locations with easting and northing grid references are identified in **Table 2.1**. The proposed turbine locations are shown on **Figure 2.3**.

Table 2.1: Proposed turbine locations

Turbine	Easting	Northing
1	130451	848831
2	131024	848443
3	131745	848078
4	132269	847589
5	132826	847171
6	132005	846528
7	131443	847020

Turbine	Easting	Northing
8	130999	847503
9	130253	847705

2.6.3 The proposed turbine locations and ancillary infrastructure would be subject to a maximum micro-siting tolerance of 50 m in any direction. In those places where environmental features may be potentially affected by the micro-siting, tolerance would be constrained to less than 50 m, and such changes would be managed in consultation with an appropriately qualified and experienced environmental manager during the construction phase. The micro-siting constraints relevant to the Proposed Development are set out within each of the technical sections of this EIA. Any relocation of the turbines from the Proposed Development layout outwith the micro-siting tolerance would be agreed with the Highland Council and would be in accordance with the mitigation set out in this EIA.

2.6.4 A summary of the proposed environmental commitments is provided in **Chapter 17: Schedule of Environmental Commitments**.

Wind Turbine Structure

2.6.5 It is proposed that there will be nine turbines within the project area, with a combined capacity of approximately 59.4 MW.

2.6.6 The height of the proposed turbines from the ground to the blade tip would measure up to 200 m.

2.6.7 The turbines would have an approximate rotor diameter of between approximately 140 m and 155 m. The model and actual dimensions of the wind turbines ultimately selected would be influenced by the economic market and technological advances at the time of procurement. However, blade tip height would not exceed 200 m. Indicative elevations are shown on **Figure 2.4**.

2.6.8 The wind turbines would be three bladed, horizontal axis turbines with solid tubular towers. The blades would be made from reinforced composite materials such as fibreglass. The turbine towers would be made of steel.

Colour and Finish

2.6.9 The wind turbines would all be the same basic appearance and colour. It is proposed that the turbines are to be of a matt grey colour finish. Although off-white has been an accepted colour for turbines, more recently constructed wind turbines have been a mid-grey tone, which reduces the distance over which turbines are visible, especially in dull weather or low light conditions. The choice of material and colour for the proposed turbines is important as this has an impact on the visual impact. Finishing would be expected to be agreed by a condition placed on the Section 36 consent.

Turbine Foundations

2.6.10 Turbine foundations would be dependent upon site-specific ground conditions at the turbine locations and the type of turbine chosen. However, it is envisaged that installation of the turbines using a steel reinforced concrete base (gravity foundation) would be suitable.

- 2.6.11 The concrete gravity bases would be located underground. A quantity of earth would therefore need to be removed. The amount of earth to be removed would depend upon site-specific ground investigations at each turbine location. Topsoil, peat and other material would be removed from the foundation area and stored so that it may be used later for reinstatement.
- 2.6.12 Turbine foundations would be set down to the depth of suitable bearing strata with an approximate area of 480 m² and circular shape (see Indicative Wind Turbine Foundations at **Figure 2.5**). Should geotechnical investigations demonstrate that the required bearing capacities are not achievable; a piled foundation design would be adopted using the same overall design footprint.
- 2.6.13 An imbedded tower section would be cast into a central column onto which the turbine tower would be fixed. Concrete for the foundations would either be delivered to the proposed development in a “ready mix” form, or processed in a concrete batching plant located within a construction compound.
- 2.6.14 For the purposes of this EIAR, an approximate foundation depth of 4 m below existing ground level¹ has been assumed. With a 22.8 m diameter circular footprint foundation, this equates to approximately 426 m³ of concrete per turbine (assuming a 50:50 ratio of concrete to steel). The concrete bases would be allowed to cure (reach its design strength) before turbines are fitted.

Turbine Erection

- 2.6.15 The turbine components would be delivered to the proposed development area and stored in a temporary construction compound or on turbine hardstandings until weather conditions are appropriate for turbine erection. Typically, the bottom turbine tower section would firstly be imbedded into the central column of the foundations, followed by the upper turbine tower sections being crane lifted into place. The cranes would then lift the nacelle into place on the top section of the turbine tower. Blades would then be fitted to the rotor hub, either on the ground before lifting altogether onto the nacelle, or otherwise individually lifted for connection to the rotor hub *in situ*.

Turbine Hard Standings

- 2.6.16 An area of hard standing approximately 3,820 m² in total would be constructed in the form of one or more separate bases to accommodate two cranes adjacent to each turbine along with blade laid-down areas. An indicative arrangement is shown at **Figure 2.6**. This is required to allow the safe operation of the cranes during turbine erection. The hard standings would be constructed using suitable surplus material generated from the excavation process elsewhere within the development area and from borrow pits where possible. Once the existing turbines have been decommissioned, some of the material within the hardstandings of the existing turbines will be reused in the production of new hardstandings for the proposed repowering turbines. Topsoil would be excavated and stone sourced from the existing turbine hardstandings laid and compacted to the required depth. The depth of the hard standings would be dependent on the ground conditions at specific locations.

¹ Subject to site Geotechnical Investigations.

Turbine Lighting

- 2.6.17 Air Navigation Order Article 222² requires turbines exceeding a tip height of 150 m to display aviation lighting to indicate their presence. Dispensations for reduced lighting schemes can be agreed with the Civil Aviation Authority (CAA), according to the guidance provided in CAP-764³. For the Proposed Development, only the cardinal turbines (T1, T5, T6 and T9) would be lit – the lighting design is discussed in more detail in **Chapter 14**.

Transformer Houses

- 2.6.18 Each wind turbine would be expected to have an associated transformer. The electrical transformers would be expected to be located adjacent to the turbines. External transformers would be located within houses which would have indicative dimensions of 5.5 m by 3.0 m by 3.0 m. Transformer houses would be colour finished to blend in with the surrounding landscape.

New Site Entrances and Access Tracks

- 2.6.19 A Site entrance would be established at an existing farm entrance at its junction with the A863 to the south of the Site. Approximately 9 km of new track will be constructed as part of the Proposed Development, of which approximately 1.5 km would be floating track, and approximately 2.3 km of the existing crofters' track would be upgraded.
- 2.6.20 The following principles were applied during the design of the on-site access tracks:
- tracks make use of existing infrastructure and track/disturbed ground where possible;
 - track length is kept to a minimum to reduce construction time, the requirement for stone, and land-take;
 - gradients have been kept to acceptable levels and the geometry of the tracks optimised to accommodate the requirements of delivery vehicles and also to allow construction plant to move safely around the proposed development area;
 - tracks are routed to avoid sensitive hydrological, ecological and archaeological features as far as practicable; and
 - tracks are routed to avoid areas of deepest peat. Where this is not achievable, and where the slope of the ground allows, floating track will be used.
- 2.6.21 The access track would generally be unpaved (stone surface) and of 4.5 m running width, with a 0.5 m shoulder verge to either side as per **Figure 2.7**.
- 2.6.22 Approximately 1.7 km of new access track between the southern entrance off the A683 and the crofters' track would be required, and a further 7.3 km of new track would be required to access the proposed turbines, of which approximately 1.5 km would be made up of floating track. Turning heads of sufficient size to accommodate articulated vehicles would also be provided at several locations.
- 2.6.23 Approximately 2.3 km of existing track will be upgraded to accommodate the vehicles and machinery required to construct the wind turbines.

² UK Statutory Instruments (2016), The Air Navigation Order Part 8 Chapter 2 Article 222. Accessed at: <https://www.legislation.gov.uk/ukSI/2016/765/article/222/made> [accessed December 2022].

³ Civil Aviation Authority (2016), CAP 764: Policy and Guidelines on Wind Turbines. Accessed at: <https://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=5609> [accessed December 2022].

- 2.6.24 In general terms, the construction method would see topsoil being removed and stored adjacent to the construction area until required for reinstatement. Excavations would continue to expose a suitable horizon or bedrock on which to construct the track.
- 2.6.25 The tracks would be constructed in layers, with a geo-textile membrane overlain by a base of coarse stone, and subsequent layers of higher graded stone. Each layer of stone would be compacted and shaped to provide a profile and surface finish of a quality suitable for the turbine construction vehicles. The minimum depth of stone would be 200 mm, though the final thickness used would be dependent on local ground conditions and load capacity as per **Figure 2.7**.
- 2.6.26 The need for access track drainage would be established on-site during construction. The access tracks would have a suitable cross-fall to drain run-off and, where gradients are present, lateral drains would intercept any flow along the road. The dimensions of the lateral drains would be matched to the estimated water flow and outlets would be suitably located with erosion protection as required.
- 2.6.27 Where ground conditions are of a permeable nature, swales would be utilised alongside the access tracks to allow natural filtering of surface water into the ground. Where areas are less free draining, land drains or drainage ditches would be installed as topography and ground conditions dictate. Drainage filters would be installed at suitable locations to remove silts from the run-off.
- 2.6.28 Post construction, where tracks will not be retained for use during the operational phase, the vegetated turf layer will be used for reinstatement. This will allow re-establishment of natural vegetation to the area. Reuse of the turf layer is the preferred option over seeding the edges of the access track, as seeding rarely gives a representative cover.

Watercourse Crossings

- 2.6.29 As part of the access track construction and associated hard standing works, sixteen new watercourse crossings will be required, at the locations identified on **Figure 9.4.1** in **Technical Appendix 9.4**. Bridges and culverts will be used for the main watercourse crossings. Closed culverts may be used for minor drainage channels.

Borrow Pits

- 2.6.30 The Proposed Development will require crushed stone to construct new tracks, create hardstanding areas for the cranes and lay the foundations.
- 2.6.31 It is the Applicant's intention to re-use stone from the existing hardstandings for the construction of the proposed repowering turbines. It is estimated that approximately 3,240 m³ of the existing hardstanding material will be re-used for this purpose, with approximately 31,658 m³ of new crushed stone from borrow pits or in the worst-case scenario, off-site stone sources, being used to supplement any shortfall of hardstanding construction materials.
- 2.6.32 The total estimated required quantity of stone is approximately 34,898 m³. However, it is anticipated that approximately 4,290 m³ will need to be brought in from off-site sources to build the initial section of access road leading to the borrow pit 1. For purposes of assessing worst-case, the Traffic and Transport assessment (refer to **Chapter 11**) also considers the scenario where 100% of stone requirement would be brought in from off-site sources.

- 2.6.33 Location for up to two borrow pits have been carefully sited. As a result, the volume of topsoil/peat that would need to be removed in order to access the stone from borrow pits is limited.

Substation Compounds

- 2.6.34 The Proposed Development requires separate substations for the repowering and extension turbines to accommodate the construction phasing (described in **paragraphs 2.6.53 to 2.6.54** below) and grid connection requirements. The locations of each substation are shown on **Figure 2.3**.
- 2.6.35 Cables from the repowering turbine transformers will converge at the repowering substation building.
- 2.6.36 Cables from the extension turbine transformers will converge at the extension substation building. Indicative cable trench details are shown on **Figure 2.8**.
- 2.6.37 The indicative layout of the substation compounds is shown in **Figure 2.9**. It is anticipated that the onsite substation compounds will house the transformers, switchgear, metering, telecommunications equipment, electrical control panels, control equipment, storage and workshop, welfare facilities and offices.
- 2.6.38 The substation compound will measure approximately 40 m x 50 m and will contain a storage yard/laydown area for the materials required by the grid operator during operations or erection of external electrical equipment.

Substation buildings

- 2.6.39 Within the substation compounds, the substation buildings are likely to comprise a single storey unit measuring approximately 23 m x 7.5 m x 6.5 m height with a pitched roof as shown in **Figure 2.11**. The substation building will contain internal and external transformers and switch-gear, stores and welfare facilities.
- 2.6.40 The substation will be constructed in keeping with the local built environment. The final designs for the buildings and compound will incorporate sustainable design features and will be agreed with THC.
- 2.6.41 Lighting will be kept to a minimum and will be limited to working areas only and will comply with health and safety requirements. Lighting will be down lit and linked to timers and movement sensors so that light pollution is kept to a minimum.
- 2.6.42 The final designs for the building and compound will incorporate sustainable design features and will be agreed with THC.

Energy Storage

- 2.6.43 It is the Applicant's intention to install and operate a permanent co-located energy storage facility. This is anticipated to comprise a lithium-ion battery technology solution, with modular elements comprising a number of battery housings (either standard ISO containers, electrical-houses ('eHouses') or otherwise) with associated 'heating, ventilation and air-condition' ('HVAC') systems, along with paired power conversion systems ('PCS') comprising bi-directional inverters and transformers, as well as central switchgear, metering and transformer, and space for access and operations.
- 2.6.44 This area of technology is currently fast-evolving in terms of:

- technological advances in battery energy density and performance;
 - the design and existence of various potential service markets for providing revenues; and
 - opportunities for time-shifting of wind farm generation.
- 2.6.45 Indicative designs for the battery storage facility are provided in **Figure 2.10**. These were based upon certain parameters, which form the basis of the impact assessment herein. These indicative parameters are considered to represent the realistic worst case scenario in impact assessment terms.
- 2.6.46 It is expected that the battery storage facility will be able to store up to 20 MW of electricity.
- 2.6.47 The number, dimensions, housing type, finish, arrangement, security fencing and landscaping of energy storage elements will be subject to THC consultation and approval prior to construction.

Health and safety during construction, operation and decommissioning

- 2.6.48 The RenewableUK Onshore Wind Health and Safety Guidelines (2015) note that wind turbine development and operation can give rise to a range of risks to public safety including:
- traffic (especially lorries during construction, and abnormal loads for the transport of wind turbine components; including beyond the application boundary);
 - construction site hazards (particularly to any people entering the Site without the knowledge or consent of the site management);
 - effects of catastrophic wind turbine failures, which may on rare occasions result in blade throw, tower topple or fire; and
 - ice throw, if the wind turbine is operated with ice build-up on the blades.
- 2.6.49 The RenewableUK guidance (2015) states that “Developers should ensure that risks to public safety are considered and managed effectively over the project lifecycle, and should be prepared to share their plans for managing these risks with stakeholders and regulators; effective engagement can both build trust, and help to reduce the level of public safety risk by taking account of local knowledge.”
- 2.6.50 Site security and access during the construction period would be governed under Health and Safety at Work Act 1974 and associated legislation. There would be no public access to the Site during construction. However, the Land Reform (Scotland) Act (2003) which came into effect in February 2005 establishes statutory rights of responsible access on and over most land. The legislation offers a general framework of responsible conduct for both those exercising rights of access and for landowners.
- 2.6.51 During construction, some restrictions on use of the paths running through the Proposed Development may be required for public safety. Once the construction period and commissioning of the proposed Development is complete, no special restrictions on access are anticipated.
- 2.6.52 Informal recreational access within the Site during the operational phase, would be permitted. Appropriate warning signs would be installed concerning restricted areas such as the substation compound, transformers, switchgear and metering systems. All onsite electrical cables would be buried underground with relevant signage. Public access would be improved through a more extensive accessible network of tracks.

Construction phase

- 2.6.53 The Applicant is considering alternative construction programme scenarios:
- Scenario 1 proposes that the construction of the extension turbines and the construction of the repowering turbines is undertaken at the same time.
 - Scenario 2 proposes that the four extension turbines are constructed first, followed by the decommissioning of the existing, operational Ben Aketil Wind Farm, followed by construction of the five repowering turbines.
- 2.6.54 It is estimated that construction would take the following approximate times to complete:
- Scenario 1: 18 months;
 - Scenario 2: Construction of the four extension turbines (approximately 1 year), followed by decommissioning and removal of the existing wind turbines and associated infrastructure (approximately 1 year), followed in turn by construction of the five repowering turbines (approximately 1 year) – Total of 3 years. There would be a delay between the completion of construction of the first five turbines and the start of construction of the second five turbines of no more than 5 years.
- 2.6.55 Both construction phasing scenarios have been taken into consideration during the EIA. The approach to considering these scenarios when assessing impacts is discussed for each topic in **Chapters 6 to 15**.

Programme of works

- 2.6.56 An indicative construction programme for construction phasing Scenario 1 is set out in **Table 2.2** below, while that for Scenario 2 is set out in **Table 2.3**. Many of the construction activities would be carried out concurrently, although predominantly in the order set out below. A more detailed construction plan will be prepared prior to construction.



Table 2.2: Indicative Construction Programme – Scenario 1

Activity	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site mobilisation/demobilisation																		
Construction of construction compounds and access points																		
Track and hardstanding construction																		
Decommissioning of existing Turbines																		
Construction of turbine foundations																		
Substation and BESS construction																		
Excavating trenches and laying electrical and communications cables																		
Site restoration																		
Turbine delivery and installation																		
Turbine fit out and grid connection																		
Turbine commissioning																		



Table 2.3: Indicative Construction Programme – Scenario 2

Scenario 2: Phased Construction Programme												
Activity	Phase 1 - Construction of Extension turbines											
	1	2	3	4	5	6	7	8	9	10	11	12
Site mobilisation/demobilisation												
Construction of construction compounds and access points												
Track and hardstanding construction												
Construction of turbine foundations												
Substation and BESS construction												
Excavating trenches and laying electrical and communications cables												
Turbine delivery and installation												
Site restoration												
Turbine fit out and grid connection												
Turbine commissioning												
Period between completion of Phase 1 and commencement of Phase 2 Maximum 5 years, includes 1 year for decommissioning of the existing turbines												
Activity	Phase 2 - Construction of Repowering turbines											
	1	2	3	4	5	6	7	8	9	10	11	12
Track and hardstanding construction												
Decommissioning of existing turbines												
Construction of turbine foundations												
Substation and BESS construction												

7 Years Total



Scenario 2: Phased Construction Programme												
Excavating trenches and laying electrical and communications cables												
Turbine delivery and installation												
Site restoration												
Turbine fit out and grid connection												
Turbine commissioning												

Construction Activities

2.6.57 The construction of the Proposed Development will likely require the following:

- decommissioning of 12 operational turbines and existing substation. Existing tracks and hardstands would remain in place temporarily;
- existing foundations would likely remain in place with exposed plinth of foundation nibbled down to below ground level reinforced concrete material to be removed from Site;
- existing substation building would likely be taken down to foundation;
- existing internal network/grid cabling would likely be removed from the Site;
- existing turbines to be removed from Site;
- new hardstands to be constructed for the Extension turbines i.e. Turbines 6 to 9. Material from the decommissioned track and hardstanding areas from the operational Ben Aketil Wind Farm would be reused where possible, supplemented by imported new material and/or aggregate won from on-site borrow pits;
- replacement (repowering) turbines, i.e. Turbines 1 to 5, to be constructed once the existing turbines have been removed;
- material from existing track and hardstands is likely to remain in place where possible to meet requirements of new turbine access track and hardstandings;
- material from existing hardstands will likely be lifted to widen the access track and construct the new repower hardstandings and new substations.

2.6.58 In addition, the planned construction works would likely include:

- temporary and permanent highway modifications to enable vehicles to access the Site, using the local and strategic highway network;
- construction of permanent new Site tracks required to access the wind turbine positions, where access cannot be gained from the existing wind farm track. These would be used by civil engineering plant and construction equipment;
- widening and upgrading of sections of the existing crofter's track, where required;
- construction of a secure Site compound / storage area for Site office facilities and storage of materials and components;
- installation of hardstandings and outrigger pads for the support of the cranes that would be used for the erection of the extension and repower turbines;
- construction of foundations for the support of the turbine structures;
- wind turbine delivery and erection;
- installation of transformers in separate housings alongside each wind turbine;
- installation of on-site high voltage cabling, communication cabling and earthing;
- installation of Supervisory Control and Data Acquisition system;
- construction of two new substations;
- construction and installation of a battery storage facility;
- commissioning of Site mechanical and electrical equipment; and
- reinstatement and landscaping, removal of temporary Site offices, reseeding verges and areas around turbine bases.

Construction Traffic

2.6.59 It is anticipated that the largest volume of traffic will be associated with the construction phase of the project, when vehicles are likely to be travelling from major centres and ports

to deliver materials to the proposed Site. Materials and goods will be transported to the port at Kyle of Lochalsh. The turbine components will be temporarily stored at Broadford before being transported by road to the Site.

2.6.60 The proposed delivery route for abnormal indivisible loads (ALLs) would follow one of two routes:

- Accessing the Site from the north:
 - loads would depart the port and turn left onto the A87 before crossing onto the Isle of Skye via the Skye Bridge;
 - loads would continue north on the A87 before turning left onto the A850 at Borge; and
 - loads would continue west on the A850 and proceed to the site access west of Edinbane.
- Accessing the Site from the south:
 - loads would depart the port and turn left onto the A87 before crossing onto the Isle of Skye via the Skye Bridge;
 - loads would continue north on the A87 before turning left onto the A863; and
 - loads would continue north on the A863 until Feorlig where they would turn right into a new site access junction.

2.6.61 Other construction materials will also likely be delivered along the same routes. Further detail is provided in **Chapter 11: Traffic and Transport**.

Construction Workforce

2.6.62 A detailed construction workforce schedule, i.e., employee numbers throughout the construction programme and likely shift patterns would not be known until the contract for building the wind farm has been granted, however the maximum number of staff likely to be on site at any one time would be 50.

2.6.63 The Applicant is committed to using local suppliers, contractors and labourers as far as possible.

Construction Compounds

2.6.64 During the construction period, up to 6 construction compounds will be required as follows:

- four small construction compounds located on existing hardstandings to receive deliveries arriving via the northern Site entrance, facilitate decommissioning of the existing turbines and construction of the repowering turbines;
- a main construction compound at the southern entrance to receive and temporarily store deliveries arriving via the southern Site entrance; and
- a construction compound between T6 and T7 to facilitate storage of equipment and materials in close proximity to the extension turbines.

2.6.65 It is intended to utilise the proposed construction compounds for mobilisation when construction commences.

2.6.66 The planned locations of the construction compounds are indicated on **Figure 2.3**, and the dimensions and indicative drawings of the compounds are shown on **Figure 2.9**.

- 2.6.67 The construction compounds will cover a total of 10,500 m², with 4,000 m² of the total area planned to be located on existing hardstandings.
- 2.6.68 The main construction site office and compound will comprise temporary cabins to be used for the site offices, the monitoring of incoming vehicles and welfare facilities for site staff including toilets; parking for construction staff visitors and construction vehicles; secure storage for tools and small parts; a receiving area for incoming vehicles; and security fencing around the compound.
- 2.6.69 The compounds will be used as storage areas for the various components, fuels and materials required for construction. The major structural components of the turbines would be delivered directly to Site. Temporary lay-down areas will be provided for parking and unloading vehicles and, in particular, abnormal loads.
- 2.6.70 Any lighting would be directional in accordance with ILP guidance, and mounted on the individual portacabins.
- 2.6.71 The construction compounds and lay down areas would be constructed by first stripping the topsoil/peat, which would be stored in a mound for subsequent reinstatement at the end of the construction period, as described in **Chapter 9: Hydrology, Geology, Hydrogeology and Peat** and **Technical Appendix 9.2**. Care will be taken to maintain separate stockpiles for turf and the different soil/peat types to prevent mixing during storage. A geotextile would then be placed on the sub-stratum, which would be overlain by a working surface of stone to approximately 750 mm thickness.
- 2.6.72 Reinstatement would involve removing the stone and underlying geotextile before carefully ripping the exposed substrate and replacing the excavated soil/peat.
- 2.6.73 A concrete batching plant will most likely be located within the construction compound for the extension turbines or over two of the northern construction compounds for construction of the repowering turbines.

Construction Hours

- 2.6.74 It is anticipated that the main construction hours for the development will be between 07:00 and 19:00 from Monday to Friday, and 08:00 and 17:00 on Saturdays and Sundays, unless otherwise agreed with THC. Construction hours generally also apply to the delivery of materials to the proposed development; however, abnormal loads may be delivered out of these hours when the road network is at its quietest to reduce traffic disturbance. Delivery of the nacelles, towers and blades to the proposed development area would require the use of abnormal sized and slow-moving trucks. These trucks would require a police escort and the timing of these deliveries may be dictated by the police.

Felling

- 2.6.75 The northern access track may require very minimal felling alongside the track contained to individual trees that have overhanging branches as the current clearing for the track is approximately 25m wide. If borrow pit 2 near the existing northern entrance to the wind farm is required to access rock, felling of forestry within the footprint of the borrow pit will be required. However, this borrow pit is being held as a contingency that will be used only if insufficient rock is available from borrow pit 1. If this potential borrow pit is not used, there will be no requirement to undertake felling in this area. However, should felling be

required to enable access to borrow pit 2, the relevant stakeholders and consultees will be consulted prior to felling, and the Applicant would undertake compensatory planting.

Operational Phase

Turbine Monitoring and Control

- 2.6.76 Wind turbines have a track record for safety. All turbines are controlled by a Supervisory Control and Data Acquisition (SCADA) system, which would gather data from all the turbines and provide the facility to control them from a remote location. The SCADA system would gather data from all the turbines via communications cables connecting to each turbine (the cables being buried in the electrical cable trenches).
- 2.6.77 In the case of any fault, including over-speed of the blades, overpower production, or loss of grid connection, the turbines shut down automatically through braking mechanisms. They are also fitted with vibration sensors so that, if, in the unlikely event a blade were damaged, the turbines would again automatically shut down.

Meteorological Effects

- 2.6.78 Turbines, as with any tall structure, can be susceptible to lightning strike and appropriate measures are included in the turbine design to conduct lightning strike down to earth and minimise the risk of damage to the structure. In the case of a lightning strike on a turbine or blade the turbine would automatically shut down.
- 2.6.79 In cold weather, ice can build up on blade surfaces when operating. The turbines can continue to operate with a thin accumulation of snow or ice, but would shut down automatically when there is a sufficient build up to cause aerodynamic or physical imbalance of the rotor assembly. Many models now include de-icing technology.

Turbine Servicing and Repair

- 2.6.80 Each manufacturer has specific maintenance requirements; however, it is anticipated that routine servicing of the turbines would typically be undertaken twice a year, with a full annual service and a minor service every six months. In the first year, there is also likely to be an initial three-month service post-commissioning. Individual turbines would be switched off as servicing was ongoing. Maintenance and servicing would include activities such as changing of gearbox oils and individual turbine components.
- 2.6.81 Blade inspections would be likely to be required between every two and five years. These would traditionally be undertaken using a cherry picker or similar, but may also be performed with a 50-tonne crane and a man-basket, or even nowadays using drones. Repairs to blades would use the same equipment. Light winds and warmer, dry conditions are required for any blade repairs hence summer (June, July and August) would be the most appropriate period for this work.
- 2.6.82 Operational waste would generally be restricted to small volumes of waste generated from machinery repair and maintenance. The maintenance contractors would dispose of any such waste off-site, in line with Scottish waste management regulations and duty of care.

Track Maintenance

- 2.6.83 Once the wind farm is operational, the volume of traffic using the access tracks would be low (although heavy plant lorries can be particularly wearing on the road). Correspondingly, the need for any track maintenance works is anticipated to be low and infrequent. Any such works required would generally be undertaken during the drier conditions in the summer months.

Operational Workforce

- 2.6.84 A team of several staff including engineer fitters would supervise the operation of the wind turbine installation and would visit the Proposed Development to conduct routine maintenance. The frequency of these visits would depend on the turbine manufacturer.

Decommissioning Phase

- 2.6.85 The Proposed Development is anticipated to have an operational life of 35 years, after which it would be decommissioned and the turbines dismantled and removed. This is the proposed course of operations which is being applied for and any alternative to this action would require separate consent from THC, and so is not considered within this EIAR.
- 2.6.86 During decommissioning the turbines would be dismantled and removed, along with any associated above ground electrical equipment. This decommissioning work would be the responsibility of the Applicant, or any subsequent owners of the Proposed Development. Underground cables would be left in place and foundations would be removed to a depth of 0.5 m below ground level to avoid environmental impacts from deeper removal. This is in line with current industry best practice. Prior to decommissioning of the site, a method statement would be prepared and agreed with THC.
- 2.6.87 Decommissioning of the existing turbines prior to the construction of the proposed repowering turbines will be undertaken in accordance with the conditions of consent for the existing Ben Aketil Wind Farm. This requires a decommissioning plan to be agreed with the Council 5 years prior to decommissioning.

2.7 References

Civil Aviation Authority (2016), CAP 764: Policy and Guidelines on Wind Turbines. Accessed at:

<https://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=5609> [accessed December 2022].

RenewableUK (2015). Onshore Wind Health and Safety Guidelines. Available at: https://cdn.ymaws.com/www.renewableuk.com/resource/collection/AE19ECA8-5B2B-4AB5-96C7-ECF3F0462F75/OnshoreWind_HealthSafety_Guidelines.pdf [Accessed December 2022]

Scottish Government (2020), Scottish Planning Policy, published by the Scottish Government (2020).

Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland, Historic Environment Scotland and Marine Scotland Science (2019), Good Practice during Wind Farm Construction, 4th Edition. Available at: https://www.scottishrenewables.com/assets/000/000/453/guidance_-

[_good_practice_during_wind_farm_construction_original.pdf?1579640559](#) [accessed December 2022].

UK Statutory Instruments (2016), The Air Navigation Order Part 8 Chapter 2 Article 222. Available at: <https://www.legislation.gov.uk/ukSI/2016/765/article/222/made> [accessed December 2022].

3 CONSULTATION

3.1 Overview

- 3.1.1 Consultation has been integral to the design and development of the Proposed Development, identification of existing environmental constraints and sensitivities, and identification and assessment of the likely environmental effects of the Proposed Development.
- 3.1.2 Consultation with NatureScot commenced in May 2021 regarding the scope of ornithological surveys. An EIA Scoping request was submitted to the ECU, statutory and non-statutory consultees in July 2022. The Applicant undertook formal pre-application consultation with THC and statutory consultees in August 2022. Consultation with the general public commenced in September 2022. Consultation has taken a number of forms, including:
- stakeholder liaison;
 - public information events; and
 - informal discussions.

3.2 Stakeholder Liaison

- 3.2.1 Consultation with statutory consultees and other organisations has been undertaken throughout the EIA process to obtain environmental data, to discuss and agree the scope of individual environmental assessments and the adopted methods of assessment, and to develop appropriate environmental mitigation measures.
- 3.2.2 EIA topic-specific consultation is summarised in each chapter of this EIAR where relevant.
- 3.2.3 Copies of the EIA Scoping Report and ECU's Scoping Opinion are available on the ECU website⁴.

Public Information Events

- 3.2.4 Two in-person public consultation events were held at key stages in the design process to inform the general public and other interested parties of project alternatives, the emerging findings of the EIA, and to elicit comment and feedback on the Proposed Development. During both exhibitions, A2 banners containing project information were set up for public display, including photomontage and wireline visualisations.
- 3.2.5 The first public exhibition was held over two days, on 7th and 8th September 2022, at the Dunvegan Community Hall. The event aimed to inform the general public and other interested parties of the Applicant's initial plans for the proposed repowering and extension of the existing Ben Aketil Wind Farm, and to elicit comment and feedback from the community.

⁴ <https://www.energyconsents.scot/ApplicationSearch.aspx>. Search for "Ben Aketil", ECU reference ECU00004552.

- 3.2.6 The second public exhibition was also held over two days, on 25th and 26th January 2023. The purpose of this event was to present how the design of the Proposed Development had evolved since the first public exhibition and to present more detailed environmental information which had become available during the EIA process. Part of the exhibition included the use of visualisation software which presented views from various viewpoints live to attendees.

Informal Discussions

- 3.2.7 Discussion was undertaken with land users, affected parties and landowners during the development of the Proposed Development and the EIA process.
- 3.2.8 EIA topic-specific consultation is summarised in each chapter of this EIAR where relevant.

3.3 Pre-Application Consultation Report

- 3.3.1 A Pre-Application Consultation (PAC) Report has been compiled which describes the consultation process that was followed in more detail, and summarises consultation responses and other feedback from all sources throughout the EIA process. The PAC Report will be submitted to the Scottish Government as a stand-alone document that will accompany this EIAR and form part of the Applicant's application for consent.

3.4 References

Energy Consents Unit (2022), Scoping Opinion September 2022. Available at: <https://www.energyconsents.scot/ApplicationSearch.aspx>. Search for "Ben Aketil", ECU reference ECU00004552.

RSK Environment Ltd (2020), The Repowered and Extended Ben Aketil Wind Farm Scoping Report. Dated Jul 2022. Available at: <https://www.energyconsents.scot/ApplicationSearch.aspx>. Search for "Ben Aketil", ECU reference ECU00004552.

4 ENVIRONMENTAL ASSESSMENT PROCESS

4.1 Scoping

- 4.1.1 An underlying principle of the EIA process is that it should concentrate on environmental issues where effects associated with a development proposal are likely to be significant.
- 4.1.2 Although it is not required under the EIA Regulations, the Proposed Development was subject to a detailed scoping exercise in July 2022 in order to determine issues that should be addressed in the EIA and the form individual assessments should take.
- 4.1.3 The scoping exercise involved a review of available documentation related to the form and status of the existing environment; consultation with statutory and non-statutory agencies and other environmental bodies with knowledge of the proposed development Site and surrounding areas; preliminary desk-based and site-based appraisals and surveys; and knowledge of the potential environmental implications of comparable schemes (based on direct past project experience and other published experience and guidance).
- 4.1.4 The following considerations were factored into the scoping process:
- The nature of the receiving environment and the type of operations associated with the Proposed Development are such that environmental effects could arise during construction, operation and decommissioning stages.
 - A review of the proposed development Site revealed ecological habitats and species of potential interest.
 - There is a requirement for early liaison with stakeholder and regulatory authorities (e.g. the Scottish Environment Protection Agency and Health and Safety Executive) to provide input for the EIA and design development processes.
 - There is a need for early consultation and commencement of ecological and ornithological surveys and noise monitoring to accommodate data collection within seasonal and programme constraints.
 - Significant cumulative effects could potentially arise through the interaction of the project with other existing and consented development projects in the vicinity, and the combined effects of two or more environmental aspects associated with the project on environmental interests (e.g. combined visual, noise and air quality effects on local residents).
- 4.1.5 Scoping concluded that the following aspects were relevant for investigation in the EIA owing to the potential for significant environmental effects to arise:
- Landscape and Visual Assessment;
 - Ecology;
 - Ornithology;
 - Hydrology, Geology, Hydrogeology and Peat;
 - Archaeology and Cultural Heritage;
 - Traffic and Transport;
 - Noise;

- Socio-economics;
- Aviation;
- Telecommunications;
- Shadow Flicker; and
- Climate Change Mitigation.

4.1.6 The following environmental aspects were reviewed and subsequently scoped out of the EIA based on the limited potential for significant environmental effects to arise:

- *Air quality*: The main source of impact on air quality would be increased traffic flows on local roads during construction and emissions from construction activities. It is considered that air emissions associated with these activities would be transient and localised, and highly unlikely to have a significant effect on local air quality. Best practice measures would be applied to construction, forming an integral part of the Environmental Management Plan (EMP). There would be no emissions to air during operation.
- *Vulnerability of the Proposed Development to risks of major accidents and/or disasters (including climate change)*: None of the following climate trends would affect the Proposed Development: increased temperature, changes in the frequency, intensity and distribution of rainfall events, increased windstorms and sea level rise. Braking mechanisms on turbines allow them only to be operated under specific wind speeds and, given the elevated location of the site, flooding would not pose a significant risk. Furthermore, the Proposed Development would not contribute to flooding elsewhere.
- *Forestry*: The existing northern access track passes through commercial forestry. As this track will not require upgrading, forestry assessment in this area was scoped out. The only forestry which might be affected is present within the footprint of a contingency borrow pit (borrow pit 2) which may not be required if sufficient stone is extracted from the main borrow pit (borrow pit 1). Should borrow pit 2 be required, the applicable stakeholders and consultees will be consulted and compensatory planting would be undertaken for any trees that may need to be felled. Due to the lack of potentially significant effects on forestry, this topic was scoped out of the EIA.

Population and Human Health

4.1.7 The 2017 EIA Regulations state that an assessment of population and human health should be considered during the EIA process. At scoping stage, it was proposed that this requirement be covered through the findings of other assessments undertaken as part of the EIA process and so no dedicated EIA chapter would be produced.

4.1.8 Limited interactions with human health are possible, and consideration was given to the findings of the following assessments in the EIAR:

- Health and Safety at Work including best practice (**Chapter 2**);
- Ice build-up on turbine blades and risk of ice throw (see **Section 4.1.9** below);
- Lightning Strike (see **Section 4.1.9** below);
- Risk of turbine failure and consideration of inbuilt emergency procedures and best practice (see **Section 4.1.9** below);
- Residential Amenity (**Chapter 6**);
- Traffic and Transport (**Chapter 11**);
- Noise (**Chapter 12**);
- Aviation (**Chapter 14**);

- Telecommunications (**Chapter 15**); and.
 - Shadow Flicker (**Chapter 17**).
- 4.1.9 Properly designed and maintained wind turbines are a safe technology. The site design and inbuilt buffers from sensitive receptors will minimise any risk to human health resulting from the operation of the turbines. As risks associated with ice build-up and lightning strike are removed or reduced through inbuilt turbine mechanisms in modern machines, it was proposed that these be scoped out of the further assessment.
- 4.1.10 Effects on Traffic and Transport, Noise and Residential Amenity are assessed in full elsewhere within the EIA.

Scoping Process

- 4.1.11 The Scoping process also concluded that the relationship and compliance of the Proposed Development to local, regional and national planning policy would be best established in a separate Planning Statement. Accordingly, the Applicant has prepared a standalone Planning Statement that accompanies the S36 application for the Proposed Development. In addition, **Chapter 5** sets out the planning policy context for the EIA.
- 4.1.12 The outcomes of the Scoping process were collated in a Scoping report; this accompanied a formal request for a Scoping opinion that was issued by the Applicant to the ECU on 19th July 2022. The EIA Scoping report is available on the ECU website ⁵.
- 4.1.13 Following receipt of the Scoping Request, the ECU undertook consultation with statutory and non-statutory consultees and other environmental bodies with knowledge of the Proposed Development site and surrounding areas.
- 4.1.14 The ECU authority received scoping responses from the following consultees:
- Arqiva;
 - British Telecommunications (BT);
 - Crown Estate Scotland;
 - Defence Infrastructure Organisation (DIO);
 - Historic Environment Scotland (HES);
 - Joint Radio Company (JRC);
 - MBNL;
 - Ministry of Defence (MoD);
 - Mountaineering Scotland;
 - National Air Traffic Services (NATS) Safeguarding;
 - NatureScot;
 - Nuclear Safety Directorate;
 - RSPB Scotland;
 - Scottish Water;
 - SEPA;
 - Skye and Lochalsh Rivers Trust;
 - Telefonica (O₂ & Virgin Media);

⁵ <https://www.energyconsents.scot/ApplicationSearch.aspx>. Search for "Ben Aketil", ECU reference ECU00004552.

- The Highland Council;
 - The Highlands and Islands Airports;
 - Transport Scotland;
 - Virgin Media; and
 - Vodafone.
- 4.1.15 Marine Scotland did not provide a specific response; instead, Marine Scotland has made generic scoping guidelines for onshore wind farm and overhead line development available online. A standard checklist was provided for completion.
- 4.1.16 No responses were received from the following consultees:
- British Horse Society;
 - Civil Aviation Authority;
 - Dunvegan Community Council;
 - Fisheries Management Scotland;
 - Glendale Community Council;
 - John Muir Trust;
 - Kyle Community Council;
 - Portree & Braes Community Council;
 - Scottish Forestry;
 - Scottish Wildlife Trust;
 - Scottish Rights of Way and Access Society (ScotWays);
 - Skeabost and District Community Council;
 - Skye District Salmon Fisheries Board;
 - Struan Community Council;
 - Visit Scotland;
 - Waternish Community Council.
- 4.1.17 The ECU issued its Scoping Opinion, available on the ECU website⁶, to the Applicant on 13th October 2022.
- 4.1.18 The scope of the individual assessments has been reviewed regularly throughout the EIA process to take account of new published guidance and/or assessment methodologies, stakeholder feedback, new environmental information, and ongoing design changes.
- 4.1.19 Explanations of the methods of assessment adopted and the issues identified are provided in **Chapters 6 to 16** of this EIAR, which detail the findings in relation to the various environmental aspects considered in the EIA.

4.2 Additional Consultation

THC Pre-Application Meeting

- 4.2.1 In parallel to EIA Scoping, the Applicant undertook THC's formal pre-application consultation process for major projects. The online pre-application meeting was held on 17th August 2022, and THC's pre-application advice response was issued on 15th

⁶ <https://www.energyconsents.scot/ApplicationSearch.aspx>. Search for "Ben Aketil", ECU reference ECU00004552.

September 2022. The pre-application consultation process involved THC's planning, landscape, contaminated land, flood risk management, environmental health, transport planning, access and historic environment teams. Other consultees included SEPA, NatureScot and HES.

Gatecheck Process

- 4.2.2 As part of the Section 36 process, RSK prepared and submitted a Gatecheck Report for the Proposed Development to the ECU on 17th January 2023
- 4.2.3 The Gatecheck Report described the design evolution of the Proposed Development since the scoping stage including, where relevant, changes that had been made in response to consultation and community engagement. The document also set out the scope of the EIA in advance of the application for consent being made.
- 4.2.4 Responses to the Gatecheck Report were received from the following stakeholders:
- HES;
 - SEPA; and
 - The Highland Council.
- 4.2.5 The feedback received has been addressed and incorporated in the EIAR where relevant.

4.3 EIA Delivery

- 4.3.1 Insofar as practical, a common approach has been adopted in the undertaking and reporting of individual environmental assessments.

EIA Guidance

- 4.3.2 The EIA has been undertaken with regard to the following published best-practice guidance:
- Planning Circular 1: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017⁷; published by the Scottish Government (2017);
 - Planning Advice Note 1/2013: Environmental Impact Assessment, published by the Scottish Government (2013);
 - Guidelines for Environmental Impact Assessment, published by IEMA (2004); and
 - A handbook on environmental impact assessment: Guidance for competent authorities, consultees and others involved in the Environmental Impact Assessment process in Scotland, published by NatureScot (V5, 2018).

Establishment of Baseline Environment

- 4.3.3 The EIA of scoped-in environmental aspects commenced with the identification and review of information relating to known, or the likely presence of, environmental receptors and resources within a defined study area in order to determine their relative value, importance and/or sensitivity towards change.

⁷ Note: there is no planning circular or PAN for the Electricity EIA Regulations, and the planning circular contains information which is generally applicable to all EIA developments.

- 4.3.4 Environmental resources were defined as those environmental aspects that support and are essential to natural or human systems. These include areas or elements of population, ecosystems, watercourses, air and climatic factors, landscape, and material assets.
- 4.3.5 Environmental receptors were defined as people (i.e. occupiers of dwellings and users of recreational areas, places of employment and community facilities) and elements within the environment (e.g. flora and fauna) that rely on environmental resources.
- 4.3.6 Desk-based data sources comprised consultation responses; published literature; databases, records and schedules relating to environmental designations; national, regional and local policy documentation; historic and current mapping; aerial photography; and data gathered from previous environmental studies.
- 4.3.7 Site surveys were undertaken to verify and consolidate information gathered during the desk-based review, and to evaluate the relationships between specific environmental interests and their wider environmental value.
- 4.3.8 Study area extents vary in accordance with the environmental aspect being considered. For some topics, a study area has been defined as being relatively localised to the Proposed Development, while for others it has extended outward to capture the surrounding road network, distant communities, and environmentally sensitive areas. The definition of each study area has been informed by a review of the relationship between the Proposed Development and the receiving environment, the outcomes of scoping, and reference to thresholds stipulated in topic-specific EIA guidance.

Impact Prediction and Assessment

- 4.3.9 Impacts comprise identifiable changes to the baseline environment. These can be either beneficial (e.g. introduction of planting to screen visually detracting elements) or adverse (e.g. loss of an attractive environmental component), and can take the following forms:
 - direct [primary] (e.g. loss of habitat to accommodate the Proposed Development);
 - indirect [secondary] (e.g. pollution downstream arising from silt deposition during earthworks);
 - transboundary;
 - short-term/temporary (e.g. dust generated during construction);
 - medium-term (e.g. cutting back of planting which is subsequently allowed to regenerate);
 - long-term/permanent (e.g. improvement in air quality); and
 - cumulative (e.g. incremental changes caused by other past, present or reasonably foreseeable actions together with those associated with the Proposed Development, or where a receptor or resource is subject to a combination of individual impacts such as air pollution, noise and visual impact associated with the Proposed Development in isolation).
- 4.3.10 Impact assessments have been both quantitative and qualitative in nature, and based on comparisons between the environmental conditions immediately prior to the assumed construction of the Proposed Development and the predicted environment conditions resulting from its implementation. Each technical chapter of the EIAR describes the forecasting methods used in the EIA.

- 4.3.11 Impacts have been defined in accordance with accepted terminology and standardised methodologies to predict the magnitude of impact (or change) resulting from the Proposed Development.
- 4.3.12 Assessments have been undertaken for the period of construction and in the year when the Proposed Development would become operational. Some environmental aspects have required further assessment beyond the operational year to take account of factors such as predicted traffic growth or activities associated with decommissioning of the Proposed Development.
- 4.3.13 Where relevant, the assessments describe the expected significant effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters relevant to the Proposed Development. This includes consideration of effects resulting from future climate change and the vulnerability of the project to climate change.

Environmental Effects

- 4.3.14 Effects are defined as the consequence of impacts. They are formulated as a function of the receptor/resource value and sensitivity, and the predicted magnitude of impact.
- 4.3.15 Professional judgement, defined thresholds, established criteria and standards have been used to report the environmental effects of impacts, which can be referred to as either being prior to, or following establishment of, environmental mitigation.

Environmental Mitigation

- 4.3.16 Environmental mitigation measures have been developed to address potentially significant adverse environmental effects.
- 4.3.17 Mitigation can take the form of agreed measures incorporated into the evolving design of the Proposed Development (e.g. environmental treatments), standard measures (e.g. best practice construction management to control dust emissions) that are enforceable through planning conditions, and measures proposed in outline (e.g. off-site planting to provide visual screening to nearby residential dwellings) that may require further development and formal agreement to ensure their implementation.
- 4.3.18 The principles adopted in the identification and development of environmental mitigation for the Proposed Development are avoidance (wherever possible), reduction (where avoidance cannot be achieved) and compensation (where reduction is unachievable or would not achieve the required level of mitigation).

Significance of Environmental Effects

- 4.3.19 The significance of an environmental effect has been established by way of reference to the importance/value of affected resources; the number and sensitivity of affected receptors; impact magnitude, duration, frequency and extent of effect; and the reversibility of effect (or the extent to which the adverse effects can be effectively reduced).
- 4.3.20 The following generic significance criteria have been applied across the environmental aspects to ensure identified environmental effects are assessed in a comparable manner, except where such criteria are not applicable due to other prevailing topic-specific guidance (e.g. ecological impact assessment) and/or established standards and thresholds (e.g. National limit values for air emissions):

Table 4.1: Generic Significance Criteria

Level of effect	Description
Major	Very large or large change in environmental or socio-economic conditions. These effects, both adverse and beneficial, are likely to be important considerations at a national to regional level because they contribute to achieving national / regional objectives or are likely to result in exceedance of statutory objectives and/or breaches of legislation.
Moderate	Intermediate change in environmental or socio-economic conditions. These effects are likely to be important considerations at a regional and local level.
Minor	Small change in environmental or socio-economic conditions. These effects may be raised as local issues, but are unlikely to be of importance in the decision-making process.
Negligible	No discernible change in environmental or socio-economic conditions (i.e. variation within normal bounds or below measurable levels). An effect that is likely to have a negligible or neutral influence, irrespective of other effects.

- 4.3.21 Only major and moderate effects, which are likely to be factors in deciding whether a development is acceptable, are typically considered to be significant effects. Significance assumes only incorporated and standard mitigation measures are in place, these being the measures for which delivery and implementation can be secured.
- 4.3.22 The residual effects (i.e. the post-mitigation effects) of the Proposed Development are considered by the Scottish Ministers in the decision-making process when determining the S36 application.

4.4 Assessment Reporting

- 4.4.1 Each individual assessment follows a comparable format to ensure consistency in reporting the existing environmental conditions and the potential effects on them arising from implementation of the Proposed Development.
- **Introduction** introduces the assessment topic under consideration.
 - **Scope and Methodology** identifies and describes the scope of the assessment, the methods and criteria adopted, relevant guidance followed, and any assessment limitations, assumptions or difficulties encountered.
 - **Consultation Undertaken** summarises the stakeholder engagement including dialogue with statutory consultees and with other stakeholders and where relevant the influence on the EIA.
 - **Statutory and Planning Context** outlines statutes, guidance, policies and plans relevant to the environmental interests forming the focus of the assessment.
 - **Existing Environment** describes the features and characteristics associated with the baseline environment.
 - **Predicted Impacts** reports the predicted impacts on the baseline environment during the construction, operational and decommissioning phases.
 - **Mitigation** details all measures that have been incorporated into the design of the project and/or agreed as deliverable, including proposed monitoring where applicable.

- **Summary of Residual Effects** summarises the nature and significance of residual environmental effects that are predicted to remain, post-implementation of mitigation measures.

4.5 Difficulties and Uncertainties

- 4.5.1 The EIA was undertaken and the resulting EIAR has been compiled using the material made available to the EIA team by the client and members of their project team, together with other readily available and publicly accessible material including existing literature and studies, as well as personal communication with local experts. To the best of the EIA team's knowledge, the information used as a basis for the assessment is accurate and up to date. The team is not aware of any limitations of the underlying information or of any constraints that would materially affect the evaluations.
- 4.5.2 This EIAR has been based on the best available information at the time of publication. However, further information may become available during the detailed design phase that will be used to inform the project if relevant.
- 4.5.3 Assumptions adopted in the evaluation of impacts are reported in each of the relevant sections. However, these assumptions are often implicit and rely on expert judgement. Any assumptions and known technical deficiencies have been documented.
- 4.5.4 The EIA has been undertaken during the initial design phase of the project and therefore some of the technical aspects of the construction and operation have yet to be determined. Where an alternative option could cause additional impacts, these are discussed within the relevant sections. In addition, the EIA has taken a precautionary approach to adopt conservatism in the assumptions made and any scenarios assumed, so that a reasonable 'worst-case' scenario was assessed. Therefore, inherent uncertainties are accounted for and subsequent modifications to the project during the detailed design phase are less likely to fall outside of the assumed envelope of the assessment parameters.

4.6 References

Energy Consents Unit (2022), Scoping Opinion September 2022. Available at: <https://www.energyconsents.scot/ApplicationSearch.aspx>. Search for "Ben Aketil", ECU reference ECU00004552.

IEMA (2004), Guidelines for Environmental Impact Assessment.

NatureScot (2018), A handbook on environmental impact assessment: Guidance for competent authorities, consultees and others involved in the Environmental Impact Assessment process in Scotland V5.

RSK Environment Ltd (2020), The Repowered and Extended Ben Aketil Wind Farm Scoping Report. Dated Jul 2022. Available at: <https://www.energyconsents.scot/ApplicationSearch.aspx>. Search for "Ben Aketil", ECU reference ECU00004552.

Scottish Government (2017), Planning Circular 1/2017: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

Scottish Government (2013), Planning Advice Note 1/2013: Environmental Impact Assessment, published by the Scottish Government (2013).

5 PLANNING POLICY CONTEXT

5.1 Introduction

- 5.1.1 This Chapter of the Environmental Impact Assessment Report (EIAR) describes the legislative and policy background relevant to the Proposed Development. It refers to energy and planning policy at a national and local level. It provides an objective summary of the energy and planning policy considerations that have been taken into account in the preparation of the EIAR to ensure that it provides the appropriate information for the consideration of the application.
- 5.1.2 This Chapter does not include an assessment of the accordance of the Proposed Development against planning policy; a separate Planning Statement has been prepared to support the application and should be referred to for a detailed planning policy appraisal.

5.2 The Statutory Framework

The Electricity Act 1989

- 5.2.1 The Proposed Development will have an installed capacity of over 50 Megawatts (MW). In Scotland, onshore renewable energy developments that have capacity to generate over 50 MW require consent from the Scottish Ministers under the Electricity Act 1989 (the Electricity Act). In such cases, the Planning Authority is a statutory consultee in the development management process and procedures.
- 5.2.2 In an application under Section 36 of the Electricity Act the Development Plan does not have primacy in the decision-making process. The provisions of Schedule 9 of the Electricity Act are relevant to the assessment of the Proposed Development.
- 5.2.3 Schedule 9, Sub-paragraph 3(2), requires the Scottish Ministers to have regard to:
“(a) the desirability of the matters mentioned in paragraph (a) of sub-paragraph (1) above; and (b) the extent to which the person by whom the proposals were formulated has complied with his duty under paragraph (b) of the sub-paragraph”.
- 5.2.4 The matters referred to in Schedule 9 sub-paragraph 3(1) (a) and (b) of the Electricity Act do not apply to the Applicant, but the matters set out in sub-paragraph 3(1)(a) to which the Scottish Ministers must have regard are:
- 5.2.5 *“...the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest”.*
- 5.2.6 At sub-paragraph 3(3), the Scottish Ministers [are required to...]
- 5.2.7 *“avoid, so far as possible, causing injury to fisheries or to the stock of fish in any waters”.*
- 5.2.8 The provisions of Schedule 9 of the Electricity Act set out a number of features to which regard must be had by the Scottish Ministers and such features have been addressed in the EIA process.

- 5.2.9 The principal planning statute in Scotland is the Town and Country Planning Act (Scotland) 1997 (the 1997 Act) as amended by the Planning etc (Scotland) Act 2019 (the 2019 Act).
- 5.2.10 Section 57(2) of the 1997 Act provides that:
- 5.2.11 *“On granting a consent under section 36 or 37 of the Electricity Act 1989 in respect of any operation or change of use that constitutes development, the Scottish Ministers may direct that planning permission for that development and any ancillary development shall be deemed to be granted, subject to any conditions (if any) as may be specified in the direction”.*
- 5.2.12 Section 25 of the 1997 Act states that:
- 5.2.13 *“Where, in making any determination under the Planning Acts, regard is to be had to the development plan, the determination shall be made in accordance with the plan unless material considerations indicate otherwise”.*
- 5.2.14 Section 57(2) of the 1997 Act makes no reference to the provisions of section 25 which requires regard to be had to the provisions of the Development Plan. The Courts have confirmed that section 57(3) does not apply section 25 to a decision to make a direction to grant deemed planning permission pursuant to section 57(2)⁸.
- 5.2.15 The Scottish Ministers will determine the application having regard to the statutory duties in Schedule 8 and 9 of the Electricity Act, so far as relevant, and any other relevant material considerations, one of which will be relevant aspects of the statutory Development Plan.

5.3 Renewable Energy Policy: Summary

- 5.3.1 In recent years United Kingdom (UK) and Scottish Government policies have focussed increasingly on concerns about climate change. Each tier of Government has developed targets, policies and actions to achieve targets to deal with the climate crisis and generate more renewable energy and electricity.
- 5.3.2 The UK Government retains responsibility for the overall direction of energy policy, although some elements are devolved to the Scottish Government. The UK Government has published a series of policy documents setting out how targets can be achieved. Onshore wind generation, located in Scotland, is identified as an important technology to achieve the various goals set.
- 5.3.3 The Scottish Government has published a number of policy documents and has set its own targets. The most relevant policy, legislative documents and recent statements published by the Scottish Government include:
- Draft Energy Strategy and Just Transition Plan – delivering a fair and secure zero carbon energy system for Scotland (January 2023);
 - Onshore Wind Policy Statement (December 2022);
 - The Scottish Government’s ‘Programme for Government’ (September 2022);
 - The Climate Change (Emissions Reductions Targets) (Scotland) Act 2019 and the legally binding net zero target for 2045 and interim targets for 2030 and 2040;

⁸ William Grant & Sons Distillers Limited, Court of Session [2012] CSIH 28.

- The Scottish Climate Change Plan Update (2020);
 - The Scottish Government's declaration of a Climate Emergency (April 2019);
 - Onshore Wind Policy Statement (December 2017);
 - Scottish Energy Strategy (December 2017) and
 - The Letter from Chief Planned to all Heads of Planning in relation to energy targets and SPP (November 2015).
- 5.3.4 The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 requires that "The Scottish Ministers must ensure that the net Scottish emissions account for the net-zero emissions target year is at least 100% lower than the baseline (the target is known as the "net zero emissions target")". The target year is 2045 and the Act also sets out challenging interim targets. It requires that:
- 5.3.5 *"The Scottish Ministers must ensure that the net Scottish emissions account for the year-*
- (a) 2020 is at least 56% lower than the baseline.*
 - (b) 2030 is at least 75% lower than the baseline, and*
 - (c) 2040 is at least 90% lower than the baseline".*
- 5.3.6 It is important to note that these targets are minimum targets, they are not maximums or aspirations. The targets legally bind the Scottish Ministers and have largely been legislated to set the framework for Scotland's response to the Climate Emergency.
- 5.3.7 The Proposed Development related to the generation of electricity from renewable energy sources and comes as a direct response to national planning and energy policy objectives. The Proposed Development would make a contribution to the attainment of emissions reduction, renewable energy and electricity targets at both the Scottish and UK levels. Detailed reference to the renewable energy policy framework is provided in the Planning Statement.

5.4 National Planning Policy

National Planning Framework 4

Procedure and implementation

- 5.4.1 NPF4 has been subject to consultation and Parliamentary Scrutiny over the last year since it was first laid before Parliament in November 2021. The Revised Draft NPF4 was laid before Parliament on 8th November 2022, accompanied by an Explanatory Report setting out how the Scottish Government considered responses to the initial draft and explaining responses to scrutiny and consultation thereof. Revised Draft NPF4 was approved by the Scottish Parliament, without amendments, following a vote on 11th January 2023. NPF4 came into force at 9am on 13 February 2023.
- 5.4.2 Section 13, of the 2019 Act amends Section 24 of the 1997 Act regarding the meaning of the statutory Development Plan, such that for the purposes of the 1997 Act, the Development Plan for an area is taken to consist of the provisions of:
- The National Planning Framework;
 - Any Strategic Development Plan; and
 - Any local Development Plan (LDP).

- 5.4.3 NPF4 therefore now forms part of the statutory Development Plan and should be afforded substantial weight. A key provision of the 2019 Act is that in the event of any incompatibility between the provisions of NPF4 and a provision of a Local Development Plan (LDP), then whichever of them is the later in date will prevail. That will include where a LDP is silent on an issue that is now provided for in NPF4.
- 5.4.4 Section 13 of the 2019 Act amends Section 24 of the 1997 Act to provide that:
- 5.4.5 *"In the event of any incompatibility between a provision of the National Planning Framework and a provision of a local development plan, whichever of them is the later in date is to prevail".*
- 5.4.6 In Highland, there is no Strategic Development Plan. The Highland Wide LDP (HwLDP) was adopted in 2012. Key provisions of the LDP are addressed below, however, it makes no mention of Net Zero and contains a Spatial Framework approach to wind energy which is inconsistent with NPF4. Moreover, the HwLDP contain policies which are now inconsistent with national policy in NPF4, and this will reduce the weight to be afforded to this element of the Development Plan. This matter is examined in more detail in the Planning Statement.
- 5.4.7 As explained, for the purposes of Section 36 decision making, Section 25 of the 1997 Act is not engaged, NPF4 however forms a significant material consideration in the overall decision-making process.

National Developments

- 5.4.8 NPF4 sets the approach to planning and development to help achieve a net zero, sustainable Scotland by 2045. It continues the planning policy approach of identifying 'national developments' which refers to the allocation of national development status to certain classes of development. There are three categories of national development proposed namely 'liveable places, productive places and distinctive places'.
- 5.4.9 Page 97 of NPF4 sets out that 18 National Developments (NAD) have been identified. These are described as: "significant developments of national importance that will help to deliver the spatial strategy ... National development status does not grant planning permission for the development and all relevant consents are required".
- 5.4.10 It adds that:
- 5.4.11 *"Their designation means that the principle for development does not need to be agreed in later consenting processes, providing more certainty for communities, businesses and investors. ... In addition to the statement of need at Annex B, decision makers for applications for consent for national developments should take into account all relevant policies".*
- 5.4.12 Annex B of NPF4 sets out the various NADs and its related Statements of Need. It explains that NADs are significant developments of national importance that will help to deliver the Spatial Strategy. It states (page 99) that:
- 5.4.13 *"The statements of need set out in this annex are a requirement of the Town and Country Planning (Scotland) Act 1997 and describe the development to be considered as a national development for consent handling purposes".*

National Development 3 "Strategic Renewable Electricity Generation and Transmission Infrastructure"

- 5.4.14 Page 103 of NPF4 describes NAD3 and it states:
- 5.4.15 *"This national development supports renewable electricity generation, repowering, and expansion of the electricity grid.*
- 5.4.16 *A large and rapid increase in electricity generation from renewable sources will be essential for Scotland to meet its net zero emissions targets. Certain types of renewable electricity generation will also be required, which will include energy storage technology and capacity, to provide the vital services, including flexible response, that a zero carbon network will require. Generation is for domestic consumption as well as for export to the UK and beyond, with new capacity helping to decarbonise heat, transport and industrial energy demand. This has the potential to support jobs and business investment, with wider economic benefits.*
- 5.4.17 *The electricity transmission grid will need substantial reinforcement including the addition of new infrastructure to connect and transmit the output from new on and offshore capacity to consumers in Scotland, the rest of the UK and beyond. Delivery of this national development will be informed by market, policy and regulatory developments and decisions."*
- 5.4.18 The location for NAD3 is set out as being all of Scotland and in terms of need it is described as:
- 5.4.19 *"Additional electricity generation from renewables and electricity transmission capacity of scale is fundamental to achieving a net zero economy and supports improved network resilience in rural and island areas."*
- 5.4.20 Reference is made to the designation and classes of development which would qualify as NAD3, and it states in this regard:
- 5.4.21 *"A development contributing to 'Strategic Renewable Electricity Generation and Transmission' in the location described, within one or more of the Classes of Development described below and that is of a scale or type that would otherwise have been classified as 'major' by 'The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009', is designated a national development:*
- (a) on and off-shore electricity generation, including electricity storage, from renewables exceeding 50 megawatts capacity;*
- (b) new and/or replacement upgraded on and offshore high voltage electricity transmission lines, cables and interconnectors of 132kv or more; and*
- (c) new and/or upgraded Infrastructure directly supporting on and offshore high voltage electricity lines, cables and interconnectors including converter stations, switching stations and substations."*
- 5.4.22 The Proposed Development, having a capacity which materially exceeds the 50 MW threshold set for a NAD and is classified as 'major' development by The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009 means it would have national development status as per these provisions of NPF4. The Proposed Development is of national importance for the delivery of the national Spatial Strategy.

- 5.4.23 The Strategy requires a “large and rapid increase” in electricity generation from renewables and the National Spatial Strategy makes it clear (NPF4, page 6) that “*we must make significant progress*” by 2030.

National Planning Policy

- 5.4.24 Part 2 of the NPF contains proposed new ‘National Planning Policy’. The ‘lead’ policies of relevance to the Proposed Development are Policies 1 and 11.
- 5.4.25 **Policy 1 entitled ‘Tackling the climate and nature crisis’** states that: “*when considering all development proposals significant weight will be given to the global climate and nature crisis*”.
- 5.4.26 **Policy 11 Energy** has a stated intent: “*To encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies including hydrogen and carbon capture utilisations and storage (CCUS)*”.
- 5.4.27 The desired outcome of this policy is stated as an “*Expansion of renewable, low carbon and zero emissions technologies*”.
- 5.4.28 LDPs are directed to seek to realise their area’s full potential for electricity and heat from renewable, low carbon and zero emissions sources by identifying a range of opportunities for energy development.
- 5.4.29 Policy 11, Energy states:
- 5.4.30 “a) development proposals for all forms of renewable, low carbon and zero emissions technologies will be supported these include:
- i. *Wind farms including repowering, extending, expanding and extending the life of existing wind farms.*
 - ii. *Enabling works such as grid transmission and distribution infrastructure;*
 - iii. *Energy storage such as batter storage and pumped storage hydro;*
 - iv. *Small scale renewable energy generation technology;*
 - v. *Solar arrays;*
 - vi. *Proposals associated with negative emissions technologies and carbon capture; and*
 - vii. *Proposals including co-location of these technologies.*
- 5.4.31 b) development proposals for wind farms in National Park and National Scenic Areas will not be supported.
- 5.4.32 c) development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities.
- 5.4.33 d) development proposals that impact on international or national designations will be assessed in relation to Policy 4.
- 5.4.34 e) in addition, project design and mitigation will demonstrate how the following impacts are addressed:
- i. *impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and shadow flicker;*

- ii. *significant landscape and visual impacts, recognising that some impacts are to be expected from some forms of renewable energy. Where impacts are localised and /or appropriate design mitigation has been applied, they will generally be considered to be acceptable.*
 - iii. *public access, including impact on long distance walking and cycling routes and scenic routes;*
 - iv. *impacts on aviation and defence interests including seismological recording;*
 - v. *impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised;*
 - vi. *impacts on road traffic and on adjacent trunk roads, including during construction;*
 - vii. *impacts on historic environment;*
 - viii. *effects on hydrology, the water environment and flood risk;*
 - ix. *biodiversity including impacts on birds;*
 - x. *impacts on trees, woods and forests;*
 - xi. *proposals for the decommissioning of developments, including ancillary infrastructure, and site restoration;*
 - xii. *the quality of site restoration plans including the measures in place to safeguard or guarantee availability of finances to effectively implement those plans; and*
 - xiii. *cumulative impacts.*
- 5.4.35 In considering these impacts, significant weight will be placed on the contribution of the proposal to renewable energy generation targets and on greenhouse gas emissions reduction targets.
- 5.4.36 Grid capacity should not constrain renewable energy development, it is for developers to agree connections to the grid with the relevant network operator. In the case of proposals for grid infrastructure, consideration should be given to underground connections where possible.
- 5.4.37 f) consents for development proposals may be time limited. Areas identified for wind farms are, however, expected to be suitable for use in perpetuity.
- 5.4.38 The other policies of most relevance in NPF4, are as follows:
- Policy 3 – Biodiversity;
 - Policy 4 – Natural Places;
 - Policy 5 – Soils;
 - Policy 6 – Forestry, Woodland and trees; and
 - Policy 7 – Historic assets and places.
- 5.4.39 **Policy 3 – Biodiversity** seeks to protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen nature networks with an outcome of ensuring biodiversity is enhance and better connected. Policy 3 states:
- 5.4.40 “LDPs should protect, conserve, restore and enhance biodiversity in line with the mitigation hierarchy. They should also promote nature recovery and nature restoration across the development plan area, including by: facilitating the creation of nature networks and strengthening connections between them to support improved ecological connectivity; restoring degraded habitats or creating new habitats; and incorporating measures to increase biodiversity, including populations of priority species.
- 5.4.41 a) Development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature

networks and the connections between them. Proposals should also integrate nature-based solutions, where possible.

- 5.4.42 b) Development proposals for national or major development, or for development that requires an Environmental Impact Assessment will only be supported where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention. This will include future management. To inform this, best practice assessment methods should be used. Proposals within these categories will demonstrate how they have met all of the following criteria:

i. the proposal is based on an understanding of the existing characteristics of the site and its local, regional and national ecological context prior to development, including the presence of any irreplaceable habitats;

ii. wherever feasible, nature-based solutions have been integrated and made best use of;

iii. an assessment of potential negative effects which should be fully mitigated in line with the mitigation hierarchy prior to identifying enhancements;

iv. significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty. Management arrangements for their long-term retention and monitoring should be included, wherever appropriate; and

v. local community benefits of the biodiversity and/or nature networks have been considered.

- 5.4.43 c) Proposals for local development will include appropriate measures to conserve, restore and enhance biodiversity, in accordance with national and local guidance. Measures should be proportionate to the nature and scale of development. Applications for individual householder development, or which fall within scope of (b) above, are excluded from this requirement.

- 5.4.44 d) Any potential adverse impacts, including cumulative impacts, of development proposals on biodiversity, nature networks and the natural environment will be minimised through careful planning and design. This will take into account the need to reverse biodiversity loss, safeguard the ecosystem services that the natural environment provides, and build resilience by enhancing nature networks and maximising the potential for restoration”.

- 5.4.45 **Policy 4 – Natural Places** seeks to protect, restore and enhance natural assets making best use of nature-based solutions and states:

- 5.4.46 “LDPs will identify and protect locally, regionally, nationally and internationally important natural assets, on land and along coasts. The spatial strategy should safeguard them and take into account the objectives and level of their protected status in allocating land for development. Spatial strategies should also better connect nature rich areas by establishing and growing nature networks to help protect and restore the biodiversity, ecosystems and natural processes in their area.

5.4.47 Policy 4

a) Development proposals which by virtue of type, location or scale will have an unacceptable impact on the natural environment, will not be supported.

b) Development proposals that are likely to have a significant effect on an existing or proposed European site (Special Area of Conservation or Special Protection Areas) and are not directly connected with or necessary to their conservation management are required to be subject to an “appropriate assessment” of the implications for the conservation objectives.

c) Development proposals that will affect a National Park, National Scenic Area, Site of Special Scientific Interest or a National Nature Reserve will only be supported where:

i. The objectives of designation and the overall integrity of the areas will not be compromised; or

ii. Any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance. All Ramsar sites are also European sites and/or Sites of Special Scientific Interest and are extended protection under the relevant statutory regimes.

5.4.48 d) Development proposals that affect a site designated as a local nature conservation site or landscape area in the LDP will only be supported where:

i. Development will not have significant adverse effects on the integrity of the area or the qualities for which it has been identified; or

ii. Any significant adverse effects on the integrity of the area are clearly outweighed by social, environmental or economic benefits of at least local importance.

5.4.49 e) The precautionary principle will be applied in accordance with relevant legislation and Scottish Government guidance.

5.4.50 f) Development proposals that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present on a site or may be affected by a proposed development, steps must be taken to establish its presence. The level of protection required by legislation must be factored into the planning and design of development, and potential impacts must be fully considered prior to the determination of any application

5.4.51 g) Development proposals in areas identified as wild land in the Nature Scot Wild Land Areas map will only be supported where the proposal:

i. will support meeting renewable energy targets; or,

ii. is for small scale development directly linked to a rural business or croft, or is required to support a fragile community in a rural area. All such proposals must be accompanied by a wild land impact assessment which sets out how design, siting, or other mitigation measures have been and will be used to minimise significant impacts on the qualities of the wild land, as well as any management and monitoring arrangements where appropriate. Buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration”.

5.4.52 **Policy 5 – Soils** seeks to protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development and states:

- 5.4.53 “LDPs should protect locally, regionally, nationally and internationally valued soils, including land of lesser quality that is culturally or locally important for primary use.
- 5.4.54 Policy 5
- 5.4.55 a) Development proposals will only be supported if they are designed and constructed:
- i. In accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land; and*
 - ii. In a manner that protects soil from damage including from compaction and erosion, and that minimises soil sealing.*
- 5.4.56 b) Development proposals on prime agricultural land, or land of lesser quality that is culturally or locally important for primary use, as identified by the LDP, will only be supported where it is for:
- i. Essential infrastructure and there is a specific locational need and no other suitable site;*
 - ii. Small-scale development directly linked to a rural business, farm or croft or for essential workers for the rural business to be able to live onsite;*
 - iii. The development of production and processing facilities associated with the land produce where no other local site is suitable;*
 - iv. The generation of energy from renewable sources or the extraction of minerals and there is secure provision for restoration; and*
- 5.4.57 In all of the above exceptions, the layout and design of the proposal minimises the amount of protected land that is required.
- 5.4.58 c) Development proposals on peatland, carbon rich soils and priority peatland habitat will only be supported for:
- i. Essential infrastructure and there is a specific locational need and no other suitable site;*
 - ii. The generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets;*
 - iii. Small-scale development directly linked to a rural business, farm or croft;*
 - iv. Supporting a fragile community in a rural or island area; or*
 - v. Restoration of peatland habitats.*
- 5.4.59 d) Where development on peatland, carbon-rich soils or priority peatland habitat is proposed, a detailed site specific assessment will be required to identify:
- i. the baseline depth, habitat condition, quality and stability of carbon rich soils;*
 - ii. the likely effects of the development on peatland, including on soil disturbance; and*
 - iii. the likely net effects of the development on climate emissions and loss of carbon. This assessment should inform careful project design and ensure, in accordance with relevant guidance and the mitigation hierarchy, that adverse impacts are first avoided and then minimised through best practice.*
- 5.4.60 A peat management plan will be required to demonstrate that this approach has been followed, alongside other appropriate plans required for restoring and/ or enhancing the site into a functioning peatland system capable of achieving carbon sequestration.

- 5.4.61 e) Development proposals for new commercial peat extraction, including extensions to existing sites, will only be supported where:
- i. *the extracted peat is supporting the Scottish whisky industry;*
 - ii. *there is no reasonable substitute;*
 - iii. *the area of extraction is the minimum necessary and the proposal retains an in-situ residual depth of part of at least 1 metre across the whole site, including drainage features;*
 - iv. *the time period for extraction is the minimum necessary; and*
 - v. *there is an agreed comprehensive site restoration plan which will progressively restore, over a reasonable timescale, the area of extraction to a functioning peatland system capable of achieving carbon sequestration”.*
- 5.4.62 **Policy 6 – Forestry, Woodland and trees** seeks to protect and expand forests, woodland and trees and states:
- 5.4.63 “LDPs should identify and protect existing woodland and the potential for its enhancement or expansion to avoid habitat fragmentation and improve ecological connectivity, helping to support and expand nature networks. The spatial strategy should identify and set out proposals for forestry, woodlands and trees in the area, including their development, protection and enhancement, resilience to climate change, and the expansion of a range of types to provide multiple benefits. This will be supported and informed by an up to date Forestry and Woodland Strategy.
- 5.4.64 Policy 6
- 5.4.65 a) Development proposals that enhance, expand and improve woodland and tree cover will be supported;
- 5.4.66 b) Development proposals will not be supported where they will result in:
- i. *Any loss of ancient woodlands, ancient and veteran trees, or adverse impact on their ecological condition;*
 - ii. *Adverse impacts on native woodlands, hedgerow and individual trees of high biodiversity value, or identified for protection in the Forestry and Woodland Strategy;*
 - iii. *Fragmenting or severing woodland habitats, unless appropriate mitigation measures are identified and implemented in line with the mitigation hierarchy;*
 - iv. *Conflict with Restocking Direction, Remedial Notice or Registered Notice to Comply issued by Scottish Forestry.*
- 5.4.67 c) Development proposals involving woodland removal will only be supported where they will achieve significant and clearly defined additional public benefits in accordance with relevant Scottish Government policy on woodland removal. Where woodland is removed, compensatory planting will most likely be expected to be delivered.
- 5.4.68 d) Development proposals on site which include an area of existing woodland or land identified in the Forestry and Woodland Strategy as being suitable for woodland creation will only be supported where the enhancement and improvement of woodlands and the planting of new trees on the site (in accordance with the Forestry and Woodland Strategy) are integrated into the design”.

5.5 National Planning Guidance

5.5.1 Planning Advice Notes (PANs) set out detailed advice from the Scottish Government in relation to a number of land use planning topics. Relevant PANs are summarised in **Table 5.1** below.

Table 5.1 Relevant PANs

Title	Summary of Document
PAN 1/2013 Environmental Impact Assessment High	Provides information on the role local authorities and consultees play as part of the EIA process, and how the EIA can inform development management.
PAN 60 (2000) Planning for Natural Heritage	Advises developers on the importance of discussing their proposals with the planning authority and Scottish Natural Heritage (SNH) (now NatureScot) and use of the EIA process to identify the environmental effects of development proposals and seek to prevent, reduce and offset any adverse effects in ecology and biodiversity.
PAN 61 (2001) Sustainable Urban Drainage Systems	Good practice drainage guidance.
PAN 75 (2005) Planning for Transport	The objective of PAN 75 is to integrate development plans and transport strategies to optimise opportunities for sustainable development and create successful transport outcomes.
PAN 1/2011 Planning and Noise	This PAN provides advice on the role of the planning system in helping to prevent and/ or mitigate any potential adverse effects of noise. It promotes the principles of good acoustic design and promotes a sensitive approach to the location of new development.
PAN 2/2011 Planning and Archaeology	The PAN is intended to inform local authorities and other organisations of how to process any archaeological scope of works within the planning process.
PAN 51 Planning, Environmental Protection and Regulation (Revised 2006)	Details the role of the planning system in relation to the environmental protection regimes.

5.6 Other Development Plan Documents & Relevant Policies

5.6.1 Other Development Plan documents for the area comprise:

- The Highland Wide Local Development Plan (HwLDP) (2012);
- The West Highlands and Islands Development Plan (WestPlan) (2019); and
- Relevant supplementary guidance, particularly the Onshore Wind Energy Supplementary Guidance (OWESG) (2016) and Addendum Supplementary Guidance: Part 2b (2017).

5.6.2 The following sections provide an overview of the planning policies of relevance to the Proposed Development in relation to these other Development Plan documents. The focus is in relation to the HwLDP which contains the relevant development management policies. As noted above, further details of the planning policy framework and discussion

as to how the Proposed Development accords with the policy framework are included in the Planning Statement which accompanies the application for consent.

HwLDP Policies

Overview of Relevant Policies

- 5.6.3 The policies of most relevance in the HwLDP are set out below. Policy 67 is the lead policy. If there are tensions between policies in the HwLDP, then policy 67 should prevail given it is specific to the land use proposed by the Development.
- 5.6.4 The policies of most relevance in the HwLDP are as follows:
- Policy 67 – Renewable Energy Developments;
 - Policy 57 – Natural, Built, and Cultural Heritage;
 - Policy 61 – Landscape;
 - Policy 55 – Peat and Soils;
 - Policy 58 – Protected Species;
 - Policy 59 – Other Important Species; and
 - Policy 60 – Other Important Habitats.
- 5.6.5 These policies are set out in full below.
- 5.6.6 Other HwLDP policies which need to be taken into consideration include the following (it should be noted that these policies contain matters already covered by the comprehensive scope of Policy 67):
- Policy 28 – Sustainable Design;
 - Policy 30 – Physical Constraints;
 - Policy 31 – Developer Contributions;
 - Policy 56 – Travel;
 - Policy 63 – Water Environment;
 - Policy 66 – Surface Water Drainage;
 - Policy 69 – Electricity Transmission Infrastructure; and
 - Policy 70 – Public Access.

Policy 67 – ‘Renewable Energy Developments’ states:

- 5.6.7 “Renewable energy development proposals should be well related to the source of the primary renewable resources that are needed for their operation. The Council will also consider:
- *the contribution of the proposed development towards meeting renewable energy generation targets; and*
 - *any positive or negative effects it is likely to have on the local and national economy;*
- 5.6.8 and will assess proposals against other policies of the development plan, the Highland Renewable Energy Strategy and Planning Guidelines and have regard to any other material considerations, including proposals able to demonstrate significant benefits including by making effective use of existing and proposed infrastructure or facilities.

- 5.6.9 Subject to balancing with these considerations and taking into account any mitigation measures to be included, the Council will support proposals where it is satisfied that they are located, sited and designed such that they will not be significantly detrimental overall, either individually or cumulatively with other developments (see Glossary), having regard in particular to any significant effects on the following:
- *natural, built and cultural heritage features;*
 - *species and habitats;*
 - *visual impact and impact on the landscape character of the surrounding area (the design and location of the proposal should reflect the scale and character of the landscape and seek to minimise landscape and visual impact, subject to any other considerations);*
 - *amenity at sensitive locations, including residential properties, workplaces and recognised visitor sites (in or out with a settlement boundary);*
 - *the safety and amenity of any regularly occupied buildings and the grounds that they occupy- having regard to visual intrusion or the likely effect of noise generation and, in the case of wind energy proposals, ice throw in winter conditions, shadow flicker or shadow throw, ground water, surface water (including water supply), aquatic ecosystems and fisheries;*
 - *the safe use of airport, defence or emergency service operations, including flight activity, navigation and surveillance systems and associated infrastructure, or on aircraft flight paths or MoD low-flying areas; other communications installations or the quality of radio or TV reception;*
 - *the amenity of users of any Core Path or other established public access for walking, cycling or horse riding;*
 - *tourism and recreation interests; and*
 - *water-based traffic and transport interests.*
- 5.6.10 Proposals for the extension of existing renewable energy facilities will be assessed against the same criteria and material considerations as apply to proposals for new facilities.
- 5.6.11 In all cases, if consent is granted, the Council will approve appropriate conditions (along with a legal agreement/obligation under section 75 of the Town and Country Planning (Scotland) Act 1997, as amended, where necessary), relating to the removal of the development and associated equipment and to the restoration of the site, whenever the consent expires, other than in circumstances where fresh consent has been secured to extend the life of the project, or the project ceases to operate for a specific period.
- 5.6.12 The Onshore Wind Energy Supplementary Guidance will replace parts of the Highland Renewable Energy Strategy. It will identify; areas to be afforded protection from wind farms, other areas with constraints, and broad areas of search for wind farms. It will set out criteria for the consideration of proposals. It will ensure that developers are aware of the key constraints to such development and encourage them to take those constraints into account at the outset of the preparation of proposals. It will seek to steer proposals, especially those for larger wind farms, away from the most constrained areas and ideally towards the least constrained areas and areas of particular opportunity. It will also set out criteria which will apply to the consideration of proposals irrespective of size and where they are located, enabling proposals to be considered on their merits. It will seek submission as part of the planning application of key information required for the

assessment of proposals and provide certainty for all concerned about how applications will be considered by the Council.”

Policy 57 – ‘Natural, Built and Cultural Heritage’ states:

- 5.6.13 “All development proposals will be assessed taking into account the level of importance and type of heritage features, the form and scale of the development, and any impact on the feature and its setting, in the context of the policy framework detailed in Appendix 2. The following criteria will also apply:
- 5.6.14 1. For features of local/regional importance we will allow developments if it can be satisfactorily demonstrated that they will not have an unacceptable impact on the natural environment, amenity and heritage resource.
- 5.6.15 2. For features of national importance we will allow developments that can be shown not to compromise the natural environment, amenity and heritage resource. Where there may be any significant adverse effects, these must be clearly outweighed by social or economic benefits of national importance. It must also be shown that the development will support communities in fragile areas who are having difficulties in keeping their population and services.
- 5.6.16 3. For features of international importance developments likely to have a significant effect on a site, either alone or in combination with other plans or projects, and which are not directly connected with or necessary to the management of the site for nature conservation will be subject to an appropriate assessment. Where we are unable to ascertain that a proposal will not adversely affect the integrity of a site, we will only allow development if there is no alternative solution and there are imperative reasons of overriding public interest, including those of a social or economic nature. Where a priority habitat or species (as defined in Annex 1 of the Habitats Directive) would be affected, development in such circumstances will only be allowed if the reasons for overriding public interest relate to human health, public safety, beneficial consequences of primary importance for the environment, or other reasons subject to the opinion of the European Commission (via Scottish Ministers). Where we are unable to ascertain that a proposal will not adversely affect the integrity of a site, the proposal will not be in accordance with the development plan within the meaning of Section 25(1) of the Town and Country Planning (Scotland) Act 1997.
- 5.6.17 Note: Whilst Appendix 2 groups features under the headings international, national and local/regional importance, this does not suggest that the relevant policy framework will be any less rigorously applied. This policy should also be read in conjunction with the Proposal map.
- 5.6.18 The Council intends to adopt the Supplementary Guidance on Wild Areas in due course. The main principles of this guidance will be:
 - *to provide mapping of wild areas;*
 - *to give advice on how best to accommodate change within wild areas whilst safeguarding their qualities;*
 - *to give advice on what an unacceptable impact is; and*
 - *to give guidance on how wild areas could be adversely affected by development close to but not within the wild area itself.*

5.6.19 In due course the Council also intends to adopt the Supplementary Guidance on the Highland Historic Environment Strategy. The main principles of this guidance will ensure that:

- *Future developments take account of the historic environment and that they are of a design and quality to enhance the historic environment bringing both economic and social benefits.*
- *It sets a proactive, consistent approach to the protection of the historic environment."*

Policy 61 – 'Landscape' states:

5.6.20 "New developments should be designed to reflect the landscape characteristics and special qualities identified in the Landscape Character Assessment of the area in which they are proposed. This will include consideration of the appropriate scale, form, pattern and construction materials, as well as the potential cumulative effect of developments where this may be an issue. The Council would wish to encourage those undertaking development to include measures to enhance the landscape characteristics of the area. This will apply particularly where the condition of the landscape characteristics has deteriorated to such an extent that there has been a loss of landscape quality or distinctive sense of place. In the assessment of new developments, the Council will take account of Landscape Character Assessments, Landscape Capacity Studies and its supplementary guidance on Siting and Design and Sustainable Design, together with any other relevant design guidance."

Policy 55 – 'Peat and Soils' states:

5.6.21 "Development proposals should demonstrate how they have avoided unnecessary disturbance, degradation or erosion of peat and soils.

5.6.22 Unacceptable disturbance of peat will not be permitted unless it is shown that the adverse effects of such disturbance are clearly outweighed by social, environmental or economic benefits arising from the development proposal.

5.6.23 Where development on peat is clearly demonstrated to be unavoidable then The Council may ask for a peatland management plan to be submitted which clearly demonstrates how impacts have been minimised and mitigated.

5.6.24 New areas of commercial peat extraction will not be supported unless it can be shown that it is an area of degraded peatland which is clearly demonstrated to have been significantly damaged by human activity and has low conservation value and as a result restoration is not possible.

5.6.25 Proposals must also demonstrate to the Council's satisfaction that extraction would not adversely affect the integrity of nearby Natura sites containing areas of peatland."

5.6.26 Policy 58 – 'Protected Species' states:

5.6.27 "Where there is good reason to believe that a protected species may be present on site or may be affected by a proposed development, we will require a survey to be carried out to establish any such presence and if necessary, a mitigation plan to avoid or minimise any impacts on the species, before determining the application.

5.6.28 Development that is likely to have an adverse effect, individually and/or cumulatively, on European Protected Species (see Glossary) will only be permitted where:

- *There is no satisfactory alternative; and*
- *The development is required for preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment; and*
- *The development will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.*
- *Development that is likely to have an adverse effect, individually and/or cumulatively, on protected bird species (see Glossary) will only be permitted where:*
 - *There is no other satisfactory solution; and*
 - *The development is required in the interests of public health or public safety.*
 - *This will include but is not limited to avoiding adverse effects, individually and/or cumulatively, on the populations of the following priority protected bird species:*
 - *Species listed in Annex 1 of the EC Birds Directive;*
 - *Regularly occurring migratory species listed in Annex II of the Birds Directive;*
 - *Species listed in Schedule 1 of the Wildlife and Countryside Act 1981 as amended;*
 - *and*
 - *Birds of conservation concern.*

5.6.29 Development that is likely to have an adverse effect, individually and/or cumulatively (see glossary), on other protected animals and plants (see Glossary) will only be permitted where the development is required for preserving public health or public safety.

5.6.30 Development proposals should avoid adverse disturbance, including cumulatively, to badgers and badger setts, protected under the Protection of Badgers Act 1992 (as amended by the Nature Conservation (Scotland) Act 2004.)

Policy 59 – ‘Other Important Species’ states:

5.6.31 “The Council will have regard to the presence of and any adverse effects of development proposals, either individually and/or cumulatively, on the Other Important Species which are included in the lists below, if these are not already protected by other legislation or by nature conservation site designations:

- *Species listed in Annexes II and V of the EC Habitats Directive;*
- *Priority species listed in the UK and Local Biodiversity Action Plans; and*
- *Species included on the Scottish Biodiversity List.”*

Policy 60 – ‘Other Important Habitats and Article 10 Features’ states:

5.6.32 “The Council will seek to safeguard the integrity of features of the landscape which are of major importance because of their linear and continuous structure or combination as habitat “stepping stones” for the movement of wild fauna and flora (Article 10 Features). The Council will also seek to create new habitats which are supportive of this concept. The Council will have regard to the value of the following Other Important Habitats, where not protected by nature conservation site designations (such as natural water courses),

in the assessment of any development proposals which may affect them either individually and/or cumulatively:

- *Habitats listed in Annex I of the EC Habitats Directive;*
- *Habitats of priority and protected bird species (see Glossary);*
- *Priority habitats listed in the UK and Local Biodiversity Action Plans; and*
- *Habitats included on the Scottish Biodiversity List.*

5.6.33 The Council will use conditions and agreements to ensure that significant harm to the ecological function and integrity of Article 10 Features and Other Important Habitats is avoided. Where it is judged that the reasons in favour of a development clearly outweigh the desirability of retaining those important habitats, the Council will seek to put in place satisfactory mitigation measures, including where appropriate consideration of compensatory habitat creation.”

5.7 Onshore Wind Supplementary Guidance

5.7.1 The Council adopted its Supplementary Guidance (OWESG) on wind energy in November 2016 and this forms part of the statutory Development Plan. Section 1 ‘Introduction’ states:

5.7.2 “The advice that follows provides a fuller interpretation of HwLDP policies as they relate to onshore wind energy development. The Council will balance these considerations with wider strategic and environmental and economic objectives including sustainable economic growth in the Highlands, and our contribution to renewable energy targets and tackling climate change....”

5.7.3 Section 2 of the OWESG includes a Spatial Framework, however this follows the approach of Table 1 in the former Scottish Planning Policy (SPP) which has now been superseded by NPF4

5.7.4 Section 4 of the OWESG sets out “*key development plan considerations*” and the topic headings broadly follow those as set out within policy 67 of the HwLDP. The topic headings, to which additional guidance is provided, broadly follow those as set out within HwLDP Policy 67 and are summarised as follows:

- Landscape and Visual Effects;
- Safety and Amenity at Sensitive Locations;
- Safety of Airport, Defence and Emergency Service Operations;
- Operational Efficiency of Other Communications;
- Operational Efficiency of Wind Energy Developments;
- The Natural and Historic Environment;
- The Water Environment;
- Peat;
- Trees and Woodland;
- Tourism and Recreation;
- Public Access;
- Traffic and Transport Interests;
- Electricity and Gas Infrastructure;
- Noise Assessment;

- Borrow Pits;
- Mitigation;
- Construction Environmental Management Plans;
- Restoration Bonds; and
- Repowering.

5.7.5 At paragraph 4.16, the OWESG sets out that “the following criteria set out key landscape and visual aspects that the Council will use as a framework and focus for assessing proposals, including discussions with Applicants”. The criteria together with the ‘measures’ for development are as follows:

Table 5.2: Criteria & Framework of ‘Landscape & Visual Aspects in the OWESG

Document	Summary
Criterion 1: Relationship between Settlements/Key locations and wider landscape respected	
<ul style="list-style-type: none"> • The extent to which the proposal contributes to perception of settlements or key locations being encircled by wind energy development. • Development should seek to achieve a threshold where: Turbines are not visually prominent in the majority of views within or from settlements/Key Locations or from the majority of its access routes. 	
Criterion 2: Key Gateway locations and routes are respected	
<ul style="list-style-type: none"> • The extent to which the proposal reduces or detracts from the transitional experience of key Gateway Locations and routes. • Development should seek to achieve a threshold where: Wind Turbines or other infrastructure do not overwhelm or otherwise detract from landscape characteristics which contribute the distinctive transitional experience found at key gateway locations and routes. 	
Criterion 3: Valued natural and cultural landmarks are respected	
<ul style="list-style-type: none"> • The extent to which the proposal affects the fabric and setting of valued natural and cultural landmarks. • Development should seek to achieve a threshold where: The development does not, by its presence, diminish the prominence of the landmark or disrupt its relationship to its setting. 	
Criterion 4: The amenity of key recreational routes and ways is respected	
<ul style="list-style-type: none"> • The extent to which the proposal affects the amenity of key recreational routes and ways (e.g. Core Paths, Munros and Corbetts, Long Distance Routes etc.) • Development should seek to achieve a threshold where: Wind Turbines or other infrastructure do not overwhelm or otherwise significantly detract from the visual appeal of key routes and ways. 	
Criterion 5: The amenity of transport routes is respected	
<ul style="list-style-type: none"> • The extent to which the proposal affects the amenity of transport routes (tourist routes as well as rail, ferry routes and local road access). • Development should seek to achieve a threshold where Wind Turbines or other infrastructure do not overwhelm or otherwise significantly detract from the visual appeal of transport routes. 	

Document	Summary
Criterion 6: The existing pattern of Wind Energy Development is respected	
<ul style="list-style-type: none"> The degree to which the proposal fits with the existing pattern of nearby wind energy development, considerations include; Turbine height and proportions; density and spacing of turbines within developments; density and spacing of developments; typical relationship of development to the landscape; previously instituted mitigation measures; Planning Authority stated aims for development of area. Development should seek to achieve a threshold where: The proposal contributes positively to existing pattern or objectives for development in the area. 	
Criterion 7: The need for separation between developments and/or clusters is respected	
<ul style="list-style-type: none"> The extent to which the proposal maintains or affects the spaces between existing developments and/or clusters Development should seek to achieve a threshold where: The proposal maintains appropriate and effective separation between developments and/or clusters 	
Criterion 8: The perception of landscape scale and distance is respected	
<ul style="list-style-type: none"> The extent to which the proposal maintains or affects receptors' existing perception of landscape scale and distance. Development should seek to achieve a threshold where: The proposal maintains the apparent landscape scale and/or distance in the receptors' perception. 	
Criterion 9: Landscape setting of nearby wind energy developments is respected	
<ul style="list-style-type: none"> The extent to which the landscape setting of nearby wind energy developments is affected by the proposal. Development should seek to achieve a threshold where: The proposal relates well to the existing landscape setting and does not increase the perceived visual prominence of surrounding wind turbines. 	
Criterion 10: Distinctiveness of Landscape character is respected	
<ul style="list-style-type: none"> The extent to which a proposal affects the distinction between neighbouring landscape character types, in areas where the variety of character is important to the appreciation of the landscape. Development should seek to achieve a threshold where: Integrity and variety of Landscape Character Areas are maintained 	

- 5.7.6 The criteria are addressed in **Chapter 6: Landscape and Visual Impact Assessment** of this EIAR and also within the supporting Planning Statement.
- 5.7.7 Paragraph 4.17 adds that the criteria do not set absolute requirements, but rather seek to ensure developers are aware of key potential constraints to development. Following paragraph 4.17 there is a list of 10 criteria, together with associated thresholds and measures for development. An appraisal of how the Development relates to the criteria in the OWESG is contained within the Planning Statement.
- 5.7.8 The OWESG includes Addendum Supplementary Guidance 'Part 2B' which was adopted in December 2017 and provides landscape sensitivity appraisals for 'Black Isle, Surrounding Hills and Moray Firth Coast Caithness'.
- 5.7.9 Paragraph 5.4 adds that Applicants will be expected to "demonstrate how their proposals align with the conclusions of the assessments, and if they do not, will be expected to demonstrate why they are still appropriate developments". Paragraph 5.6 however states that it provides "general advice" and 5.7 makes it clear that: "finding the balance between

the benefits of a particular scheme and the impacts it may present will be the subject of careful consideration on a case by case basis at the development management stage”.

5.8 Conclusions

- 5.8.1 This Chapter has set out the legislative background, a summary of the national energy policy framework, and the national and local planning policies and guidance relevant to the consideration of the Proposed Development. It provides an objective summary of the energy and planning policy considerations that have been taken into account in the preparation of the EIAR in order to ensure that it provides the appropriate information for the consideration of the application for consent.
- 5.8.2 As noted, the policy appraisal for the Proposed Development is contained in a separate Planning Statement.

6 LANDSCAPE AND VISUAL ASSESSMENT

6.1 Introduction

- 6.1.1 Stephenson Halliday was commissioned in May 2022 to prepare a landscape and visual impact assessment (LVIA) of the Proposed Development at Ben Aketil Wind Farm on behalf of the Applicant. This assessment forms part of a suite of documents supporting the application for this development proposal.
- 6.1.2 This assessment defines the existing landscape and visual baseline environments; assesses their sensitivity to change; describes the key landscape and visual related aspects of the Proposed Development; describes the nature of the anticipated changes and assesses the effects arising during construction and once completed.
- 6.1.3 This chapter is supported by:
- **Figures 6.1 to 6.14 in Volume 2;**
 - Photomontages in **Volume 2;**
 - Comparative Wirelines in **Volume 2;** and
 - **Technical Appendices 6.1 to 6.7 in Volume 3.**

6.2 Scope and Methodology

Site and Proposals

- 6.2.1 The Proposed Development occupies south and western facing open moorland approximately 3.5 km south-west of Edinbane on the Isle of Skye. **Figure 6.1** places the Proposed Development within its local context. The site is currently in commercial use for wind power generation consisting of twelve 2.3 megawatt (MW) turbines, each with a tip height of 99.5 m, alongside grazing on the moorland.
- 6.2.2 The Proposed Development involves repowering and extension of the existing wind farm with nine new turbines, each generating between 5.6-6.6 MW. The new turbines would have a maximum tip height of 200 m, with on-site energy storage capacity of approximately 20 MW, along with associated infrastructure including access tracks, and control building. There are also temporary elements to support construction as well as an option for a phased construction stage. It is proposed to decommission after 35 years of operational life.
- 6.2.3 To inform the assessment, site visits were made to various locations within the study area including, but not restricted to, representative viewpoints by Stephenson Halliday's assessment team during 2022.

Competence

- 6.2.4 This Chapter along with the design and mitigation of the Proposed Development has been prepared by Chartered Landscape Architects at Stephenson Halliday. The Practice has over 24 years of experience working on wind energy proposals for over 200 wind energy proposals throughout the UK. Key individuals working on this project have over 18 years of experience as chartered landscape architects.

- 6.2.5 The Practice is a Landscape Institute and IEMA registered practice and all work is prepared and reviewed internally by senior highly experienced landscape planners with Public Inquiry experience.

Methodology

- 6.2.6 The detail of the methodology is described in **Technical Appendix 6.1**. A summary of the primary judgements is provided below.

Sensitivity

- 6.2.7 Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor as illustrated by **Table 6.1** and **Table 6.2** below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted. A slightly greater weight is given to susceptibility in judging sensitivity of visual receptors as indicated below:

Table 6.1: Landscape Sensitivity

LANDSCAPE RECEPTORS		Susceptibility		
Value		High	Medium	Low
	National	High	High/Medium	Medium
	Regional	High/Medium	Medium	Medium/Low
	Community	Medium	Medium/Low	Low

Table 6.2: Visual Sensitivity

VISUAL RECEPTORS		Susceptibility		
Value		High	Medium	Low
	National	High	High/Medium	Medium
	Regional	High/Medium	High/Medium	Medium/Low
	Community	Medium	Medium/Low	Low

Magnitude

- 6.2.8 Scale of effect is the primary factor in determining magnitude; which may be higher if the effect is particularly widespread and/or long lasting, or lower if it is constrained in geographic extent and/or timescale. **Table 6.3** below illustrates how this judgement is considered as a two-step process.

Table 6.3: Visual Sensitivity

Scale / extent		Large	Medium	Small	Negligible
Wide		Substantial			
Intermediate			Moderate		
Localised				Slight	
Limited					Negligible

Stage 1 Result / Duration	Substantial	Moderate	Slight	Negligible
Permanent	Substantial			
Long-term		Moderate		
Medium-term			Slight	
Short-term				Negligible

6.2.9 Where magnitude is judged to lie between levels, an intermediate assessment will be adopted.

Significance of Effects

6.2.10 The significance of any identified landscape or visual effect is assessed as major, moderate, minor or negligible. These categories are based on the consideration of sensitivity with the predicted magnitude of change. The table below is not used as a prescriptive tool and illustrates the typical outcomes, allowing for the exercise of professional judgement. In some instances, a particular parameter may be considered as having a determining effect on the analysis.

Table 6.4: Significance

		Magnitude of Change			
		Substantial	Moderate	Slight	Negligible
Receptor Sensitivity	High	Major	Major/ Moderate	Moderate	Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor/ Negligible
	Low	Moderate	Moderate/ Minor	Minor	Negligible

- 6.2.11 Where the effect has been classified as Major or Major/Moderate this is considered to be equivalent to likely significant effects referred to in the EIA Regulations. The conclusion that some effects are 'significant' should not be taken to imply that they should warrant refusal in any decision making process.

Beneficial/Adverse

- 6.2.12 Landscape and visual effects can be beneficial or adverse and in some instances may be considered neutral. Neutral effects are those which overall are neither adverse nor positive but may incorporate a combination of both.
- 6.2.13 Taking a precautionary stance, changes to rural landscapes involving construction of man-made objects of a large scale are generally considered to be adverse.
- 6.2.14 With regard to the visual effects of wind farms, it is important to recognise the differing views revealed by extensive available research and to take into account that for the same development, some may view the impact as adverse, some as beneficial and yet others as neutral. This depends to some extent on the viewer's predisposition towards landscape change but also their opinions regarding climate change and the principle of renewable energy development including wind farms in the landscape. Taking a precautionary approach in making an assessment of the 'worst case scenario', the assessment considers that all effects on views which would result from the construction and operation of the Proposed Development to be adverse, unless specified otherwise in the text. It should be noted however that not all people would consider the effects to be adverse.

Cumulative Assessment

- 6.2.15 Cumulative assessment relates to the assessment of the effects of more than one development. The approach to cumulative assessment is set out within **Technical Appendix 6.1**. The Cumulative Landscape and Visual Impacts Assessment (CLVIA) is presented in full in **Section 6.8**.
- 6.2.16 In addition to the operational array at Ben Aketil, there are operational turbines at Edinbane Wind Farm, located 2.3 km east of the Proposed Development. Adjacent to Ben Aketil are consented turbines at Ben Sca. There is also a consented wind farm at Glen Ullinish, 4 km to the south-east and at Beinn Mheadhonach, 11 km to the south-east. These operational and consented cumulative sites are included as part of the future baseline of the LVIA.

- 6.2.17 There are two proposals at Beinn Mheadhonach and Balmeanach which are still at scoping but anticipated to be submitted at the same time as the Proposed Development and therefore have been included in the detailed cumulative assessment. The other pre-planning proposals of Glen Ullinish 2 and Breakish have not been included within the detailed cumulative assessment.

Table 6.5: Cumulative Developments within 45 km Search Area – 5th December 2022

Development	Status	Distance/ Direction	Number of Turbines	Tip Height
Operational and Consented				
Ben Aketil	Operational	0 km	12	100 m
Edinbane	Operational	2.3 km E	18	100 m
Ben Sca + Extension	Consented	1.2 km NE	7 + 2	135 m + 149.9 m
Glen Ullinish (S42)	Consented	4.1 km SE	11	149.9 m
Beinn Mheadhonach (S42)	Consented	11.1 km SE	4	120 m
Planning				
none				
Scoping with PAN				
Balmeanach	Scoping (PAN)	c. 1 km	10	149.9 m
Beinn Mheadhonach (replacement)	Scoping (PAN)	10 km SE	5	150 m
Scoping				
Glen Ullinish 2 (replacement)	Scoping	2.4 km E	59	200 m
Breakish	Scoping	42 km E	20	200 m

Night-time Assessment

- 6.2.18 The development proposals include aviation lighting for which an assessment of potential night-time impacts is included in **Section 6.7**. There is a distinction between light pollution or nuisance and the effect of lighting on the character and amenity of the landscape at night. This is not a technical lighting assessment but focusses on the night-time effects as a result of the introduction of new artificial lighting within the landscape with consequent effects on visual amenity of the area and any designated landscapes.
- 6.2.19 The impact on the landscape designations including NSAs and SLAs will be included **Section 6.7**. Impacts on Wild Land Areas are provided within the assessment in **Technical Appendix 6.6**.
- 6.2.20 For visual receptors, the value attached to night-time views is considered to be low unless there is a particular feature that can be best appreciated in the hours of darkness. The susceptibility of visual receptors also differs at night reflecting the different activities people undertake in the hours of darkness, such as stargazing. As a result, the receptors for night-time impacts may be different from those which experience day-time impacts.

- 6.2.21 As noted in **Table 6.5**, there are no other cumulative developments above 150 m which are consented, proposed or being considered within the detailed cumulative assessment which would require visible lighting and therefore cumulative effects at night are not assessed.

Residential Amenity

- 6.2.22 As set out within LI Technical Guidance Note 02/19 'Residential Visual Amenity Assessment (RVAA)':

"Changes in views and visual amenity are considered in the planning process. In respect of private views and visual amenity, it is widely known that, no one has 'a right to a view.' ...

It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before."

- 6.2.23 A 2 km study area was agreed with consultees at Scoping. There are no residents within this study area and therefore this has not been included, as it is judged that the Proposed Development would not give rise to effects meeting the threshold described above.

Distances

- 6.2.24 Where distances are given in the assessment, these are approximate distances between the nearest part of the site and the nearest part of the receptor in question, unless explicitly stated otherwise.

Visual Aids

- 6.2.25 Photographs of the existing views, along with wirelines and photomontages showing the Proposed Development are included within **Volume 2**. The method of visualisation selected has been informed by LI Technical Guidance Note 06/19 'Visual Representation of Development Proposals' and NatureScot's 'Visual Representation of Wind Farms - Guidance' (Feb 2017). The methodology of production for the visualisations is described in **Technical Appendix 6.2 Visuals Methodology**.

6.3 Consultation Undertaken

- 6.3.1 Information regarding Scoping and consultation is included in **Chapter 3: Consultation**. A formal Scoping Report was submitted in July 2022 and a Scoping Opinion issued by ECU in October 2022. A Major Project Pre-application consultation and presentation took place on 17th August 2022 with The Highland Council, with a written response on 15 September 2022, (not 2020). NatureScot responded to Scoping on 16 November 2022. Further information regarding Viewpoint selection was also submitted and comments from Scoping include that additional information. Key consultation responses are detailed in **Table 6.6**.

Table 6.6: Consultations

Consultee	Issue	How this is addressed
Energy Consents Unit (ECU)	Noted reference to THC scoping response and requirement for a night time assessment within the LVIA.	THC response noted below. A night-time assessment has been included in Section 6.7 .
The Highland Council (THC) Major Developments Pre-application Response and Scoping Response	<p>Visualisations: Require single frame images with focal lengths of 50 mm and 75 mm.</p> <p>Viewpoints: Viewpoint selection agreed with additional suggested Viewpoint from the Uig to Lochmaddy Ferry route. Also requested additional night-time viewpoint at Dunvegan.</p> <p>Assessment of proposal against criterion set out in the Council's Onshore Wind Energy Supplemental Guidance.</p> <p>Include an assessment from all SLAs.</p> <ul style="list-style-type: none"> Response also includes references potential impacts from the A835 and minor routes between Dingwall, Muir of Ord, and Beaully and states site lies within the area of the Black Isle, Surrounding Hills, and Moray Firth Coast Landscape Sensitivity Appraisal. 	<p>A full set of THC visuals is provided in Volume 3.</p> <p>Viewpoint 19 is on the Uig-Lochmaddy Ferry route. There is no visibility from Dunvegan and therefore this has not been included in the assessment.</p> <p>This is included in Section 6.6.</p> <p>This is included in Section 6.7.</p> <p>References to the site being near the Black Isle are in error and will not be included in the assessment of effects.</p>
Scoping Mountaineering Council	Endorsed Viewpoints proposed but noted that The Storr is more popular and slightly closer than Ben Edra, so suggested its inclusion.	The Storr is included as Viewpoint 15 and Ben Edra is Viewpoint 17 .

Consultee	Issue	How this is addressed
NatureScot	<p>Design / scale of the development in relation to the receiving landscape and the cumulative effects are identified as key issues.</p> <p>We advise that impacts on Trotternish National Scenic Area (NSA) and Cuillins NSA, Special Qualities of these sites should be considered in the EIA, particularly with respect to cumulative impacts.</p> <p>We advise that impacts on Duirinish Wild Land Area (WLA) and Cuillins WLA, including night-time impacts are included in assessment.</p> <p>A full lighting assessment should be provided and should include lowlight photomontages.</p> <p>Request additional VP on Bruach na Frithe. Also highly Recommend VP of Storr.</p>	<p>Design/scale and cumulative impacts are included in this assessment Section 6.6 and Section 6.7.</p> <p>Impacts on the noted NSA have been included in Section 6.7.</p> <p>Impacts on the noted WLA have been included in Technical Appendix 6.6.</p> <p>A night-time assessment has been included Section 6.7, include low light photomontages for 3 viewpoints.</p> <p>Bruach na Frithe is Viewpoint 18 and The Storr is Viewpoint 15.</p>

6.4 Statutory and Planning Context

National Planning Policy

6.4.1 Relevant national planning policy is set out in **Chapter 5: Planning Policy Context**.

Local Planning Policy

6.4.2 Current local planning policy is described in the following adopted and emerging policy documents:

- The Highland-wide Local Development Plan (HwLDP) (adopted April 2012); and
- The West Highland and Islands Local Development Plan (WestPlan) (2019).

The Highland-wide Local Development Plan (HwLDP) 2012

6.4.3 The HwLDP covers the whole of Highland Council area (excluding the area covered by the Cairngorms National Park) and contains development management policies. It is considered that the following key policies of the HwLDP are applicable to the Proposed Development:

- **Policy 67 Renewable Energy Development**, taking account of the considerations in the Onshore Wind Energy Supplementary Guidance (2016);
- **Policy 57 Natural, Built and Cultural Heritage**, taking account of the level of importance of heritage features (international, national or local/regional); and
- **Policy 61 Landscape**, taking account of particular landscape characteristics.

- 6.4.4 **The West Highland and Islands Local Development Plan (WestPlan) (2019)** does not include policy that covers renewable energy or otherwise large-scale infrastructural development, yet instead it is geared toward community prosperity in townships and remote settlements. Of the policies detailed in the plan, there are several which encompass nearby settlements on Skye including Edinbane, Dunvegan, Skeabost, Carbost and Portree.

Local Guidance

- 6.4.5 In addition to the policy documents identified above, there are relevant local guidance and baseline documents as follows:
- THC Onshore Wind Energy Supplementary Guidance (2016).

Local Policy and Guidance Considerations

- 6.4.6 The design response to the considerations set out in the policies and guidance identified above is reviewed in **Section 6.5** of this assessment. Effects on landscape character and visual amenity (including nearby National Scenic Areas and Special Landscape Areas) are considered within **Section 6.7** of this report.

6.5 Existing Environment

Introduction

- 6.5.1 An overview of the baseline study is provided in this section with the full baseline description of the individual landscape and visual receptors being provided alongside the assessment in **Section 6.7** for ease of reference.
- 6.5.2 This section provides a review of the key local baseline studies and guidance documents and identifies those landscape and visual receptors which merit detailed consideration in the assessment of effects, and those which are not taken forward for further assessment as effects *“have been judged unlikely to occur or so insignificant that it is not essential to consider them further”* (GLVIA3, para. 3.19).
- 6.5.3 Both this baseline section and the effects section describe landscape character and visual receptors before considering designated areas as it is common for designations to encompass both character and visual considerations within their special qualities or purposes of designation.

Local Guidance and Baseline Studies

- 6.5.4 The following guidance documents provide advice relevant to this assessment:
- THC Onshore Wind Energy Supplementary Guidance (2016)
- 6.5.5 This supplementary planning guidance supports policy within the Highland-wide Local Development Plan by setting out “how Highland Council will manage onshore wind energy development proposals in line with Section 22 of the Town and Country Planning (Scotland) Act 1997 as amended by the Planning etc. (Scotland) Act 2006”.
- 6.5.6 The guidance includes a Spatial Framework for Onshore Wind Energy (updated in May 2020) which adopts a set of spatial criteria to determine areas with potential for wind farm development, areas of significant protection and areas where wind farms would not be

acceptable. The site falls predominantly within an area of significant protection, but a few areas of potential for wind farm development on the site.

- 6.5.7 Within the report, fine grain landscape character areas have been assigned for areas surrounding Loch Ness, The Black Isles, surrounding hills and the Moray Firth and for Caithness. Other areas within the Highlands, notably the western highland and isles are not included in this study in detail, in which case this assessment will refer to NatureScot's 2019 Landscape Character Assessment for further detail on character and capacity.

ZTV Study

- 6.5.8 Zone of Theoretical Visibility (ZTV) studies have been undertaken for the layout of the Proposed Development. **Figure 6.5** illustrates theoretical visibility based on a 'bare earth' model and illustrates the maximum potential visibility of the turbines while **Figure 6.6** incorporates above ground screening features (including woodlands, forestry and buildings) and provides a more realistic impression of likely visibility. The screening ZTV calculation was carried out using a topographic model and with including buildings and trees (with heights assumed at 7 m for all buildings and 10 m for all woodland and forestry).
- 6.5.9 The ZTVs illustrate that there is fairly widespread potential visibility within 5 km, encompassing open moorland areas within and surrounding the Site and the coastal areas to the south-west, although the landform of Ben Horneval breaks this up within approximately 2 km to the north-west. Within 10 km, potential visibility reduces noticeably to the east around Loch Snizort Beag and to the north-west on the Waternish peninsula, but would be widespread visibility extending to the west towards the Macleod's Tables and associated ridgeline and south west to the coastal areas around Loch Bracadale.
- 6.5.10 Beyond 10 km, potential visibility would be intermittent and largely limited to more open and elevated areas. The exception to this would be coastal area on the north eastern side of the Duirinish peninsula and the northern end of the Minginish peninsula where visibility would extend to around 15 km.
- 6.5.11 Beyond 20 km potential visibility would be very limited from areas on land, largely confined to high ground in remote areas with very distant potential or distant islands.
- 6.5.12 Effects on landscape or visual receptors outside the areas of visibility shown on the ZTV study are not assessed in detail.

Landscape Character

- 6.5.13 Landscape character areas in the study area are shown on **Figure 6.3**. Landscape character for the study area is described in the 2019 NatureScot Landscape Character Assessment.
- 6.5.14 Local landscape character is described in the NS Landscape Character Assessment in Scotland digital map based character assessment (2019). The Proposed Development lies within Landscape Character Type (LCT) 359 Upland Sloping Moorland. Neighbouring landscapes includes the higher ground associated with LCT 360 Stepped Moorland including areas to the north and south and lower lying LCT 357 Farmed and Settled Lowlands – Skye and Lochalsh.
- 6.5.15 The host LCT 359 Upland Sloping Moorland is described as an upland area of moderate elevation on Skye, closely associated with LCT 360 Stepped Moorland. Landform within

LCT 359 broadly undulates with moorland and forestry which combine to form a large-scale patchwork of contrasting colours and textures. The area is mainly used for forestry and grazing with few structural elements such as occasional remote settlements and farm buildings, power lines and wind turbines. The area has extensive views to surrounding mountains, islands, coastlines and out to sea.

6.5.16 Along with the host LCT 359, effects on the following character areas are also considered within **Section 6.7**, with baseline description provided alongside the assessment of effects for ease of reference:

- LCT 360: Stepped Moorland
- LCT 357: Farmed and Settled Lowlands – Skye and Lochlash
- LCT 358: Low Smooth Moorland

6.5.17 Apart from the above character areas, the combination of large-scale landscape, intervening landforms, limited visibility and extent of existing or consented wind energy developments mean that effects would diminish rapidly with distance, and more distant character areas are not considered further as significant effects are not predicted on landscape character.

Visual Receptors

6.5.18 Visual receptors are “*the different groups of people who may experience views of the development*” (GLVIA, 3rd edition, para 6.3). In order to identify those groups who may be significantly affected the ZTV study, baseline desk study and site visits have been used.

6.5.19 The different types of groups assessed within this report encompass local residents; people using key routes such as roads, ferries, cycle ways, people within accessible or recreational landscapes; people using core paths or long distance trails; or people visiting key viewpoints. In dealing with areas of settlement, Public Rights of Way and local roads, receptors are grouped into areas where effects might be expected to be broadly similar, or areas which share particular factors in common.

6.5.20 Representative viewpoints have been selected to aid the assessment of effects on visual receptors.

Baseline Visual Environment

6.5.21 As shown on **Figure 6.4** the Proposed Development is located on a predominantly west facing upland sloping landform north of Gleann Eoghainn between Ben Sca and Ben Aketil directly east and south-east and Ben Hornevan and Ben Vic to the west. The site is comprised of grazing moorland with two small linear woodland blocks on Rageary Burn and Aketil Burn to the east and uphill from the Caroy River. A private crofters track crosses the site from Upper Feorlig to the existing wind farm.

6.5.22 The existing wind farm site access is from the A850 in the north, through dense forestry adjacent to the site. Existing turbines at Ben Aketil are very notable features of the site itself with a strong linear design of a single line of turbines, running in a north-west – south-east direction (parallel with the plantation) towards the summit of Ben Aketil.

6.5.23 Landform tends to be more undulating in the west and south towards Dunvegan and beyond over Loch Dunvegan, or to the rocky coastline with bays inlets and small islands

between Duirinish and Minginish. Hilltops of Ben Aketil and Beinn a Chleirich separate the site from where the operational Edinbane turbines, which has a predominantly linear form, with some spurs, which follows the topography closely. It is reasonable to assume the consented turbines at Ben Sca (including recent extension of two turbines) will be constructed and as a result these are included as part of the baseline for the purposes of the assessment.

- 6.5.24 The closest visual receptors would include a few scattered residents, local road users and visitors to the west. There are no promoted long distance walking or cycle routes in the vicinity of the Site, however, there are a number of Core Paths in the local area.
- 6.5.25 The study area at night is a very dark area. There are few additional lights beyond the lights at dispersed dwellings and farms, campsites, settlements and vehicle lights of drivers, leading to a very dark landscape at night. The westernmost turbine of Ben Aketil is currently lit with two (in case one fails) steady red low intensity aviation lights, but otherwise there is no other aviation lighting on or towers that we are aware of in the local area following our night-time assessment.

Visual Receptor Groups

- 6.5.26 The following visual receptor groups are located within the study area and are likely to have visibility of the Proposed Development, as shown on the ZTV study on **Figures 6.5-6.7** and are considered further in **Section 6.7**:

- Upper Feorlig (2.3 km)
- Feorlig (3.2 km)
- Caroy (3 km)
- Harlosh (5.2 km)
- Roag (4.3 km)
- Dunvegan (4.1 km)
- Edinbane (3.9 km)
- Flashader (6.1 km)
- Greshornish (4.9 km)
- Colbost, Durinish (8.7 km)
- Waternish (9 km)
- Borge (11.5 km)
- Uig (14 km)
- North Minginish (11.5 km)
- Moineach, Glen Brittle Forest (21 km)

- 6.5.27 There are also a number of receptor groups which are excluded from the detailed assessment, on the basis that visual effects are likely to be Negligible, for the reasons indicated below:

- Bracadale (8.1 km SSE) – including surrounding settlements are enclosed by landform to the north and are outside of the ZTV;
- Glendale (12 km E) – settlement and areas in surrounding low land are enclosed by landform and are outside the ZTV;
- Drynoch (16.8 km SE) – settlement and areas to the south east along the A863 are enclosed by landform;

- Sligachan (22.9 km SE) – including settlement and walking trails which lead away from the settlement and into the Cuillins which are outside of the ZTV;
- Portree (15.5 km E) – Areas in and around the settlement of Portree and Loch Portree which are outside the ZTV;
- Broadford (32.2 km SE) – settlement and surrounding routes & dispersed settlement are outside the ZTV;
- Torrin & Strathaird (34.8 km SE) – settlement and associated areas to the south of the Cuillins on the Strathaird peninsular are outside the ZTV;
- Sleat (43.9 km SE) – entire Sleat peninsula including all settlements, roads and recreational routes are screened by landform at the Cuillins;
- North-east Trotternish (23 km NE) – including Staffin and coastal settlements along the A855 between Portree and Balmaqueen; and
- Clachan, Rassay (24.6 km E) – including Inverarish.

Key Routes

6.5.28 As shown on **Figure 6.7**, the following longer distance routes lie within the study area:

Transport Routes

- A87 from Portree to Uig (11.8 km – 17.6 km)
- A850 from Borve to Dunvegan (11.2 km - 1.7 km)
- A863 Sligachan to Dunvegan (23.2 km -2.5 km)
- Ferry Route Uig to Lochmaddy, North Uist (16.8 km – 42.7 km)

6.5.29 Other roads in the study area are more likely to be used for local journeys and are considered within the receptor group areas they lie within.

Recreational Routes

- **Skye Trail** (15.5 km);
- informal routes across the Site.

6.5.30 Effects on the following recreational routes are likely to be **Negligible** and **Not Significant** and are not considered further in the main assessment.

- **North Coast 500** (44 km E) This road based long distance route traces a loop on coastal roads around the north coast of Scotland, From Inverness through Caithness and Sutherland, Assynt and Wester Ross then returning to Inverness. ZTV studies have indicated a small patch of visibility to the Proposed Development between 44 – 45 km east on an elevated section of the route around the Bealach na Ba viewpoint between Applecross and Kishorn, where up to three hubs and nine blade tips would be marginally visible as a distant object in very clear conditions. Effects on this section of the route would be **Negligible** due to intervening distance and as such it is not considered further.

Specific Viewpoints

- **The Storr** (18.3 km WNW)

Designated and Valued Landscapes

6.5.31 The Site itself is not covered by any landscape designations. Landscape designations within the Study Area are illustrated on **Figure 6.1**.

- 6.5.32 The Cuillin Hills National Scenic Area (NSA) is located 23 km south of the Proposed Development and shows visibility is predicted from high ground. Trotternish NSA is located 20 km north-east and indicates very limited visibility on the ridge itself only. Consultees requested both areas be included in the assessment, in **Section 6.7**
- 6.5.33 'The special qualities of the National Scenic Areas, NatureScot Commissioned Report No. 374 (2010)' sets out the 'special qualities' of the NSAs across Scotland and this forms the basis of the assessment of The Cuillins and Trotternish NSAs.
- 6.5.34 There are regionally designated landscapes of value within the Study Area. Given the separation distance and screening as illustrated in the ZTVs, it has been agreed with Consultees that the following areas would be included within the assessment and are considered further in **Section 6.7**:
- North West Skye Special Landscape Area;
 - Greshornish Special Landscape Area; and
 - Trotternish and Tianavaig Special Landscape Area.
- 6.5.35 Consultees requested that the Wild Land Areas at Duirinish (c. 8.5 km away) and the Cuillins (c. 20 km away) be included in the assessment, '*at least initially*' particularly with regard to potential cumulative and night-time effects given the uncertainty regarding lighting at the time of Scoping. However, it should be noted that since the Scoping response was made, the new Scottish National Planning Framework 4 was approved in January 2023 by the Scottish Parliament but not yet adopted. Under the Natural Places policy g), it states that '*buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration.*' So whilst we have included the Wild Land Assessment in **Technical Appendix 6.6**, as requested by Consultees, it should be considered in that context.

6.6 Design and Embedded Mitigation

The Proposed Development

- 6.6.1 The Proposed Development is described in detail in **Chapter 2: Proposed Development** and illustrated on **Figure 2.3** and comprises nearly 60 MW of wind energy and around 20 MW of energy storage (likely battery) and associated infrastructure including access tracks, control buildings, borrow pits and construction components. The Proposed Development would re-use and share existing infrastructure from the existing wind farm and farming access tracks where possible.
- 6.6.2 As noted in **Chapter 2: Proposed Development**, there are two construction scenarios.
- **Scenario 1:** proposes that the construction of the extension turbines and the construction of the repowering turbines is undertaken at the same time. The approximate timescale for construction would be 18 months and the northern access route is preferred. This would be classed as a short term operation for the purposes of this assessment.
 - **Scenario 2:** proposes that the four extension turbines are constructed first, followed by the decommissioning of the existing, operational Ben Aketil Wind Farm, followed by construction of the five repowering turbines. The approximate timescales for construction would be construction of the four extension turbines (approximately one year), followed by decommissioning and removal of the existing wind turbines and associated infrastructure (approximately 1 year),

followed in turn by construction of the five repowering turbines (approximately 1 year) – Total of three years. There would be a delay between the completion of construction of the first four turbines and the start of construction of the second five turbines of no more than five years. The use of both access routes is preferred. This would be classed as medium term operation for the purposes of this assessment.

6.6.3 The activities and temporary features with the potential to cause an effect on landscape and visual amenity include HGV & abnormal load deliveries to the Site, the movement of vehicles therein, construction compounds, borrow pits and construction/decommissioning of elements of the Proposed Development including the use of cranes for erection/decommissioning of wind turbines.

6.6.4 The operational phase would follow for 35 years before being decommissioned.

Operational Phase - Design Process

6.6.5 The description of the site selection rationale and the iterative design process is described within **Chapter 2: Proposed Development**. The design of the Proposed Development has been a staged process with the aim of arriving at an optimal design configuration in respect of landscape and visual effects, and a range of other factors including; other environmental, energy yield and technical. Mitigation measures (including embedded mitigation) have been proposed to reduce the level of potential impacts and to inform the assessment of residual effects which would occur with mitigation in place are described in the following sections.

Design Approach and Mitigation

6.6.6 Siting and Designing Windfarms in the Landscape Version 3 (NatureScot, 2017) provides a framework for the consideration of key design issues including wind turbine size, layout composition, relating windfarm design to landscape character, forestry and designing for multiple wind farms. There are further criteria for consideration with THC Onshore Wind Energy Supplementary Guidance (2016).

6.6.7 In addition to the standard good design principles set out within the NS and THC documents noted above, some of the key design principles established during design development from a landscape and visual perspective may be summarised as follows:

- design fit with local topography and nearby wind farms;
- minimise effects on views from local settlements including Dunvegan, peninsulas to the east and west, and key roads (A850 and A863) and ferry routes;
- avoid significant impacts upon any nationally valued landscapes and minimise impacts on regionally or locally valued landscapes; and
- minimise impacts on key views.

6.6.8 With these principles the design responded to these:

- Maintain design continuity with original Ben Aketil – as the turbine size and separation increases, the repowering has kept to the existing footprint, replacing the existing twelve turbines with five. The extension has created a second line parallel thereby retaining the design integrity.

- Created two parallel gently curving arcs will reflect existing topography and be read as a cohesive array. Work well with adjacent cumulative sites such as Ben Sca and Edinbane which use similar design patterns;
- With regard to the optional phased construction phase, the extension is located on lower ground and maintains design continuity with the existing turbines to minimise any temporary adverse impacts when the two are seen together.
- The areas of highest ground on the site would remain free of turbines.
- Composition is legible and stacking of turbines has been minimised from the A850 to the north, A863 to the west and surrounding summits like Macleod's Table, The Storr or Beinn Edra.

Mitigation During Operation

6.6.9 The operational period of the Proposed Development would be 35 years and would include site management to ensure the adequate maintenance of site facilities and landscape features such as access tracks, field boundaries, gates, and signage. Measures to reduce landscape and visual impacts have been embedded into the design of the Proposed Development and include;

- keep turbine locations to the design principles established;
- minimise inconsistent turbine spacing, such as, relatively large gaps, outliers or excessive overlapping turbines and ensure a balanced/compact array especially from key views and sequential receptors;
- use of the existing tracks where possible (which would require upgrading) to minimise the requirement for new tracks within the Site;
- substation compounds and energy storage areas located in visually discreet part of the Site;
- a reduced lighting scheme for visible aviation lighting agreed with CAA and further mitigation including directional intensity, automatic dimming of the lights and timer activated lighting; and
- allowed use of the wind farm access track (similar to Edinbane) which would link the A863 to A850 and allow informal recreational access into this area;

Mitigation During Construction

6.6.10 Construction of the Proposed Development would follow an agreed construction method statement that would include arrangements for implementation of various aspects of the works to mitigate local adverse impacts during construction. These would be designed in agreement with THC and other statutory agencies. Specific mitigation measures during construction would include:

- protection of valued landscape features that are to be retained within the Site;
- placing of turbines on gentler gradients, where possible, to minimise the groundworks necessary to accommodate the turbines, hard standings and access requirements;
- location of new borrow pits where rock resource is likely and within areas of forestry or located within the core of the site to screen views .
- restoration of borrow pits post-construction, with an overall aim of creating a naturalistic and sympathetically designed landscape profile. Reinstatement would be carried out as soon as possible after phases of work are complete;
- maintaining the Site and temporary construction compound in a tidy and contained condition;

- removing all temporary construction materials from the Site once work is completed; and
- controlling construction lighting so that it does not impinge into sensitive views (e.g. from residential dwellings).

Local Design Guidance

6.6.11 This section of the appraisal considers the fit with guidance provided in respect of strategic guidance contained within the THC Wind Energy SG criteria and the sensitivities.

Table 6.7: THC Design Criteria

Criterion	Wind Energy SG commentary	Site considerations
Relationship between Settlements/Key locations and wider landscape respected.	The extent to which the proposal contributes to perception of settlements or key locations being encircled by wind energy development. Development should seek to achieve a threshold where: Turbines are not visually prominent in the majority of views within or from settlements / Key Locations or from the majority of its access routes.	No settlements would be 'encircled' and turbines would be screened from the core of Dunvegan. There would be views on the approach or exit from Dunvegan, see Viewpoints 3 and 4 , but these views would be partially screened and intermittent from roads. Views from key locations would be respected and would not be visually prominent in views.
Key Gateway locations and routes are respected	The extent to which the proposal reduces or detracts from the transitional experience of key Gateway Locations and routes. Development should seek to achieve a threshold where: Wind Turbines or other infrastructure do not overwhelm or otherwise detract from landscape characteristics which contribute the distinctive transitional experience found at key gateway locations and routes.	The turbines would not be particularly prominent from ferry routes, ports or other notable gateway locations.
Valued natural and cultural landmarks are respected	The extent to which the proposal affects the fabric and setting of valued natural and cultural landmarks. Development should seek to achieve a threshold where: The development does not, by its presence, diminish the prominence of the landmark or disrupt its relationship to its setting.	The turbines would not be visible from Dunvegan Castle GDL. Whilst visible to some extent from some other natural or cultural landmarks, the turbines would not diminish the prominence of the landmark or disrupt its relationship to its setting.

Criterion	Wind Energy SG commentary	Site considerations
The amenity of key recreational routes and ways is respected.	The extent to which the proposal affects the amenity of key recreational routes and ways (e.g. core paths, Munros and Corbetts, Long Distance Routes etc.). Development should seek to achieve a threshold where: Wind Turbines or other infrastructure do not overwhelm or otherwise significantly detract from the visual appeal of key routes and ways.	There are a few core paths in the local area where walkers may experience views of the turbines and the existing wind farm access track is used for informal recreation. In both cases the turbines would appear in the view where wind energy development is already characteristic of the views. Views from the Skye Trail and associated summits (including The Storr); Macleod's Tables; and the Cuillins would not receive significant visual effects nor diminish their visual appeal.
The amenity of transport routes is respected.	The extent to which the proposal affects the amenity of transport routes (tourist routes as well as rail, ferry routes and local road access). Development should seek to achieve a threshold where: Wind Turbines or other infrastructure do not overwhelm or otherwise significantly detract from the visual appeal of transport routes.	There would be no significant effects on the A850 and A863. Views from the A850 (Viewpoints 1, 4, and 6) would not be overwhelming. Nor would views from the A863 (Viewpoints 2, 3 and 8).
The existing pattern of wind energy development is respected.	The degree to which the proposal fits with the existing pattern of nearby wind energy development...Development should seek to achieve a threshold where: The proposal contributes positively to existing pattern or objectives for development in the area.	The Proposed Development maintains a similar pattern of development to the original Ben Aketil and the proposed Ben Sca wind farm, and is still compatible with the more organic forms of Glen Ullinish and Edinbane.
The need for separation between developments and/ or clusters is respected	The extent to which the proposal maintains or affects the spaces between existing developments and/ or clusters. Development should seek to achieve a threshold where: The proposal maintains appropriate and effective separation between developments and/ or clusters	The extension and repowering respects and maintains the same separation between itself and other developments.

Criterion	Wind Energy SG commentary	Site considerations
The perception of landscape scale and distance is respected.	The extent to which the proposal maintains or affects receptors' existing perception of landscape scale and distance. Development should seek to achieve a threshold where: The proposal maintains the apparent landscape scale and/or distance in the receptors' perception.	The perception of scale and distance would be respected from Dunvegan and from nearby receptors. In more distant views, the scale of turbines would be noticeably larger but still respects the scale of the receiving landscape.
Landscape setting of nearby wind energy developments is respected	The extent to which the landscape setting of nearby wind energy developments is affected by the proposal. Development should seek to achieve a threshold where: Proposal relates well to the existing landscape setting and does not increase the perceived visual prominence of surrounding wind turbines.	The repowering and extension would replace the operational scheme. The proposal would relate well to consented Ben Sca and would be perceived similarly in the landscape. There would be a noticeable increase in turbine scale compared to Edinbane, but this would be not different from that perceived elsewhere in Scotland as part of the natural development of wind energy.
Distinctiveness of landscape character is respected	The extent to which a proposal affects the distinction between neighbouring landscape character types, in areas where the variety of character is important to the appreciation of the landscape. Development should seek to achieve a threshold where: Integrity and variety of Landscape Character Areas are maintained.	The layout follows on from the same pattern as the existing Ben Aketil and adjacent consented Ben Sca array and maintain distinction between the Upland Sloping Moorland LCT and adjacent Stepped Moorland LCT.

- 6.6.12 As illustrated on **Figure 6.3**, the operational Edinbane wind farm is located 2.3 km to the east of Ben Aketil within the Upland Sloping Moorland LCT. Ben Sca (and its extension) is also located in this LCT, 1 km from Ben Aketil running parallel along the ridgeline from Ben Sca. The operational Ben Aketil and Ben Sca follow precisely the same design pattern as each other, forming a single line of turbines flowing the ridgeline from the summit and will be perceived as a single group. Edinbane also follows the local topography but in a slightly different way, following the base of the stronger topography within the Stepped Moorland at Cruachan Glen Vic Askill. So, whilst these designs are not the same, they are/would be compatible and complement each other in the landscape.
- 6.6.13 The design response of the Proposed Development has maintained design continuity with the original Ben Aketil and these nearby cumulative sites to ensure that whilst the new proposal does not follow precisely the original design solution, it does follow similar principles which is compatible with Ben Sca and Edinbane, thereby reducing the cumulative impacts with the future consented baseline.
- 6.6.14 The turbines of the Proposed Development would be noticeably larger than exists at present in the area but less so with consented developments. There is also a relative

increase in the separation distance between individual turbines in an array. Where there is a noticeable difference, this is likely to be perceived as part of the evolution of wind energy development throughout Scotland and would not cause a notable increase in adverse impacts.

- 6.6.15 In terms of the pattern of wind energy with the consented baseline within this LCT and locally, this is illustrated in **Figure 6.3**. This shows that when all these schemes are operational, Ben Sca (9no.) and the Proposed Development (9no.) would appear as a single group with a very similar pattern of development. Edinbane (18no.) and Glen Ullinish (11no.) will appear as separate arrays but with a very similar pattern of development. The three groups would be read as complementary in the landscape, responding to landform and the other baseline cumulative developments.

6.7 Predicted Landscape and Visual Impacts

Introduction

- 6.7.1 This section sets out the effects that the Proposed Development would have on landscape and visual receptors.
- 6.7.2 Effects during construction and operation of the Proposed Development are considered for each receptor. The effect of decommissioning would be equal to, or lesser than the effects during construction. Therefore, they have been considered together.
- 6.7.3 Where effects on receptors are judged to be less than Moderate they are described in detail in **Technical Appendix 6.5** and summarised in the relevant sections below.

Effects on Site Fabric

- 6.7.4 Changes to landscape fabric occur where there would be physical changes to the landscape. In this instance, changes to landscape fabric would predominantly occur within the Site.
- 6.7.5 There would be a long term loss of landscape elements, mainly moorland, as a result of the introduction of the upgraded and new sections of track, turbine foundations and hardstanding and substation/energy storage compounds. All borrow pits and construction compounds would be restored after construction.

Construction and Decommissioning Effects

- 6.7.6 There are two construction scenarios, as noted in **Section 6.6**.

Landscape Effects – Scenario 1

- 6.7.7 In Scenario 1, construction of the repowering and extension would occur at the same time over an approximate 18-month period. The construction of the extension and repowering, as well as the decommissioning stage at the end of life of the Proposed Development, would result in Short Term effects within the host Upland Sloping Moorland. The effects would mainly result from upgrades to, or new sections of the access track required, decommissioning of existing turbines, erection of new wind turbines and the ground level construction activities such as, borrow pits, construction compounds, construction of control building/substation and energy storage, as well as the activity and movement of

large construction vehicles/cranes within the moorland areas of site. These activities would contrast with some of the quieter qualities of landscape character. However, given that many of these activities would occur within or adjacent to areas of existing wind energy (Ben Aketil and Edinbane) and commercial forest activity, some aspects of this activity may be difficult to distinguish from the baseline.

- 6.7.8 The landscape character of the Upland Sloping Moorland is considered to be of **Medium/Low** landscape sensitivity to construction activity. The surrounding forestry and topography would limit the influence of construction operations, particularly ground-level operations from most vantage points outside of Glen Heysdal/Gleann Foghann within the Upland Sloping Moorland. The effects of construction activity are considered to be Large in scale but only over a Limited extent of the Upland Sloping Moorland in the Short term. Accordingly, the magnitude of change is considered to be **Moderate**, which gives rise to **Moderate** effects which would be **Not Significant** for the Upland Sloping Moorland LCT.

Visual Effects – Scenario 1

- 6.7.9 Residents at Upper Feorlig, Feorlig, Caroy, Roag, road users of the A863 and A850 would clearly notice the construction impacts. Recreational users on the informal tracks through the site would be very noticeably affected by the construction and decommissioning activities. There would also be views into the site from anyone hillwalking surrounding moorland hills such as Ben Aketil or other surrounding hills. The construction activity may be perceptible as far as the elevated summits such as Macleods Tables but unlikely to be clearly discernible on the Trotternish ridge/Skye Trail.
- 6.7.10 The construction activity across the site would be visible as an increase in activity compared to the normal forestry extraction and wind farm maintenance which is characteristic across the Site from time to time. This would include the access track, construction work on the extension, repowering of the existing turbines including some of the borrow pit extraction, turbine foundations, electrical infrastructure, control buildings/substation, energy storage as well as vehicle movements at or near the site entrance.
- 6.7.11 These effects would be different in nature to those experienced once the Proposed Development was complete. Careful management of the construction process in relation to these receptors will be included within the Construction Environmental Management Plan (CEMP).
- 6.7.12 For residents at Upper Feorlig, Feorlig, Caroy, Roag, and road users of the A863 and A850, and recreational users on surrounding fells and the site, the effects of construction activity are considered to be Large in scale but only over a Localised extent of the area in the Short Term. The magnitude of change is considered to be **Moderate**, which for a receptor of **High/Medium** sensitivity would give rise to **Major/Moderate** and **Significant** effect.
- 6.7.13 The erection/removal of the proposed wind turbines involving the use of large cranes would be another component of the construction/decommissioning stages. Compared to the ground level construction activities noted above, the visual influence of this activity would be available to a wider range of receptors, more similar to the operational phase. These construction/decommissioning effects would occur for the same visual receptors

as reported in **Section 6.7** for the operational phase, and therefore have not been repeated here.

Landscape Effects – Scenario 2

- 6.7.14 In Scenario 2, the extension would be constructed first, followed by a break of up to 5 years and then the repowering would be undertaken. This construction stage scenario would result in Medium Term changes mainly within the host Upland Sloping Moorland. However, the Decommissioning stage at the end of life of the Proposed Development, would result in Short Term effects.
- 6.7.15 The effects would predominantly result from upgrades to, or new sections of the access track required, decommissioning of existing turbines, erection of new wind turbines and the ground level construction activities such as, borrow pits, construction compounds, construction of control building/substation and energy storage, as well as the activity and movement of large construction vehicles/cranes within the moorland areas of site. In this scenario this impacts would be more widely spread out across the construction period resulting in a reduce scale of activity at any one time but over a longer programme. These activities would still contrast with some of the quieter qualities of landscape character. However, given that most of these activities would occur within or adjacent to areas of existing wind energy (Ben Aketil and Edinbane) and commercial forest activity, some aspects of this activity may be difficult to distinguish from the baseline.
- 6.7.16 During the time between the extension phase and the repowering phase, the existing turbines would be seen adjacent to the new turbines, as illustrated the **Construction Stage Comparative Wirelines** in **Volume 2d**. There would be a noticeable difference between the size of the existing turbines and the new turbines, particularly from the south (**Viewpoints 2, 5 and 8**) where the new turbines are seen in close association in front of the old turbines, but it would be less noticeable from the north (**Viewpoints 1 and 6**). In some cases the existing turbines, either from distance or from elevation, the existing Ben Aketil turbines would be perceived as similar sized to the other existing turbines such as Edinbane which are also visible in the view. Where the two are visible they conform to a similar design pattern and the designs would complement, rather than detract. Where there is a noticeable difference in scale, this is likely to be perceived as part of the evolution of wind energy development throughout Scotland and would not cause a notable increase in adverse impacts.
- 6.7.17 The landscape character of the Upland Sloping Moorland is considered to be of **Medium/Low** landscape sensitivity to construction activity. The surrounding forestry and topography would limit the influence of construction operations, particularly ground-level operations from most vantage points outside of Glen Heydsal/Gleann Foghann within the Upland Sloping Moorland. The effects of construction activity are considered to be Large in scale over a Localised extent of the Upland Sloping Moorland in the Medium term. Accordingly, the magnitude of change is considered to be **Moderate**, which gives rise to **Moderate** effects which would be **Significant** for the Upland Sloping Moorland LCT.

Visual Effects – Scenario 2

- 6.7.18 In Scenario 2, the extension would be constructed first, followed by a break of up to 5 years and then the repowering would be undertaken. This construction stage scenario

would result in Medium Term changes. However, the Decommissioning stage at the end of life of the Proposed Development, would result in Short Term effects.

- 6.7.19 Residents at Upper Feorlig, Feorlig, Caroy, Roag, road users of the A863 and A850 would clearly notice the construction impacts. Recreational users on the informal tracks through the site would be very noticeably affected by the construction and decommissioning activities. There would also be views into the site from anyone hillwalking surrounding moorland hills such as Ben Aketil or other surrounding hills. The construction activity may be perceptible as far as the elevated summits such as Macleods Tables but unlikely to be clearly discernible for those traversing the Trotternish ridge/Skye Trail.
- 6.7.20 The construction activity across the site would be visible as an increase in activity compared the normal forestry extraction and wind farm maintenance which is characteristic across the Site from time to time. This would include the access track, construction work on the extension, repowering of the existing turbines including some of the borrow pit extraction, turbine foundations, electrical infrastructure, control buildings/substation, energy storage as well as vehicle movements at or near the site entrances.
- 6.7.21 These effects would be different in nature to those experienced once the Proposed Development was complete and would occur in phases with periods of more activity and periods of less activity spread across the Medium Term. Careful management of the construction process in relation to these receptors will be included within CEMP.
- 6.7.22 For residents at Upper Feorlig, Feorlig, Caroy, Roag, and road users of the A863 and A850, and recreational users on surrounding fells and the site, the effects of construction activity are considered to be Large in scale but only over a Localised extent of the area in the Medium Term. The magnitude of change is considered to be **Substantial/Moderate**, which for a receptor of **High/Medium** sensitivity would give rise to **Major/Moderate** and **Significant** effect.
- 6.7.23 The erection/removal of the proposed wind turbines involving the use of large cranes would be another component of the construction/decommissioning stages. Compared to the ground level construction activities noted above, the visual influence of this activity would be available to a wider range of receptors, more similar to the operational phase. These construction/decommissioning effects would occur for the same visual receptors as reported in **Section 6.7** for the operational phase, and therefore have not been repeated here.

Viewpoint Analysis

- 6.7.24 Viewpoint analysis has been undertaken from a total of 19 viewpoints. The final list of viewpoints was prepared following consultation during Scoping with THC and NS and other consultees.
- 6.7.25 The viewpoint locations are illustrated on LVIA Figures. The visualisations (comprising photographs of the existing view, wireframes and photomontages) are presented in **Volume 2b** and **2c**.
- 6.7.26 The full viewpoint analysis is contained within **Technical Appendix 6.4**. The findings are summarised below in **Table 6.8**. In each case, distances are listed in relation to the nearest turbine.

6.7.27 Please note that **Technical Appendix 6.4** considers the nature and the scale of changes to character and views at each viewpoint location only. The sensitivity of receptors and wider extent of the effect (beyond the individual viewpoint location) and its duration are considered in the main body of the assessment text below as part of the consideration of the magnitude and significance of effects. The assessment baseline includes the existing influence of wind energy as well as the future consented baseline in the scale of change.

Table 6.8: Viewpoint Analysis Summary

VP no.	Viewpoint	Distance from nearest turbines	Scale of visual change	Scale of landscape change
1	A850 north of site	1.6 km N	Large/Medium	Medium
2	A863 at Feorlig	3.3 km S	Medium	Medium
3	A863 south of Dunvegan	3.5 km, SW	Large/Medium	Medium
4	A850 east of Dunvegan	3.7 km, W	Medium/small	Medium/small
5	Roag	4.3 km, SW	Medium	Medium
6	A850 Flashader	5.7 km, NE	Medium/small	Small
7	Minor Road to Greshornish	5.9 km, N	Medium/small	Small
8	A863 near Gearymore	6.6 km, S	Medium/small	Small
9	Macleod's Table North / Healabhal Mhor	8.6 km, SW	Medium/small	Small
10	B884 Colbost, Duirinish	9.7 km, W	Medium/small	Small
11	Ardtreck, Minginish	11.4 km, S	Medium/small	Small
12	A87 at Borge	11.6 km, E	Small	Small
13	Ardmore, Waternish	14 km, NW	Small/negligible	Negligible
14	Minor road above Uig	17.7 km, N	Small	Small
15	The Storr	18 km, E	Small	Small
16	Moineach Mararaulin	21.1 km, SE	Small	Small/negligible
17	Beinn Edra	20 km, NE	Small	Small
18	Bruach na Frithe, Cuillin Hills	25.5 km, SE	Small	Small
19	Uig to Lochmaddy Ferry	24.7 km	Small/Negligible	Negligible

6.7.28 Each of the viewpoints is a ‘sample’ of the potential effects, representing a wide range of receptors – including not only those actually at the viewpoint, but also those nearby, at a similar distance and/or direction. In consideration of the ZTVs and these viewpoints it can be seen that the distribution of effects would be as follows:

- the Large and Medium scales of change for visual receptors would be contained within approximate 5km radius of the Proposed Development;
- the Medium scale of change for landscape receptors would also be contained with an approximate 5km radius;
- beyond a 5km radius, the scale of change would drop to Medium/Small for visual receptors and Small for landscape receptors.

Effects on Landscape Character

6.7.29 Descriptions for each of the assessed character areas/types are briefly summarised below, along with further observations from site-based work.

Upland Sloping Moorland LCT 359

6.7.30 As shown on **Figure 6.3**, this LCT includes the Site and upland areas of northern central Skye and is closely associated with LCT 360 Stepped Moorland. The Upland Sloping Moorland broadly undulates with moorland and forestry to form a large-scale patchwork of contrasting colours and textures. Intervisibility of the proposed turbines with this LCT would occur within the Site and approximately 5 km radius, with little influence beyond high ground and forestry at Beinn Uilleim.

6.7.31 The sensitivity of the host landscape is considered to be Medium/low, as noted in **Technical Appendix 6.3**. This assessment judged the susceptibility of the host landscape type to be Low and the value to be Regional.

6.7.32 **Figure 6.5** illustrates the extent of theoretical visibility of the Proposed Development and **Figure 6.6** includes the screening effect of forestry which would reduce this extent even further. Viewpoints 1 and 4 are located within this LCT and **Viewpoints 2, 3, 5 and 6** have a good outlook towards this landscape. The nature of the change at these viewpoints is described in detail within **Technical Appendix 6.4**.

6.7.33 **Table 6.9** outlines the local characterising effect the Proposed Development would have on the key characteristics of the Upland Sloping Moorland, as stated in the NatureScot LCA 2019.

Table 6.9: Effects on Key Characteristics of Upland Sloping Moorland LCT 359

Key Characteristic	Effect of the Proposed Development
Expansive moorland with gentle slopes and broad undulations above 50 metres and sweeping, rounded summits up to 260 metres.	Whilst the turbines would occupy a larger extent of this LCT and the scale of turbines would be much larger, the receiving landscape would remain expansive in scale.
Mainly smooth, with small radiating burns cutting into lower slopes and weakly defined steps where peat is thinner overlying the stepped bedrock.	No change

Key Characteristic	Effect of the Proposed Development
Occasional finer grain, ridge-like or hummocky undulations in surface deposits, found in places at the base of slopes.	No change
Mainly used for grazing on rough grass land, and for forestry, which together form a large scale patchwork of contrasting colours and textures.	No change in land use proposed. Large scale patchwork of contrasting colours and textures and patchwork would remain.
Little settlement – occasional isolated modern farms.	No change to settlement pattern.
Distance and scale are difficult to judge, except where roads, power lines or occasional wind turbines introduce scale.	The proposed turbines would introduce additional scaling elements in an area already affected by wind turbines.
Simple overall composition.	This would be maintained.
Exposed and open, with extensive views to surrounding mountains, islands, coastlines and the sea.	This would be maintained.

- 6.7.34 The Proposed Development would increase the presence and influence of renewable energy generation within the Upland Sloping Moorland LCT but the effect on the key characteristics would be relatively limited and localised in an area already influenced by wind energy development. The southern access track would create a track into the upland, similar to the Edinbane track, which would link the A863 to A850 and allow informal recreational access into this area. The proposed substation and energy storage would appear in the core of the array and would accord with the key characteristic of 'occasional isolated modern farms'. The ground level infrastructure would not be perceived locally outwith Glen Heysdal.
- 6.7.35 The turbines of the Proposed Development would be noticeably larger than the existing Ben Aketil turbines. They would also appear larger than those at the operational Edinbane but the difference compared to the consented Ben Sca would not be so noticeable. Where there is a noticeable difference in height, this is likely to be perceived as part of the evolution of wind energy development throughout Scotland and would not cause a notable increase in adverse landscape impacts.
- 6.7.36 Where visible from the proposed turbines would represent additional large-scale features in this large-scale landscape such as the landform and landcover. The turbines would be 200 m high to tip and would be located on landform which extends from approximately 100 m to just over the 210 m contour near Ben Aketil. The summit of Ben Aketil is 266 m AOD with adjacent Ben Sca at 283 m AOD. The wind turbines would accord with the exposed and open nature of the landscape and other wind turbine development in this part of Skye. However, the vertical aspect would contrast with the more horizontal and smaller scale elements in adjacent LCTs. There is already a sharp contrast between the scale of the Upland Sloping Moorland and '*the human scale of the adjoining settled landscapes*'⁹.

⁹ Page 1 Landscape Character Type 359, Upland Sloping Moorland, National Landscape Character Assessment NatureScot, 2019

- 6.7.37 As illustrated in ZTVs, there would be a distinct area of influence within 5 km of the proposed turbines within this LCT, but this would drop away quickly due to landform. Much of these areas are already influenced by existing or consented wind energy development, as well as large scale forestry. The extension and repowering would not extend the area influenced by wind energy by much, but the larger turbines would strengthen that existing influence, as illustrated in the visualisations. The key characteristics would be relatively limited and localised in an area already influenced by wind energy development.
- 6.7.38 For the Upland Sloping Moorland there would be a Medium scale of change over a Intermediate extent of the LCT due to the introduction of the Proposed Development. These changes are considered to be Long Term which would lead to a Moderate magnitude of change for the Upland Sloping Moorland LCT. For this landscape of Medium/low sensitivity, this would lead to a **Moderate** effect which would be **Not Significant**.

Stepped Moorland LCT

- 6.7.39 As shown on **Figure 6.3**, this LCT includes much of central Skye and surrounds the site on all sites with pockets and larger areas which is closely associated with the host LCT 359 Upland Sloping Moorland. The Stepped Moorland has a distinctive stepped landform rising from the coast up to moderate elevation uplands. Intervisibility of the proposed turbines with this LCT would occur within approximately 5 km radius and forms the hills of the main visual envelope. There are a few patches of visibility on high ground to the south-west of Portree, on elevated parts of Minginish and a few islands in Loch Bracadale.
- 6.7.40 The sensitivity of the Stepped Moorland is considered to be Medium. The value of this landscape is judged to be Regional, on account of some parts being covered by THC Special Landscape Areas; some presence of natural and cultural heritage interests; a degree of distinctiveness and scenic quality. The susceptibility is judged to be Medium, on account of the large scale of the receiving landscape which is open and exposed with large to moderate scale forest blocks amongst a predominantly moorland landcover; distinctive but not dramatic landform; extensive intervisibility but not so dramatic a skyline as the surrounding NSAs, but more distinctive than the other moorland types.
- 6.7.41 **Figure 6.5** illustrates the extent of theoretical visibility of the Proposed Development and **Figure 6.6** includes the screening effect of forestry which would reduce this extent even further. **Viewpoints 6, 8 and 16** are located within this LCT. The nature of the change at these viewpoints is described in detail within **Technical Appendix 6.4**.
- 6.7.42 The consented Glen Ullinish (149.9 m to tip) and Beinn Mheadhonach (120 m to tip) wind energy developments are located within the central Skye within this LCT. The influence of wind energy will occur in this LCT within central Skye. The Proposed Development would increase the influence of renewable energy generation within the Stepped Moorland LCT but this would be localised and limited in an area already influenced by wind energy development.
- 6.7.43 Given the nature of the key characteristics and nature of change on this LCT, the key characteristics would not be affected.

- 6.7.44 The turbines of the Proposed Development would be larger than the consented turbines in this LCT but they would be separated by over 4 km where the difference would be less noticeable. They would appear noticeably larger than those at the operational Edinbane but the difference compared to the consented Ben Sca would not be so noticeable. Where there is a noticeable difference in height, this is likely to be perceived as part of the evolution of wind energy development throughout Scotland and would not cause a notable increase in adverse landscape impacts.
- 6.7.45 Where visible from the proposed turbines would represent additional large-scale features in this large-scale landscape such as the landform and landcover. The wind turbines would accord with the exposed and open nature of the landscape and other wind turbine development in this part of Skye. However, the vertical aspect would contrast with the more horizontal and smaller scale elements in adjacent LCTs.
- 6.7.46 As illustrated in ZTVs, there would be greater extent of influence within approximately 5 km radius and much of these areas are already influenced by existing or consented wind energy development, as well as large scale forestry. The larger turbines would strengthen that existing influence, as illustrated in the visualisations. There would also be a few more distant patches of visibility on high ground to the south-west of Portree, on elevated parts of Minginish and islands in Loch Bracadale. Overall the key characteristics would not be affected and the influence would be relatively limited and localised in an area already influenced by wind energy development.
- 6.7.47 For the Stepped Moorland there would be a Medium or Small scale of change over an Intermediate extent of the LCT due to the introduction of the Proposed Development. These changes are considered to be Long Term which would lead to a **Moderate/Slight** magnitude of change for the Stepped Moorland LCT. For this landscape of Medium sensitivity, this would lead to a **Moderate** effect, which would be **Not significant**.

Farmed and Settled Lowlands – Skye and Lochlash LCT 357

- 6.7.48 As shown on **Figure 6.3**, this LCT relatively small proportion of Skye and Lochlash found in patches of low lying and mainly coastal parts of Skye. This LCT is a focus of human activity and associated land uses which contrast sharply with surrounding moorland and mountain types. Intervisibility of the proposed turbines with this LCT would be extremely variable and intermittent across the study area.
- 6.7.49 The sensitivity of the Farmed and Settled Lowlands is considered to be **High/Medium**. The value of this landscape is judged to be Regional, as many parts are included within THC Special Landscape Areas; presence of cultural heritage and cultural associations with crofting; distinctiveness and scenic quality but a lack of wildness. The susceptibility is judged to be High, on account of the small scale and complexity of the landscape which is often open and exposed with extensive intervisibility, but is also characterised by human activity.
- 6.7.50 **Figure 6.5** illustrates the extent of theoretical visibility of the Proposed Development and **Figure 6.6** includes the screening effect of forestry which would reduce this extent even further. **Viewpoints 2, 5, 7, 10, 11 – 14** are located within or on the edge of this LCT. The nature of the change at these viewpoints is described in detail within **Technical Appendix 6.4**.

- 6.7.51 Given the nature of the key characteristics and nature of change on this LCT, the only key characteristic would be likely to be affected is the '*sharp contrast between human activity and small-scale land use patterns, and the surrounding large scale, mainly uninhabited, landscapes*'. The others would remain unaffected.
- 6.7.52 Wind energy development is, or will be present in some of the moorland which forms the background to most of this LCT. Often from these landscapes, the Proposed Development would appear large in scale within a large scale landscape, but this would contrast with the smaller scale elements of the Farmed and Settled Lowlands. The larger turbines would strengthen that contrast. However, this contrast is one of the key characteristics and this aspect would remain largely intact. The Proposed Development would occur in an area already, or consented to be, occupied by wind energy, which would limit the change in perception of this key characteristic. The wind turbines would accord with the exposed and open nature of this landscape.
- 6.7.53 The Proposed Development would appear as a noticeable increase in scale compared to the operational, and in some cases consented turbines. Where there is a noticeable difference in height, this is likely to be perceived as part of the evolution of wind energy development throughout Scotland and would not cause a notable increase in adverse landscape impacts.
- 6.7.54 As illustrated in ZTVs, there would be a variable extent of influence within the study area. However, this change would occur where the adjacent moorland is already influenced by existing or consented wind energy development, as well as large scale forestry. Overall the key characteristics would not be significantly affected and the influence would be intermittent and localised, occurring in a part of the adjacent moorland already influenced by wind energy development.
- 6.7.55 For the Farmed and Settled Lowlands – Skye and Lochlash there would be a Localised Medium scale of change to the west and Small scale of change over an Intermediate extent of the LCT due to the introduction of the Proposed Development. These changes are considered to be Long Term which would lead to a **Moderate/Slight** magnitude of change. For this landscape of **High/Medium** sensitivity, this would lead to a **Moderate** effect which would be **Not Significant**.
- 6.7.56 Effects on the following landscape receptor is assessed to be less than Moderate and described within **Technical Appendix 6.5**
- **Low Smooth Moorland LCT** – intervisibility with this LCT would be limited to the occurrence south of Dunvegan and to a more limited extent in the occurrence south of Greshornish, with limited impact on key characteristics and **Moderate/Minor** impact.

Landscape Summary and Conclusions

- 6.7.57 The Proposed Development adheres to much of the design guidance within the THC Wind Energy SG criteria. With regard to the pattern of development with the future baseline (operational and consented), the Proposed Development would appear as a single group with Ben Sca with a very similar pattern of development and would read as complementary in the landscape to Edinbane and Glen Ullinish.
- 6.7.58 The extent of operational effects upon the landscape character would be limited by the topographic containment of the surrounding moorland. The effects of the Proposed

Development have been mitigated by the extent of influence of wind energy development on the site and surrounding landscapes as a result of existing and consented wind energy. As a result there were no significant effects reported on landscape character. However there were Moderate adverse impacts on three landscape character types including the host, Upland Sloping Moorland and the Stepped Moorland and Farmed and Settled Lowlands – Skye and Lochalsh. This level of impact would be predominantly contained within approximately a 5km radius of the proposed wind turbines, with impacts reducing even further with greater distance and extent of screening.

- 6.7.59 Significant construction effects would occur for the host area Upland Sloping Moorland LCT in Scenario 2 but not Scenario 1.
- 6.7.60 The turbines of the Proposed Development would be noticeably larger than exists at present in the area but less so with consented developments. Where there is a noticeable difference in height, this is likely to be perceived as part of the evolution of wind energy development throughout Scotland and would not cause a notable increase in adverse landscape impacts.

Table 6.10: Summary of Landscape Effects

Landscape receptor	Sensitivity	Level of Effects
Upland Sloping Moorland LCT	Medium/Low	Moderate – Not Significant
Stepped Moorland LCT	Medium	Moderate – Not Significant
Farmed and Settled Lowlands – Skye and Lochalsh	High/Medium	Moderate – Not Significant
Low Smooth Moorland	Medium/Low	Moderate/Minor – Not Significant

Visual Effects

- 6.7.61 Effects on the following visual receptor groups are assessed to be less than Moderate are described within **Technical Appendix 6.5**.
- Edinbane (3.9 km NE) – **Moderate/Minor** effects would be experienced from elevated areas on the fringe of the group where the Proposed Development would appear behind the consented Ben Sca turbines;
 - Flashader (6.1 km NE) – **Moderate/Minor** effects would be experienced where the Proposed Development would appear behind the consented Ben Sca turbines;
 - Greshornish (4.9 km N) – **Moderate/Minor** effects would be experienced from this small group which is screened in part by landform, localised vegetation and forestry;
 - Watninish (over 9 km N) – **Minor** effects would be experienced from a very small part of this area on the western side of this peninsula, where main views are west;
 - Borve (11.5 km E) – **Moderate/Minor** effects would be experienced from settlement in this area but views would be predominantly screened by landform;
 - North Minginish (over 11.5 km S) – **Moderate/Minor** effects would be experienced for some residents but landform and local vegetation provide notable screening;

- Uig (c.14 - 18 km NW) – **Moderate/Minor** effects would be experienced from those on high ground, where views from the harbour and main settlement would be fully screened; and
- Moineach, Glen Brittle Forest (21 km SW) – **Moderate/Minor** effects would be experienced for recreational users in this area but effects would be limited by screening from intervening landform and forestry;

Visual Receptor Groups

- 6.7.62 This assessment focuses on effects on groups of visual receptors, incorporating effects on views from public spaces and streets within settlements. The assessment of effects focuses on the visual amenity of public spaces, though views from groups of dwellings will also be noted in the descriptions.
- 6.7.63 Unless noted differently, these visual receptors are considered to be of **High/Medium** sensitivity as a result of a **High** susceptibility to the change and a Community value of the view.
- 6.7.64 **Upper Feorlig** (2.3 km S) – This receptor group comprises a very small number of residential and crofting properties set along a local road to the north of the A863 and is represented with **Viewpoint 2**. Properties are generally aligned to face the road, and have an east facing frontage looking across the valley over the river Caroy, with some properties having views to the north and south. All but one of the properties at the northern end of the group have some level of tree cover within their curtilage which would provide a degree of local screening. Existing views north contain visibility of all twelve of the existing turbines at Ben Aketil. In future, there will also be views to the consented Ben Sca turbines behind Ben Aketil and views to the consented Glen Ullinish turbines to the south-east. Key views in this area are directed towards the south-east where land drops into Loch Caroy and long views are available to the distinct peaks of the Cuillin Hills. Outlook to the north and west consists of the moorland hills, which curtails and long-range views.
- 6.7.65 All nine turbines, the Southern Site Access track and some of the ground level infrastructure of the Proposed Development would be visible for few residents. The Proposed Development would be seen as a double row of turbines to the north, replacing the existing turbines within moorland rising up to the low summit of Ben Aketil to the north-east. The proposed turbines in the array would appear much larger in scale compared to the existing Ben Aketil turbines, but there would be fewer in number and the extent of the array would only increase marginally. The proposed turbines would occupy an area of the view where turbines are presently key visual elements and would not appear in key views to the south-east.
- 6.7.66 For receptors in this group of **High/Medium** sensitivity, there would be a Large/Medium scale of change across a very Localised group. These Permanent changes would result in a **Moderate** magnitude of change, leading to a **Major/Moderate** effect which would be **Significant**.
- 6.7.67 **Feorlig** (3.2 km S) - This another very small group consisting of local road users, a few residential properties and a core path over the peninsula. Properties in this group have a general eastern outlook across Loch Caroy and south-east to the Cuillin Hills which are the focus of views. Topography tends to be flatter to the south of the group and along the east – west oriented core path. Clear views to the existing Ben Aketil turbines are

available from small sections of the core path, parts of the minor road and from a few of the residential curtilages. There will be views to the consented Glen Ullinish turbines to the south-east.

- 6.7.68 The Proposed Development would be clearly noticeable in views to the north in place of the existing Ben Aketil turbines, with some screening from garden vegetation. The Proposed Development would be visible in an area of interior moorland outside of key views to the south-east, but due to their increased height, they would be more visible than the current turbines from this group. However, there would still be screening from local garden vegetation and landform, as illustrated on the ZTVs, limiting the extent of visibility within this group.
- 6.7.69 For receptors in this group of **High/Medium** sensitivity, there would be a Medium scale of change, with a Localised group. These Permanent changes would result in a **Moderate** magnitude of change, leading to a **Moderate** effect which would be **Significant**.
- 6.7.70 **Caroy** (3 km S) – This group consists of local road users and residents on the eastern bank of Loch Caroy and along the A863. Settlement is dispersed along the road and the coastline, changing aspect to match either the roadside or coastal edge and in general take advantage of views over the Loch towards Macleod's Tables to the west and seaward to the south-west. Some of the more elevated dwellings have secondary aspects which face north, looking inland toward the existing Ben Aketil turbines. Undulating topography coupled with small, dispersed blocks of woodland and roadside vegetation provide intermittent screening throughout the area.
- 6.7.71 The Proposed Development would be visible in views north, replacing views of the existing turbines. Properties close to Caroy slipway which have a north-western outlook and elevated properties further south which have open outlook to the north towards the site would obtain views to the Proposed Development. Other properties would be fully or partially screened and the turbines would not appear in key views.
- 6.7.72 For receptors in this group of **High/Medium** sensitivity, there would be a Medium scale of change, with this Localised group. These Permanent changes would result in a Moderate magnitude of change, leading to a **Moderate** effect which would be **Significant**.
- 6.7.73 **Harlosh** (5.2 km SW) - This receptor group comprises the crofting settlements of Harlosh, Balmore and Vatten, local road users, walkers on the core path in between the settlements. The group is located at the southern end of a small peninsula between Loch Caroy and Loch Vatten and settlement here follows the pattern of the roads/landform. This group have coastal aspects to the east, south and west which represents the key views from this group though some properties would also experience views to the north. Views in this area are focused across a complex coastline of peninsulas and small island with cliff edges with the Macleod's Tables to the west and the Cuillin Hills to the south-east forming key features of the available views. Existing turbines at Ben Aketil are visible to the north in occasional properties and parts of the group with open northern aspects. Glen Ullinish will be visible to the east.
- 6.7.74 The Proposed Development would be visible to the north when views to the north are available, but the general pattern of local screening provided by localised landform, adjacent settlement and occasional vegetation tending to focus views seaward to the

east, south and west. When visible, the turbines would introduce a larger scale of feature to northern views, replacing views of the existing turbines of Ben Aketil.

- 6.7.75 For receptors in this group of **High/Medium** sensitivity, there would be a Medium/Small scale of change, with a Limited extent of the group. These Permanent changes would result in a **Moderate/Slight** magnitude of change, leading to a **Moderate** effect which would be **Not Significant**.
- 6.7.76 **Roag** (4.3 km SW) - This group is made up of residents at Roag and Orbest, and local road users. **Viewpoint 5** is located at Roag where views towards the site are at their greatest. The settlement of Roag is aligned along the road/landform with a predominantly eastern aspect and there is some minor screening afforded by garden vegetation and trees. Orbest consists of a large farm with main house and some smaller dwellings nearby, although Orbest is predominantly outwith the ZTV due to screening by trees. Primary outlook from this group is predominantly to the east and south-east over Pool Roag, Roag Island onto a complex coastline of peninsulas and islands to Minginish and the Cuillin Hills in the distance. Existing turbines at Ben Aketil can be seen to the north-east from parts of the road and from some properties where they are not screened by garden trees or landform. Glen Ullinish will be visible to the south-east.
- 6.7.77 The Proposed Development would be visible to the north-east when travelling north along the minor road or from views from some of the properties and the ZTV with screening shows the variable nature of visibility across this group. However, when visible, the proposed turbines would appear larger in scale, as they replace the existing turbines within the moorland but outside of key views to the south and south-east from properties.
- 6.7.78 For receptors in this group of **High/Medium** sensitivity, there would be a Medium scale of change, across an Intermediate extent of the group. These Permanent changes would result in a Moderate magnitude of change, leading to a **Moderate** effect which would be **Significant**.
- 6.7.79 **Dunvegan** (4.1 km W) - This group is comprised of the residents and visitors of Dunvegan including Kilmuir and Lonmore and core path to the Castle. The settlement is spread across the bottom of a south-western facing slope at the mouth of Loch Dunvegan, which focuses the primary outlook to the south-west across Loch Dunvegan to the Macleod's Tables.
- 6.7.80 As illustrated in the ZTVs, visibility to the Proposed Development would be limited from this receptor group, with views of the turbines restricted to areas outside of the settlement, as illustrated in **Viewpoints 3** and **4**. Views to blade tips and up to 2-3 hubs would be available from short stretches of the A850, as woodlands, garden trees or adjacent settlement would screen views from the edges of the settlement, limiting them to visibility from the rear of a few properties. There would also be a short section of the core path to the castle with visibility on high ground but no views from the majority of the route or the castle itself. There would be no views from the centre of the village along the loch or at the nearby church. There would be some visibility from dwellings at the eastern end of Dunvegan, similar to **Viewpoint 3**, but for most it would be fully screened. There would be views of the Proposed Development on the approach and exit to the village, as illustrated in **Viewpoints 3** and **4**.
- 6.7.81 For receptors in this group of **High/Medium** sensitivity, there would be a Medium/Small scale of change, within a Limited extent of the group. These Permanent changes would

result in a **Moderate/Slight** magnitude of change, leading to a **Moderate** effect which would be **Not Significant**.

- 6.7.82 **Colbost** (over 8.7 km W) - this group consists of linear crofting settlement along the Duirinish peninsula, to the west of Loch Dunvegan along the B884. Much of the scattered settlement is low lying beside the coast with views focused seaward and into Loch Dunvegan with rising moorland landform containing western and southern outlooks, as illustrated in **Viewpoint 10**. The low area is well established with mature garden vegetation in many of the properties. From properties with a south-eastern aspect, existing turbines at Ben Aketil can be seen and a few turbines of Ben Sca will be seen within low area of moorland forming the background of the view across the loch. Glen Ullinish will be visible in the more distant moorland.
- 6.7.83 The Proposed Development would be seen, replacing the existing turbines in front of Ben Sca, as illustrated in **Viewpoint 10**. The proposed array would be partially screened by landform, seen in the background moorland above Loch Dunvegan, but those turbines which are visible would appear more noticeable than the existing turbines.
- 6.7.84 For receptors in this group of **High/Medium** sensitivity, there would be a Medium/Small scale of change, with an Intermediate extent of the group. These Permanent changes would result in a **Moderate** magnitude of change, leading to a **Moderate** effect which would be **Not Significant**. It should be noted that receptors further north up the coast on the Duirinish peninsula would experience reduced impacts with increasing distance and reduced relationship with the central moorland of Skye.

Key Transport Routes

- 6.7.85 Effects on the following visual receptors are assessed to be less than Moderate are described within **Technical Appendix 6.5**.
- **A87 from Portree to Uig** (11.8 km – 17.6 km E & NE) – **Moderate/Minor** effects would be experienced from this route, where views would be often screened by intervening landform;
 - **A850 from Borge to Dunvegan** (c.11 km - 1.7 km) – **Moderate/Minor** effects would be experienced from this route near the Proposed Development but limited elsewhere;
 - **Ferry Route Uig to Lochmaddy, North Uist** (17 km – 42 km away) – **Minor** effects would be experienced from this route where only patchy visibility would be possible at distance;
- 6.7.86 **A863 Sligachan to Dunvegan** (23 km -2.5 km away) – this c. 37 km (23 mile) route runs between the A87 at Sligachan to Dunvegan in a north-south orientation via Drynoch, Bracadale, Caroy and Roskill. This receptor is considered to be of **Medium** sensitivity as a result of a Medium/low susceptibility to the change and a Regional value of the view as this route extends through the North West Skye SLA.
- 6.7.87 The route northbound begins beside the Sligachan Hotel, extending over moorland and through small, low forestry into Glen Drynoch and further to Bracadale following the coast. There would be only one small stretch of visibility north of Drynoch where there are views over the moorland. Otherwise there would be no views of the Proposed Development through these southern areas of the route. The consented Glen Ullinish will be visible when constructed and have a notable influence on this section of the route. North of Bracadale, the Proposed Development would come into view approaching Gearymore,

as illustrated in **Viewpoint 8** where the road crosses a section of open moorland before dropping into Glen Ose, where landform would screen views. Intermittent views to the Proposed Development alongside Edinbane would occur for the next approximately 9 km of the route to Dunvegan. Here the route follows the coastal edge moving in and out of intricate landform or moves across moorland as it passes peninsulas which often screens or changes the nature of the view from either coastal or moorland. The Proposed Development would be visible as much larger turbines in the view, but would occur in views inland to moorland which is already or will be a characteristic element in those views inland, as illustrated in **Viewpoints 8, 2 and 3**.

- 6.7.88 Southbound there would be intermittent views from Dunvegan to Feorlig, but beyond Feorlig views would be behind the direction of travel.
- 6.7.89 For this road receptor, which is considered to be of **Medium** sensitivity, there would be a Medium scale of change across a Localised extent of the route. These Permanent changes would result in a **Moderate** magnitude of change, leading to a **Moderate** effect which would be **Not Significant**.

Recreational Routes

- 6.7.90 Effects on the following visual receptors are assessed to be less than Moderate and described within **Technical Appendix 6.5**.
 - **Skye Trail** (c.15 km east) – **Minor/Moderate** effects would be experienced, mainly as a result of distant views from the Trotterish ridge;
- 6.7.91 **Informal routes across the Site** – There are informal walking routes to the summit of Ben Aketil and also walkers, runners and cyclists who use the existing wind farm and Ben Aketil and Edinbane and crofting track at Upper Feorlig to create a loop. Receptors using these routes of Community value would have a High susceptibility to the proposed Development and would be **High/Medium** sensitivity. Part of the mitigation incorporated into the Proposed Development is to continue access of these routes in the long term.
- 6.7.92 As illustrated on the ZTVs, there would be close range visibility of the Proposed Development throughout much of these routes, except perhaps when the route extends through mature forestry. Whilst there would be close range views of the Proposed Development, these routes already extend through an area which is already highly characterised by wind energy development and therefore the change to the nature of views would be more limited.
- 6.7.93 For people using these routes across the site, which are considered to be of **High/Medium** sensitivity, there would be a Large/Medium scale of change across a Wide extent of the route. These Permanent changes would result in a **Substantial** magnitude of change, leading to a **Major/Moderate** effect which would be **Significant**.

Specific Viewpoint

- 6.7.94 Effects on the following visual receptor is assessed to be less than Moderate are described within **Technical Appendix 6.5**.
 - **The Storr** (18 km E) – **Moderate/Minor** effects would be experienced from this popular viewpoint at the southern end of the Trotterish ridge near Portree;

Visual Summary and conclusions

- 6.7.95 In summary, there would be significant visual effects for residents at Upper Feorlig, Feorlig and Caroy and users of the informal recreational routes across the Site. Given the existing and consented baseline, there would be **Moderate** but **Not Significant** visual effects for residents at Harlosh, Road, Dunvegan, Colbost and users of the A863.
- 6.7.96 Overall, there would be limited impacts on visual receptors in the area, partially due to the extent of screening locally and partially due to the extent of existing and consented wind energy on site and in the immediate area.
- 6.7.97 There would be significant construction effects for residents at Upper Feorlig, Feorlig, Caroy, Roag, and road users of the A863 and A850, and recreational users on site and surrounding fells in both Scenarios.

Table 6.11: Summary of Visual Effects - Daytime

Visual receptor	Sensitivity	Level of Effects
Upper Feorlig	High/Medium	Major/moderate - Significant
Feorlig	High/Medium	Moderate - Significant
Caroy	High/Medium	Moderate- Significant
Harlosh	High/Medium	Moderate- Not Significant
Roag	High/Medium	Moderate- Not Significant
Dunvegan	High/Medium	Moderate- Not Significant
Edinbane	High/Medium	Moderate/Minor- Not Significant
Flashader	High/Medium	Moderate/Minor- Not Significant
Greshornish	High/Medium	Moderate/Minor- Not Significant
Colbost, Duirinish	High/Medium	Moderate - Not Significant
Waternish	High/Medium	Minor- Not Significant
Borve	High/Medium	Moderate/Minor- Not Significant
Uig	High/Medium	Moderate/Minor- Not Significant
North Minginish	High/Medium	Moderate/Minor- Not Significant
Moineach, Glen Brittle Forest	High/Medium	Moderate/Minor- Not Significant
A87 from Portree to Uig	Medium/low	Moderate/Minor- Not Significant
A850 from Borve to Dunvegan	Medium/low	Moderate/Minor- Not Significant
A863 Sligachan to Dunvegan	Medium	Moderate - Not Significant
Ferry Route Uig to Lochmaddy, North Uist	High/Medium	Minor- Not Significant
Skye Trail	High/Medium	Moderate/Minor- Not Significant
The Storr	High	Moderate/Minor- Not Significant
Informal routes across the Site	High/Medium	Major/moderate - Significant

Night-time Visual Impacts

Summary of Visible Aviation Lighting Requirements and Mitigation

- 6.7.98 The Proposed Development will require visible aviation lighting, as set out within the **Chapter 2: Proposed Development** and **Chapter 14: Aviation**. Following an Aviation Study, it has been agreed with Civil Aviation Authority (CAA) that a reduced lighting scheme is acceptable for this proposal on this site. This will comprise a single 2000 candela steady red light mounted on the nacelle of four of the nine turbines at cardinal points which translates to T1, T5, T6 and T9. Visible lights on the towers are not required.
- 6.7.99 Unlike many aviation lights which currently exist in Scotland, such as on large TV masts, bridges and some existing wind turbines, the lights proposed would include some mitigation. Additional embedded mitigation includes automatic (controlled by sensors installed on the turbines) dimming of the lights to a nominal intensity of 200 candela during periods of meteorological visibility in excess of 5 km. The directional intensity mitigation has the potential to reduce the intensity of the lights for nearby receptors located at elevations below the turbine nacelles. As the precise specification for this mitigation is somewhat variable for each specific light design, this has been mentioned where this might reduce the impacts but not relied upon in the level of impact identified. The switching on and off of lights would be controlled by a timer 30 minutes before sunset until 30 minutes after sunrise, and not by photocells or similar that respond to particular light levels, thereby not incurring effects in the daytime.
- 6.7.100 All embedded mitigation is included within this assessment, unless noted otherwise.

Approach and Scope of the Assessment

- 6.7.101 There is a distinction between light pollution or nuisance and the effect of lighting on the character and amenity of the landscape at night. This is not a technical lighting assessment but focusses on the night-time effects as a result of the introduction of new artificial lighting, with consequent effects.
- 6.7.102 This part of the assessment is still an emerging area regarding the scope and receptors which would be impacted as a result of the aviation lighting. It is clear that night-time impacts would occur on the visual amenity of the area, but there is some debate regarding the extent of impact on surrounding landscape character. One of the most recent and relevant determinations by Scottish Ministers¹⁰ stated that '*Reporters conclude that proposed aviation lighting would be a visual impact alone and consider that without being able to see and fully appreciate the features of the landscape and the composition of views, it is not possible to carry out a meaningful landscape character assessment. The Scottish Ministers concur with this conclusion.*'
- 6.7.103 As a result, the effects on landscape character have not been included in this section of the assessment. However, visual effects at night would be possible and included in this section of the assessment. Consideration of the potential for night-time impacts on any special qualities of designated landscapes is considered in the assessment for each designation and the night-time impact on any wild land area is considered in **Technical**

¹⁰ Page 12 of Determination Decision Letter for Crystal Rig Wind Farm Phase IV by ECU.

Appendix 6.6. There are no other cumulative developments which are consented, proposed or being considered within the cumulative assessment which would require visible lighting and therefore not assessed.

- 6.7.104 The bare earth aviation lighting ZTV is presented in **Figure 6.14**. The NSAs and WLAs are shown on this ZTV. All wirelines have included the potential visibility of lighting. Visualisations at dawn/dusk have been prepared for **Viewpoints 2, 6 and 11**. These have been selected as representative of potential visual receptors which are most likely to be affected at night from a range of directions.

Potential Effects

- 6.7.105 The aviation lights would be visible as points of light, especially where there would be a high degree of contrast at the viewpoint (i.e. the lights were seen against a dark sky / dark landmass or where there would be little or no existing artificial light sources present). As noted in the baseline **Section 6.5**, the local area is very dark.
- 6.7.106 During periods of greater ambient light, (e.g. sunset, twilight, dusk, dawn) there would be a reduced effect as the contrast of the aviation lighting against the background would be less. The hours of darkness vary considerably across Scotland. The lights would be switched on 30 minutes before sunset until 30 minutes after sunrise. Therefore, in Dunvegan on the longest day on 21st June, the lights would be on between 20:58 and 04:57 but there would be no full darkness. By contrast on the shortest day on 21st December, the lights would be on between 15:12 and 09:36 with full darkness c. 12hrs. This variation means that in summer the lighting would not be switched on when people are predominantly active and contrast with the background would be reduced. However, in winter the lighting would be switched on during peak active times.
- 6.7.107 Due to the location of the lighting on the turbines relative to the rotating blades, this can result in a blinking effect caused by the screening effect of blades as they travel past the lights. These effects are dependent upon the rotation speed of the blades, direction of wind and the location of the receptor. Where a number of lit turbines are present in the view, such blinking is likely to be at the same frequency but uncoordinated.

Night-time Receptors and their Sensitivity

- 6.7.108 For visual receptors, the value attached to night-time views are considered to be low unless there is a particular feature that can be best appreciated in the hours of darkness. This may include views of stars and the night sky that are only possible in particularly dark areas or views of well-known landmarks that are lit up at night. The susceptibility of visual receptors also differs at night reflecting the different activities people undertake in the hours of darkness. For example, drivers using roads at night tend to be more focused on the road and the area illuminated by their headlights than during the day and may have oncoming headlights, cats eyes or other reflective signage drawing their attention, resulting in lower susceptibility. This is particularly the case on unlit rural roads that may be narrow and winding. On the other hand, people taking part in activities requiring darkness, such as stargazing, would be of higher susceptibility.
- 6.7.109 There are no Dark Sky Parks within the study area, which are more sensitive to visual changes at night. However, stargazing is a promoted recreational activity on Skye and in the study area, which includes the Waternish peninsula where there are places to park

and interpretation boards at Trumpan, Knockbreck/Gillan, and at Stein Jetty. However, as illustrated in **Figure 6.14**, there would be no intervisibility of the Proposed Development at those locations and little visibility of the lights on the entire Waternish peninsula. There is also star gazing promoted in Glendale, but again there is no intervisibility of the Proposed Development lighting with this area.

Visual Effects at Night

- 6.7.110 The impact on visual receptors at night is different from the impact in the daytime. The receptors potentially affected are different and their sensitivity may also be different.
- 6.7.111 Residents would remain of similar sensitivity. Road users would have a low value to the view, as there is no amenity value from the roads at night in this area, which reduces their overall sensitivity. Ferries do not run at night. In terms of recreational users, long distance paths, core paths, users of tourist routes are unlikely to be used at night and/or would not have any amenity value and therefore are not considered. However, it is noted that there may be some recreational users who wild camp or who spend time on popular beaches or points after sunset.
- 6.7.112 The night-time viewpoint analysis for all viewpoints is located within **Technical Appendix 6.4**, noting where visual receptors are different from the daytime analysis.

Residents and Settlements

- 6.7.113 As Illustrated in the ZTVs, visualisations and the main LVIA the impacts on nearest settlements and residents would be very limited. There would be no night-time impacts on residents at Waternish.
- 6.7.114 At Upper Feorlig, Feorlig and Caroy, residents with views of the Proposed Development would see all four aviation lights at night but they would appear as a pair of lights at either end of the array in views east or north-east, as illustrated in the dusk photomontage of **Viewpoint 2**. They would contrast with the generally dark local landscape and would result in a clearly noticeable addition at night. During periods of meteorological visibility in excess of 5 km, the lights would be reduced from 2000 candela to 200 candela but would still be visible. For residents at Upper Feorlig, Feorlig and Caroy, of **High/Medium** sensitivity, there would be a Medium scale of change, with this Localised group. These Permanent changes would result in a **Moderate** magnitude of change, leading to a **Moderate** effect which would be **Not Significant**. As indicated on the aviation lighting ZTV in **Figure 6.8**, these nearest residents are also likely to benefit from the additional mitigation of reduced directional intensity, where the intensity of the lights could be reduced by up to 95% (depending on individual light design) which would have the potential to notably reduce the impacts even further.
- 6.7.115 For residents at Harlosh, Roag and Dunvegan a few of the residents may be able to see up to 4 of the lights at night in views to the north-east at night and appear as two lights at either end of the array. They would contrast with the generally dark local landscape and would result in a clearly noticeable addition at night. During periods of meteorological visibility in excess of 5 km, the lights would be reduced from 2000 candela to 200 candela but would still be visible. For residents Harlosh, Roag and Dunvegan, of **High/Medium** sensitivity, there would be a Medium/small scale of change, with this Localised group. These Permanent changes would result in a Slight magnitude of change, leading to a

Moderate/Minor effect which would be **Not Significant**. As indicated on the aviation lighting ZTV in **Figure 6.8**, residents at Roag and Dunvegan would also likely benefit from the additional mitigation of reduced directional intensity, where the intensity of the lights could reduce by up to 95% (depending on individual light design) which would have the potential to notably reduce the impacts even further.

- 6.7.116 For residents at Flashader, Edinbane and Greshornish a few of the residents may be able to see 1-4 of the lights at night in views to the south-west at night and appear as lights at either end of the array, as illustrated in the dusk photomontage of **Viewpoint 6**. They would contrast with the generally dark local landscape and would result in a clearly noticeable addition at night. During periods of meteorological visibility in excess of 5 km, the lights would be reduced from 2000 candela to 200 candela but would still be visible. For residents at Flashader, Edinbane and Greshornish, of **High/Medium** sensitivity, there would be a Medium/small scale of change, with a Localised extent of the group. These Permanent changes would result in a **Slight** magnitude of change, leading to a **Moderate/Minor** effect which would be **Not Significant**. As indicated on the aviation lighting ZTV in **Figure 6.8**, residents at Edinbane and the southern part of Greshornish would also likely benefit from the additional mitigation of reduced directional intensity, where the intensity of the lights could reduce by up to 95% (depending on individual light design) which would have the potential to notably reduce the impacts even further.
- 6.7.117 For residents around Colbost, Duirinish a few of the residents may be able to see up to three of the lights at night in views to the east at night on the horizon. They would contrast with the generally dark moorland landscape above the settlement and would result in a clearly noticeable addition at night. During periods of meteorological visibility in excess of 5 km, the lights would be reduced from 2000 candela to 200 candela but would still be visible. For these residents of **High/Medium** sensitivity, there would be a Small scale of change, with an Intermediate extent of the group. These Permanent changes would result in a **Slight** magnitude of change, leading to a Moderate/minor effect which would be **Not Significant**.
- 6.7.118 For residents around Borge some of the residents may be able to see up to one of the lights at night in views to the west at night on the horizon. For these residents of **High/Medium** sensitivity, there would be a Negligible scale of change, with an Intermediate extent of the group. These Permanent changes would result in a **Slight/Negligible** magnitude of change, leading to a Minor effect which would be **Not Significant**.
- 6.7.119 For residents around Uig and Earlish a few of the residents may be able to see one-four of the lights at night in views to the south-west at night on the horizon, c. 15 km away. They would contrast with the generally dark moorland landscape above the settlement around the coast and would be visible but not so noticeable at this distance. During periods of meteorological visibility in excess of 5 km, the lights would be reduced from 2000 candela to 200 candela but would still be visible. For these residents of **High/Medium** sensitivity, there would be a Small/Negligible scale of change, with a Localised extent of the group. These Permanent changes would result in a **Slight/Negligible** magnitude of change, leading to a **Minor** effect which would be **Not Significant**.
- 6.7.120 For residents at North Minginish residents may be able to see up to four of the lights at night in views to the north at night on the horizon, c. 11-15 km away, as illustrated in the

dusk photomontage of **Viewpoint 11**. They would contrast with the generally dark moorland landscape above the settlement around the coast. During periods of meteorological visibility in excess of 5 km, the lights would be reduced from 2000 candela to 200 candela but would still be visible. For these residents of High/medium sensitivity, there would be a Small scale of change, with a Localised extent of the group. These Permanent changes would result in a Slight magnitude of change, leading to a Moderate/Minor effect which would be Not Significant.

Recreational Users

- 6.7.121 As noted earlier, there would be no star gazing recreational receptors at night with visibility of the aviation lights. However, it is understood that visitors would spend time at night on beaches and at points after sunset and also wild camping would occur within the study area. There are no popular beaches with views of the lights, but there would be a few coastal areas around Loch Bracadale where views of the lights would be most likely to occur, generally over 5 km away in views looking back towards the moorland for sunrise, rather than key views to the coastal sunsets to the west. From those wild camping on the east facing slopes below the Macleod's Tables, there would be widespread views of the four lights to the east. For these recreational receptors of **High/Medium** sensitivity, there would be a Small scale of change, with a Limited group. These Permanent changes would result in a **Slight** magnitude of change, leading to a **Moderate/Minor** effect which would be **Not Significant**.
- 6.7.122 For those wild camping on the west facing slopes of the Trotternish ridge, there would be more patchy visibility of the one-four of the lights 12-17 km away. For these recreational receptors of **High/Medium** sensitivity, there would be a Small/Negligible scale of change, with a Limited group. These Permanent changes would result in a **Slight/Negligible** magnitude of change, leading to a **Minor** effect which would be **Not Significant**.

Night-time Summary and Conclusions

- 6.7.123 The Proposed Development will require visible aviation lighting the nacelles of only 4 of the 9 turbines, having agreed a reduced lighting scheme with the CAA. A range of additional embedded mitigation measures have also been committed to in relation to minimising the night-time impacts including a reduced intensity light (from 2000 candela to 200 candela) in good visibility on the nacelle, directional intensity to limit brightness below the turbines and a timer to ensure the impacts only occur at night. With the exception of directional intensity, all embedded mitigation is included in the assessment of night-time impacts.
- 6.7.124 Given the extent of mitigation incorporated into the Proposed Development, no significant visual effects were identified at night.

Table 6.12: Summary of Visual Effects – Night-time with Embedded Mitigation

Visual receptor	Sensitivity	Level of Effects
Upper Feorlig, Feorlig and Caroy	High/Medium	Moderate – Not Significant
Harlosh, Roag and Dunvegan	High/Medium	Moderate/Minor – Not Significant

Visual receptor	Sensitivity	Level of Effects
Flashader, Edinbane and Greshornish	High/Medium	Moderate/Minor – Not Significant
Colbost, Duirinish	High/Medium	Moderate/Minor – Not Significant
Borve	High/Medium	Minor – Not Significant
Uig and Earlish	High/Medium	Minor – Not Significant
North Minginish	High/Medium	Moderate/Minor – Not Significant
Loch Bracadale and Macleod's Tables	High/Medium	Moderate/Minor – Not Significant
Trotternish	High/Medium	Minor – Not Significant

Designated Landscapes

6.7.125 Effects on the following designated landscapes are described within **Technical Appendix 6.5**:

- **Cuillin Hills National Scenic Area** – located over 23 km south of the Proposed Development with visibility limited to the summit, there would be no significant impacts on any of the Special Qualities; and
- **Trotternish National Scenic Area** – located over 20 km east of the Proposed Development with visibility limited to the ridge, there would be no significant impacts on any of the Special Qualities;

North West Skye Special Landscape Area

- 6.7.126 This large Special Landscape Area (SLA) covers much of Skye's north western peninsulas of Waternish, Duirinish and Minginish, extending from to Waternish Point in the north to Loch Brittle in the south and including Lochs Dunvegan and Loch Bracadale. This area includes varied and dynamic scenery of coastal landscapes which contrast with a stepped moorland and complex interplay of land and sea with the Macleod's Tables forming a prominent local landmark. The closest point to the Proposed Development is 3.3 km away where the A863 forms the eastern boundary. The extent of the SLA is shown on **Figure 6.1** and the extent of theoretical visibility including screening is shown on **Figure 6.6**. **Viewpoints 2, 5, 8 – 11** are located within or on the edge of this SLA from a range of low level, coastal and elevated positions.
- 6.7.127 The Proposed Development is not within the designation itself, so the physical integrity of the SLA would remain intact. The only potential for effects would occur as a result of visibility to or from the SLA of the Proposed Development. This designated landscape is considered to be of **High/Medium** sensitivity overall as a Regional designation for landscape value, although the susceptibility of each Special Quality may vary.
- 6.7.128 The Special Qualities of this SLA have been set out in 'Assessment of Highland Special Landscape Areas' June 2011 by The Highland Council. The special qualities identified within that document and the potential effect as a result of the Proposed Development are set out in the **Table 6.13**.

6.7.129 In reviewing the Special Qualities and underpinning landscape characteristics, it is not considered that any of these would be appreciated at night. Therefore, the impacts at night have not been assessed.

Table 6.13: Impact on Special Qualities of North West Skye SLA

Special Quality of the SLA	Underpinning landscape characteristics	Potential Impact
Dynamic Coastline	<i>'The dominant and defining influence is the relationship between land and sea which can be experienced from commanding coastal viewpoints such as Biod an Athair, Idrigill Point, or Oronsay Island, or in intimate corners such as Loch Bharcasaig or the inner reaches of Loch Dunvegan.'</i>	Given the location of the Proposed Development, there would be limited locations where the Proposed Development would be seen in combination with the coast. In the few occasions where this would occur, such as at Viewpoint 10 , the Proposed Development would appear clearly located in the moorland background. As a result, no significant effects on this SQ are predicted.
Distinctive Terrain	<i>'Sequence of dramatic peninsulas separated by deep penetrating sea lochs and large scale complex bays. Macleod's Tables form prominent flat-topped landmarks from within and around the SLA, rising above the generally uniform and low lying moorland landscape. These have a close relationship with Dunvegan Castle, the seat of the Clan Macleod which is a popular visitor attraction.'</i>	As illustrated in the Viewpoints, there would be few locations where the Proposed Development would appear in front of Macleod's Tables and there would be little or no impact on the perception of distinctiveness of this terrain. There would be no visibility from Dunvegan Castle. As a result, no significant effects on this SQ are predicted.
Crofting Landscapes	<i>'The sense of remoteness and tranquillity experienced among the more traditional crofting settlements...' 'Harlosh to Bracadale is an almost continuous patchwork of sub-rectangular field systems and small townships.' 'At Minginish there are sporadic remains of shielings and the occasional prehistoric roundhouses dotted throughout the hills...'</i>	As illustrated on the ZTVs, there would be very limited visibility from Waternish. As illustrated in Viewpoints 10, 11 and 13 , whilst there would be views of the Proposed Development from some of these more remote and historic crofting settlements, the Proposed Development would appear associated with the background moorland where wind energy is already present. There would be limited change to the perception of this SQ and as a result, no significant effects on this SQ are predicted.

6.7.130 Of the three identified Special Qualities no significant effects are predicted on any of them as a result of the Proposed Development. Whilst there would be views of the Proposed

Development from parts of this SLA, it would not diminish the distinctiveness of the terrain of Macleod's Tables. Whilst there would be views of the Proposed Development within the moorland background of some of these crofting landscapes, it would appear where turbines exist already. Any increased contrast in scale between the crofting landscapes and the Proposed Development would be very localised. As a result, there would not be any significant effects on the special qualities and they would all remain well expressed.

Greshornish Special Landscape Area

- 6.7.131 This is a small SLA which encompasses the inner reaches of Loch Snizort. This small SLA is rich in features and has both intricacy and relatively high relief for its size. There are '*excellent views to Waternish to the west, Trotternish to the east and, in clear conditions, to Harris to the north*'. The closest point to the Proposed Development is 5km away. The extent of the SLA is shown on **Figure 6.1** and the extent of theoretical visibility including screening is shown on **Figure 6.6**. **Viewpoint 7** is located within this SLA on the minor road into the area.
- 6.7.132 The Proposed Development is not within the designation itself, so the physical integrity of the SLA would remain intact. The only potential for effects would occur as a result of visibility to or from the SLA of the Proposed Development. This designated landscape is considered to be of **High/Medium** sensitivity overall as a Regional designation for landscape value, although the susceptibility of each Special Quality may vary.
- 6.7.133 The Special Qualities of this SLA have been set out in 'Assessment of Highland Special Landscape Areas' June 2011 by The Highland Council. The special qualities identified within that document and the potential effect as a result of the Proposed Development are set out in the **Table 6.14**.
- 6.7.134 In reviewing the Special Qualities and underpinning landscape characteristics, it is not considered that any of these would be appreciated at night. Therefore, the impacts at night have not been assessed.

Table 6.14: Impact on Special Qualities of Greshornish SLA

Special Quality of the SLA	Underpinning landscape characteristics	Potential Impact
Contrasting Geology, Enclosure and Exposure	<p><i>'Seclusion is found within the small scale Diubaig Bay which lies between the sheltering cliffs.'</i></p> <p><i>Sheltered and screened by broadleaf woodland, the gently sloping grazings around Greshornish House and former crofting land give way to more rugged terrain which becomes more dramatic where the coastal geology presents high sheer cliffs and a steep, puckered coastal margin.</i></p> <p><i>Distinctly defined, stepped moorland presents a varied mosaic of crag, heath and grassland offering alternating sheltered containment and isolated exposure.</i></p> <p><i>Stimulating views towards the imposing ridges of the adjacent peninsulas.'</i></p>	<p>There would be no visibility from the shores around Loch Diubaig. There would be views to the Proposed Development from the more rugged elevated terrain, when looking south towards the moorland, similar to Viewpoint 7. Here Edinbane is notable on the horizon and Ben Sca will appear on the horizon, predominantly in front of the Proposed Development.</p> <p>The Proposed Development would not appear in views towards the ridges of the adjacent peninsulas.</p> <p>Whilst there would be some intervisibility, this would not diminish the ability to appreciate the contrasting geology, enclosure and exposure special quality. No significant impacts are predicted on this special quality.</p>
Historic Landscape	<p><i>'At Greshornish there are a number of prehistoric roundhouses, two hillforts, some relic field systems which may also be prehistoric, and the occasional later medieval enclosure and ruined building evident in the landscape.'</i></p>	<p>Due to the extent of screening by landform and further by localised tree cover (not included in the screening ZTV) there would be limited intervisibility. Where there would be intervisibility, the Proposed Development would appear in an adjacent area of moorland where wind energy is already present. As a result, no significant effects predicted on this special quality.</p>

- 6.7.135 It is noted in the SLA description that there are 'views towards the SLA from Trotternish feature the wind turbines at Edinbane as a group of evenly spaced moving features on the horizon which contrast with the horizontal emphasis of the landform'. This would also be the case for the existing Ben Aketil and consented Ben Sca. Given this baseline the Proposed Development would appear behind/ or replace these developments, rather than adding a new occurrence.
- 6.7.136 Where there would be intervisibility, the Proposed Development would appear in an adjacent area of moorland where wind energy is already present. Given this baseline, the Proposed Development would not detract from the undisturbed character and feeling of isolation found within this SLA.
- 6.7.137 Of the two identified Special Qualities of the Greshornish SLA, no significant effects are predicted on either of them as a result of the Proposed Development. Whilst there would be some intervisibility with this area, the special qualities would still remain intact and be

appreciated. As a result, there would no significant effects on the special qualities and they would all remain well expressed.

Trotternish and Tianavaig Special Landscape Area

- 6.7.138 This SLA covers most of the Trotternish peninsula on Skye which lies outwith the National Scenic Area and at the southern end of the Sound of Raasay it includes the bays at Tianavaig and Balmeanach. This area includes the Trotternish ridge and includes two of Skye's most distinctive and iconic landscape features – the pinnacle of the Old Man of Storr, and Beinn Tianavaig, whose stepped profile is particularly striking viewed from the southern end of the Sound of Raasay. The closest point to the Proposed Development is 14 km away. The extent of the SLA is shown on **Figure 6.1** and the extent of theoretical visibility including screening is shown on **Figure 6.6**. **Viewpoints, 14, 15 and 17** are located within this SLA from mainly elevated locations, as low-level views would be more limited.
- 6.7.139 The Proposed Development is not within the designation itself, so the physical integrity of the SLA would remain intact. The only potential for effects would occur as a result of visibility to or from the SLA of the Proposed Development. This designated landscape is considered to be of **High/Medium** sensitivity overall as a Regional designation for landscape value, although the susceptibility of each Special Quality may vary.
- 6.7.140 The Special Qualities of this SLA have been set out in 'Assessment of Highland Special Landscape Areas' June 2011 by The Highland Council. The special qualities identified within that document and the potential effect as a result of the Proposed Development are set out in the **Table 6.15**.
- 6.7.141 In reviewing the Special Qualities and underpinning landscape characteristics, it is not considered that any of these would be appreciated at night. Therefore, the impacts at night have not been assessed.

Table 6.15: Impact on Special Qualities of Trotternish and Tianavaig SLA

Special Quality of the SLA	Underpinning landscape characteristics	Potential Impact
Dynamic Landslip Character	<p><i>From the ridge crest, a succession of basalt lava layers create a gentle dip slope of undulating open moorland descending westwards to Loch Snizort, whilst to the east, a steep escarpment has been dramatically accentuated by a sequence of gigantic rotational landslips, although some of the best examples of this are also included within the adjacent Trotternish National Scenic Area.</i></p> <p><i>The dramatic isolated pinnacle of the Old Man of Storr forms a prominent feature along the eastern fringe. It is popular with visitors and frequently portrayed in publicity and media as distinctive Scottish landscape.'</i></p>	<p>There would be views from the ridge, as illustrated in Viewpoints 15 and 17, but this would not affect the appreciation of the landslip character of the landscape of the SLA.</p> <p>There is no visibility from the Old Man of Storr or the eastern parts of this SLA.</p> <p>No significant impacts predicted on this SQ.</p>
Ridgeline Spine and Coastal Fringe	<p><i>Walking this great ridge in either a northerly or a southerly direction is an exhilarating experience which gives contrasting views – Raasay, Rona and the high peaks of the mainland on one side; broad Loch Snizort and the long profile of the Western Isles on the other. The ridge is somewhat lower than that of the Cuillins but is still grand in scale and accessible in a wider range of weather conditions</i></p>	<p>From the ridge, there would be views of the Proposed Development over 18 km away, when looking west over Loch Snizort, as illustrated in Viewpoints 15 and 17. The Proposed Development would replace the existing Ben Aketil turbines, behind the consented Ben Sca. Whilst there are views from the ridge looking west, this would not detract from the contrasting views and experience of walking the ridge. No significant impacts predicted on this SQ.</p>
Historic landscape	<p><i>'Throughout North and West Trotternish remains of prehistoric settlement predominantly roundhouses are common, both within the crofting townships and further up into the hills.'</i></p>	<p>Whilst there may be some intervisibility with some of the historic landscape features, the Proposed Development would not affect the appreciation of the historic character of the landscape of the SLA. No significant impacts predicted on this SQ.</p>

6.7.142 Of the three identified Special Qualities of the Trotternish and Tianavaig SLA, no significant effects are predicted on them as a result of the Proposed Development. Whilst there would be some intervisibility with this area, the special qualities of 'historic

landscape, *'dynamic landslide character'* and the experience of the *'ridgeline spine and coastal fringe'* would still remain intact and be appreciated. As a result, there would no significant effects on the special qualities and they would all remain well expressed.

Designated Landscapes Summary and Conclusions

- 6.7.143 There were several landscapes designated for their scenic quality which were assessed, two of these were NSAs and three were local designations. Of these areas, no significant effects were identified.

Table 6.16: Summary of Effects on Designated Landscapes

Designated Landscape	Sensitivity	Level of Effects
The Cuillins NSA	High	Not significant
Trotternish NSA	High	Not significant
North West Skye SLA	High/medium	Not significant
Greshornish SLA	High/medium	Not significant
Trotternish and Tianavaig SLA	High/medium	Not significant

Wild Land Area

- 6.7.144 Wild Land Areas are not a statutory designation, however, they are included in Scottish Planning Policy. The Scottish National Planning Framework (NPF) 4's Natural Places policy g) relates to Wild Land Areas and it states that *'buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration.'*
- 6.7.145 Although the Proposed Development is not within a Wild Land Area, NatureScot requested a Wild Land Assessment be included *'at least initially'* for both the Duirinish (c. 8.5 km away) and the Cuillins (c. 20 km away) and that this includes both cumulative and night-time impacts. This assessment is included in **Technical Appendix 6.6**. There would be limited intervisibility with the Duirinish WLA where the Proposed Development would have a **Slight/Negligible** magnitude of change leading to a **Moderate/Minor** effect which would be **Not Significant**. There would also be limited intervisibility with the Cuillin Hills WLA where the Proposed Development would have a **Negligible** magnitude of change leading to a **Minor** effect which would be **Not Significant**.

6.8 Cumulative Impacts

Introduction

- 6.8.1 In line with GLVIA3 and NatureScot guidance on Assessing the Cumulative Impact of Onshore Wind Energy Developments, the assessment of cumulative effects should focus on whether there are any likely significant cumulative impacts which are reasonably foreseeable and which are likely to influence the decision making of the Proposed Development, rather than an assessment of every potential cumulative effect. As recommended by the NatureScot cumulative guidance, this assessment focusses on the *'additional cumulative change which would be brought about by the Proposed Development'* (bottom of page 6 of NatureScot Guidance).

Assessment Scenarios

- 6.8.2 It is important to differentiate between the assessment of cumulative effects arising from Proposed Development with projects that are operational (existing baseline Scenario 1) and consented (future baseline Scenario 2); and those that are proposed and about which there can be little certainty. Accordingly, the assessment distinguishes between the fully consented future baseline (Scenario 2) considered as the baseline for the LVIA assessment in **Section 6.7** and the cumulative assessment presented here in **Section 6.8**.
- 6.8.3 This cumulative assessment considers the additional effects arising from the Proposed Development to the different cumulative scenarios, which are as follows:
- Scenario 3 – Planning: all operational, consented and proposed developments with a submitted planning application; and
 - Scenario 4 – Pre-planning: all operational, consented and selected proposals which are still at Scoping stage but likely to be submitted around the same time as repowered and extended Ben Aketil.
- 6.8.4 Table 6.5 lists the cumulative developments included within these scenarios. As noted in the table, there are no renewable energy proposals in Scenario 3 and therefore there is no assessment of this scenario. Scenario 4 consists of two further developments with a submitted PAN notice which is due to be submitted at the same time as Proposed Development and a degree of certainty regarding the nature of the scheme. As a result, these two developments have been included in this cumulative assessment. With regard to the rest of proposals at pre-planning, there is no certainty that these will progress to planning submissions and the nature of the developments which are likely to be submitted and therefore they are not included in this cumulative assessment. If these later proposals do come forward, the burden of cumulative assessment will remain with the later applications.
- 6.8.5 The location of all developments are illustrated on **Figure 6.2** and the developments in this assessment are included in **Figures 6.3**. The cumulative ZTVs are presented in **Figures 6.13** and **6.14** and these developments are also illustrated in the visualisations in **Volume 2**.

Cumulative Landscape and Visual effects

- 6.8.6 Notable cumulative interactions with the other proposals (Scenario 4) would include Balmeanach, c. 1 km to the east and a replacement proposal for Beinn Mheadhonach, over 10 km south-east, both within the central moorland area of Skye.
- 6.8.7 The following assessment focuses on the likely significant cumulative interactions on landscape character and key visual receptors including local residents, key tourist routes and local roads. The undulating nature of landform on Skye leads to strong variability of visibility which reduces the potential for likely significant cumulative interactions with many landscape and visual receptors.

Scenario 4: Pre-Planning Proposals

Balmeanach

- 6.8.8 **Landscape Character:** The Proposed Development and Balmeanach would be located within the Upland Sloping Moorland LCT (359). Balmeanach would be located adjacent (west) of Edinbane with an approximately 1 km gap between Ben Sca and the Proposed Development. The layout of Balmeanach appears to be a clustered arrangement of 10 turbines (149.9 m to tip). Whilst it does not take the linear form of Ben Aketil or Ben Sca; or relatively linear form of either Edinbane or Glen Ullinish; it does have some aspects which relate to landform in a similar way to Edinbane or Glen Ullinish. Therefore, it does not contrast strongly with the existing pattern of cumulative development.
- 6.8.9 However, due to the location of this development in between these clusters and only separated by the summit of Ben Aketil/Ben Sca, Balmeanach, if consented and constructed, would likely be perceived to join these separate clusters together (except Glen Ullinish). There would be a mix of different turbine sizes, which would be noticeable, this is likely to be perceived as part of the evolution of wind energy development throughout Scotland and would not cause a notable increase in adverse landscape impacts.
- 6.8.10 As noted in the landscape assessment in **Section 8.7**, the fully consented baseline would already have a local influence on landscape character of the Upland Sloping Moorland and parts of the Stepped Moorland as result of these developments. The addition of Balmeanach to the fully consented baseline would not extend this influence much, but would strengthen the influence on local landscape character of these two LCTs as a result of the addition of more turbines in these LCTs and the linking together of smaller clusters. The addition of the Proposed Development would not extend the area influenced by wind energy by much, but the larger turbines of the Proposed Development would strengthen that existing influence. This would lead to a **Moderate** magnitude of change and **Moderate** effect for both the Upland Sloping Moorland and Stepped Moorland which would be **Significant** for both (greater than main LVIA). However, it should be noted that this cumulative impact would be localised in extent.
- 6.8.11 **Visual Effects:** As illustrated in **Viewpoints 2, 3, 5 – 8, 10, 11 and 14**, Balmeanach would be well separated from most of the visual receptors along the coast and transport routes, where it would appear in the background behind other turbines, increasing the density of turbines but not adding a new occurrence. As a result, there would be no additional significant cumulative effects on these residential receptors or transport routes.
- 6.8.12 For those using the informal routes across the site, the addition of Balmeanach would be a notable addition to the route on the Edinbane wind farm track. Assuming the prior presence of the fully consented baseline and Balmeanach, the addition of the Proposed Development would lead to a **Large/Medium** scale of change and a **Major/Moderate** effect which would be **Significant** (same as main LVIA).
- 6.8.13 **Landscape Designations:** The most likely potential for cumulative impacts would occur on the nearest SLAs. With regard to the North West Skye SLA, whilst there would be views of the Proposed Development and Balmeanach from parts of this SLA, it would not diminish the distinctiveness of the terrain of Macleod's Tables. Whilst there would be views of the Proposed Development and Balmeanach within the moorland background of some of these crofting landscapes, it would appear in a part of the moorland where

turbines exist already. Any increased contrast in scale between the crofting landscapes and the Proposed Development and Balmeanach would be very localised. As a result, there would not be any significant cumulative effects on the special qualities, and they would all remain well expressed.

- 6.8.14 With regard to the Greshornish SLA, the Proposed Development and Balmeanach would appear together in views south and Balmeanach would appear to fill the gap between the separate arrays, they would appear in a part of the adjacent moorland which is already characterised by wind energy development would not detract from the undisturbed character and feeling of isolation found within this SLA.

Beinn Mheadhonach (Replacement)

The latest Beinn Mheadhonach proposal (five at 150 m to tip) would replace the consented Beinn Mheadhonach (four at 120 m) in a similar location but with wider spacing between turbines, 10 km from the Proposed Development.

- 6.8.15 **Landscape Character:** The Proposed Development would be located within the Upland Sloping Moorland LCT (359), whilst Beinn Mheadhonach would be located within the Stepped Moorland LCT (360). The layout of the latest Beinn Mheadhonach proposal would also occur in a linear form, similar to Ben Aketil/Ben Sca but extending across a saddle rather than extending down the ridge from the summit. It would have a similar relationship and form as the existing and consented wind energy pattern. The separation distance would remain similar and it would be perceived as a stand-alone array in the Stepped Moorland. These developments would be seen within clearly separate landscapes and have different areas of influence.
- 6.8.16 Assuming the prior presence of the fully consented baseline and the latest proposal at Beinn Mheadhonach, the addition of the Proposed Development to this scenario would reinforce the existing influence locally to each of these developments but they would not extend their influence notably or lead to a greater level of effect than identified alone with the fully consented baseline. As a result, the addition of the Proposed Development to the fully consented baseline with Beinn Mheadhonach would result in a **Moderate** and **Not Significant** effect (same level as main LVIA) on the Upland Sloping Moorland and Stepped Moorland LCTs.
- 6.8.17 **Visual Effects:** In cumulative terms, the consented development at Beinn Mheadhonach is already part of the baseline of the main LVIA in **Section 6.7**. This part of the assessment would consider the additional cumulative visual effect of the additional turbine, increased height and spacing.
- 6.8.18 Given the separation distance and differing visual influence of these two proposals, the main visual receptors with the potential for significant cumulative effects would be on the A863, as illustrated on **Figure 6.13** and the visualisations for **Viewpoints 2, 3 and 8**. However, given that the impacts would be mainly sequential and the consented development at Beinn Mheadhonach is already in the baseline, no significant cumulative effects would occur with this replacement proposal.
- 6.8.19 **Landscape Designations:** Beinn Mheadhonach would appear similarly to other wind energy developments on Skye within the central moorland. It would be well separated as an array and given that an occurrence of wind energy has been consented in this location,

the potential for significant cumulative effects with the Proposed Development in relation to the special qualities of the North West Skye SLA would be limited.

Cumulative Summary and Conclusions

- 6.8.20 The operational and consented wind farms are considered as the future baseline of the main LVIA. The cumulative assessment considered impacts related to other proposals in the study area. There were no other proposals with a submitted planning application, but two of the proposals at Scoping were expecting to submit planning applications at the same time as the Proposed Development therefore these two proposals were considered in the cumulative assessment.
- 6.8.21 Balmeanach would be located c. 1 km east of the Proposed Development and is likely to consist of ten turbines at 149.9 m to tip. It would appear adjacent to the operational Edinbane. Due to the location of this proposal if consented and constructed it would likely be perceived to join Ben Aketil, Ben Sca and Edinbane together. The Extension and Repowering of Ben Aketil would add onto the end of this combined cluster and would lead to a **Moderate** impact on the Upland Sloping Moorland and Stepped Moorland LCTs which would be raised to **Significant** (greater than in the main LVIA).
- 6.8.22 Whilst there would be a mix of different turbine sizes noticeable in this group and this is likely to be perceived as part of the evolution of wind energy development throughout Scotland and is not expected it would cause a notable increase in adverse landscape impacts.
- 6.8.23 Although there would be combined views of Balmeanach and the Proposed Development for visual receptors along the coast and transport routes, the nature of the cumulative effect would be to increase the density of turbines visible but not add a new occurrence and therefore the magnitude of change for the Proposed Development would remain the same as reported for the main LVIA.
- 6.8.24 With regard to the replacement scheme for Beinn Mheadhonach, this proposal is to increase the number of turbines from 4 turbines at 120m to tip to 5 turbines at 150m to tip in a similar location but with wider spacing. This proposal would be located over 10km to the south-east of the Proposed Development. Given the separation distance and differing local influence of these two proposals, there were no additional significant effects predicted.

6.9 Conclusions and Summary of Effects

- 6.9.1 The Proposed Development adheres to much of the design guidance within the THC Wind Energy SG criteria. With regard to the pattern of development with the future baseline (operational and consented), the Proposed Development would appear as a single group with Ben Sca with a very similar pattern of development and would read as complementary in the landscape to nearby Edinbane and Glen Ullinish wind farms.
- 6.9.2 The extent of operational effects upon the landscape character would be limited by the topographic containment of the surrounding moorland. The effects of the Proposed Development have been further mitigated by the extent of influence of wind energy development on the site and surrounding landscapes as a result of existing and consented wind energy. As a result, there were no significant effects reported on landscape character. However, there were **Moderate** adverse impacts on three

landscape character types including the host, Upland Sloping Moorland and the Stepped Moorland and Farmed and Settled Lowlands – Skye and Lochalsh. This level of impact would be predominantly contained within approximately a 5 km radius of the proposed wind turbines, with impacts reducing even further with greater distance and extent of screening.

- 6.9.3 The turbines of the Proposed Development would be noticeably larger than exists at present in the area, but would be less so with consented developments. Where there is a noticeable difference in height, this is likely to be perceived as part of the evolution of wind energy development throughout Scotland and would not cause a notable increase in adverse impacts.
- 6.9.4 Significant construction effects on landscape character would occur for the host area Upland Sloping Moorland LCT in Scenario 2 but not Scenario 1. There would also be significant construction visual effects for residents at Upper Feorlig, Feorlig, Caroy, Roag, and road users of the A863 and A850, and recreational users on the site and surrounding fells in both Scenarios.
- 6.9.5 There would be significant visual effects for residents at Upper Feorlig, Feorlig and Caroy and users of the informal recreational routes across the site. Given the existing and consented baseline, there would be **Moderate** but **Not Significant** visual effects for residents at Harlosh, Road, Dunvegan, Colbost and users of the A863.
- 6.9.6 Overall, there would be limited impacts on visual receptors in the area, partially due to the extent of screening locally and partially due to the extent of existing and consented wind energy on site and in the immediate area.
- 6.9.7 The Proposed Development would require visible aviation lighting the nacelles of only four of the nine turbines, having agreed a reduced lighting scheme with the CAA. A range of additional embedded mitigation measures have also been committed to in relation to minimising the night-time impacts including a reduced intensity light (from 2000 candela to 200 candela) in good visibility on the nacelle, directional intensity to limit brightness below the turbines and a timer to ensure the impacts only occur at night. With the exception of directional intensity, all embedded mitigation is included in the assessment of night-time impacts. Given the extent of mitigation incorporated into the Proposed Development, no significant visual effects were identified at night.
- 6.9.8 The Proposed Development would be outwith any designated landscapes. However, there were several landscapes designated for their scenic quality in the study area which were assessed, two of these were NSAs and three were local designations. Of these areas, no significant effects were identified. Nor were there any significant effects identified on any of the surrounding Wild Land Areas.
- 6.9.9 With regard to the cumulative impacts, the impacts with the future baseline (existing and consented developments) were included in the main assessment. There were no other proposals with a submitted planning application. However, there were two proposals at Scoping stage which were expected to be submitted alongside the Proposed Development and these were considered in the cumulative assessment.
- 6.9.10 Balmeanach would be located c. 1 km east of the Proposed Development and is likely to consist of 10 turbines at 149.9 m to tip. It would appear adjacent to the operational Edinbane. Due to the location of this proposal if consented and constructed it would likely be perceived to join Ben Aketil, Ben Sca and Edinbane together. The Extension and

Repowering of Ben Aketil would add onto the end of this combined cluster and would lead to a **Moderate** impact on the Upland Sloping Moorland and Stepped Moorland LCTs which would be raised to **Significant** (greater than in the main LVIA).

- 6.9.11 Although there would be combined views of Balmeanach and the Proposed Development for visual receptors along the coast and transport routes, the nature of the cumulative effect would be to increase the density of turbines visible but not add a new occurrence and therefore the magnitude of change for the Proposed Development would remain the same as reported for the main LVIA.
- 6.9.12 With regard to the replacement scheme for Beinn Mheadhonach, this proposal is to increase the number of turbines from four turbines at 120 m to tip to five turbines at 150 m to tip in a similar location but with wider spacing. This proposal would be located over 10 km to the south-east of the Proposed Development. Given the separation distance and differing local influence of these two proposals, there were no additional significant effects predicted.
- 6.9.13 The changes arising from a project may engender positive or negative responses depending on individual perceptions regarding the merits of renewable energy. However, the assessment has taken a precautionary approach in considering that effects on the landscape and on views, which would result from the construction and operation of the Proposed Development, would be adverse; however, many people would not consider the effects to be adverse.
- 6.9.14 Whilst there would be some significant construction and visual effects arising from the Proposed Development, this would be localised in nature.

6.10 References

See Technical Appendix 6.7.

7 ECOLOGY

7.1 Introduction

7.1.1 This Chapter considers the potential for significant effects on important ecological features associated with the construction, operation and decommissioning of the Proposed Development.

7.1.2 The assessment is based upon comprehensive baseline data, comprising specifically targeted ecological field surveys of important and legally protected ecological features identified from desk study and consultation feedback. It draws on pre-existing information, where appropriate, from other studies and survey data sources, and is based on the Guidelines for Ecological Impact Assessment (EclA) in the UK and Ireland (Chartered Institute of Ecology and Environment Management (CIEEM), 2018) and NatureScot's Environmental Impact Assessment Handbook (formerly Scottish Natural Heritage (SNH), 2018).

7.1.3 The specific objectives of the chapter are to:

- describe the assessment methodology and significance criteria used in completing the impact assessment;
- describe the ecological baseline conditions at the Proposed Development and associated Study Areas, to identify the ecological features which will be the focus of this assessment;
- evaluate the sensitivity of each ecological feature;
- describe the potential impacts, including direct, indirect and cumulative impacts;
- describe the mitigation measures proposed to avoid, reduce and offset potential significant adverse effects; and
- assess the significance of residual effects remaining following the implementation of mitigation.

7.1.4 The assessment has been carried out by Avian Ecology Ltd. Lead author: Dr Claudia Garratt, Senior Ecologist supported by Mr Howard Fearn MSc MCIEEM, Director (technical support and review). Dr Garratt and Mr Fearn have over 11 and 15 years' experience respectively as ecological consultants specialising in renewable energy developments. During this time, they have written and reviewed Environmental Impact Assessment (EIA) Report chapters and information to inform Appropriate Assessment (AA) for Habitats Regulations Appraisal (HRA) for ornithological or ecological interest at numerous onshore wind developments, repowers and life extensions.

7.1.5 This chapter is supported by the following figures and technical appendices:

- **Volume 2: Figures**
 - **Figure 7.1:** Statutory Sites Designated for Ecological Interest;
 - **Figure 7.2(a and b):** Phase 1 Habitat Survey;
 - **Figure 7.3(a and b):** National Vegetation Classification Survey;
 - **Figure 7.4:** Terrestrial Mammal Survey;
 - **Figure 7.5:** Bat Roost Survey;
 - **Figure 7.6:** Bat Activity Survey; and

- **Figure 7.7:** Fish Habitat Survey.
 - **Volume 3: Technical Appendices:**
 - **Technical Appendix 7.1:** Habitats and Vegetation;
 - **Technical Appendix 7.2:** Protected Terrestrial Mammals;
 - **Technical Appendix 7.3:** Bats;
 - **Technical Appendix 7.4:** Fish Habitat;
 - **Technical Appendix 7.5:** Deer Assessment; and
 - **Technical Appendix 7.6:** Outline Habitat Management Plan.
 - **Volume 4: Confidential Appendices:**
 - **Confidential Appendix 7.7:** Gleann Eoghainn Windfarm Baseline and Ornithology Report 2014-2016
- 7.1.6 Figures and technical appendices, including those of other chapters, are referenced in the text where relevant. Note that, with the exception of habitat community names and references to genus groups, only common names are used within this chapter; scientific names are provided in the technical appendices.
- 7.1.7 This chapter complements **Chapter 8: Ornithology** and **Chapter 9: Hydrology, Geology, Hydrogeology and Peat**. Note that in the interests of concision, information contained in other chapters and appendices is not repeated herein unless essential for understanding, and is instead cross referred to within this chapter.

Terminology

- 7.1.8 The Site is defined by the red line site boundary shown on **Figures 7.1 to 7.7**. The proposed development is defined in **Chapter 2: Proposed Development**.
- 7.1.9 Due to the iterative approach to site design that has been ongoing throughout the baseline survey period, the survey scope and the applicable red line boundary have changed during the baseline period. Therefore, the area in which surveys have been undertaken does not in all cases correspond with the red line site boundary included in place the Proposed Development. Rather, surveys have been undertaken with reference to a defined 'Study Area' which is shown on **Figures 7.2 to 7.7**. The area surveyed (the Survey Area) is an appropriate buffer of the Study Area, in line with guidance. How this relates to the red line boundary is discussed in survey method sections.

7.2 Statutory and planning context

- 7.2.1 Legislation, policy and guidance of specific relevance to ecology, taken into account as part of this ecology assessment, is outlined below. General legislation and planning policy relevant to the Proposed Development are detailed in **Chapter 5: Planning Policy Context** and so in the interests of brevity is not repeated here. However, the Ecology assessment has been undertaken with consideration to National Planning Framework (NPF)4, the Environmental Impact Assessment (EIA) Directive and other relevant local and national planning policy. For further details of policy see **Chapter 5**.

Legislation and guidance relevant to Ecology

Legislation

- Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019;

- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) ;
- The Wildlife and Countryside Act 1981 (as amended in Scotland);
- The Wildlife and Natural Environment (Scotland) Act 2011;
- The Nature Conservation (Scotland) Act 2004;
- The Conservation (Natural Habitats, &c.) Regulations 1994 (the Habitats Regulations) (as amended in Scotland; and
- The Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003.

7.2.2 Copies of all UK and Scottish Government legislation, including original, as enacted, and revised versions, are available from the National Archives at <https://www.legislation.gov.uk>.

Planning Policy

- Scottish Government (2008) Scottish Government Planning Advice Note 60: Planning for Natural Heritage 2008;
- Scottish Government (2022a) The Scottish Biodiversity Strategy to 2045;
- Scottish Government (2022b) Onshore Wind Policy Statement;
- Scottish Government (2023) National Planning Framework (NPF)4;
- The Highland Council (2019) West Highland and Islands Local Development Plan;
- Highland-wide Local Development Plan (Adopted 2012):
 - Policy 58 – Protected Species: Policy 58 sets out the criteria that must be met for development to be permitted where such development may have an adverse effect on European Protected Species;
 - Policy 59 - Other Important Species: Policy 59 mandates for consideration of adverse effects to other important species comprising: species listed in Annexes II and V of the EC Habitats Directive, priority species listed in the UK and Local Biodiversity Action Plans (UKBAP and LBAPs), and species included on the Scottish Biodiversity List (SBL);
 - Policy 60 – Other Important Habitats: Policy 60 mandates for consideration of adverse effects to other important habitats including Annex I habitat, UKBAP and LBAP priority habitats and habitats listed on the SBL. It sets out the Council's commitment to safeguard the integrity of features of the landscape which are of major importance for movement of wild flora and fauna, and for creation of new habitats supportive of this aim; and
 - Policy 74 - Green Networks: Policy 74 sets out a required commitment to protect, enhance and avoid fragmentation of green spaces and green corridors linking built up areas to the surrounding countryside.

Guidance

7.2.3 The following key guidance has been referred to, and followed as appropriate, in this assessment:

- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine;
- The Highland Council (2003) The Skye & Lochalsh Biodiversity Action Plan;

- SNH (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments;
- NatureScot (2019, updated 2021) Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation;
- NatureScot (2020) 'General Pre-application/scoping advice to developers of onshore wind farms';
- SNH (2016a) Carbon and Peatland map;
- NatureScot (2021) Standard Advice for Planning Consultants: Protected Species. Available at: <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species>;
- SNH (2016b) Planning for development: What to consider and include in Habitat Management Plans;
- Rodwell, J. S., (1991, 1992, 1998, 2000) British Plant Communities. Vol 1-5;
- Scottish Government (2013) The Scottish Biodiversity List;
- Scottish Renewables et al. (2019) 'Good Practice During Wind Farm Construction';
- SEPA (2017) Land Use Planning System Guidance Note 4: Planning Guidance on On-shore Windfarm Developments; and
- Highland Council (2013) Supplementary Guidance: Highland's Statutorily Protected Species.

7.2.4 Guidance solely in respect to survey methodologies followed is detailed in **Technical Appendices 7.1 to 7.4**.

Application Within the EclA

7.2.5 In the interests of proportionate EIA (Institute of Environmental Management and Assessment [IEMA] 2017) generic descriptions of what is contained in the relevant legislation, policy and guidance is not repeated here, though information regarding how some key elements have been applied or have shaped the approach in this chapter is summarised below.

Scottish Planning Policy

7.2.6 Scottish Planning Policy has been regarded from the outset in the design and assessment of the Proposed Development. Of relevance to this chapter, it sets out guiding 'Principal Policies', including: "protecting, enhancing and promoting access to natural heritage, including green infrastructure, landscape and the wider environment".

7.2.7 The planning system policy principals which are of relevance to and have been applied to this EclA include the following':

- "conserve and enhance protected sites and species, taking account of the need to maintain healthy ecosystems and work with the natural processes which provide important services to communities;
- promote protection and improvement of the water environment, including rivers, lochs, estuaries, wetlands, coastal waters and groundwater, in a sustainable and co-ordinated way; and
- seek benefits for biodiversity from new development where possible, including the restoration of degraded habitats and the avoidance of further fragmentation or isolation of habitats."

- 7.2.8 Scottish Planning Policy also states that “The level of protection afforded by legislation must be factored into the planning and design of the development” and that “developers should seek to minimise adverse impacts through careful planning and design, considering the services that the natural environment is providing and maximising the potential for enhancement”.

Scottish Government's Onshore Wind Policy Statement

- 7.2.9 The Scottish Government's Onshore Wind Policy Statement 2022 (OWPS 2022) identifies the need to balance the increased deployment of onshore wind to meet Scotland's Net Zero target, with Scotland's ambition to halt and restore biodiversity loss by 2045.
- 7.2.10 The OWPS 2022 does however acknowledge that in some cases the investigation and development of onshore wind may be necessary on sensitive habitats, such as peatlands and which represent over a third of Scotland's land area. In doing so it also recognises and highlights the advances and contributions made by the Scottish onshore wind industry towards the conservation and restoration of Scotland's peatlands and the important wildlife they support. The OWPS sets out the availability of good practice industry guidance and provides best practice examples for developers to draw from, to ensure that wind energy can be built in harmony with the natural environment and secure positive effects for biodiversity, in line with the principals of NPF4 Policy 3.

National Planning Framework (NPF)4

- 7.2.11 NPF4 Policy 3 seeks to ensure that “development proposals contribute to the enhancement of biodiversity, including restoring degraded habitats and building and strengthening nature networks and the connections between them” in order to protect biodiversity, reverse biodiversity loss, and deliver positive effects from development.
- 7.2.12 In accordance with both Scottish Planning Policy and NPF4, the mitigation hierarchy has been applied throughout the design and assessment stages of the Proposed Development. The Proposed Development has undergone several design iterations (detailed in **Chapter 2: Proposed Development**) in response to the findings of baseline ecological, ornithological and peat depth and condition studies and which established the distribution and importance of nature conservation interests within the Site.
- 7.2.13 As detailed in **Chapters 2, 7, 8 and 9** of the EIAR, the scheme design specifically sought to:
- Limit habitat losses through the minimisation of tracks and optimisation of turbine locations and spacing, to reduce the requirement for land take;
 - Buffering of watercourses from infrastructure in accordance with Scottish Environment Protection Agency (SEPA) guidance;
 - Buffering of bat habitat features from turbines, in accordance with NatureScot guidance;
 - Limiting of watercourse crossings, to minimise the potential for impacts on aquatic interests; and,
 - Avoiding and buffering the most sensitive peatland habitats within the Site.

- 7.2.14 Embedded scheme design measures have therefore recognised the potential for impacts upon local biodiversity at an early stage, complying with the first step of the mitigation hierarchy i.e. avoidance.
- 7.2.15 Good practice measures are also embedded into the Proposed Development, as detailed in **Chapter 17: Schedule of Mitigation**, and including a Construction Environmental Management Plan (CEMP) to be agreed in consultation with The Highland Council (THC), NatureScot, SEPA and other relevant consultees. The CEMP will include for all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the development in line with industry and mandatory statutory guidance applicable at the time. An environmental manager will oversee implementation of the agreed CEMP, including pre-construction surveys and construction phase species protection plans (SPPs) to prevent breaches of legislation pertaining to protected species.
- 7.2.16 A Habitat Management Plan (HMP) is proposed which has identified scope for delivery of extensive biodiversity improvements within the wider MacLeod Estate, facilitated through developer investment and the implementation of an ambitious, yet targeted and attainable enhancement measures, to compliment the Proposed Development's Peat Management Plan (PMP) and provide habitat enhancements for protected species present at or likely to use the Site.
- 7.2.17 The overarching aim of the HMP will be to substantially offset residual habitat losses and positively contribute to the enhancement of local biodiversity within the Site and wider MacLeod Estate, resulting in a no overall negative impact over the lifetime of the development.
- 7.2.18 The HMP will be finalised on the basis of the Outline DRAFT Habitat Management Principals presented as **Technical Appendix 7.6** of this EIAR, in consultation with THC and additional relevant stakeholders, including NatureScot and specialist habitat and species interest groups.

Biodiversity Action Plans

- 7.2.19 The UK Biodiversity Action Plan (UKBAP) list of priority habitats and species (as defined in UK Post-2010 Biodiversity Framework) has been superseded in Scotland by the Scottish Biodiversity Strategy and the Scottish Biodiversity List (SBL), but remains an important reference point, particularly for defining and cross referencing status of priority habitats.
- 7.2.20 Local authorities have a responsibility to produce their own list of priority habitats and species and associated actions for conservation (Local Biodiversity Action Plans (LBAPs)). The Skye & Lochalsh Biodiversity Action Plan (THC 2003) outlines the main issues facing Highland biodiversity and biodiversity objectives for the region, and also provides lists of habitats and species of key importance for conservation action.

7.3 Consultation undertaken

- 7.3.1 Consultation with statutory and non-statutory advisors, together with species specialist groups has been undertaken to inform the approach to and undertaking of assessment.

7.3.2 A summary of consultations undertaken, responses received and how they have been considered is provided in **Table 7.1**.

Table 7.1: Summary of Consultations

Consultee	Consultation response	Response/action taken
NatureScot 13 th July 2021 Response to Baseline Survey Scoping	NatureScot confirmed they were not aware of additional data sources that should be approached for ecological desk study data to inform the scope of ecological surveys, other than those proposed.	Noted
	NatureScot agreed that species surveys should focus on otters, pine marten and bats, and that badger, water vole and wildcat will not be present.	Surveys concentrated on those protected mammal species considered likely to be present. See Technical Appendix 7.2 and Section 7.5 .
	NatureScot stated that if detailed National Vegetation Classification (NVC) surveys and peat depth surveys have already been carried out for Gleann Eoghainn these data can be used to inform assessment provided there have been no major changes (e.g. due to fire). As most habitats will be Annex 1 or UKBAP habitats (e.g. wet heath and blanket bog) NVC surveys are required rather than Phase 1.	Approach to habitat surveys is detailed in Technical Appendix 7.1 and in Section 7.5 .
	NatureScot agreed that freshwater pearl mussel are unlikely to be present and that consideration of freshwater pearl mussel was not required for the Proposed Development.	Noted. This species was not considered in the surveys or assessment for the Proposed Development.
Energy Consents Unit (ECU) Letter Scoping Response dated 10/10/2022	The ECU stated that the EIA should outline how fish populations will be impacted during the construction, operation and decommissioning, in relation to freshwater and diadromous fish and fisheries.	Rationale for the approach to baseline consideration of fish is provided in Section 7.8 . A fish Technical Appendix (Technical Appendix 7.4) is provided outlining the results of surveys and suitability of habitats at the Site for fish species. Commitment to a fish monitoring plan, to be produced in consultation with the Skye & Wester Ross Fisheries Trust (SWRFT) and Skye and Lochalsh Rivers Trust (SLRT), is embedded in the Proposed Development,

Consultee	Consultation response	Response/action taken
		and an Outline Habitat Management Plan (OHMP), including habitat enhancements to benefit fish species at the Site is proposed and included as Technical Appendix 7.6 .
	ECU directed the Applicant to the Marine Scotland Science (MSS) standing advice and associated check-list for onshore wind farm development outlining what information, relating to freshwater and diadromous fish and fisheries, is expected in the EIAR. Developers are required to submit the completed checklist in advance of their application submission.	The completed MSS check-list, and response in relation to baseline assessment of fish was included in the Gatecheck 1 Report. Rationale for the approach to baseline consideration of fish is provided in Section 7.8 .
NatureScot 16th November 2022 Response to EIA Scoping Report	NatureScot confirmed they were content with the Scoping Report	Noted
	NatureScot suggested that the two construction scenarios are assessed separately where phasing is relevant to particular sensitivities.	Approach to assessing the two construction scenarios is discussed in Section 7.4 and in the assessment section for relevant important ecological features.
	NatureScot noted the proximity of Turbine 8 and the southern access route to the Rageary Burn, identified as a potentially important (but not surveyed) watercourse (Category D). They stated that the EIA must include proposed mitigation to prevent adverse effects and details of mitigation measures to prevent sedimentation and pollution, and maintain flow.	Note that Turbine 8 is now renumbered to Turbine 7. Embedded mitigation and good practice measures to prevent impacts to watercourses are summarised in Section 7.5 , with further information provided in Chapter 9: Hydrology, Geology, Hydrogeology and Peat , and in Chapter 17: Schedule of Mitigation .
	NatureScot queried the necessity of having two access routes, as tracks tend to have the greatest effect on loss and fragmentation of peatland habitat. They stated the design should seek to maximise the re-use of infrastructure in-situ in the first instance and failing that re-use the materials for the new infrastructure. Where peat disturbance is	Access routes have been reconsidered following comments received from NatureScot and SEPA in response to scoping. Approach to iterative design to minimise impacts, including consideration of alternatives, is discussed in Chapter 2: Proposed Development . Impacts of

Consultee	Consultation response	Response/action taken
	unavoidable, it is preferable to re-use previously disturbed sites (e.g. site compounds, track edges) rather than undisturbed bog.	habitat loss associated with the Proposed Development infrastructure is assessed in Section 7.8 .
	NatureScot recommended early consideration of degraded peatland areas that could be included in a Habitat Management Plan. They highlighted areas of failed conifer plantation immediately north of the site in the headwaters/watershed of the Red Burn which could be considered for forest to bog restoration (conifer removal, drain blocking, furrow smoothing). They also noted areas of peat haggings at the north of the Site which could be restored. They stated the EIA should include details of peat depth, and habitat condition, along with an assessment of the feasibility and prospects for improvement. NatureScot also noted that there may be opportunities for biodiversity enhancement relating to the two Category D watercourses on site (Rageary Burn and Aketil Burn), such as promoting woodland expansion.	An OHMP is embedded in the Proposed Development, which details areas of habitat that are suitable for enhancement or restoration (see Technical Appendix 7.6 and Section 7.5), and includes provision for peatland restoration, and also riparian planting to improve habitat connectivity. It is understood that the area of failed conifer plantation to the north of the Site is already optioned by another developer and so is unavailable to the applicant for habitat restoration.
	NatureScot welcomed consideration of data collected for the earlier Gleann Eoghainn Wind Farm proposal	Noted
	NatureScot agreed that designated sites notified for biological interests can be scoped out.	Noted
	NatureScot agreed that focussing on otter and pine marten is proportionate and stated that information on the pine marten surveys carried out should be included even if no detailed assessment is carried out.	Noted. Information regarding survey methods and results are provided in Technical Appendix 7.2 .
	NatureScot queried why the plantation woodland to the north of the existing wind farm is considered unsuitable for pine marten.	To clarify the Scoping Report stated that there were no notable areas of woodland within the Study Area; the woodland to the north of the existing wind farm is outwith the Study Area (see Figure 7.4), though there is a narrow strip which falls within the

Consultee	Consultation response	Response/action taken
		250m 'Survey Area' buffer of the Study Area, and which was surveyed for pine marten (see Technical Appendix 7.2 and Figure 7.4). Pine martens' preferred habitat consists of structurally complex habitats with a good availability of safe resting sites, more common in older growth woodland. The majority of the plantation within this buffer is clear felled and much of what remains is poor quality and stunted, due to having been planted on bog, and some areas are dead due to fire damage. As such, as stated in the Scoping Report it is unlikely to be used by pine marten other than for occasional foraging. The forestry is also in most instances >100 m away from proposed construction works. Surveys did not record any evidence of pine marten within this area of woodland.
	NatureScot highlighted that bat survey guidance was updated in August 2021 and the EIA should follow the revised guidance.	Assessment has been conducted in accordance with current guidance (NatureScot 2021)
	NatureScot agreed that the EIA focus on the proposed habitat categories, though it should include a broad definition (e.g. areas of M25 within M17 should be considered as blanket bog).	Approach to assessment of habitats is provided in Section 7.5 . Phase 1 classification has been used for impact assessment, such that mosaics are categorised as the overarching habitat type.
The Highland Council (THC) 15 September 2022 ¹¹ . Pre-Application Advice Pack	THC stated they will object if it is not sufficiently demonstrated through the EIA assessment that the development will not result in additional adverse impacts on peatland habitats	Assessment of impacts to peatland habitats is provided in Section 7.8 . A HMP is embedded in the Proposed Development, which is expected to deliver significant beneficial effects for peatland habitats.

¹¹ Note that the THC response letter was dated 2020 but the pre-application meeting was in August 2022; as stated in the Gatecheck Report we assume the correct date should have been 15.09.2022.

Consultee	Consultation response	Response/action taken
	THC requested consideration of statutory designated sites including Inner Hebrides and The Minches Special Area of Conservation (SAC), Ascrib, Isay and Dunvegan SAC and An Cleireach Site of Special Scientific Interest (SSSI).	Impacts to designated sites is scoped out of impact assessment due to spatial separation and an absence of any route to impact, as agreed by NatureScot. Rationale is provided in the Scoping Report, and in Section 7.3 below.
	THC identified areas where habitat restoration such as peatland restoration can be undertaken as part of the development, including the areas of failed forestry to the north of the Site and areas of hagged peat within the Site, and requested that these should be considered within the EIA and opportunities detailed within the application.	An OHMP is embedded in the Proposed Development, which details areas of habitat that are suitable for enhancement or restoration (see Technical Appendix 7.6 and Section 7.5). The area of failed conifer plantation to the north of the Site is already optioned by another developer and so is unavailable to the applicant for habitat restoration.
	THC stated that habitat surveys should include an appropriate area beyond the footprint of the development and should comprise Phase 1 survey and NVC survey accompanied by supporting quadrat information and records of any rare and scarce plant species.	Phase 1 and NVC surveys in line with guidance have been conducted within the Study Area plus a 250 m buffer of the Study Area to identify potential groundwater dependent terrestrial ecosystems (GWDTE). Survey methods are detailed in Technical Appendix 7.1 and are summarised in Section 7.5 .
	THC noted that the proposal site has the potential to support a range of European and nationally protected species including otter, bats, wildcat, water vole, pine marten and breeding birds and requested consideration of NatureScot standing advice for the relevant species, and inclusion of impact assessment for protected species, including consideration of the need for species licences, in the EIAR.	Surveys and assessment for protected species have been carried out in accordance with NatureScot advice. See Technical Appendix 7.2 , and Section 7.5 .
	THC stated that impacts of the proposal on deer and the dispersal of deer onto the surrounding area should also be assessed.	Consideration of deer is provided in Technical Appendix 7.5 .

Consultee	Consultation response	Response/action taken
The Highland Council (THC) 20 th September 2022. Response to EIA Scoping Report	THC stated habitat enhancement and mitigation measures should be detailed, particularly in respect to blanket bog. Details of any habitat enhancement programmes (such as native- tree planting, stock exclusion, etc.) for the proposed site should be provided.	An OHMP is embedded in the Proposed Development, which details areas of habitat that are suitable for enhancement or restoration (see Technical Appendix 7.6 and Section 7.5).
	If wild deer are present or will use the site an assessment of the potential impact on deer will be required. This should address deer welfare, habitats, and other interests	Consideration of deer is provided in Technical Appendix 7.5 .
	The EIA should address the aquatic interests within local watercourses, including downstream interests that could be affected by the Proposed Development. It should also evidence consultation input from the local fishery board(s) where relevant	Rationale for the approach to baseline consideration of fish is provided in Section 7.8 . A fish Technical Appendix (Technical Appendix 7.4) is provided outlining the results of surveys and suitability of habitats at the Site for fish species. The Skye District Salmon Fisheries Board (SDSFB) made no comment at Scoping. The SLRT is broadly supportive of the Proposed Development (see scoping response from SLRT in this table).
RSPB Scotland Letter Scoping Response dated 29/09/2022.	RSPB stated that they would not object, and agree with all species scoped in, but are concerned by the scale of development.	Noted
Skye and Lochalsh Rivers Trust 26 th August 2022	SLRT stated that they recognise that the long-term impacts of a wind farm on local rivers will be negligible.	Noted
	SLRT noted that previous electrofishing data from watercourses within and adjoining the Site found evidence that brown trout and eels are present, including potentially in the smaller streams in the area. This presence demonstrates the need for mitigation practices to limit the harmful environmental impacts that are associated with heavy machinery access and development in and around river systems which can lead to damaging effects on vulnerable salmon and trout ova and	Noted. Embedded mitigation and good practice built in to the Proposed Development will prevent adverse impacts to the aquatic environment (see Section 7.5, Chapter 9: Hydrology, Geology, Hydrogeology and Peat and Chapter 17: Schedule of Mitigation). Commitment to a fish monitoring plan, to be produced in consultation with the SWRFT and SLRT, is also embedded in the

Consultee	Consultation response	Response/action taken
	<p>juveniles. However, if proper protective measures are put into place to limit the disruption and pollution of the water courses within the site, SLRT feels that the development and placement of further access tracks and turbines will have a small impact on wild fish populations.</p> <p>SLRT is supportive of the development of the Ben Aketil wind farm, however, the protection of wild fish populations and important habitats that fall within the development area must be incorporated into future work plans.</p>	<p>Proposed Development, and an OHMP, including habitat enhancements to benefit fish species at the Site is proposed and included as Technical Appendix 7.6.</p>

Features scoped out

- 7.3.3 The EIA scoping report for the Proposed Development was submitted on 19 July 2022. Several ecological features were scoped out of consideration during the scoping process, and so they are not considered further in this EIAR. However, a summary of these is provided here for information; for further details see the Scoping Report (available on the Scottish Ministers' Energy Consents Unit (ECU) online portal: <https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00004552>).
- 7.3.4 Where consultation responses to scoping have requested inclusion of features that were proposed in the Scoping Report to be scoped out, these have been addressed further in the Gatecheck 1 report, with further justification for not including them in the impact assessment process where relevant, in line with the principles of proportionate EIA, provided in **Section 7.8**.
- 7.3.5 The potential for indirect effects upon the habitat or floristic qualifying interests of any statutorily designated site for nature conservation located greater than 2 km from the Site was scoped out of the assessment, by virtue of the static nature of the sites' qualifying habitats interests, spatial separation and/ or absence of hydrological pathways of connectivity. There are no such designated sites located within 5 km of the Proposed Development.
- 7.3.6 Additionally, no route to impact was identified for the following statutory designated sites, designated solely for marine features, within 10 km:
- Inner Hebrides and The Minches SAC; and
 - Ascrib, Isay and Dunvegan SAC.
- 7.3.7 These were consequently also scoped out of assessment. There are no other statutory or non-statutory sites designated for ecological interest within a Zone of Influence (Zoi) of the Proposed Development (defined as up to 5 km from the Site boundary for national designations and 10 km for international designations).
- 7.3.8 Due to absence within the Site and surrounding area, or no likelihood for significant effects, all protected mammal species were scoped out of the EIAR, with the exceptions

of otter and bats. There are other species which may be present, but with the application of good practice and embedded mitigation, are unlikely to be subject to significant population level effects at any geographic scale as a result of the Proposed Development, and so have been scoped out of impact assessment in the EIAR. This includes pine marten, fish species, reptiles, amphibians and invertebrates. Protection measures are embedded in the Proposed Development to prevent adverse impacts and breaches of legislation pertaining to these and other protected species (see **Section 7.5**).

- 7.3.9 Impacts to common and widespread habitats of low sensitivity and/or conservation interest, such as bracken, improved grassland and scrub, have been scoped out of the assessment, and so consideration in the EIAR is restricted to habitats which:
- may correspond with habitats listed on Annex 1 of the Habitats Directive;
 - are included on the SBL or LBAP; and/or,
 - have potential to represent GWDTE.
- 7.3.10 Note that the majority of upland habitats are highlighted for biodiversity action on the Highland LBAP, so habitats which are solely mentioned in the LBAP are not considered in the impact assessed in terms of habitat loss (rough grassland e.g.), but are given consideration in Site-wide recommendations for habitat enhancement where relevant (in the context of grazing pressure by deer for example).

7.4 Approach to the Assessment

Scope of Assessment

- 7.4.1 The assessment presented within this chapter has been undertaken in accordance with CIEEM guidelines (2018) and considers the following potential impacts upon ecological features associated with construction, operation and decommissioning of the Proposed Development:
- habitat loss/ deterioration - direct and indirect loss and deterioration of habitats;
 - mortality/ injury - direct or indirect loss of life or injury; and
 - disturbance/ displacement of species - disturbance and displacement of non-avian faunal species; loss, damage or disturbance to their breeding and/ or resting places.
- 7.4.2 The potential effects are considered as a result of the Proposed Development alone and cumulatively, in-combination with other wind farm developments which are the subject of a valid planning application. Operational, under construction and consented developments are considered for the cumulative impact assessment. Developments close to the end of their operational life will be included as part of the cumulative assessment to present 'worst case scenario'.
- 7.4.3 CIEEM guidelines (2018) stipulate that it is not necessary to carry out a detailed assessment of impacts upon ecological features that are sufficiently widespread, unthreatened and resilient to impacts of the Proposed Development. As such, the assessment considers effects upon designated sites and ecological features which are considered 'important' on the basis of relevant guidance and professional judgement.
- 7.4.4 Where ecological features are not considered so important as to warrant a detailed assessment, or where they would not be significantly affected on the basis of baseline

information, these are 'scoped out' of the assessment. Mitigation measures for such features may, however, still be outlined as appropriate to reduce and / or avoid any potentially adverse effects or to ensure legislative compliance.

- 7.4.5 The assessment is based on the Proposed Development described in **Chapter 2: Proposed Development**, and has been undertaken in recognition of design evolution and embedded mitigation measures, as detailed in full within **Chapter 2: Proposed Development (Section 2.5)**. and standard practices and construction environmental management included within **Chapter 17: Schedule of Mitigation**.
- 7.4.6 In consideration of two alternative construction programme scenarios under consideration by the Applicant (see **Chapter 2: Proposed Development, Paragraphs 2.6.53 – 2.6.55**), a worst-case scenario approach has been taken for assessment of impacts to important ecological features, with a single assessment that captures the most precautionary basis for either construction scenario, as outlined below. This allows for a precautionary assessment which is also proportionate to the likelihood of significant effects to ecological features arising from either scenario.

Construction

- 7.4.7 Following the application of embedded mitigation and good practice measures as outlined at the end of this chapter, potential construction phase ecological effects associated with the Proposed Development are considered to relate to:
- direct land take (habitat loss) to accommodate the Proposed Development;
 - temporary disturbance and land take for laydown areas and construction compounds;
 - disturbance to, fragmentation or severance of connecting habitat or potential commuting routes within, and adjacent to, the Site; and
 - disturbance resulting from site clearance and construction, plant and vehicles movements and Site workers' activities.
- 7.4.8 The principal consideration for ecology of the two different construction scenarios is disturbance to and displacement of ecological features as a result of construction activity.
- 7.4.9 Scenario 1 (construction of the extension and the repower carried out concurrently) will extend the area over which disturbance is happening at a single point in time. Scenario 2 (a phased construction of the extension followed by the repower) will extend the construction timeframe and therefore the duration of potential construction disturbance to ecological features.
- 7.4.10 As such, Scenario 1 is likely to have greater potential to lead to disturbance impacts in a spatial context, and Scenario 2 is likely to have greater potential to lead to disturbance impacts in a temporal context. To capture this within an assessment that allows for either construction scenario to be adopted, construction impacts are assessed based on a the most precautionary scenario that the construction works for both phases are undertaken as one, within a defined extended area and over an extended timeframe, i.e., undertaking assessment based on the whole development spatial area (extension and repower) but extending the timeframe for impacts to that which is applicable to Scenario 2. As set out in the construction programmes provided in **Chapter 2: Proposed Development**, it is expected that each phase of active disturbance (i.e. construction of the extension, decommissioning of the existing wind farm, and construction of the repower) will take

approximately a year each, with potentially up to four years between the phases for Scenario 2, so an overall construction phase for Scenario 2 lasting up to seven years (though noting there will be periods within that time where no active disturbance is occurring).

- 7.4.11 The existing operational Ben Aketil Wind Farm forms part of the existing baseline, and so construction works for both the extension and the repower would be being carried out in an area already subject to disturbance. In view of this, any displacement of ecological features due to construction impacts would not be additive with displacement that may already have arisen due to the presence of the operational turbines, as it is not possible to displace a feature that is already displaced.

Operation

- 7.4.12 Operational effects are defined as effects following the construction of the Proposed Development. Operational effects generally relate to disturbance of adjacent habitats or species, on either a temporary or permanent basis. Some effects may reduce with habituation or remain for the lifetime of the Proposed Development.
- 7.4.13 During the operational phase, with the application of good practice measures relating to wind farm operation and maintenance activities, it is considered that potential adverse impacts are restricted to the risk of collision mortality for bats. Direct adverse effects for other sensitive ecological features (such as habitat loss and disturbance) are not anticipated to occur during the operational period.
- 7.4.14 Whilst in practice one development may be built and commissioned first, and then decommissioned first, assessment has been undertaken based on an unlikely to be realised precautionary assumption that all proposed turbines become operational at the same time and the operational life for both development phases (as applied to assessment of collision impacts) is obtained from the date at which the latter constructed development reaches the end of its operational life. In the context of impact assessment, this would extend the lifetime of, and impacts associated with, the extension by up to seven years where this development is constructed first.

Decommissioning

- 7.4.15 Decommissioning, including the removal of infrastructure, would involve earthworks which in the absence of mitigation have the potential to cause pollution, and / or to adversely impact habitats and protected species. Potential future decommissioning effects of the repowered and extended wind farm are considered to be similar to those identified for the construction phase.
- 7.4.16 The scope of the assessment has been informed by consultation responses summarised in **Table 7.1** and key legislation, policy and guidance outlined in **Section 7.2**.

Assessment Methodology

- 7.4.17 Assessment has been undertaken in accordance with CIEEM guidelines (2018) and includes the following stages:
- determination and evaluation of important ecological features;
 - identification and characterisation of impacts;

- outline of mitigating measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures; and
- identification of appropriate compensation measures to offset significant residual effects.

Value of Features

- 7.4.18 Relevant European, national and local guidance from governments and specialist organisations has been referred to in order to determine the sensitivity (or importance) of ecological features. Reference has also been made to NatureScot guidance on key ecological features when considering the development of onshore wind farms in Scotland (NatureScot, 2022).
- 7.4.19 In addition, sensitivity has also been determined using professional judgement and taking account of the results of baseline field and desk study findings and the functional role of features within the context of the geographical area.
- 7.4.20 For the purposes of this assessment the sensitivity or importance of an ecological feature is considered in the context of a defined geographical area, ranging from International to Local, as detailed in **Table 7.2**.

Table 7.2: Sensitivity / Geographic Scale of Ecological Feature Importance

Importance	Definition
Very High - International	<p>An internationally designated site i.e. SAC and/or Ramsar site or candidate site (or cSAC).</p> <p>Large areas of priority habitat listed under Annex I of the Habitats Directive, and smaller areas of such a habitat that are essential to maintain the viability of that ecological resource.</p> <p>A regularly occurring, nationally significant population of any internationally important species, listed under Annex II or Annex IV of the Habitats Directive.</p>
High - National	<p>A nationally designated site e.g. SSSI, or area meeting criteria for national level designations.</p> <p>Significant extents of a priority habitat identified in the UK BAP / SBL, or smaller areas which are essential to maintain the viability of that ecological resource.</p> <p>A regularly occurring, regionally significant population of any nationally important species listed as a UK BAP / SBL priority species and Species listed under Schedule 1 or Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.</p>
Regional	<p>Viable areas of key semi-natural habitat identified in the UKBAP.</p> <p>A regularly occurring, locally significant population of any nationally important species listed as a UK BAP / SBL priority species and Species listed under Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.</p> <p>Sites which exceed the local authority-level designations but fall short of SSSI selection guidelines, including extensive areas of semi-natural woodland.</p>

Importance	Definition
Local	<p>Nature conservation sites selected on local authority criteria.</p> <p>Other species of conservation concern, including species listed under the LBAP. Areas of habitat or species considered to appreciably enrich the ecological resource within the local context e.g. species-rich flushes or hedgerows.</p> <p>All other species and habitats that are widespread and common and which are not present in locally, regionally or nationally important numbers or habitats which are considered to be of low ecological value.</p>

7.4.21 It should be noted that importance does not necessarily relate solely to the level of legal protection that a feature receives and ecological features may be important for a variety of reasons, such as their connectivity to a designated site, rarity of species or the geographical location of species relative to their known range.

7.4.22 Similarly, whilst a particular feature may be associated with a nearby internationally designated site, the feature is not automatically assigned a value of “International” importance.

Magnitude of impact (change)

7.4.23 Once identified, potential effects are described making reference to the following characteristics as appropriate:

- adverse or beneficial;
- extent;
- magnitude;
- duration;
- timing;
- frequency; and
- reversibility.

7.4.24 The assessment only makes reference to those characteristics relevant to understanding the nature of an effect and determining its significance. For the purposes of this assessment the temporal nature of potential effects are described as follows:

- negligible: of inconsequential duration;
- short-term: for 1-5 years;
- medium-term: for 5-10 years;
- long-term: for 10-30 years; and
- permanent: >30 years.

7.4.25 The likelihood or probability that an effect will occur is also described as far as possible based on best available information and where relevant. The likelihood of an impact occurring is referred to using the following terms: ‘certain’, ‘likely’, ‘unlikely’ or ‘highly unlikely’, where appropriate.

7.4.26 The criteria used to determine the magnitude of impacts are set out in **Table 7.3**.

Table 7.3: Definition of impact magnitude

Magnitude	Definition
Very High	The impact (either on its own or in-combination with other proposals) may result in the permanent total or almost complete loss of a site and/or species status or productivity.
High	The impact (either on its own or in-combination with other proposals) may adversely affect the biodiversity conservation status of a site/population, in terms of the coherence of its ecological structure and function (integrity), across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest.
Medium	The impact (either on its own or in-combination with other proposals) would not adversely affect the conservation status of a site and/ or species, but some element of the functioning might be affected and impacts could potentially affect its ability to sustain some part of itself in the long term.
Low	None of the above applies, but some minor adverse effect is evident on a temporary basis or affects extent of habitat/species abundance in the local area.
Negligible	A very slight (indiscernible) reduction in a site and/ or species status or productivity and/ or no observable impact.
Beneficial	The impact is considered to be beneficial to a species or sites nature conservation status.

Determination of significance

- 7.4.27 For the purposes of assessment, a ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives for ‘important features’ at a defined geographic scale, or for biodiversity in general. Unless otherwise stated, all effects are assumed to be adverse.
- 7.4.28 Significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution) and are identified on the basis of magnitude, professional judgment and best available evidence, to identify whether the integrity of a feature would be affected.
- 7.4.29 The term ‘integrity’ is used here to refer to the maintenance of the conservation status of a population of a species at a specific location or geographical scale.
- 7.4.30 In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect has been assumed as a precautionary approach. Where uncertainty exists, this is acknowledged.
- 7.4.31 Where the ecological assessment proposes measures to mitigate adverse effects on ecological features, a further assessment of residual ecological effects, taking into account any ecological mitigation recommended, has been undertaken.

- 7.4.32 CIEEM guidelines (2018) do not recommend the sole use of a matrix table as commonly set out in EIAR Chapters to determine 'significant' and 'non-significant' effects. The predicted significance of the effect has been determined through a standard method of assessment based on the exercise of professional judgement, a combination of sensitivity and magnitude of change and has been further informed by relevant information on species ecology, population trends, distributions, and evidence from the studies of ecological feature and wind farm interactions, as referenced herein.
- 7.4.33 For the purposes of this assessment presented herein, **Table 7.4** sets out adapted CIEEM terminology and equivalent in the context of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

Table 7.4: Effect Significance

Effect (EIA Significance)		
Significant	Major Adverse / Beneficial	A medium or high, medium-term or long-term adverse or beneficial effect upon the integrity of an ecological feature at a national (Scottish) or international level.
	Moderate Adverse / Beneficial	A high or very high, long-term or permanent adverse or beneficial effect upon the integrity of an ecological feature at a regional level.
Not significant	Minor Adverse / Beneficial	A low or medium, short-term or long-term adverse or beneficial effect upon the integrity of an ecological feature at a regional level or below.
	Negligible or Low Adverse/ Beneficial	A negligible or low adverse or beneficial effect upon the integrity of an ecological feature, typically at a site level or below.

- 7.4.34 Major and moderate effects are considered significant in the context of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

Requirements for Avoidance, Mitigation, Compensation and Enhancement

- 7.4.35 Environmental mitigation measures are necessary to address likely **significant** adverse environmental effects. However, it is also good practice to propose measure to reduce non-significant effects and to provide overall biodiversity enhancements associated with the Proposed Development.
- 7.4.36 The mitigation hierarchy has been adopted to avoid, mitigate and compensate for ecological impacts arising to significant effects as a result of the Proposed Development:
- avoidance is used where an impact has been avoided e.g., through changes in Proposed Development design;
 - mitigation is used to refer to measures to reduce or remedy a specific adverse impact *in situ*;
 - compensation describes measures taken to offset residual effects, i.e., where mitigation *in situ* is not possible; and

- enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

7.4.37 Note that in this chapter these are referred to collectively as 'mitigation' for brevity when discussing generalities, though with the form of mitigation specified as appropriate in discussion of any specific requirements.

Assessment of Cumulative Impacts

7.4.38 Potentially significant cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location.

7.4.39 For aquatic features, potential cumulative effects are likely to be significant only for other developments located relatively close (i.e., within 2 km) and within the same hydrological sub-catchments.

7.4.40 For (non-avian) species potentially significant cumulative effects are only likely where other developments are located within the regular range of more mobile species (e.g., bats). Cumulative impacts have therefore been assessed for bats only and within 10 km of the Proposed Development for longer term impacts associated with the operational phase.

7.4.41 In accordance with NatureScot guidance (SNH, 2012), a cumulative impact assessment need only be sought where it is considered that a proposal could result in significant cumulative impacts.

7.4.42 Cumulative effects are only considered for features above negligible magnitude impacts, as there is no likelihood that negligible residual impacts will add measurably to cumulative effects.

7.4.43 Cumulative impacts to habitats are only considered where there will be an above negligible adverse magnitude impact of loss of habitats following any mitigation and/ or enhancement proposals.

7.4.44 Due to the nature of the species and impacts assessed, no non-wind developments were included in the consideration of cumulative effects, and no such developments were identified for consideration in the ecology assessment by consultees during the scoping process.

7.4.45 The potential for cumulative impacts have therefore been assessed with reference to NatureScot guidance (SNH, 2012), and encompass the effects of the proposal in-combination with relevant:

- existing wind farm developments, either operational or under construction;
- consented wind farm developments, awaiting implementation; and
- wind farm applications awaiting determination within the planning process with relevant ecological information in the public domain.

7.4.46 Those developments which have been withdrawn and / or refused are not considered, unless an appeal is currently in progress and information is available.

7.4.47 Whilst single or small-scale wind turbine developments (three turbines or less) may contribute to cumulative effects, these have been scoped out of assessment, in line with

NatureScot guidance (SNH, 2012) as applications for such developments do not generally consider the potential for impacts upon ecological features in sufficient detail to inform meaningful assessment, and information is often not readily available for small-scale developments.

7.5 Baseline Methodology

Study Area

- 7.5.1 Study areas adopted for baseline ecological surveys are shown on **Figures 7.2 to 7.7**, in relation to the identified developable area and the indicative scoping turbine layout (hereafter the 'Proposed Development').
- 7.5.2 Details of study areas and survey areas are given in each of the specific survey methods sections below.

Existing Baseline Conditions

- 7.5.3 Baseline information in relation to ecological features which may be affected by the Proposed Development has been informed through desk study and ecological field surveys.

Desk Study and Consultation

- 7.5.4 A desk study review of existing ecological information was undertaken to:
 - identify the location of designated sites for nature conservation within and within close proximity to the Proposed Development (10 km for statutory sites and 2 km for non-statutory sites);
 - identify existing records of protected and / or notable species and habitats within 2 km of the Proposed Development;
 - identify any factor or features that may influence the potential for impacts to ecological features as a result of the Proposed Development;
 - inform the requirement for further detailed survey; and
 - provide context for assessment.
- 7.5.5 The following key sources were reviewed and consulted for existing information on designated sites for nature conservation and ecological records within the Application Site and surrounding area:
 - NatureScot Sitelink;
 - Scotland's Environment Web;
 - NatureScot Carbon and Peatland Map
 - Multi-Agency Geographic Information for the Countryside (MAGIC);
 - Highland Biodiversity Recording Group (HBRG) (records requested from within 5 km of the Site Boundary); and,
 - EIARs and Environmental Statements for nearby wind developments.
- 7.5.6 Existing ecological information for the Site derived from baseline ecological information gathered in relation to a previously investigated wind farm proposal on the Site, known as the Gleann Eoghainn Wind Farm (2014-2016) was also reviewed.

Survey Methodology

7.5.7 The following field surveys have been undertaken to provide detailed information pertaining to the presence and distribution of ecological features within the Site and surrounding area, which may be affected by the Proposed Development:

- Phase 1 habitat survey;
- NVC Survey;
- Terrestrial mammal surveys;
- Bat activity surveys;
- Bat preliminary roost assessment survey; and
- Fish habitat survey.

7.5.8 All surveys have been undertaken within the most recently available two-year survey window prior to submission, and by competent and qualified ecologists in accordance with industry standard guidance. Methods are summarised below, with further details in **Technical Appendices 7.1 to 7.4.**

Habitats and Vegetation

7.5.9 Surveys which have established baseline terrestrial habitat conditions within the Site and surrounding area were undertaken as part of investigations into the Gleann Eoghainn Wind Farm in 2014, 2015 and 2016. These comprised a Phase 1 habitat survey and NVC Survey (JNCC, 2010 and Rodwell, 2006).

7.5.10 Updated surveys were undertaken in September and October 2021 to ground-truth and, where relevant, update previous recorded habitats distribution and condition, and expand geographical coverage to ensure baseline habitat conditions at the Site are established in accordance with NatureScot (2022) and SEPA (2014) guidance.

7.5.11 Survey coverage has therefore comprised coverage of those habitats likely to be affected by the Proposed Development, with the survey area including the Study Area plus a 250 m buffer.

7.5.12 Surveys have been undertaken following standard survey guidance for Phase 1 habitat (JNCC, 2010) and NVC survey (Rodwell, 2006). The purpose of the surveys was to identify vegetation communities of notable importance, including potential GWDTE, habitats listed on Annex 1 of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (i.e., Habitats Directive) and as SBL priority habitats.

7.5.13 Surveys have been undertaken at appropriate times of year, applicable to the nature of the predominant habitat types present. Full details of survey methodologies are provided in **Technical Appendix 7.1.**

Terrestrial mammals

7.5.14 Terrestrial mammal walkover surveys were undertaken in September 2021 by suitably competent ecologists, following industry standard guidance and species-specific survey methodologies as outlined in **Technical Appendix 7.2.**

7.5.15 In consultation with NatureScot in May 2021 it was agreed that targeted surveys for badger, water vole and wildcat were not required on the basis of the established and

generally accepted absence of these species within this locale of Scotland. Red squirrel are also known to be absent on Skye.

- 7.5.16 Terrestrial mammal surveys sought to identify the presence and distribution of field signs confirming or indicating the potential presence of otter and pine marten.
- 7.5.17 The survey area comprised the Study Area plus a 250 m buffer in accordance with NatureScot guidance.

Bats

- 7.5.18 Surveys to establish the bat species assemblage using the Site and the spatial and temporal distribution of activity were undertaken in 2021 and 2022, in line with guidance applicable at the time (SNH, 2019).

Bat Activity Surveys

- 7.5.19 Bat activity surveys were undertaken in 2021 and 2022, adopting survey effort appropriate to a 10-turbine scheme (as was proposed at the time surveys were undertaken) in accordance with NatureScot guidance (NatureScot, 2021).
- 7.5.20 Eleven ground-level static detectors ('Monitoring Stations' [MSs]) were deployed to record bat activity within the Site, for a period of at least 10 nights in summer (June to July) and autumn (August to September) 2021 and spring (May to June) 2022. In the absence of precise turbine locations being known, MSs were placed in a representative sample of locations/habitats within the main area of interest for turbine placement, as per NatureScot guidance (NatureScot, 2021). Locations of MSs are shown on **Figure 7.6**.
- 7.5.21 NatureScot guidance advises a minimum of ten consecutive monitoring nights with suitable weather conditions (temperatures of $\geq 8^{\circ}\text{C}$, maximum ground level wind speed of 5 m/s and no greater than very light, rainfall) are collected for each activity period (spring, summer and autumn). Instances where this was not achieved are identified and discussed in **Technical Appendix 7.3**, and in 'Difficulties and Uncertainties' below.
- 7.5.22 All bat activity data was analysed through Kaleidoscope (Wildlife Acoustics) software and manually checked by an experienced ecologist. All sonogram data obtained from activity surveys was then be uploaded to the online *Ecobat* tool in order to quantify bat activity in accordance with NatureScot guidance (2019), with the *Ecobat* output used to assess the likelihood for significant effects to bat species arising as a result of the Proposed Development. Full details are presented in **Technical Appendix 7.3**.

Bat Roost Surveys

- 7.5.23 A Preliminary Roost Assessment (PRA) was undertaken in September 2021, comprising a daytime ground-level inspection of trees (and any other features, e.g., buildings) within the Study Area, and out to 200 m where access allowed, for potential to support bat roosts in accordance with NatureScot guidance (NatureScot 2021). The survey area is shown on **Figure 7.5**.

Difficulties and Uncertainties

Habitats

- 7.5.24 Detailed habitat surveys were carried out within the Site in 2014 and 2015 for an earlier wind farm proposal by another developer (Gleann Eoghainn), as detailed in **Technical Appendix 7.1** and **Confidential Appendix 7.7**. These surveys were comprehensive, and the data have been made available to the Applicant to inform this EIA submission. In their response to informal survey scoping, NatureScot agreed that these survey data may be used as baseline to inform assessment for the Proposed Development provided there have been no major changes to the habitats present. As such, where the 2021 habitat Study Area for the Proposed Development overlapped with the area surveyed previously for Gleann Eoghainn, the surveyor carried out a walkover to validate the previous results and to check that there had been no substantive changes to habitat composition or condition.
- 7.5.25 It should be noted that NVC classification of habitat composition, particularly where habitats occur in mosaic, may have a degree of subjectivity based on the surveyor's judgement. The ground-truthing survey was carried out by a different surveyor, at a slightly different time of year, and six years after the original surveys and as such there may be minor (inconsequential) differences in how habitats have been classified between the 2014-15 and 2021 surveys.
- 7.5.26 As the purpose of the 2021 walkover was to ground-truth rather than to collect new survey data in the previously surveyed area, the previous surveyor's results were not changed based on a different subjective opinion of the habitat composition; changes were only made where it was considered that the habitats present had changed notably.
- 7.5.27 Where habitat within the Study Area crossed from areas surveyed previously into areas for which no baseline data had yet been collected, new Phase 1 and NVC survey data were collected in line with guidance. As such there are areas where habitat classifications within a polygon differ across this border between the previous Gleann Eoghainn surveys and the survey carried out in 2021. This primarily applies to the NVC habitat classification results and to interpretation and recording of habitat mosaics.
- 7.5.28 Given the nature and protection status of the majority of habitats present this is not considered to represent a constraint to assessment. To address inconsistencies in habitat recording between the two different surveys, habitat loss calculations have been conducted using Phase 1 rather than NVC data (though noting that NVC results are also provided) and habitat mosaics containing Annex 1 / protected habitat have been assigned the protection status of the most sensitive component (e.g. mosaics containing blanket bog are treated as blanket bog, for the purposes of assessment). This represents a proportionate approach as it confers the same, high value on all areas of e.g. Annex 1 habitat whereas in reality some areas of e.g. blanket bog are higher quality habitat (M17) than others (M20). However, they are all Annex 1 and so Phase 1 data is suitable for use in habitat loss calculations as it captures the necessary information and corrects for differences in the data gathering approach.
- 7.5.29 The survey area used for surveys in 2021 followed an intended access track route to the south. Following responses from consultees to scoping (**Table 7.1**), this route was changed in November 2022, to incorporate as much of an existing crofters track from Feorlig as possible (see **Chapter 2**). This change to the design took place outwith the

recommended habitat survey season. This has meant that there is a small area (2.21 ha) of track which has not been surveyed and so which is within the RLB but not within the survey area.

- 7.5.30 Although the southern access largely follows an existing track, the crofters track will need widening in places, and so will be subject to areas of habitat loss. The exact locations and extent of engineering works to the track, and so the exact locations of loss of new habitat as opposed to the upgrade of a track that is already there, are not known at this stage. To account for this, and for the lack of habitat survey data for the 2.21 ha of track which falls outside the Survey Area, assessment has been carried out based on a worst case scenario that the southern access track is an entirely new track, and will all represent habitat loss, rather than widening of an existing track. A further worst-case assumption has been applied that the underlying habitat in the areas for which there is no survey data is all blanket bog. In reality, the majority of the track is already *in situ*, and crosses some habitats of lower value than bog. Therefore, impacts of construction of this element will be lower than those assessed and the assessment outcome represents worst-case. Habitat surveys can be carried out during forthcoming survey seasons to validate assumptions and provided as further environmental information (FEI) if required.

Terrestrial mammals

- 7.5.31 Surveys were scheduled to be undertaken during appropriate weather conditions, however it should be noted that weather conditions on the west coast of Scotland are extremely changeable. Given the remoteness of Skye and difficulty in obtaining accommodation, surveys occasionally had to be undertaken in sub-optimal conditions, though surveys were abandoned if it was considered that the weather would invalidate the survey results obtained.
- 7.5.32 The day before the otter survey there was rain, and so water levels on Site were slightly raised which may have resulted in fewer rocks in watercourses being visible, and in some otter spraints having been washed away. This is not considered to represent a constraint to the data obtained to inform assessment, as spraints were located, confirming otter presence. The number of spraints recorded within the Study Area was consistent with the data from the 2015 surveys for Gleann Eoghainn (see **Technical Appendix 7.2** and **Confidential Appendix 7.7**) and so it is considered that the survey data obtained in the 2021 surveys is representative of conditions at the Proposed Development, and that the weather conditions on the preceding day do not represent a major constraint to the validity of the survey results obtained. The majority of the habitat in the northern part of the Site in which turbines will be located comprises open blanket bog and so is unsuitable for holt establishment, and areas of the Site which may be suitable for holts were easily identified. Some of these areas were inaccessible to the surveyor on health and safety grounds, and so assessment will be carried out on the precautionary basis that there may be holts present in areas that could not be accessed.

Bats

Surveys

- 7.5.33 NatureScot guidance (NatureScot, 2021) requires a minimum of ten consecutive monitoring nights for each of the spring, summer and autumn activity periods. Ideally the sampled activity periods should be within the same year; however, due to delays in

commissioning the surveys the spring period in 2021 was missed. The summer deployment was conducted early in the summer sampling period and the MSs were deployed for 27 nights during this period to compensate. This ensured the correct level of survey effort was conducted in 2021, and a spring deployment was conducted in 2022 to capture data from earlier in the active season. As such, it is not considered that spring 2021 being missed will affect the validity of the data to inform impact assessment.

- 7.5.34 There were various unforeseen detector malfunctions, as detailed in **Technical Appendix 7.3**, meaning that certain detectors did not capture the numbers of nights of activity data as recommended in guidance during all deployment periods (spring, summer and autumn). However, overall there were more detectors deployed than are required by guidance (11 rather than 9) and 401 nights of data collected; considerably in excess of the requirement of 180 nights to characterise bat interest and activity levels at a development of this size and site of this type. The area where turbines are to be located comprises relatively homogenous upland bog habitat of low overall value to bats. As such, failures at individual MSs do not represent a limitation to the data obtained, which it is considered will be representative for the Site.
- 7.5.35 Weather constraints including temperatures $<8^{\circ}\text{C}$, heavy rain and/ or winds $>5\text{ m/s}$ were recorded on several nights of survey (see **Technical Appendix 7.3**); however, these weather conditions are likely to be representative for sites at this latitude, and so any bat activity recorded during these 'sub-optimal' (in general terms) conditions may also be considered to be representative for a development in this location. As such nights of poor weather where bat activity was still recorded have been included within the analysis. Although it is recognised that poor weather can affect bat activity, excluding these data from the analysis skews the dataset, does not account for likely prevailing Site-specific weather conditions and would remove some high collision risk species (noctule) from the dataset. Subsequently inclusion of these nights represents a precautionary approach. Furthermore, if these nights were excluded the number of nights sampled would still exceed the recommended 330 nights; spring: 99, summer: 174 and autumn: 117 nights.
- 7.5.36 Due to an unforeseen weather station malfunction it was not possible to retrieve the weather data for the summer 2021 survey period. Instead, the weather data for this static deployment period was obtained from the Time and Date website. Weather masts in this area are very limited with the closest Time and Date mast being at Portree approximately 14 km east. As a result, the weather data for summer may not be totally accurate for the Site; however, considering that bats were recorded on the majority of nights (17 of 27), including during nights deemed as having unsuitable weather, this is not considered to represent a limitation to the data.

Ecobat Tool

- 7.5.37 The *Ecobat* tool remains in its infancy, and naturally there are fewer data in the reference range, reducing the confidence in the assigned category. The tool does, however, provide a guide for discussion along with Site-specific circumstances (e.g., habitats present, desk study information) and its use is advised in accordance with NatureScot guidance (NatureScot, 2021).
- 7.5.38 The data within the reference range used to compare activity levels between Site data and other records within the region is likely to have been obtained primarily from surveys undertaken at proposed or operational wind farm sites. Thus, most of the records are

likely to be from low value habitats (upland, exposed commercial forestry and/or blanket bog) compared to habitats of greater value (such as those detailed in Table 3a of NatureScot guidance (NatureScot, 2021) and listed under 'High').

- 7.5.39 Furthermore, *Ecobat* recommends a reference range >200 records to be confident in the relative activity levels. The reference range used by *Ecobat* for noctule was 90 records and so did not meet this threshold, and therefore the *Ecobat* output for this species should be treated with caution.
- 7.5.40 When data are entered into *Ecobat* for analysis, there is no allowance for entering recording nights where conditions were suitable, but no bat passes were recorded, and so the analysis is carried out only on presence data. As 'no bats present' is a valid result, this can act to skew the results and elevate the risk levels of percentile ranks calculated, and does not allow for consideration of the fact that if no bats are present during suitable conditions, this is a useful indication of the likely importance of a site for bat species.
- 7.5.41 *Ecobat* output is therefore regarded as an indicative assessment and to be considered alongside desk study information and professional judgement, rather than conclusive evidence of the importance of a site for bats.

Design basis and assumptions

- 7.5.42 The Proposed Development has been subject to a number of design iterations and evolution in response to constraints identified as part of the baseline studies, intended to reduce environmental effects. The following design considerations have been incorporated to specifically reduce and/or otherwise avoid adverse impacts upon ecological features.
- 7.5.43 Full details of the scheme design evolution and embedded mitigation measures are detailed in **Chapter 2: Proposed Development**.

Land-Take

- 7.5.44 Proposed turbine locations, proposed access tracks and infrastructure have been designed to minimise the requirement for land-take, impacts on areas of deeper peat and the number of water crossings, reducing the loss of blanket bog and other sensitive habitats and potentially sensitive fish habitats.
- 7.5.45 The repowered turbines are located in the area of the Site containing the operational Ben Aketil Wind Farm, and so in an area that is already subject to disturbance and habitat loss. In so far as is possible, taking account of the larger turbines proposed for the repower, infrastructure from the existing wind farm will be reused or upgraded to prevent the need for new land-take. Following scoping, the proposed Southern Access route has been re-routed to make use of as much of the existing crofters track as possible, and to reduce the length of completely new track required.
- 7.5.46 The Proposed Development design has, in so far as has been possible, avoided locating infrastructure within areas of higher quality blanket bog. It has however, not been possible to entirely avoid areas of peatland habitats, due to the distribution of these habitat types within the Site boundary. The layout of infrastructure (e.g. wind turbines, tracks and substation) has sought to avoid areas of deeper peat, minimising the potential for impacts to habitat types with greater future restoration potential.

- 7.5.47 A HMP is proposed which will seek to restore areas of degraded habitat elsewhere within the Site to compensate for any loss of habitat which could not be avoided through sensitive siting of infrastructure.

Watercourse Buffers

- 7.5.48 A minimum 50 m buffer has been included around all mapped watercourses for turbine hardstanding and associated access tracks, except for at T7 where the hardstanding sits slightly within this buffer to avoid an area of deep peat (see **Chapter 2: Proposed Development**) The other exception is at watercourse crossings, for which the requirement has been minimised as part of sensitive Proposed Development design. Further information relating to watercourse buffers, design evolution and siting of infrastructure is provided in **Chapter 2: Proposed Development**.
- 7.5.49 The buffer of all watercourses also achieves the minimum buffer required between turbine locations and watercourses (71 m) to achieve a minimum 50 m 'standoff' from bat habitat features and turbine blade tips in accordance with current good practice mitigation outlined in NatureScot guidance (NatureScot, 2021).

Watercourse Crossings

- 7.5.50 Design of new watercourse crossings would maintain hydraulic connectivity and allow the free passage of fish and other wildlife beneath. Watercourse crossings would also be of sufficient size so as not to restrict or concentrate flows downstream and to convey flows during periods of heavy rainfall (e.g., 1 in 200-year event plus climate change allowance).
- 7.5.51 In addition, as detailed below, the CEMP prepared for the Proposed Development will include all good practice construction measures and pollution prevention controls.

Good Practice Measures

Construction Environment Management Plan (CEMP)

- 7.5.52 Details of construction phase embedded mitigation measures for the Proposed Development (also to be applied to the decommissioning of the existing wind farm) will be contained within a CEMP which will include the measures identified in the Schedule of Mitigation set out in **Chapter 17**. The CEMP will include an outline of all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the pre-construction and construction of the Proposed Development in line with current industry and statutory guidance (Scottish Renewables, 2019).
- 7.5.53 Good practice measures in relation to pollution risk, sediment management, water quality monitoring, watercourse crossings and sensitive techniques with regards to construction in peatlands and near watercourses to be adopted during the construction and operation phases are detailed in **Chapter 9: Hydrology, Geology, Hydrogeology and Peat**. These measures will negate potentially significant effects upon the aquatic environment over the construction phase and will also be adopted into operational management plans to protect habitats from pollution events throughout the operational lifetime of the Proposed Development.
- 7.5.54 Good practice measures to protect retained habitats during the construction works would be implemented including the sensitive demarcation of working areas, to be overseen by

a suitably qualified and experienced environmental manager and / or project ecologist. Good practice habitat reinstatement measures would also be adopted and implemented, on areas subject to disturbance during construction works as soon as it is practical to do so.

- 7.5.55 Good practice measures to prevent harm to faunal species, would also include the careful storage of potentially dangerous substances or materials within construction compounds. Excavations will either be temporarily covered at night or designed to include a ramp. Construction will take place during daylight hours as far as possible, and any lighting required would be kept to a minimum and would be directed away from habitat features which may be used by protected species.
- 7.5.56 In accordance with NPF4, which requires development proposals to contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature networks and the connections between them, a commitment to implementing a HMP is included in the Proposed Development from the outset to provide significant enhancement measures for important ecological features and biodiversity in general (see **Technical Appendix 7.6**). The Outline HMP (OHMP) proposals have been designed to conserve, restore and enhance biodiversity, including nature networks, so they are in a demonstrably better state than without intervention, strengthening habitat connectivity within and beyond the development.
- 7.5.57 A pre, during and post-construction fish monitoring plan (FMP) will also be established in consultation and agreement with the SWRFT and SLRT. The aim of the monitoring plan would be to characterise baseline conditions prior to construction works commencing and to continue throughout and immediately after the construction phase to confirm that the mitigation measures with respect to water quality and maintenance of fish passages are effective.
- 7.5.58 The monitoring plan would also include details of response and remediation measures in the unlikely event mitigation measures are found not to be performing.
- 7.5.59 Compliance of construction to the methods in the approved CEMP will be audited by an Environmental Clerk of Works (ECoW).

Pre-construction Surveys

- 7.5.60 There is potential for a change in the distribution of protected terrestrial mammal species within the Site, between the completion of baseline surveys presented herein and the commencement of construction activities for the Proposed Development. Pre-construction surveys for protected terrestrial mammals including otter and pine marten would therefore be undertaken, within a defined period prior to the commencement of construction works and as outlined within the Schedule of Mitigation (**Chapter 17**).
- 7.5.61 This would cover all areas within 250 m of the Proposed Development infrastructure and associated working areas.
- 7.5.62 The results of the pre-construction surveys would inform the need for further mitigation (if required) in respect of sensitive working practices, SPPs and the requirement to consult with NatureScot, in relation to protected species licensing.

Environmental Manager

- 7.5.63 A suitably qualified environmental manager and / or project ecologist (as appropriate) would be employed for the duration of the construction and reinstatement periods, to oversee environmental protection measures and working practices specified in the CEMP and prevent breaches of legislation pertaining to protected species and habitats. The role of the environmental manager would be defined in the CEMP, and would include the following tasks:
- provide toolbox talks and information to all staff on-site, so staff are aware of the ecological sensitivities within the Site and the legal implications of not complying with agreed working practices;
 - agree and monitor measures designed to minimise damage to retained habitats;
 - undertake pre-construction surveys and advise on ecological issues and working restrictions where required;
 - complete site-supervision works as required, in relation to sensitive habitats and protected species; and
 - oversee restoration of working areas following construction.

Habitat Management Plan

- 7.5.64 The Applicant has committed to provision of a HMP to reduce adverse environmental effects and also to provide significant enhancements for important ecological features and biodiversity in general at the Proposed Development. This, in outline form, is provided as **Technical Appendix 7.6** and has been embedded in the Proposed Development and considered during the design stage. As is good practice, and also a requirement under NPF4, measures have been proposed for appropriate ecological features known to be present at the Site irrespective of their status as important ecological features, and irrespective of whether they are assessed as being potentially subject to significant adverse effects arising from the Proposed Development.
- 7.5.65 The outline HMP proposes the following four Aims, and associated Objectives:
- Aim 1: Enhancement of Peatland Habitats
 - Aim 2: Enhancement of Riverine Habitats
 - Aim 3: Enhancement of Opportunities for Otter
 - Aim 4: Reduction in Attraction Risks for Eagles (see **Chapter 8: Ornithology**)
- 7.5.66 Aims 1 to 3 are summarised as follows:
- Aim 1: Enhancement of Peatland Habitats
- 7.5.67 This will complement the PMP and mitigation commitments made in relation to the use of excavated soils and peat in Site restoration and rehabilitation at the end of the construction period.
- 7.5.68 Objective: Promote Improved Structural Diversity of Blanket Bog, via habitat improvement measures such as ditch-blocking to promote re-wetting where appropriate, re-profiling of peat hags, and hydroseeding if necessary and appropriate, cessation of burning and management of grazing by livestock and deer in sensitive areas.
- Aim 2: Enhancement of Riverine Habitats

- 7.5.69 Opportunities to enhance and/or create fish habitats by way of the management of grazing, creation of fish cover and riparian planting will be identified in consultation with the SWRFT and SLRT.
- 7.5.70 Objective 1: Management of Fish Cover, via increasing habitat complexity for fish within watercourses in the Site using techniques such as placing boulders and wood debris in watercourse channels.
- 7.5.71 Objective 2: Management of Bank Side Vegetation, via riparian planting in appropriate areas within the Site to deliver benefits for fisheries, including the casting of shade, maintenance of cool water temperatures, provision of cover and sources of food from in-falling litter and insects, and to deliver opportunities for other wildlife, including foraging and commuting bats, terrestrial mammals (including otter), birds and reptiles.
- Aim 3: Enhancement of Opportunities for Otter
- 7.5.72 Evidence of otter presence was recorded within the Site, and it is likely that otters which are resident in Loch Caroy use the watercourses in the Site for foraging. The highest value habitat for otter within the Site is in the steep-sided vegetated gorges lining the Rageary and Aketil burns.
- 7.5.73 Objective: Riparian Planting (linked to Objective 2 of Aim 2), to include both continuous and discontinuous shrub and tree dominated planting of broad-leaved species of local provenance, to provide cover for commuting otters, and potentially rest site opportunities in denser areas of planting. Benefits for other biodiversity including fish and amphibians will benefit otters by potentially increasing food resources.
- 7.5.74 The appropriateness of any specific measures proposed to achieve the aims and objectives, methods to be used and suitable locations within the Site for implementation, will be determined in consultation with the landowner, NatureScot, the SWRFT and SLRT post-consent. Prescriptive measures will be included in the HMP to be agreed with NatureScot, THC and additional relevant stakeholders, and to be secured by appropriate planning condition. The success of management prescriptions and habitat creation in achieving the aims and objectives of the HMP will be monitored, with the results reported to an advisory group, in accordance with timings and protocols to be agreed with NatureScot and THC. The HMP, once finalised, will be a live document, with the habitat management measures implemented being adaptive throughout the lifetime of the proposed development in response to the findings of ongoing monitoring.

7.6 Existing environment

- 7.6.1 This section provides a summary of baseline ecological conditions in relation to:
- habitats and vegetation;
 - protected and notable species;
 - terrestrial mammals;
 - fisheries;
 - bats; and
 - additional species.

Desk Study

- 7.6.2 Detailed information regarding desk study records and field survey results is presented in **Technical Appendices 7.1 to 7.4** where relevant, and also as relevant within the “Predicted Effects” with regards important ecological features.
- 7.6.3 Data from the HBRG returned records of 22 protected/notable species from within the 5 km buffer of the Site since 2012. These are provided in **Technical Appendix 7.2**. Of these two are records from within the Site, a small heath butterfly and a moss carder bee. Several of the records are of marine species recorded in and around Loch Caroy, Loch Brachadale and Loch Vatten.
- 7.6.4 There were no records of invasive non-native species from within the Site, and no records of non-statutory designated sites within 5 km of the Site.

Habitats and Vegetation

- 7.6.5 A summary overview of habitats recorded within the site is provided below. Detailed survey results are provided in **Technical Appendix 7.1** and illustrated on **Figures 7.2 and 7.3**.
- 7.6.6 Habitats are discussed with reference to both the Phase 1 habitat and NVC survey findings. However, for the reasons outlined in ‘Difficulties and Uncertainties’, and due to the overall protection status of the majority of habitats on the Site (95.5% of total habitat area recorded; see **Table 7.5**), these are grouped in this EIAR chapter by Phase 1 habitat for the purposes of results and assessment. Given the extensive range of habitat mosaics on site this is considered to be a precautionary approach.
- 7.6.7 A variety of acid flushes and springs are found across the survey area, primarily within the blanket bog habitats.
- 7.6.8 Habitats within the southern extent of the survey area, along the route of the proposed southern Site access, are a mix of improved fields for fodder and grazing with some remnant patches of bog and some areas of planted broadleaf woodland and acid grassland. The Site is bordered to the north by dense Sitka spruce and lodgepole pine plantation, some of which shows fire damage.
- 7.6.9 Several streams and burns of peat-stained water drain across the Site with the main watershed draining through the Caroy River.
- 7.6.10 In summary, the survey area is largely comprised of blanket bog and wet modified bog, with small areas of dry and wet heath, and acid and marshy grassland. A brief description of the most extensive protected/notable habitats within the Site is provided below.

Blanket bog

- 7.6.11 Blanket bog covers the vast majority of the area and is found on peat over 50 cm deep. There are two main types of blanket bog, deer grass dominated areas which are generally much wetter and common heather dominated areas which are generally drier, and in many areas have been subject to muirburn in the past. To the south of Aketil Burn there are extensive swards of intact bog to the east of the Southern Access Route. North of the Aketil Burn intact bog is the most prevalent habitat. Drainage channels and historic and recent burning of the heather has occurred and is particularly extensive within the largest

area of blanket bog to the east of the Southern Access Route, however bog-mosses remain abundant, with the key peat-former papillose bog-moss occasional to frequent.

Wet Modified Bog

- 7.6.12 Much of the revised core survey area comprises wet modified bog. The layer of peat is >0.5 m deep and is clearly visible from channels or excavations. This habitat is noted to be generally dry underfoot. It is dominated by dense purple moor grass tussocks with a very low diversity of other species Bog-mosses are restricted to wet runnels.
- 7.6.13 The condition of areas of bog may be derived from repeated burning and heavy grazing. Large areas of the heather have been burnt; heather is a slow-growing plant and, although many of these muirburns are several years old, the regrowth has only reached a height of up to 10 cm; allowing faster growing colonisers such as deergrass and purple moor-grass to dominate. In addition to muirburns, heavy grazing by cattle and sheep has facilitated nutrient enrichment and peat erosion of the bog.

Wet Dwarf Shrub Heath

- 7.6.14 This habitat is largely restricted to the higher areas to the west of the Caroy River and on the lower slopes of Ben Aketil, where the peat depth is less than 0.5 m. Steep slopes and drainage channels in these areas prevent the ground from becoming waterlogged and creating blanket bog. Wet heath has also recolonised the rides in the coniferous forestry block. It is generally quite damp but not overly wet. The habitat is largely dominated by deer grass, with abundant common cotton grass, and also diminutive common heather and cross-leaved heath.
- 7.6.15 A summary of habitat types and communities and their approximate areas and relative extents within the Site is provided in **Table 7.5**. Note that only protected and notable habitats are included in **Table 7.5**; detailed survey results relating to all habitats recorded are provided in **Technical Appendix 7.1** and on **Figures 7.2** and **7.3**. The relative coverage is based on an area within the Site of 894.20 ha (891.99 ha within the Survey Area plus 2.21 ha of crofters track located outside the Survey Area but for which habitat assumptions have been made; see 'Difficulties and Uncertainties').

Table 7.5: Summary of Protected Habitats Including Approximate Area and Relative Percentage Coverage Within the Site

Phase 1 Habitat Type	Phase 1 code	Component NVC Habitats, including mosaics	Extent within Study Area (Ha)	Relative coverage (%)	Protection Status
Broadleaved semi-natural woodland	A1.1.1	W9/H10, W9	3.38	0.378	SBL
Scattered scrub	A2.2	W7/M15/H10/W11	1.56	0.175	Annex 1; SBL.
Unimproved acid grassland	B1.1	U6	1.57	0.175	SBL
Semi-improved acid grassland/Marshy grassland	B1.2/B5	U4/M6, M6	11.84	1.324	SBL
Semi-improved acid grassland/Marshy grassland/Blanket bog/Wet heath	B1.2/B5/E1.6.1/D2	U4/M6/M19/M15	7.75	0.867	Annex 1; SBL
Semi-improved neutral grassland/dry heath	B2.2	M9/H10	0.03	0.003	Annex 1; SBL
Marshy grassland	B5	M6	1.14	0.127	SBL
Marshy grassland/Acid/neutral flush	B5/E2.1	M6	1.60	0.179	SBL
Dry heath	D1	H10, H10 (CG10)	0.35	0.040	Annex 1; SBL
Dry heath/Semi-improved acid grassland	D1/B1.2	H10 (U4 10%)	0.31	0.035	Annex 1; SBL
Wet heath	D2	M15, M15 (M17)	17.32	1.936	Annex 1; SBL
Wet heath/dry heath	D2	M15 (H10), M15 (H21)	1.14	0.127	Annex 1; SBL
Wet heath/blanket bog	D2	M15 (M19), M15/M19(U4), M15/M19	6.80	0.760	Annex 1; SBL

Phase 1 Habitat Type	Phase 1 code	Component NVC Habitats, including mosaics	Extent within Study Area (Ha)	Relative coverage (%)	Protection Status
Wet heath/Unimproved acid grassland/Continuous bracken	D2/B1.1/C1	M15/U4/U20	0.01	0.001	Annex 1; SBL
Wet heath/Marshy grassland	D2/B5	M15/M6	0.22	0.025	Annex 1; SBL
Wet heath/acid grassland mosaic	D6	M15	2.42	0.271	Annex 1; SBL
Wet heath/acid grassland	D6	M15/U4(M6), M15/U4	5.71	0.639	Annex 1; SBL
Blanket bog/wet heath	E1.6.1/D2	M19 (M15), M19 (M2), M19/M15, M17 (M15), M17/M15 (M37 1%), M17/M15	91.80	10.266	Annex 1; SBL
Blanket bog	E1.6.1	M17/M25/(M15), M17, M17/M19/M15/M25(5%), M17/M15, M19, M19/M15, M17/(M15/M2/3/6), M19/M15/M10/M17, M17/M2, M17/M19/M15, M17/M25/M15, M2	311.54	34.840	Annex 1; SBL
Blanket bog/Marshy grassland	E1.6.1/B5	M6/M19, M19/M6	3.10	0.347	Annex 1; SBL
Blanket bog/Wet heath/Unimproved acid grassland	E1.6.1/D2/B1.1(5%)	M17/M15/U4/U5	10.30	1.152	Annex 1; SBL
Blanket bog/Wet heath/Marshy grassland	E1.6.1/D2/B5	M19/M15/M6	0.73	0.081	Annex 1; SBL
Blanket bog/Wet modified bog	E1.6.1/E1.7	M19/M15, M17/M25	21.71	2.428	Annex 1; SBL
Wet modified bog	E1.7	M15/M19, M19, M15, M15/M10, M17&M15 burnt/(M19), M15(U5)/M10/17, M17 burnt,	276.39	30.909	Annex 1; SBL

Phase 1 Habitat Type	Phase 1 code	Component NVC Habitats, including mosaics	Extent within Study Area (Ha)	Relative coverage (%)	Protection Status
		M15/M17, M15/M19/(M6), M15/M17/(M3), M15(M2)/(M17), M15, H10/M25			
Wet modified bog/Semi-improved acid grassland/Marshy grassland	E1.7/B1.2/B5	M19/U4/M6	6.51	0.727	Annex 1; SBL
Wet modified bog/Continuous bracken	E1.7/C1	M25/U20	0.02	0.003	Annex 1; SBL
Wet modified bog/Wet heath	E1.7/D2	M25	6.06	0.678	Annex 1; SBL
Wet modified bog/Wet heath/Marshy grassland/Semi-improved acid grassland	E1.7/D2/B5/B1.2	M19/M15/U4/M6/M37	36.88	4.124	Annex 1; SBL
Acid/neutral flush	E2.1	M6, M6/(M9)/(M4), M6/M15, M6/M15/M9/M10, M4/M9, M6/M9, M4, M4/M6c, M4/M6, M6/M4	20.44	2.285	Annex 1; SBL
Basic Flush	E2.2	M10/M15, M10/M6/(M9)	1.38	0.154	Annex 1; SBL
Fen - Valley Mire	E3.1	M9/M6, M9/M4/M6, M9/M6/M17, M9, M9/M10	4.10	0.458	Annex 1; SBL
Total			854.092	95.514	

7.6.16 In addition to protected and/or sensitive habitats as summarised above, the surveys also recorded several habitat communities within the Site which are indicative of potential groundwater dependency (GWDTE). **Table 7.6** below summarises the NVC habitat communities recorded on site which indicate that a habitat may be either highly groundwater dependent or moderately groundwater dependent, depending on the hydrogeological setting (SEPA, 2017). Actual GWDTE status, based on investigation of underlying geological and hydrological context, is discussed in **Technical Appendix 9.3**.

Table 7.6: Potentially highly or moderately groundwater dependent GWDTE habitats recorded in the Study Area

NVC community	Potential dependence of community/ habitat on groundwater. 1=High 2=Moderate
M6 – <i>Carex echinata</i> – <i>Sphagnum fallax</i> / <i>denticulatum</i> mire	1
M6a <i>Carex echinata</i> – <i>Sphagnum fallax</i> / <i>denticulatum</i> mire, <i>Carex echinata</i> sub-community	1
M6c <i>Carex echinata</i> – <i>Sphagnum fallax</i> / <i>denticulatum</i> mire, <i>Juncus effusus</i> sub-community	1
M6d <i>Carex echinata</i> – <i>Sphagnum fallax</i> / <i>denticulatum</i> mire, <i>Juncus acutiflorus</i> sub-community	1
M9 <i>Carex rostrata</i> - <i>Calliergon cuspidatum</i> / <i>giganteum</i> mire	1
M10 <i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire	1
M15 <i>Trichophorum germanicum</i> – <i>Erica tetralix</i> wet heath	2
M15a <i>Trichophorum germanicum</i> – <i>Erica tetralix</i> wet heath, <i>Carex panacea</i> sub-community	2
M15b <i>Trichophorum germanicum</i> – <i>Erica tetralix</i> wet heath, typical sub-community	2 (3 where deep peat)
M15c <i>Trichophorum germanicum</i> – <i>Erica tetralix</i> wet heath, <i>Cladonia</i> subcommunity	2 (3 where deep peat)
M23 <i>Juncus effusus</i> / <i>acutiflorus</i> - <i>Galium palustre</i> rush pasture	1
M25 <i>Molinia caerulea</i> - <i>Potentilla erecta</i> mire.	2 (3 where on deep peat)
M25a <i>Molinia caerulea</i> - <i>Potentilla erecta</i> mire, <i>Erica tetralix</i> sub-community	2 (3 where on deep peat)

NVC community	Potential dependence of community/ habitat on groundwater. 1=High 2=Moderate
M27 – <i>Filipendula ulmaria</i> – <i>Angelica sylvestris</i> mire	2
M32 <i>Philonotis fontana</i> – <i>Saxifraga stellaris</i> spring	1
M37 <i>Palustriella commutata</i> - <i>Festuca rubra</i> spring	1
MG9 <i>Holcus lanatus</i> – <i>Deschampsia cespitosa</i> grassland	2
MG10 <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush-pasture	2
U6a <i>Juncus squarrosus</i> - <i>Festuca ovina</i> grassland, <i>Sphagnum</i> spp. sub-community	2
W7 <i>Alnus glutinosa</i> - <i>Fraxinus excelsior</i> - <i>Lysimachia nemorum</i> woodland	1

- 7.6.17 No rare, protected or sensitive plant species were recorded during the surveys. However, the wooded gorse lining the Aketil Burn was noted to contain cotoneaster which is an invasive non-native species.

Terrestrial Mammals

Otter

- 7.6.18 The only protected terrestrial mammal evidence recorded on Site in 2021 was of otter, in the form of five spraints (see **Technical Appendix 7.2** and **Figure 7.4**); most of the watercourses surveyed are considered suitable for the species. No potential breeding or resting sites were identified; however, several areas of potentially suitable habitat for holt creation were noted, particularly in areas of dense willow birch and alder scrub that line deep, steep-sided vegetated gorges on the Rageary Burn and Aketil Burn, and about the Caroy River at its southern extent.
- 7.6.19 Otter were also recorded during surveys undertaken for the Gleann Eoghainn proposal (see **Technical Appendix 7.2** and **Confidential Appendix 7.7**). The otter surveys in 2015 recorded three spraints within the core turbine area, including two within the operational Ben Aketil Wind Farm. In 2016, during the Extended Phase 1 survey carried out for the potential Gleann Eoghainn access track, 12 spraints were recorded, plus a potential above ground resting site and one record of prints. These were all at the mouth of the Caroy River where it joins Loch Caroy. Additionally, 30 spraints (though no well-established sprainting sites) and an above ground resting site were recorded during the baseline surveys for the existing Ben Aketil Wind Farm in 2002. Some of the spraints were noted to contain marine crustaceans, and it was concluded that otter presence in the Site was likely to be primarily transitory presence of marine-dwelling otters for the purposes of foraging and accessing fresh water to wash salt from their pelts.

Bats

- 7.6.20 This section should be read with reference to **Technical Appendix 7.3** and **Figures 7.5** and **7.6**.
- 7.6.21 No existing bat records from within the last 10 years were returned by the HBRG. Only one species of bat, common pipistrelle, was recorded during the course of the bat surveys in 2015 for the Gleann Eoghainn proposal.

Preliminary Roost Assessment

- 7.6.22 The turbine area is dominated by open blanket bog and wet modified bog habitat which offers negligible roost opportunities. No structures or trees with the potential to support maternity or hibernation roosts were identified within 200 m plus maximum potential rotor radius distance (285 m) of proposed turbine locations. The only feature recorded within this ZOI was the substation building for the operational wind farm, which was noted to have 'Low' roosting potential. The conifer plantation trees within 285 m to the north of the Site boundary were assessed as having negligible potential, and were noted in the results of the Phase 1 survey to be stunted and fire damaged in places.
- 7.6.23 Three features were recorded which were considered to offer moderate suitability for roosting bats (though no dropping or staining were noted) and therefore could potentially support maternity or hibernation roosts; two road bridges with cracks and crevices, and a mature pine with broken upper branches. All of these are greater than 3 km from the nearest proposed turbine location, either at or outwith the southern Site boundary at Feorlig (see **Figure 7.5**).
- 7.6.24 The *Ecobat* tool identified the possible presence of roosts of noctule bat within proximity of the Site based on recording of activity at the Site within their species-specific emergence times. Activity within this period was highest at MS9, however the number of calls detected within the species specific emergence time was still very low.

Table 7.7: Records of bat activity within species-specific emergence times

Detector ID	Species /Species Group	Nights Recorded	Peak Count	Month of Peak Count
MS 1	Noctule	1	1	June
MS 7	Noctule	1	1	June
MS 9	Noctule	2	3	July

- 7.6.25 Noctules are tree roosting bats and there are no trees within 500 m of MS1, MS7 or MS9, though based on the *Ecobat* analysis there may be small roosts comprising low numbers of bats in the wider area (potentially in the plantation to the north of the Proposed Development), although due to the low number of both nights recorded and peak count it is considered unlikely that these will be significant roosts such as maternity roosts.

Baseline activity surveys

- 7.6.26 Baseline activity surveys in 2021-22 identified calls with the characteristics of the following bat species:
- Common pipistrelle; and

- Noctule;

7.6.27 Overall 699 bat passes were recorded, over 11 monitoring stations. Bats were detected on 37 nights between 11/06/2021 and 05/06/2022, out of a possible 54 recording dates and a collective 401 survey nights (successful recording nights at all eleven detectors combined).

Table 7.8: Total number of recorded bat passes

Species	Passes (No.)	Percentage of total (%) ¹²	Mean Passes per Night ¹³
Common pipistrelle	612	88	1.53
Noctule	87	12	0.22
Total	699	100	1.74

Spatial Distribution of Bat Activity

- 7.6.28 Common pipistrelle was the most frequently recorded species representing 88% of all recordings, and activity was recorded at all 11 detectors. Activity overall was considered to be low, with the species being recorded on 105 nights out of 401 and representing 1.53 passes per night for the survey period. The median pass rate for all MS locations was below 1 and all had low activity levels.
- 7.6.29 When compared with activity at other sites (*Ecobat* reference range and percentiles) common pipistrelle activity was concluded to be low at the 5th median percentile.
- 7.6.30 Noctule represented 12% of all recordings, with activity recorded at seven out of the 11 detectors. Activity overall was considered to be low, with the species being recorded on 20 nights out of 401 and representing 0.22 passes per night for the survey period. Highest activity was at MS 5 with low to moderate activity and a median pass rate of 0.7, followed by MS 10 and M 11 with low to moderate activity and both with a median pass rate of 0.5. The remaining detectors had low activity levels. The median pass rate for noctule at all detectors was below 1.
- 7.6.31 When compared with activity at other sites (*Ecobat* reference range and percentiles), noctule activity was concluded to be low at the 15th median percentile.
- 7.6.32 The predominantly blanket bog and wet modified bog habitats of the Site provide relatively poor foraging opportunities for bat species; however the small areas of broad-leaved semi-natural woodland and scrub in the centre of the Site and numerous small watercourses, including Ben Aketil Burn and Rageary Burn running throughout the Site offer more suitable foraging opportunities and also connectivity with potentially higher value habitats within the wider landscape.
- 7.6.33 The highest levels of bat activity (44% of all recorded passes) were recorded at MS6 which was sited within 50 m of the Rageary Burn; all of these passes were common pipistrelle however activity was still low with a median pass rate of 0.8. There is no

¹² The 'Total' percentage may not be exactly 100% due to rounding of the percentages per species

¹³ Total passes recorded/ total nights included

obvious habitat association with the spatial distribution of passes for the remaining detectors, which each recorded between 0.86% and 9.87% of the passes, and many of which were located in blanket or wet modified bog which was not within 50 m of a linear feature. Some MSs in blanket bog habitat recorded a higher overall percentage of bat passes than other MSs within 50 m of a watercourse, for example MS3 and MS4, both of which were located in open bog and which recorded the second highest percentage of recorded bat passes after MS6, at 9.01% and 9.87% respectively.

- 7.6.34 The lack of strong associations between habitat type and activity identified suggest the majority of habitats within the site are of a consistent quality for foraging bats, with that overall quality likely to be low based on the marked increase in activity at a location likely to represent higher quality habitat (i.e. alongside a woodland-lined watercourse).

Temporal Distribution of Bat Activity

- 7.6.35 Common pipistrelle activity was recorded during all months, peaking in August and September 2021, with overall activity (based on the median) being low.
- 7.6.36 Noctule was recorded every month, with the exception of September, with overall activity for June and July 2021 being low to moderate (based on the median) and May 2022 and August 2021 being low (based on the median).
- 7.6.37 Overall, based on the median percentile, bat activity was generally low, with only the summer months for noctule recording higher activity levels with low to moderate (based on the median).

Activity Peaks

- 7.6.38 While the median percentile provides us with the 'typical' levels of bat activity at the Site, the maximum percentile allows identification of peaks in activity that may still be low in relative terms, but are higher for particular areas of the Site or for specific times of year. This allows any required mitigation to be tailored to the most appropriate turbines and/or the most appropriate times of year.
- 7.6.39 It is stated in the NatureScot guidance (2021) that the median will usually be the most appropriate metric to report, and is considered appropriate for the Proposed Development based on professional judgement. However, for a Site where overall activity levels are as low as they are at the Proposed Development, leading to lower levels of data and so increased uncertainty, the maximum percentile helps to provide a more detailed understanding of (albeit low-level) use of the Site by bat species.
- 7.6.40 Consideration of the maximum percentile identifies peaks in activity for common pipistrelle at MS6 in particular (High), and also at MS7 (Moderate), with increased levels of activity (Low to Moderate) also apparent at MS3 and MS4.
- 7.6.41 In temporal terms, common pipistrelle activity is Low in spring, Low to Moderate in summer and late autumn (September) and High in early autumn (August). The overall risk assessment for these locations and periods with higher activity at the maximum percentile is 'Medium' based on the parameters in NatureScot guidance (2021).
- 7.6.42 For noctule, using the maximum percentile, the same three detectors show activity peaks as is apparent from the median percentile, though activity levels at MS5 increase to 'Moderate' and at MS11 increase to 'High'. Activity at MS10 remains the same at 'Low to

Moderate' whether using the median or the maximum percentile. MS9, which is categorised as 'Low' at the median percentile displays a peak when using the maximum percentile and is categorised as 'High'.

- 7.6.43 In temporal terms, noctule activity increases from 'Low' (median percentile) to 'Low to Moderate' (maximum percentile) in early spring, increases from 'Low to Moderate' to 'High' in late spring/early summer (June) and remains unchanged in late summer (July; 'Low to Moderate') and early autumn (August; 'Low') when using the maximum percentile. The overall risk assessment for these locations and periods with higher activity at the maximum percentile is 'Medium' based on the parameters in NatureScot guidance (2021).

Additional Species

- 7.6.44 During protected mammal surveys, evidence of roe and red deer, including sightings and droppings, was recorded. Roe deer were also sighted during habitat surveys.
- 7.6.45 Information regarding all mammal species recorded during surveys is provided in **Technical Appendix 7.2**. No other species recorded as present are considered as having relevance for the Proposed Development.

7.7 Future Baseline

- 7.7.1 In the absence of the Proposed Development, or assuming a gap between baseline surveys and the commencement of the Proposed Development construction, changes in baseline ecology conditions (i.e. distributions and populations) are most likely to result from habitat modifications within or surrounding the site due to the decommissioning of the operational Ben Aketil Wind Farm, and to baseline land management practices.
- 7.7.2 The existing Ben Aketil Wind Farm will be nearing its end of operational life within the next ten years. If the Proposed Development were not to be implemented, the existing wind farm would be decommissioned and the site reinstated as far as practicable to align with the conditions of the rest of the Site, as per the applicable planning conditions and current good practice guidance. The land currently used to generate renewable energy would become available for alternative land uses, predominantly for sheep grazing by crofters, and would be likely to return to the management regime which exists within the rest of the landholding. Large areas of blanket and modified bog habitats are noted to have been subject to drainage and burning to improve their quality for livestock. In the absence of the Proposed Development this is likely to continue, leading to further modification impacts of drying and degradation of the bog habitat within the Proposed Development area over the medium to long term.
- 7.7.3 Commercial forestry operations within adjacent plantation forestry, such as felling and replanting, may also alter the distribution of faunal species recorded during baseline surveys; however, it is highly unlikely this would be in such a way as to substantially alter the baseline reported here. It is understood that some of the conifer plantation in the northern buffer of the Site has been identified within the proposed Ben Sca development as an area in which to undertake habitat management proposals, and so the nature of this area is likely to change in accordance with the habitat management measures included in the agreed Ben Sca plan (unavailable in the public domain).

- 7.7.4 Whilst short-term and small-scale variability in populations and distributions may occur, and revisions to conservation statuses and designations are possible, such changes would be unlikely to qualitatively alter the conclusion of the assessment presented within and have been accounted for through application of a precautionary approach and appropriate mitigation.
- 7.7.5 It is more difficult to predict changes that that may occur in the longer-term (i.e. over 35 years), especially in the wake of climate change, which is predicted to cause range shifts in some species. Extreme weather events including heavy rainfall (e.g., 1 in 200-year event plus) are predicted to become more frequent and may have effects on the structure of watercourses within the Site, and hence on the species which use them. In addition, climate change may alter habitat types by impacting on the composition and health of the plant communities present, thereby affecting the suitability of the Proposed Development area for some of the species which currently occupy the site. The results of baseline surveys carried out for the Proposed Development cannot reliably be extrapolated to predict future population trends in the event of climate change, or future changes in land use.

7.8 Predicted effects

Features Scoped Out

- 7.8.1 CIEEM guidelines (2018) stipulate that it is not necessary to carry out a detailed assessment of impacts upon ecological features that are sufficiently widespread, unthreatened and/ or resilient to impacts of a development proposal.
- 7.8.2 As such, the assessment presented within this chapter considers the effects upon designated sites for nature conservation and ecological features which are considered 'important' on the basis of relevant guidance and professional judgement.
- 7.8.3 Where ecological features are not considered so important as to warrant a detailed assessment or where they would not be significantly affected on the basis of baseline information, these are 'scoped out' of the assessment below, and are not considered further within this chapter. Mitigation measures for such features may however, still be outlined as appropriate, to reduce and / or avoid any potentially adverse effects, or to ensure legislative compliance.

Habitats and Vegetation

- 7.8.4 A table detailing all habitat losses for the Proposed Development is provided in **Technical Appendix 7.1**. The following habitats are considered of less than 'Local' ecological value in the context of the Proposed Development as they are features which are relatively common and/or widespread, which are present only in very small areas, and/ or for which there is no route to impact due to spatial separation from the Proposed Development:
- broadleaved semi-natural woodland;
 - broad-leaved plantation woodland;
 - coniferous plantation woodland;
 - recently felled coniferous woodland;
 - scattered broadleaved trees
 - scattered scrub;

- improved grassland;
- semi-improved acid grassland;
- semi-improved neutral grassland;
- poor semi-improved grassland
- marshy grassland;
- continuous bracken;
- tall ruderal;
- running water;
- amenity grassland; and,
- buildings and bare ground.

7.8.5 These habitats are therefore scoped out of further assessment.

7.8.6 Some of the habitats scoped out of impact assessment, for example marshy grassland, may represent GWDTE under certain hydrogeological conditions. Within the Site, habitats indicative of GWDTE potential are considered to be surface and rainwater-fed; for further discussion see **Chapter 9: Hydrology, Geology, Hydrogeology and Peat** and **Technical Appendix 9.3: GWDTE**.

7.8.7 Impacts to habitats are possible at a wider spatial scale than loss or disturbance within the construction corridor, due to dust from traffic movements and pollution, e.g. from contaminated water - wetter habitats in particular, and from fuel spills. However, embedded mitigation measures implemented under the CEMP would limit the potential of these mechanisms to adversely impact habitats to the extent that impacts are expected to be of negligible magnitude and therefore not significant, and so indirect impacts to habitats associated with dust and pollution are scoped out of assessment in this chapter.

Protected Species

7.8.8 NatureScot guidance (NatureScot, 2022) advises that there are some species, which with standard mitigation measures, are unlikely to experience a significant environmental effect as a result of the construction and/ or operation of onshore wind farms. These species do not require surveys to inform the EIA but may require appropriate mitigation to ensure legislative compliance.

7.8.9 On this basis, baseline surveys for invertebrates, reptiles and amphibians have not been undertaken to inform the design and assessment of the Proposed Development. The desk study returned one record of a small heath butterfly and one record of a moss carder bee from within the Site boundary. On consideration of the desk study and of the extent and nature of the Proposed Development, invertebrates, amphibians and reptiles are scoped-out of detailed assessment.

7.8.10 Both red and roe deer were noted to be present on-site and a deer assessment is included as **Technical Appendix 7.5**. Any requirement for wild deer management is assumed to be undertaken by the landowner. As such, the deer assessment includes a commitment to liaise with the landowner and Skye Deer Management Group (DMG) to produce a deer management plan (DMP) for the construction and operation phases of the Proposed Development. The DMP will seek to manage deer at sustainable levels for habitat restoration within the Site, in accordance with Best Practice Guidance to ensure deer

welfare is sustained. Deer are therefore scoped out of further assessment in this EIAR chapter.

- 7.8.11 Baseline information collected through desk study, consultation with specialist recording groups and terrestrial mammal surveys has identified no evidence of, and only limited suitable habitat for roosting bats within the Site and/ or within a Zol of infrastructure. No potential maternity and/ or hibernation/ swarming sites have been identified within at least 200 m plus blade tip of the proposed turbine locations and therefore likelihood of impacts to potential bat maternity or hibernation roosts is negligible. The habitats within the turbine area are considered to be of low habitat risk for bats, in accordance with criteria presented in NatureScot guidelines (NatureScot, 2021). Disturbance to and displacement of roosting bats, and damage to roosts, are therefore scoped out of further assessment.
- 7.8.12 Construction would mainly take place during daylight hours during the season when bats are active (April to October, inclusive), therefore any disturbance for foraging and commuting bats of any species is highly unlikely to occur and is therefore scoped out.
- 7.8.13 It is considered that with the application of embedded mitigation during construction, there is no likelihood for significant impacts to the local species populations arising from accidental mortality, and so this impact is not considered further within this assessment.
- 7.8.14 It is considered that with the application of embedded operational management plans, good practice and reasonable avoidance measures there is no route to impacts likely to lead to significant effects for any habitat or protected species (with the exception of bats) associated with the operational phase of the Proposed Development. As such, other than for collision risk to bats which is considered in further below, operational phase effects are scoped out.

Fish

- 7.8.15 In the Scoping Report for the Proposed Development it was proposed that impacts to fish were scoped out of assessment in the EIAR, though further information regarding survey methods and results is provided in **Technical Appendix 7.4**. In response to comments from consultees and standing advice from MSS, further justification for scoping baseline assessment for fish out is provided here.
- 7.8.16 A fish habitat survey was carried out in September 2021, to identify any areas of critical fish habitat (i.e., spawning, nursery areas, juvenile and adult holding areas) within the watercourses within the study area and out to a buffer of 100 m. Watercourses were then classified in accordance with the Scottish Fisheries Co-ordination Centre's (SFCC) Habitat Surveys Training Course Manual. The survey was undertaken by a suitably qualified ecologist, in normal flow conditions, following the SFCC industry standard guidance (SFCC, 2007).
- 7.8.17 Full details are provided in **Technical Appendix 7.4**.
- 7.8.18 The watercourses within the Site drain into two separate catchments; the Caroy River and the Red Burn, both of which are SEPA classified watercourses assessed as having an overall ecological status of 'Good' and 'High' in terms of access for migratory fish species. No obstacles were observed in any of the watercourses within the survey area.
- 7.8.19 There is good habitat for juvenile fish fauna (fry and parr stages) in the Caroy River in particular and in some of its tributaries. The Red Burn, the Rageary Burn and the Aketil

Burn also have some deeper sections which are capable of supporting low numbers of adult fish, and though the gradients are steep in places they are generally considered to be passable. The higher reaches of many of the tributaries within the turbine area of the Proposed Development comprise ephemeral peaty headwaters and therefore provide little in the way of suitable habitat for juvenile fish fauna.

- 7.8.20 Proposed Development design and evolution has inherently minimised the requirement for near watercourse working and the number of watercourse crossings to facilitate access tracks. Where watercourse crossings are required, these will be sensitively designed to ensure the continued free passage of fish movements in accordance with SEPA guidance. Embedded mitigation and good practice measures implemented under the CEMP, including (but not restricted to) pollution and siltation protection measures, water quality monitoring pre-, during and post-construction and presence of an environmental manager during construction, will prevent adverse impacts associated with the Proposed Development to fish. A FMP, including provision for pre-, during- and post-construction fish monitoring would be produced pre-consent in consultation with SWRFT and SLRT. Providing the implementation of these measures, to be agreed in consultation with NatureScot and other primary interest groups and secured by appropriate planning condition, significant effects upon solely aquatic features and fisheries interests would not occur and so a baseline assessment of effects upon fish is not required as part of the EIAR and such species are scoped out of the assessment.
- 7.8.21 Notwithstanding their exclusion from impact assessment, measures are proposed in the HMP to provide benefits and enhancements for fish species, based on impacts to fish fauna identified in The Skye Fisheries Trust Fisheries Management Plan. Specifically the following identified impacts were noted within the Site:
- over-grazing and trampling by livestock - which affects spawning redds leading to compacted ground and increased siltation, which reduces oxygen; and
 - Riparian habitat management – save for a section of the Rageary Burn and a section of the Aketil Burn bankside habitat is bare and there is a lack of cover for fish fauna.
- 7.8.22 These impacts are considered in the OHMP, with one of the specified Aims being ‘Enhancement of Riverine Habitats’ including habitat enhancement and creation to benefit fish species (see **Section 7.5** and **Technical Appendix 7.6**).

Summary of features scoped out

- 7.8.23 The above discussed features are not considered to be ‘important ecological features’ in the context of the Site and/ or of the Proposed Development. The likelihood of significant effects to their populations or extents at any geographical scale is considered to be negligible, and so they are assigned less than Local value and scoped out of further consideration within this chapter.
- 7.8.24 Notwithstanding the scoping out of the above identified species from detailed EcIA, consideration is given to the provision of precautionary mitigation to ensure legislation compliance with regards the protection afforded to these species under the Conservation (Natural Habitats, &c.) Regulations 1994 (the Habitats Regulations) (as amended in Scotland) and the Wildlife and Countryside Act 1981 (as amended in Scotland), as relevant (see **Section 7.4**).

Features scoped in

7.8.25 A summary of Ecological Features scoped-in for detailed assessment is provided in **Table 7.9**.

Table 7.9: Evaluation of Important Ecological Features

Ecological Feature	Importance	Justification
Construction		
Unimproved acid grassland	<Local	<p>There is a single small area (1.5 ha) of U6 unimproved acid grassland within the Survey Area, to the east of the Caroy River at Glen Heysdal in the southern half of the Site. A small area of this habitat will be lost where it is crossed by a new section of the Southern Access Route (0.25 ha total of direct and indirect loss, 16.7% of its extent with the Study Area; see Table 7.5)</p> <p>All areas of unimproved grassland within the Proposed Development Area correspond with habitat included on the SBL, however this is a watching brief only and therefore has only low conservation value. Given the relatively small area of habitat loss from the Proposed Development its low conservation value, this habitat is not considered to be an important ecological feature in the context of the Proposed Development and is scoped out of further assessment.</p>
Wet heath, including mosaics	Local	<p>Wet heath, including in mosaic with other habitats, comprises 39.5 ha/4.4% of the habitat recorded within the Study Area, and is the most extensive protected habitat type within the Study Area after blanket and wet modified bog. The total direct and potential indirect loss of wet heath and mosaics containing wet heath is 1.3 ha (see Table 7.10), equating to 3.3% of its extent within the Study Area.</p> <p>Wet heath is a priority habitat on Annex 1 and the SBL. However, in mosaic with acid grassland it is common and widespread and not considered to be an example of priority habitat, and therefore the wet heath that will be lost as a result of the Proposed Development is considered to be of no greater than Local value.</p>
Blanket bog and wet modified bog (including mosaics)	National	<p>Blanket and modified bog are priority habitats on Annex 1 and the SBL. The habitat is widespread on Skye and throughout Scotland, particularly in the north and west. The NatureScot Carbon and Peatland map 2016 shows that the majority of the Site comprises Class 1 peatland (nationally important carbon-rich soils, deep peat and priority peatland</p>

Ecological Feature	Importance	Justification
		habitat, likely to be of high conservation value). Blanket/modified bog at the Site is therefore considered to be important in national terms. Therefore, blanket and modified bog is considered to be an important ecological feature and impacts associated with loss of this habitat are assessed below.
Acid/neutral flush	<Local	<p>A small area of acid/neutral flush will be lost to the Proposed Development (direct loss of 0.4 ha/1.9% of the extent of this habitat within the Study Area, potential indirect loss of 0.11 ha/0.5%). Some areas of acid/neutral flush are a priority habitat on Annex 1. Within the Study Area, the only potential Annex 1 flush habitats are M9 and M10, both of which only occur in mosaic with other, lower conservation value flush habitats, and so are not considered to correspond to Annex 1 in this context.</p> <p>Upland flushes fens and swamps is included on the SBL, but under a watching brief only.</p> <p>Acid/neutral flush is a widespread and common upland habitat in Scotland. The examples of this habitat within the Study Area are of relatively low conservation value, and the extents of mosaics containing potential Annex 1 examples of this habitat to be lost to the Proposed Development are very small. Embedded mitigation and good practice, including pollution protection measures to be implemented under the CEMP, and micro-siting overseen by the environmental manager to avoid any particularly sensitive areas (where possible) will reduce the likelihood of direct and indirect effects to these habitats. As such, these habitats are considered to be of lower than Local value in the context of the Proposed Development, and so are not considered to be an important ecological feature and are scoped out of further assessment in this chapter. For discussion regarding the potential for areas of this habitat to be GWDTE, and so protected under the Water Framework Directive, see Chapter 9: Hydrology, Geology, Hydrogeology and Peat.</p>
Fen – valley mire	<Local	<p>Fen – valley mire, comprising M9 and mosaics containing M9 and M10, is located in several discrete patches in the north-west of the Study Area (see Figure 7.3a). M9 and M10 may correspond with Annex 1 habitat.</p> <p>Due to small areas of this habitat in two locations being crossed by sections of new track there will be 0.03 ha of direct loss (0.7% of the extent of fen within the Study Area) and</p>

Ecological Feature	Importance	Justification
		<p>0.02 ha (0.5%) of potential indirect loss within 2 m, as a result of the Proposed Development.</p> <p>The community is widespread but local, and is present throughout most of Scotland (Rodwell 1992). Embedded mitigation and good practice, including pollution protection measures to be implemented under the CEMP, and micro-siting overseen by the environmental manager to avoid any particularly sensitive areas (where possible) will reduce the likelihood of direct and indirect effects to these habitats. As such, and given the limited extent of the habitat loss, these habitats are considered to be of lower than Local value in the context of the Proposed Development, and so are not considered to be an important ecological feature and are scoped out of further assessment in this chapter. For discussion regarding the potential for areas of this habitat to be GWDTE, and so protected under the Water Framework Directive, see Chapter 9: Hydrology, Geology, Hydrogeology, and Peat.</p>
Otter	Local	<p>Otter are protected under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended), the Wildlife and Countryside Act 1981 (as amended) and the Nature Conservation (Scotland) Act 2004 (as amended). They are also SBL priority species. The Scottish population has a high proportion of coastal-dwelling individuals¹⁴.</p> <p>Limited evidence of otter presence, in the form of spraints, was recorded throughout the Study Area, concentrated on the Caroy River, the southern reaches of which also contains areas of habitat potentially suitable for holts. Except for areas where the southern access track follows the Caroy River, the only other location within a 250 m Zol of the Proposed Development which may have potential to support otter holts is the steep-sided vegetated gorge on the Rageary Burn. The remainder of the areas within 250 m of infrastructure, comprising open blanket bog and moorland habitat, is considered to offer negligible potential for otter holt establishment. It is therefore not considered that the habitat within a Zol of the Proposed Development would support a high density of otter, or is likely to be regularly used by this species for purposes other than foraging, grooming and commuting. Otters are widespread across Scotland and on Skye, and the levels of activity recorded indicate</p>

¹⁴ <https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/otter> last accessed 18 January 2023

Ecological Feature	Importance	Justification
		that the Proposed Development is unlikely to be of greater than Local importance to otter. This species is also readily protected by embedded mitigation and good practice measures. However, due to the proximity of Rageary Burn to some proposed infrastructure and its inaccessibility during surveys preventing confirmation or otherwise of the presence of holts and holt suitable habitat, they are scoped in as an important ecological feature and subject to further assessment. It is considered that the potential for adverse impacts is restricted to potential disturbance to holts during the construction-phase.
Operation		
Common pipistrelle and)	Local	<p>All bat species are protected under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended), the Wildlife and Countryside Act 1981 (as amended) and the Nature Conservation (Scotland) Act 2004 (as amended). They are also SBL priority species. However, common pipistrelle is listed on the Red List for Britain's Mammals as 'Least Concern' at both a British and Scottish scale (Mathews & Harrower, 2020). Common pipistrelle is the most common species of bat in the north of Scotland¹⁵.</p> <p>In accordance with NatureScot Guidance (2021), overall site risk for the Proposed Development is reported in terms of the Median percentile.</p> <p>Common pipistrelle activity recorded during 2021 and 2022 baseline surveys represents "Low Site Risk" at all locations and in all activity periods in accordance with NatureScot guidance.</p> <p>Common pipistrelle are considered to be an important ecological feature in the context of the Proposed Development and are subject to further impact assessment below, however, as discussed it is considered that the potential for impacts is limited to collision effects during the operational phase. Given the common and widespread nature of common pipistrelle, the Low risk assessment and lack of high-quality bat habitat at the Site, this species is considered to be of no greater than Local value in the context of the Proposed Development.</p>

¹⁵ <https://www.bats.org.uk/our-work/in-scotland/bats-in-scotland> last accessed 21/01/2023

Ecological Feature	Importance	Justification
Noctule	Local	<p>All bat species are protected under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended), the Wildlife and Countryside Act 1981 (as amended) and the Nature Conservation (Scotland) Act 2004 (as amended). They are also SBL priority species. However, noctule are listed on the Red List for Britain's Mammals as 'Least Concern' at both a British and Scottish scale (Mathews & Harrower, 2020).</p> <p>In accordance with NatureScot Guidance (2021), overall site risk for the Proposed Development is reported in terms of the Median percentile.</p> <p>Noctule activity recorded during 2021 and 2022 baseline surveys represents "Low Site Risk", rising to "Medium Site Risk" in late spring/early summer. "Medium Site Risk" activity levels for this species were also recorded at three of the 11 MSs; MS5, MS10 and MS11.</p> <p>Noctule are considered to be an important ecological feature in the context of the Proposed Development and are subject to further impact assessment below, however, as discussed it is considered that the potential for impacts is limited to collision effects during the operational phase.</p> <p>Noctule are rare on Skye, with the distribution of this species reported as being primarily in south-west Scotland and with scattered records mainly south of the Central Belt. Their distribution closely matches that of broadleaved woodlands, and they are generally considered to be absent from uplands¹⁶. As such and in view of the limited activity recorded, the overall Low risk assessment, the low reference range in <i>Ecobat</i> and absence of preferred noctule habitat at the Site, this species is considered to be of no greater than Local value in the context of the Proposed Development.</p>

7.8.26 This Section presents an assessment of effects upon the following 'scoped in' important ecological features:

- Wet heath;
- Blanket bog and wet modified bog;
- Otter; and
- Bat species.

7.8.27 Potential effects in the absence of non-embedded mitigation in relation to the construction and operational phases of the Proposed Development are identified as a result of the

¹⁶ <https://www.mammal.org.uk/species-noctule-bat/> last accessed 21/01/2023

Proposed Development alone, with cumulative effects with other wind farm developments (and other major developments if relevant), considered in **Section 7.11**.

- 7.8.28 Impacts arising from the decommissioning phase of the Proposed Development have not been presented in detail because they are considered to be of a similar nature to the construction issues identified but of a potentially smaller scale and shorter duration. Therefore, effects arising from decommissioning are anticipated to be broadly similar in nature to, but of a lower level effect than, those arising during the construction phase, and with all infrastructure removed and habitats reinstated to pre-development conditions.

Construction

- 7.8.29 Following the application of good practice and embedded mitigation, it is considered that the potential for significant construction phase effects on ecological features associated with the Proposed Development is restricted to:
- direct land take (habitat loss) to accommodate the Proposed Development;
 - temporary disturbance and land take for laydown areas and construction compounds;
 - disturbance to, fragmentation or severance of connecting habitat or potential commuting routes within, and adjacent to, the site; and
 - disturbance to other breeding sites within a Zol of infrastructure resulting from site clearance and construction, plant and vehicles movements, and site workers' activities.
- 7.8.30 Adopting a precautionary approach, it is considered that for the important ecological features and potential sources of impact scoped in, the effects will be the same for both construction scenarios.
- 7.8.31 Potential effects are assessed on the assumption that embedded mitigation measures, as detailed in **Section 7.5** and within **Chapter 17: Schedule of Mitigation** are implemented, and so impacts for which embedded mitigation will be sufficient to prevent significant effects are not considered in the assessment.

Habitats and Vegetation

- 7.8.32 Following application of embedded mitigation there are three main ways by which habitat features may be affected during the construction phase of the Proposed Development:
- Direct loss – to accommodate the Proposed Development. These losses are considered permanent in the context of this assessment;
 - Disturbance – the effects of disturbance are variable in their extent, depending on the nature of the disturbance and sensitivity of the habitat feature. Some disturbance types (for example, creation of temporary hard standing areas at the contractor's compound) result in medium - to long-term disturbance which require extended recovery periods. In other cases (for example, installation of cables at the sides of access tracks, traversing of machinery) disturbance is short-term, and certain habitat types are able to recover quickly; and
 - Indirect loss – calculated for blanket bog and wet dwarf shrub habitats which are located within 10 m of direct habitat loss areas, and for fen habitat within 2 m of direct habitat loss areas, to account for potential changes in habitat vegetation structure due to drying effects as a result of construction works.

- 7.8.33 The potential for effects upon the hydrological supporting conditions of bog, water quality, soils and peat as a result of surface and groundwater flows, sediment and contaminant discharges, soil loss, erosion and compaction are detailed within **Chapter 9: Hydrology, Geology, Hydrogeology and Peat**.
- 7.8.34 Overall potential effects upon the aquatic environment are considered to be highly localised and readily mitigated through sensitive scheme design, standard best practice construction methods and pollution prevention controls in accordance with current guidance, and are therefore not discussed further within this assessment.
- 7.8.35 For the purposes of assessment, a precautionary approach has been taken which assumes that direct habitat loss and indirect loss of habitats represents a permanent, irreversible adverse effect (due to for example, drying out of bog and wet heath habitats within 10 m of works). In practice, areas of habitat beyond the direct loss may not be subject to any indirect impacts. It is also highly likely that some areas of indirectly/temporarily affected habitat will be successfully fully restored i.e., during habitat reinstatement following construction in accordance with the CEMP (see **Chapter 17: Schedule of Mitigation**). Accordingly, though both figures are reported, more weight is given to consideration of direct habitat loss in the assessment.
- 7.8.36 **Table 7.10** details the estimated direct and indirect/ temporary habitat losses as a result of the construction of the Proposed Development, and potential effects on wet heath, blanket bog and fen communities. To capture losses relating to habitat communities which occur in mosaic, some of which are too complex to separate into defined habitat types, and also to smooth differences based on the amalgamation of two different habitat datasets, habitat losses are grouped and assessed by Phase 1 classification with NVC information included to provide further context.

Table 7.10: Extent of habitat losses

Habitat category	Phase 1 Code	Phase 1 Description	NVC Code	Direct Loss (ha)	Indirect Loss (ha)	Total direct loss (ha)	Total indirect loss (ha)	Total loss
Wet heath (including mosaics)	D2	Wet heath	M15	0.08	0.30	0.26	1.04	1.30
	D6	Wet heath/ acid grassland mosaic	M15	-	0.01			
	D6	Wet heath/ acid grassland	M15/U4	0.02	0.05			
	D6	Wet heath/ acid grassland mosaic/ marshy grassland	U4/M23/M15	0.16	0.68			
Blanket bog (including mosaics)	E1.6.1	Blanket bog	M17/(M15/M2/3/6)	0.51	0.69	5.77	10.60	16.37
	E1.6.1	Blanket bog	M17/M15	0.60	1.00			
	E1.6.1	Blanket bog	M17/M19/M15	0.02	0.07			
	E1.6.1	Blanket bog	M17/M19/M15/ M25(5%)	0.69	1.17			
	E1.6.1	Blanket bog	M17/M25/(M15)	2.02	3.08			
	E1.6.1	Blanket bog	M17/M25/M15	0.16	0.22			
	E1.6.1	Blanket bog	M19	0.68	1.10			
	E1.6.1	Blanket bog/ wet heath	M19/(M15)	0.29	0.33			
	E1.6.1	Blanket bog	M19/M15	0.13	0.44			
	E1.6.1 (Assumed)	Southern Access Route; area not surveyed		0.47	1.73			

Habitat category	Phase 1 Code	Phase 1 Description	NVC Code	Direct Loss (ha)	Indirect Loss (ha)	Total direct loss (ha)	Total indirect loss (ha)	Total loss
	E1.6.1/ E1.7	Blanket bog/ Wet modified bog	M19/M15	0.00	0.04			
	B2.1/ B5 /E1.6.1/ D2	Neutral unimproved grassland/ Marshy grassland/ Blanket bog/ Wet heath	U4/M6/M19/M15	0.19	0.70			
Wet modified bog (including mosaics)	E1.7	Wet modified bog	M15	0.18	0.59	7.27	10.04	17.30
	E1.7	Wet modified bog	M15/M10	0.60	0.74			
	E1.7	Wet modified bog	M15/M17	0.05	0.20			
	E1.7	Wet modified bog	M15/M19	1.48	3.98			
	E1.7	Wet modified bog	M15/M19/(M6)	0.06	0.25			
	E1.7	Wet modified bog	M17 burnt	0.63	0.89			
	E1.7	Wet modified bog	M17&M15 burnt/(M19)	0.59	0.94			
	E1.7	Wet modified bog	M19	3.06	1.45			
	E1.7/ C1	Wet modified bog/ Continuous bracken	M25/U20	0.00	0.02			
	E1.7/ D2/ B5/ B1.2	Wet modified bog/ Wet heath/ Marshy grassland/ Semi-improved acid grassland	M19/M15/U4/ M6/M37	0.62	0.97			

Habitat category	Phase 1 Code	Phase 1 Description	NVC Code	Direct Loss (ha)	Indirect Loss (ha)	Total direct loss (ha)	Total indirect loss (ha)	Total loss
Fen	E3.1	Fen - Valley Mire	M9/M10	0.01	0.01	0.03	0.02	0.04
	E3.1	Fen - Valley Mire	M9/M6	0.01	0.01			

Wet Heath

- 7.8.37 Only a very small amount (0.08 ha, 0.6% of its extent within the study area) of pristine M15 wet heath will be lost to infrastructure, with a further 0.3 ha of potential indirect loss within 10 m. The majority of the loss of wet heath is in mosaic with acid grassland; 0.2 ha (0.5%) of direct loss and 0.7 ha (1.8%) of indirect loss within 10 m. Given the limited extent of wet heath habitat to be lost, and the common and widespread nature of wet heath/acid grassland mosaics in Scotland, it is considered that loss of wet heath will be a long-term adverse impact of Low magnitude at a Local scale, resulting in an effect of Low adverse significance and so not significant.

Blanket Bog and Wet Modified Bog

- 7.8.38 These habitats are the most extensive habitat within the Study Area, with a total of 439.2 ha of blanket bog and mosaics thereof (49.1% of the Study Area), and 325.9 ha of wet modified bog and mosaics (36.4% of the Study Area). As such blanket and wet modified bog combined makes up a total of 85.6% of the habitat extent within the Study Area. The most extensive blanket bog community within the Study Area is M17, most commonly in mosaic with M19, M15 and M25 bog and heath communities. Class 1 Peatland is considered to be Nationally important, but this community was noted to be generally of poor quality within the Study Area; exposed to moderate levels of grazing and in some locations drying of peat by drainage and burning. Large areas of M17 mire show evidence of muirburns which have dried the bog-moss blanket and removed much of the vegetation. Some areas of M17 blanket bog within the Study Area are also experiencing haggling.
- 7.8.39 M19 occurs on drier peats than M17 mire and may be a result of historic repeated burning of the bog and heavy grazing. Surveys during 2021 noted that there is still grazing pressure by cattle and sheep and some large areas have been burned in the past resulting in a diminished common heather component. Such modifications of the bog, particularly due to repeated burning, can eventually produce a poorer habitat of M20 *Eriophorum vaginatum* mire, although removing grazing and preventing burning can restore such habitats (Averis *et al.*, 2004).
- 7.8.40 The total direct and potential indirect loss of bog and mosaics containing bog is 33.7 ha (see **Table 7.10**), equating to 4.4% of its extent within the Study Area. However, direct, and so permanent loss, is restricted to 5.8 ha (1.3%) of blanket bog and 7.3 ha (2.2%) of wet modified bog.
- 7.8.41 As described in **Chapter 2: Proposed Development**, the design of the Proposed Development has avoided bog habitats where possible, taking into account of other constraints and the ubiquity of bog within the Site boundary. As such, areas of the highest quality bog habitat at the Proposed Development have been avoided as part of the iterative design process, and the extent of this habitat affected by the Proposed Development is a very small proportion of the habitat available, particularly in relation to the extensive modification.
- 7.8.42 An OHMP is embedded in the Proposed Development (see **Section 7.5** and **Technical Appendix 7.6**), which includes a commitment to restoration and enhancement of highly modified and degraded peatland habitats within the Site boundary. A 73.5 ha bog restoration search area has been identified to the south of the Rageary Burn, where the

predominant habitat is M19a blanket bog, including extensive burned areas. The M19 is bordered in places by M17, and so may be derived from and potentially returnable to this higher value habitat. Aerial imagery shows that the bog in the restoration search area is heavily drained, with drainage ditches visible throughout. This, and the only shallowly sloped topography in this part of the Site, indicates there is likely to be good potential here for successful rewetting of the bog and prevention of further degradation. This will result in an overall increase in the quality of blanket bog habitats at the Proposed Development and reverse some of the degradation of bog habitat which is already taking place under baseline conditions, and which it should be noted may be expected to continue in the absence of the Proposed Development, potentially eventually leading to a loss of the bog due to modification.

- 7.8.43 It is considered that impacts associated with loss of blanket bog at the Proposed Development would represent a long-term adverse impact of Low Magnitude at a National Scale, resulting in an effect of Low adverse significance and so Not Significant in the context of the EIA Regulations. However, with consideration of the future baseline in the absence of the development, and of the OHMP, the magnitude of effect is expected to be moderate beneficial, and significant.

Otter

- 7.8.44 Otter have been included as an important ecological feature for impact assessment purposes on a precautionary basis, due to the proximity of some infrastructure and so construction activity to Rageary Burn, which may hold holt suitable habitat and which was not accessible during surveys. Works which may disturb are not permitted within 30 m of an otter resting place or place of shelter, or within 250 m of a breeding holt, without first obtaining a licence from NatureScot.
- 7.8.45 As shown on **Figure 7.4**, the gorge runs parallel to the Southern Access Route to be upgraded, at a distance of c. 30 m away, for a c.100 m stretch, and the northern borrow pit is located c. 66 m away at its closest point, to the north of the gorge. The wooded area of the gorge is also c. 175 m from T7 and its hardstand, and c. 165 m from the new track at T7 at its closest point. There is a temporary construction compound c. 175 m from the gorge, which is also c. 140 m downstream of a watercourse crossing over the burn. As such, the vegetated and inaccessible section of gorge is within the 250 m disturbance buffer required for a breeding holt of several elements of infrastructure where construction works, including borrow pit blasting, will be taking place.
- 7.8.46 Only low levels of otter evidence (five spraints) were recorded in the Study Area during the surveys in 2021. This is comparable to the results of previous survey work undertaken for both Gleann Eoghainn and the existing operational Ben Aketil Wind Farm. Low numbers of spraints and two resting sites showing otter presence within the Study Area were recorded during the two previous sets of surveys, with the highest levels of activity for Gleann Eoghainn recorded at the mouth of the Caroy River near Loch Caroy during surveys for the access track in 2016. The surveys for the existing Ben Aketil Wind Farm noted marine crustaceans in several of the spraints found. In both instances, particularly given the proximity to the coast, it was considered that the records within the Site were likely to correspond to largely transitory presence of coastal-dwelling otters. The holts of such otters are usually <50 m from the sea (Kruuk & Hewson, 1978), but they will travel

inland to forage, particularly when sea conditions are rough, and to find fresh water to wash salt from their pelts.

- 7.8.47 Surveys for Gleann Eoghainn included camera trapping; two of the cameras deployed in March, April and May 2015 were at locations on the Rageary Burn, at the entrance to and exit from the vegetated gorge. No otter were recorded over 54 nights of recording at these locations. As such, and given the likely low levels of use of the Site by otters normally resident at the coast, it is considered that the likelihood for impacts to local otter populations associated with disturbance to holts during construction is negligible. However, to ensure no breach of legislation pertaining to otters it is recommended that pre-construction surveys include provision for camera trapping on the Rageary Burn to check there has been no change to baseline conditions and to use of the gorge by this species between the baseline period and the start of construction. Measures to be employed in the event that the potential presence of an otter holt in the gorge is confirmed during the pre-construction surveys, including application to NatureScot for a licence to disturb if necessary, will be included in the SPP.
- 7.8.48 In summary it is predicted that construction phase disturbance will result in a Short-term adverse impact of Negligible Magnitude to otter at a local level, resulting in an effect of negligible adverse significance and which is not significant in the context of the EIA Regulations.

Operational Phase

- 7.8.49 Direct effects for the majority of sensitive ecological features (such as habitat loss and disturbance) are not anticipated to occur during the operational period of the Proposed Development. Potential operational effects are restricted to bats only.
- 7.8.50 It is considered that for the potential sources of impact scoped in (i.e. collision mortality), the effects will be the same irrespective of the two proposed construction scenarios, as assessment has been based on the assumption of the eventual presence of all nine turbines.

Bats

- 7.8.51 Operational wind turbines can affect bats in a number of ways, although the main concerns to species populations relates to collision mortality, and injuries resulting from collision with, or flying in very close proximity to moving turbines (NatureScot, 2021). Developments also have the potential to in result in the loss of, or damage to, commuting or foraging habitat and displacement of individuals or populations from the area (see NatureScot, 2021) though for the reasons set out previously, assessment for bat species in relation to the Proposed Development is restricted to impacts associated with collision.
- 7.8.52 Common pipistrelle and noctule, the only two species recorded, are categorised as of 'high risk' of collision from wind turbine developments (NatureScot 2021).
- 7.8.53 The assessment of potential effects upon bats resulting from the operation of the proposed wind turbines has been based on the two-stage methodology set out in NatureScot guidance (2021) using the *Ecobat* tool. Full details are presented in **Technical Appendix 7.3**.
- 7.8.54 In accordance with NatureScot guidance (2021) a Stage 1 'Initial Site Risk Assessment' of the potential risk level of the Proposed Development site has been undertaken based

on a consideration of the habitats present and development-related features. This concludes that the site (Low Habitat Risk and Medium Project Size) is assessed as having an overall 'Site Risk' of 2, which represents a Low/Lowest Site Risk.

- 7.8.55 Stage 2 'Overall Risk Assessment' of the two-stage process detailed within NatureScot guidance (2021) has then subsequently been completed to provide an overall assessment of risk to bat species, by considering the conclusions of Stage 1 in relation to relative levels of bat activity obtained through using the *Ecobat* tool (Lintott *et al.*, 2018) and considering the vulnerability of species recorded, at the population level.
- 7.8.56 In accordance with NatureScot guidance (2021), Stage 2 has been carried out separately for all high collision risk species recorded during baseline bat activity surveys, and which includes the following species:
 - Common pipistrelle; and
 - Noctule.
- 7.8.57 The calculated Stage 2 'Overall Risk Assessment' per species, both temporally and spatially is presented in **Technical Appendix 7.3**.
- 7.8.58 The Overall Risk Assessment for common pipistrelle and noctule is considered to fall under "Low Site Risk" for common pipistrelle and "Low/Medium Site Risk" for noctule.
- 7.8.59 On this basis, the conclusions of the Stage 2 'Overall Risk Assessment' concludes that there is a Low/Medium likelihood of the proposed Development resulting in significant impact on bat species populations.
- 7.8.60 It is highlighted that the *Ecobat* tool is in its infancy, and is understood to currently be experiencing technical issues. Given current limitations in available reference data on the database for many renewable energy developments, definitive bat activity for regions are not generated and bat activity representations for regions are instead considered to be indicative.
- 7.8.61 In particular, the reference range used by *Ecobat* for noctule was 90 records; 200+ records are required from the reference range to give confidence in the outcome of the risk assessment. As such, due to the low reference range and the associated wide 95% confidence interval (see **Technical Appendix 7.3**), there is little confidence in the outcome of the *Ecobat* assessment for noctule and it is considered that the assessment of Medium site risk in summer and at three detector locations is highly precautionary. The risk of operational mortality to bats is generally acknowledged to be lowest at locations with low bat activity. Data collected indicates low activity levels based on bat passes per hour, and of a very narrow range of species, which is considered representative of the low value for bats of habitats within proximity to the proposed turbine locations.
- 7.8.62 The layout of the proposed Development has adopted a minimum 42 m 'stand-off' distance between proposed wind turbine locations and all watercourses and which satisfies NatureScot guidance (NatureScot 2021) in relation to maintaining a 50 m 'stand-off' distance between wind turbine blade tips and the nearest watercourse features that may be used by bats. This is based on the calculation provided within NatureScot guidance (NatureScot 2021) adopting a precautionary watercourse feature height of 2 m over lifespan of the Proposed Development. As such the Proposed Development provides a minimum 50 m 'stand-off' distance buffer for all wind turbine locations from potential watercourse features for bats.

- 7.8.63 Greater than the minimum required 97 m standoff distance between the turbines and the trees at Rageary Burn and the plantation to the north of the Proposed Development has also been maintained, and which will allow for a worst-case scenario tree height of 40 m during the lifetime of the Proposed Development to maintain the required 50 m stand-off to the blade tips.
- 7.8.64 The bat population on the Site has been valued at a local level due to the species recorded being widespread and common and/or only likely to be present in very low numbers. Based on activity levels recorded and subsequent analysis as outlined, the risk of mortality or injury impacts for populations of bat species are considered to be low. The Proposed Development is not considered to represent a site of concern for bat collision risks following the approach to assessment set out in NatureScot guidance (NatureScot 2021). It is however, acknowledged that low risk sites can still result in bat casualties. Embedded 'stand-off' distances from habitat features in accordance with NatureScot guidance (NatureScot 2021) are considered adequate mitigation to avoid potentially significant operational mortality risks to bats at most low-risk locations. Additionally riparian planting measure proposed in the OHMP will provide higher value foraging habitat away from the turbines.
- 7.8.65 Impacts of bat collision risk mortality are subsequently considered to be a long-term adverse impact of Low magnitude at a Local level, resulting in an effect of Low adverse significance, and which is Not significant in the context of the EIA Regulations. Notwithstanding the absence of significant effects, mitigation options such as 'feathering' of the turbine blades while idling during periods of potentially higher bat activity will be investigated by the Applicant and implemented where possible/appropriate in the context of the turbine models selected, which would be expected to reduce impacts associated with collision still further to 'Negligible Magnitude and not significant'.

7.9 Mitigation

- 7.9.1 Embedded mitigation and good practice measures are detailed in **Section 7.5**, as well as in **Chapter 17: Schedule of Mitigation** and the OHMP (**Technical Appendix 7.6**).
- 7.9.2 No significant adverse effects upon any important ecological feature are predicted as a result of the construction, operation or decommissioning of the Proposed Development and no additional mitigation measures are therefore required or proposed.

7.10 Summary of effects

Table 7.11: Summary Table of Impacts and Effects upon Important Ecological Features

Feature	Predicted Impact	Characterisation of unmitigated impact upon feature	Significance without mitigation and confidence level	Mitigation and Enhancement	Residual significance and confidence level (following mitigation)
Construction phase					
Wet heath	Direct and indirect loss, to include disturbance (construction)	Long-term, Low magnitude	Low adverse, Not Significant. Certain	<p>None required.</p> <p>Embedded mitigation includes avoidance of main areas of Annex I habitats via design, and protection of habitats through good practice measures, such as pollution control measures and sensitive habitat restoration.</p>	Not Significant
Blanket and wet modified bog	Direct and indirect loss, to include disturbance (construction)	Long-term, Low magnitude. Significant enhancements to be delivered under the OHMP	Moderate Beneficial, Significant. Likely.	<p>None required.</p> <p>Embedded mitigation includes avoidance of main areas of Annex I habitats via design, and protection of habitats through good practice measures, such as pollution control measures and sensitive habitat restoration.</p> <p>HMP embedded in the Proposed Development will include peat/bog restoration which will enhance bog habitats on-site.</p>	Significant Beneficial
Otter	Disturbance/displacement during construction	Short-term, negligible magnitude	Negligible adverse, not significant. Near certain	<p>None required.</p> <p>Embedded mitigation includes a CEMP (including good practice construction measures</p>	Not significant

Feature	Predicted Impact	Characterisation of unmitigated impact upon feature	Significance without mitigation and confidence level	Mitigation and Enhancement	Residual significance and confidence level (following mitigation)
				in relation to protected species), pre-construction surveys, species protection plans and presence of a suitably qualified or experienced environmental manager or ecologist during construction.	
Operational phase					
Bats	Collision mortality (operational)	Long-term low magnitude	Low adverse, not significant	<p>None required.</p> <p>Mitigation options such as 'feathering' of the turbine blades while idling where possible/ appropriate would further reduce impact magnitude and significance</p>	Not significant

7.11 Cumulative effects

- 7.11.1 In accordance with NatureScot guidance (2012), a cumulative impact assessment need only be sought where it is considered that a proposal could result in significant cumulative effects. As no above negligible effects associated with disturbance are predicted to occur, the potential for cumulative effects is considered in relation to habitat loss and collision risk to bats only.
- 7.11.2 It should be noted that cumulative assessments may be complicated by availability of EIAR/ES chapters and Appraisals for consented developments and, where this information is available, survey periods and methods may differ between sites. Furthermore, some wind farms may have been in existence for many years, and thus contemporary data may not be available. There are three operational or consented wind farms within 10 km of the Proposed Development; Ben Sca Wind Farm, Edinbane Wind Farm and Glen Ullinish Wind Farm. However, with the exception of Glen Ullinish, ecological information and EIARs were not readily available for these developments within the public domain. As such, the likelihood for cumulative effects is considered in a qualitative context.
- 7.11.3 Overall, loss of protected and notable habitats as a result of the Proposed Development is considered to be very limited. The only habitat for which an above negligible adverse magnitude impact of loss following mitigation and/ or enhancement proposals is wet heath, and the only scale at which the loss of wet heath is considered to be above negligible is at a local scale (i.e. at the Site or immediate surrounding locality level). In the context of wider-scale consideration (i.e. Regional or above) the loss of 0.9 ha of wet heath will be of negligible magnitude. As such, no potential for significant adverse cumulative habitat loss effects is anticipated and habitat loss is scoped out of further assessment.
- 7.11.4 The Environmental Statement for Glen Ullinish states that the only records of bats at the site were of low numbers of common pipistrelle. Collision impacts associated with the development were predicted to be short-term low adverse, and not significant.

The risk of bat collision impacts, albeit already considered to be low at the Proposed Development due to the low levels of activity recorded, have been further minimised through the sensitive and considered design of the Proposed Development and by implementation of standard good practice measures regarding buffer distances of turbines from watercourses and woodland edge, thereby minimising the likelihood of cumulative operational impacts. In addition, consideration where practical of further mitigation, such as feathering the turbine blades while idling, is expected to reduce the potential for adverse effects still further. It is therefore considered that cumulative operational impacts to bats will be no greater than a long-term impact of low magnitude, resulting in an effect of low adverse significance, and which is not significant in the context of the EIA Regulations.

7.12 References

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8 ORNITHOLOGY

8.1 Introduction

- 8.1.1 This chapter assesses the potential for significant effects upon important ornithological features in relation to the construction, operation and decommissioning of the Proposed Development.
- 8.1.2 The assessment is based upon comprehensive baseline data, compiled through ornithological field surveys, desk study and consultation with nature conservation bodies and specialist species recorders.
- 8.1.3 The specific objectives of the chapter are to:
- describe the assessment methodology and significance criteria used in completing the impact assessment;
 - describe the ornithological baseline conditions and identify important ornithological features, which will be the focus of this assessment;
 - describe the potential effects, including direct, indirect and cumulative effects;
 - describe the mitigation measures proposed to avoid, reduce and offset any potentially significant effects (if required); and
 - assess the significance of residual effects remaining following the implementation of mitigation measures (if required).
- 8.1.4 The assessment is based on the Chartered Institute of Ecology and Environment Management (CIEEM) 'Guidelines for Ecological Impact Assessment (EclA) in the UK and Ireland' (CIEEM, 2018) and has been carried out by Avian Ecology Ltd. Lead authors: Mr Howard Fearn MSc MCIEEM, Director and Ms Nicole Robinson, Principal Ornithologist.
- 8.1.5 Mr Fearn and Ms Robinson have over 15 and 12 years' experience respectively as ecological consultants specialising in renewable energy developments. During this time, they have written and reviewed Environmental Impact Assessment (EIA) Report chapters and information to inform Appropriate Assessment (AA) for Habitats Regulations Appraisal (HRA) for ornithological and ecological interests at numerous onshore wind developments, repowers and life extensions.
- 8.1.6 This chapter is supported by the following figures and technical appendices:
- **Volume 2: Figures**
 - **Figure 8.1:** Statutory Designated Sites for Ornithological Interest;
 - **Figure 8.3a:** Vantage Point (VP) Survey Plan (VP1, VP2, VP3 and VP7);
 - **Figure 8.3b:** Vantage Point (VP) Survey Plan (VPA and B);
 - **Figure 8.4:** Breeding Bird Survey Areas 2021 and 2022;
 - **Figure 8.5a:** Target Species Flight Activity March 2021 to April 2022 (golden eagle);
 - **Figure 8.5b:** Target Species Flight Activity March 2021 to April 2022 (white-tailed eagle);
 - **Figure 8.5c:** Target Species Flight Activity March 2021 to April 2022 (other raptors);

- **Figure 8.5d:** Target Species Flight Activity March 2021 to April 2022 (all other target species);
 - **Figure 8.6:** Moorland Breeding Bird Survey Results (2021 and 2022);
 - **Volume 3: Technical Appendices**
 - **Technical Appendix 8.1:** Technical Ornithology Appendix;
 - **Technical Appendix 8.2:** Collision Mortality Risk Calculations;
 - **Volume 4: Confidential Documents:**
 - **Figure 8.2:** Existing Ornithological Records (HRSG) Sensitive and Restricted;
 - **Figure 8.7:** Breeding Raptor Search Results (2021 and 2022) Sensitive and Restricted;
 - **Technical Appendix 8.3:** Confidential Ornithology Appendix;
 - **Technical Appendix 8.4:** Ben Aketil Wind Farm, Skye Post Construction Monitoring Report 2017;
 - **Technical Appendix 8.5:** Ben Aketil Wind Farm, Skye Post Construction Monitoring Data 2022; and,
 - **Technical Appendix 8.6:** Golden Eagle Topographical (GET) Model Assessment.
- 8.1.7 Figures and technical appendices, including those of other chapters, are referenced in the text where relevant. Only common bird species names are referred to within this chapter. A summary of bird species referred to including common names, species names and relevant conservation status' is provided in **Technical Appendix 8.1**.
- 8.1.8 Information presented in **Volume 4: Confidential Documents** contains information pertaining to the locations of Schedule 1 breeding bird species and which is considered sensitive. Such information will not be made publicly available, but will be provided to the Scottish Government, The Highland Council (THC) and NatureScot to inform their own appraisal of the Proposed Development upon ornithological features.
- 8.1.9 This chapter complements **Chapter 7: Ecology**. Note that in the interest of concision, information contained in other chapters and appendices is not repeated herein unless essential for understanding, and is instead cross referenced.

Terminology

- 8.1.10 The Site is defined by the red line site boundary shown on **Figures 8.1 to 8.7**. The proposed development is defined in **Chapter 2: Proposed Development**.

8.2 Statutory and Planning Context

- 8.2.1 Legislation, policy and guidance of specific relevance to ornithology, taken into account as part of the assessment presented within this chapter, is outlined below. General legislation and planning policy relevant to the Proposed Development are detailed in **Chapter 5: Planning Policy Context** and so in the interests of brevity is not repeated here. However, the assessment presented within this chapter has been undertaken with consideration to National Planning Framework (NPF)4, the EIA Directive and other relevant local and national planning policy. For further details of policy see **Chapter 5**.

Legislation

- Conservation of Habitats and Species Regulations 2017, as amended in Scotland by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 (collectively 'the Habitats Regulations').
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- The Wildlife and Countryside Act 1981 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011; and,
- The Nature Conservation (Scotland) Act 2004.

8.2.2 Copies of all UK and Scottish Government legislation, including original, as enacted, and revised versions, are available from the National Archives at <https://www.legislation.gov.uk>.

Policy

- Scottish Government (2008) Scottish Government Planning Advice Note 60: Planning for Natural Heritage 2008;
- Scottish Government (2022) The Scottish Biodiversity Strategy to 2045;
- Scottish Government (2022) Onshore Wind Policy Statement;
- Scottish Government (2023) National Planning Framework (NPF) 4;

8.2.3 Local planning policies of relevance to this assessment are detailed in **Chapter 5**.

Guidance

8.2.4 The following key guidance has been referred to, and followed as appropriate, in this assessment:

- Windfarms and Birds - Calculating a theoretical collision risk assuming no avoiding action (SNH, 2000);
- Natural Heritage Zones bird population estimates (Wilson *et al.*, 2015);
- Assessing connectivity with Special Protection Areas (SPAs) (SNH, 2016);
- Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH, 2017a);
- Avoidance rates for the onshore SNH wind farm collision risk model (SNH, 2017b);
- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018);
- Assessing significance of impact from onshore windfarms on birds outwith designated areas (SNH, 2018a);
- Assessing the cumulative impact of onshore wind farms on birds (SNH, 2018b);
- Scottish Biodiversity List (SBL) 2020;
- 'Fifth Birds of Conservation Concern' (Stanbury *et al.*, 2021); and,
- General Pre-application and Scoping Advice for Onshore Wind Farms (NatureScot, 2022a).

8.2.5 Additional guidance referred to in relation to survey methodologies and interpretation is detailed in **Technical Appendices 8.1 to 8.7** and where appropriate within the main text of this chapter.

Application within the EclA

- 8.2.6 In the interests of proportionate EIA generic descriptions of what is contained in the relevant legislation, policy and guidance is not repeated here, though information regarding how some key elements have been applied or have shaped the approach in this chapter is summarised below.

Scottish Planning Policy

- 8.2.7 Scottish Planning Policy has been regarded from the outset in the design and assessment of the Proposed Development. Of relevance to this chapter, it sets out guiding 'Principal Policies', including: "protecting, enhancing and promoting access to natural heritage, including green infrastructure, landscape and the wider environment".
- 8.2.8 The planning system policy principals which are of relevance to and have been applied to this assessment include the following':
- "conserve and enhance protected sites and species, taking account of the need to maintain healthy ecosystems and work with the natural processes which provide important services to communities;
 - promote protection and improvement of the water environment, including rivers, lochs, estuaries, wetlands, coastal waters and groundwater, in a sustainable and co-ordinated way; and
 - seek benefits for biodiversity from new development where possible, including the restoration of degraded habitats and the avoidance of further fragmentation or isolation of habitats."
- 8.2.9 Scottish Planning Policy also states that "The level of protection afforded by legislation must be factored into the planning and design of the development" and that "developers should seek to minimise adverse impacts through careful planning and design, considering the services that the natural environment is providing and maximising the potential for enhancement".

Scottish Government's Onshore Wind Policy Statement

- 8.2.10 The Scottish Government's Onshore Wind Policy Statement (OWPS) 2022 identifies the need to balance the increased deployment of onshore wind to meet Scotland's Net Zero target, with Scotland's ambition to halt and restore biodiversity loss by 2045.
- 8.2.11 The OWPS 2022 does however acknowledge that in some cases the investigation and development of onshore wind may be necessary on sensitive habitats and the wildlife they support. In doing so it also recognises and highlights the advances and contributions made by the Scottish onshore wind industry towards the conservation and restoration of Scotland's natural habitats and species populations. The OWPS sets out the availability of good practice industry guidance and provides best practice examples for developers to draw from, to ensure that wind energy can be built in harmony with the natural environment and secure positive effects for biodiversity, in line with the principals of NPF4 Policy 3.

National Planning Framework (NPF)4

- 8.2.12 NPF4 Policy 3 seeks to ensure that "development proposals contribute to the enhancement of biodiversity, including restoring degraded habitats and building and

strengthening nature networks and the connections between them" in order to protect biodiversity, reverse biodiversity loss, and deliver positive effects from development.

- 8.2.13 In accordance with both Scottish Planning Policy and NPF4, the mitigation hierarchy has been applied throughout the design and assessment stages of the Proposed Development. The Proposed Development has undergone several design iterations (detailed in **Chapter 2: Proposed Development**) in response to the findings of baseline ecological, ornithological and peat depth and condition studies and which have established the distribution and importance of nature conservation interests within the Site.
- 8.2.14 Embedded scheme design measures have therefore recognised the potential for impacts upon local biodiversity at an early stage, complying with the first step of the mitigation hierarchy i.e. avoidance.
- 8.2.15 Good practice measures are also embedded into the Proposed Development, as detailed in **Chapter 17: Schedule of Mitigation**, and including a Construction Environmental Management Plan (CEMP) to be agreed in consultation with THC, NatureScot, SEPA and other relevant consultees. The CEMP will include for all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the development in line with industry and mandatory statutory guidance applicable at the time. An environmental manager will oversee implementation of the agreed CEMP, including pre-construction surveys and construction phase species protection plans (SPPs) to prevent breaches of legislation pertaining to protected species, including ornithological interests.
- 8.2.16 A Habitat Management Plan (HMP) is proposed which has identified scope for delivery of extensive biodiversity improvements within the wider MacLeod Estate, facilitated through developer investment and the implementation of an ambitious, yet targeted and attainable enhancement measures, to compliment the Proposed Development's Peat Management Plan (PMP) and provide habitat enhancements for protected species present at or likely to use the Site.
- 8.2.17 The overarching aim of the HMP will be to substantially offset residual habitat losses and positively contribute to the enhancement of local biodiversity within the Site and wider MacLeod Estate, resulting in a no overall negative impact over the lifetime of the development.
- 8.2.18 The HMP will be finalised on the basis of the Outline DRAFT Habitat Management Principals presented as **Technical Appendix 7.6** of this EIAR, in consultation with THC and additional relevant stakeholders, including NatureScot and specialist habitat and species interest groups.

Biodiversity Action Plans

- 8.2.19 The UK BAP list of priority habitats and species (as defined in UK Post-2010 Biodiversity Framework) has been superseded in Scotland by the Scottish Biodiversity Strategy and the Scottish Biodiversity List, but remains an important reference point, particularly for defining and cross referencing status of priority habitats.
- 8.2.20 Local authorities have a responsibility to produce their own list of priority habitats and species and associated actions for conservation (Local Biodiversity Action Plans (LBAPs)). The Skye & Lochalsh Biodiversity Action Plan (THC, 2003) outlines the main

issues facing Highland biodiversity and biodiversity objectives for the region, and also provides lists of habitats and species of key importance for conservation action.

8.3 Consultation Undertaken

- 8.3.1 Consultation with statutory and non-statutory advisors, together with specialist recording groups has been undertaken to inform the approach to baseline surveys and the approach to and undertaking of assessment.
- 8.3.2 A summary of consultations undertaken, responses received and how they have been considered is provided in **Table 8.1**.

Table 8.1: Summary of Consultations

Consultee	Key concerns	Response / Action Taken
<p>NatureScot 13th July 2021 Response to Baseline Ornithology Survey Scoping</p>	<p>Advised on the standard requirement for two years of ornithological survey data, no older than five years, and no older than three years where populations of key species (e.g. white-tailed eagle) are changing rapidly, unless it can be demonstrated sufficient existing data is available.</p>	<p>Baseline ornithological surveys have included two consecutive years of breeding bird surveys in 2021 and 2022, together with Vantage Point (VP) flight activity surveys between March 2021 and April 2022 (14 months). VP flight activity surveys specifically commissioned have been supported by VP flight activity survey data for the period January to December 2022 completed as part of post-construction monitoring (PCM) for the operational Ben Aketil Wind Farm.</p> <p>Collectively VP flight activity data spans two consecutive breeding seasons (2021 and 2022) and coverage of the 2021/2022 and 2022/23 non-breeding season. 2017 PCM data has also been reviewed.</p> <p>Whilst populations of white-tailed eagle continue to expand both locally and nationally, flight activity of the species has been extensively recorded within proximity to the Proposed Development as part of PCM for the Ben Aketil Wind Farm, since 2007.</p> <p>It is evident that white-tailed eagle flight activity levels have varied between PCM years. Activity has increased since the commencement of PCM and can be attributed to local and national population increases, with activity also increasing in some monitoring years in response to breeding attempts local to the Site (e.g., in 2017 and 2021). White-tailed eagle activity within proximity to the Proposed Development, is established to be strongly associated with topographical features, irrespective of population growth. Flight activity of white-tailed eagle, and that of other key target species for which flight activity has been collected (including hen harrier and golden eagle) is also well established to be substantially reduced over the non-breeding period.</p> <p>Flight activity data collected for the period March 2021 to December 2022, is therefore considered sufficiently adequate and recent to estimate potential collision mortality risks for ornithological species for the Proposed Development, including inter-annual variation, with an extensive existing ornithological monitoring data set supporting flight activity patterns detailed herein.</p>

Consultee	Key concerns	Response / Action Taken
	Sought clarity on the use of 2022 post-construction monitoring for the operational Ben Aketil Wind Farm.	2022 PCM monitoring data for the operational Ben Aketil Wind Farm has been made available for the purposes of estimating collision mortality risks for the Proposed Development and where sufficient “at collision risk” flight activity requires it. The full data set is presented in Technical Appendix 8.5 .
	Advised the scope of target species and sources to establish such seemed complete.	Noted.
	Advised on the presence of gaps in visual coverage provided by Vantage Point (VP) locations, for use in flight activity surveys. Advised it would not be acceptable to propose turbines in areas where they were not visible (or 500m turbine buffers were not visible). Requested clarification on the locations of VPs close to the boundary of the survey area and if this could influence flight activity.	The gaps in visual coverage of the VP survey area for the Proposed Development (500m turbine buffer), during the adoption of VPA and VPB between March 2021 and April 2022 have been acknowledged and are shown in Figure 8.3b . Gaps in visibility are however, not considered to be a limitation for subsequent assessment or turbine placement as proposed in this case. Flight activity of key ornithological species, which may be at potential risk of collision mortality has been extensively monitored within the VP survey area (including by PCM monitoring and previous investigations into wind farm development within the Site) and which does not evidence any reason to suggest species flight activity would be significantly higher within areas of the VP survey area, with reduced visibility from VPA or VPB. Flight activity has been recorded from VPA and VPB from areas of similar habitats immediately adjacent to gaps in visibility and the use of the NatureScot Collision Risk Model (CRM) as part of subsequent assessment, estimates collision mortality risks for species based on an average of “at collision risk” flight activity. The location of VPs adopted during the period March 2021 to December 2022, are also not considered likely to have influenced species flight activity within proximity to proposed turbine locations. Field surveyors whom have undertaken observation efforts are highly experienced and adopted discrete seated positions, allowing for settling in periods following the traversing of habitats to survey points, prior to survey commencement.
	Advised flight activity survey effort exceeded minimum requirements, but sought clarification on what increased effort was afforded during the golden eagle breeding period over periods of increased white-tailed eagle activity.	VP flight activity survey effort per VP, per year, has exceeded minimum NatureScot guidance requirements of 72 hours, split between eagle breeding and non-breeding periods (SNH, 2017). Additional observational effort was afforded during the golden eagle and white-tailed eagle breeding periods defined as February – August inclusive within NatureScot

Consultee	Key concerns	Response / Action Taken
		guidance (SNH, 2017), with a total of 39 hours per VP between February and August 2021. Survey effort from PCM during the period February – August 2022, equalled a minimum of 66 hours per VP.
	Advised published guidance should be followed in relation to the undertaking of simultaneous flight activity surveys.	Noted.
	Agreed it was reasonable to preclude targeted surveys for breeding black grouse, red-throated diver and foraging distribution surveys for migratory geese and swans.	Noted. Targeted surveys for these species have not been undertaken and are agreed not to be required.
NatureScot 16 th November 2022 Response to EIA Scoping	Commented the 18 months of flight activity survey effort detailed within the scoping report was less than the two years recommended within their guidance. Requested clarification on the use of new vantage point data and data available from post construction monitoring for the operational Ben Aketil Wind Farm.	As above.
	Requested clarification on viewshed visibility, with particular reference to turbines close to the summit of Ben Aketil and recorded activity of golden eagles.	Viewshed visibility is shown in Figure 8.3a and Figure 8.3b . Discussion of golden eagle (and white-tailed eagle) flight activity beyond the VP study area required for the Proposed Development is also provided in Technical Appendix 8.1 and 8.4 .
	Requested clarity on the collection of breeding raptor data out to 6km to assist in the interpretation of flight data and (where required) to inform population modelling.	Information on breeding raptor sites has been collected out to 10km from the Site through a combination of commissioned field surveys (including out to 6km) and desk study sources. Full details are presented in Technical Appendix 8.1 .
	Population viability analysis may be required where cumulative impacts could be of regional or national significance.	Cumulative impacts upon important ornithological species scoped in to detailed assessment are not considered to be significant. Population modelling has not been undertaken and is not considered necessary to further determine the significance of effects predicted and requirement for additional mitigation.

Consultee	Key concerns	Response / Action Taken
	Advised effects could be assessed at multiple scales, but should include assessment at the Natural Heritage Zone (NHZ) scale.	Effects have been assessed at the Regional NHZ Scale.
	Recommended the consideration of mitigation measures to include carrion/fallen stock removal, in relation to eagle collisions.	These mitigation measures have been considered and included as part of the Proposed Development.
THC 20 th September 2022 Response to EIA Scoping	The presence of Schedule 1 birds and qualifying interests of designated sites for nature conservation must be considered.	Noted.
	An assessment of impacts to birds through collision, disturbance and displacement will be required.	Noted.
	Assessment to consider the potential for effects from development alone and cumulatively with other proposals.	Noted.
	Clarity should be provided on survey methods and any deviations from guidance.	Potential limitations to assessment arising from baseline studies and analysis are discussed in Technical Appendices 8.1 and 8.2 . No substantial limitations are identified.
Highland Raptor Study Group (HRSRG) 14 th June 2022 Response to information request	Provided existing records of protected breeding raptors within 10 km of the approximate Site centre, which including records of peregrine (four territories, no territories within 2 km) and white-tailed eagles (five territories). Advised on the requirement to consult local specialist recorders with regards to golden eagle records.	Information has been used to inform the approach to further baseline information gathering, subsequent data interpretation and assessment.
Local Golden Eagle Recorders 25 th April 2022	Advised on the presence of breeding sites for three long established golden eagle ranges within approximately 10 km of the Site, with	Information has been used to inform the approach to further baseline information gathering, subsequent data interpretation and assessment.

Consultee	Key concerns	Response / Action Taken
Response to information request	foraging areas of all three territories occurring within the search area.	
Highland Biological Recording Group (HBRG) 09 th June 2022 Response to information request	Provided existing biological records for a search area, extended out to 5 km from the approximate Site centre, but which did not include records of ornithological species.	Noted.
RSPB 15 th June 2022 Response to information request	Provided existing ornithological records (from 2000 onwards) for a search area, extended out to 10 km from the approximate Site centre.	Information has been used to inform the approach to further baseline information gathering, subsequent data interpretation and assessment.
RSPB Scotland 29 th September 2022 Response to EIA Scoping	Advised the Site is the only expansive moorland area in north Skye not holding territorial adult eagles, but consultation should be undertaken with the Highland Raptor Study Group (HRSB) for updated information.	Consultation has been undertaken with the HRSB and local golden eagle recorders. Agreed the Site does not form an important part of any known occupied golden eagle range. Technical Appendix 8.6 further discusses the suitability of habitats for golden eagles within the Site, which is largely fragmented and unfavourable for territory occupation.
	Advised the Site, due to its rich prey base, is important for immature golden eagles.	Agreed the Site is likely to provide more opportunities for immature golden eagle. An assessment of potential impacts upon juvenile and dispersing golden eagles as a result of operational habitat loss (disturbance/displacement) is presented in Technical Appendix 8.6 .
	Advised on a high density of white-tailed eagles in the area, particularly roosting birds.	The potential for impacts to white-tailed eagle has been assessed in detailed within this chapter.
	Advised that higher turbines proposed would increase collision risks to white-tailed eagles.	As above.
	Advised that Choisleadar forest and the area to the east are important for breeding hen harrier, with adjacent hill ground providing foraging habitat.	The importance of the Choisleader forest area for hen harrier is acknowledged. However, the potential for significant impacts upon hen harrier are concluded as unlikely and a detailed assessment not presented. Mitigation and operational monitoring is however outlined, to enable the protection of hen harrier during construction works, and provide opportunity for species population monitoring

Consultee	Key concerns	Response / Action Taken
	Commented the Proposed Development has the potential to result in the displacement and disturbance to breeding hen harrier.	
	Commented they were generally content with the scope of bird surveys undertaken, but suggested raptor roost surveys and winter walkover should be included.	Extensive desk study information does not identify the Site as important for roosting raptors and have not been a requirement for survey in consultation with NatureScot. Species flight activity recorded over non-breeding seasons is considered sufficient to inform subsequent assessment of the Proposed Development.
	Advised on potential limitations to survey coverage and suggested development should be constrained to areas with two years of survey, or additional survey should be undertaken. Advised on the information required to be presented within the EIAR to demonstrate survey data were adequate, robust and accurate.	Full details of baseline ornithological field survey methods and results are presented in Technical Appendix 8.1 and 8.3 and associated figures. Worked collision risk calculations are provided in Technical Appendix 8.2 and raw flight activity presented in Technical Appendix 8.1 and 8.5 .
	Advised the assessment should consider all components of the Proposed Development and all phases.	Noted.
	Advised disturbance, displacement, loss of suitable habitat and collision risks should be assessed for all scoped-in species. Effects of aviation lighting should also be considered.	These effects have been considered for all scoped-in species, namely golden eagle and white-tailed eagle. Collision risks for species where sufficient “at collision risk” flight activity have also been calculated and presented for transparency. Effects of aviation lighting have been scoped out with reference to NatureScot guidance (2022a).
	Welcomed the use of the Golden Eagle Topographical (GET) model, but commented it should not take precedence over observation data, particularly of breeding golden eagles as the model is used to predict use by non-breeding birds.	An assessment of potential impacts to golden eagle as a result of habitat loss (disturbance/displacement) is presented in Technical Appendix 8.6 and which identifies areas of good golden eagle habitat. This is considered to correspond closely to concentrated areas of golden eagle flight activity, including that recorded outside the VP study area for the Proposed Development, derived from PCM in 2017 and 2022.

Consultee	Key concerns	Response / Action Taken
		As detailed in Technical Appendix 8.6 the assumptions of the GET model have been tested on adult birds and is considered sound and reliable for use in the assessment of potential impacts to range holding adult birds.
	Commented on knowledge of white-tailed eagles at onshore wind farms in Scotland, including the nearby Edinbane Wind Farm.	Noted.
	Suggested the use of historic data collected for the operational wind farm could be useful.	<p>There has been an extensive period of ornithological survey and monitoring which has been conducted within the Site since the commencement of operation of the Ben Aketil Wind Farm and which is considered sufficient and appropriate, together with additional baseline ornithological surveys specifically commissioned to inform the design and assessment of the Proposed Development. Additional historical data would not be considered to provide an accurate contemporary reflection of baseline conditions, or the do-nothing scenario (i.e. in the continued presence of the operational wind farm), upon which to base an assessment of effects.</p> <p>Baseline information used to inform the design and assessment of the operational Ben Aketil Wind Farm has therefore not been sourced or reviewed.</p>
	Recommended where collisions are predicted, the presentation of Counterfactuals of the Population Size (CPS) e.g. for golden eagle, should be provided.	<p>Whilst golden eagle collisions have occurred at Scottish wind farm sites, current evidence strongly suggests that collision mortality risks to the species are highly unlikely to be of significant threat to golden eagle populations, with habitat loss as a result of operational displacement of more significance. Population modelling of incorporating collision mortality risks to golden eagle are therefore not considered necessary to undertake an informed assessment of the Proposed Development.</p> <p>The CPS is also not considered a reliable measure for quantifying impacts of onshore wind farms upon terrestrial bird populations, given it relies on density independent population projections (i.e. no population carrying capacity), which are unrealistic. There is no current statutory guidance that requires its use during the assessment of onshore wind farms and is therefore not discussed further within this chapter.</p>

Consultee	Key concerns	Response / Action Taken
	Advised survey and GET model results should be used to avoid areas most likely to be used by golden eagles.	An assessment of potential impacts upon golden eagle as a result of habitat loss (disturbance/displacement) using the GET Model is presented in Technical Appendix 8.6 . As detailed within the assessment, it is important to look at the availability and connectivity of good golden eagle habitat within and surrounding a Site, including within the wider landscape, which has been done to inform the requirement for amendments to scheme design. The potential for significant effects upon golden eagle, requiring changes to scheme design has therefore not been identified. The Proposed Development will in large, be constructed in an area not known to be an important part of an occupied range, with limited potential for establishment of such and in an already developed environment.
	Advised mitigation for white-tailed eagles should be considered.	Measures have been considered and included as part of the Proposed Development.
	Commented the availability of non-territorial space for immature eagles in this area of Skye was diminishing and cumulative impacts should be assessed at the NHZ 6 (Western Seaboard) scale, including with the Edinbane operational and proposed repowering projects, the Ben Sca and extension wind farms, the Glen Ullinish and Beinn Mheadhonach Wind Farms.	The assessment of potential habitat loss to golden eagles presented in Technical Appendix 8.6 considers the potential for effects upon juvenile and dispersing golden eagles, which roam over vast areas of Scotland, over multiple NHZs. The assessment presented considers cumulative loss with other wind farm developments and introduces more meaningful biological constraints to quantify potential impacts, rather than assessing impacts at wider NHZ scales, and which can reasonably be concluded as trivial.
	Advised on the requirement for a HMP and provided recommendations for consideration.	The Proposed Development will include for a HMP, to be finalised on the basis of the OHMP in consultation with THC and NatureScot, submitted as Technical Appendix 7.6 .

Receptors Scoped Out

- 8.3.3 The EIA scoping report for the Proposed Development was submitted on 19th July 2022. A number of ornithological features were scoped out of consideration during the scoping process, and so they are not considered further in this EIAR, and targeted baseline surveys have not been undertaken.
- 8.3.4 A summary of these is provided here for information; for further details see the Scoping Report (available on the Scottish Ministers' Energy Consents Unit (ECU) online portal: <https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00004552>).

Designated Sites for Nature Conservation

- 8.3.5 The Site is not located within 10 km of any statutory designated site for nature conservation, with cited ornithological interests, or within 20 km of any Special Protection Area (SPA) or Ramsar site, with cited migratory waterfowl interests.
- 8.3.6 In accordance with NatureScot guidance (SNH, 2016), no potential connectivity between the Proposed Development and any SPA is therefore identified. As such, the potential for impacts upon designated sites with ornithological interests is scoped out of consideration within this EIAR.

Migratory Waterfowl

- 8.3.7 The Site is not located within 20 km of any SPA with cited migratory waterfowl interests, or located within an area of known importance for foraging distributions of such (e.g. Mitchell, 2012). The open moorland habitats within the Site are also unsuitable for such species, although it was acknowledged that flight activity of migratory geese and swan may be recorded and these species were identified as target species for baseline Vantage Point (VP) Flight Activity Surveys. Flight activity of migratory waterfowl species recorded during baseline surveys and identified during desk study is reported within **Technical Appendix 8.1**.
- 8.3.8 Due to the low incidence of flight activity recorded, which indicates the Site is not located within an important migratory flyway, the potential for impacts and significant effects upon migratory waterfowl have been scoped out of consideration within this EIAR.
- 8.3.9 Collision mortality risks to migratory waterfowl, in the absence of detailed analysis, are highly unlikely, on the basis of with high avoidance rates (99.5-99.8%) for swans and geese recommended for use with the NatureScot Collision Risk Model (SNH, 2000 and 2018b) and the low levels of flight activity recorded.

Black Grouse

- 8.3.10 Black grouse are generally accepted as being absent from the Isle of Skye.
- 8.3.11 Targeted baseline surveys for the species have therefore not been undertaken and are not considered a requirement. The potential for impacts upon black grouse have therefore been scoped out of consideration within this EIAR.

Divers

- 8.3.12 Targeted baseline surveys for red-throated and black-throated divers have not been undertaken due to the absence of suitable waterbodies within proximity to the Site i.e. within 1 km in accordance with NatureScot guidance (SNH, 2017).
- 8.3.13 Divers were however identified as target species for baseline VP Flight Activity Surveys, with flight activity recorded during baseline surveys and identified during desk study reported within **Technical Appendix 8.1**.
- 8.3.14 Due to the low incidence of flight activity recorded and which indicates the Site is not located within an important foraging route for such species, the potential for impacts and significant effects upon divers have been scoped out of consideration within this EIAR.

8.4 Approach to the Assessment

Scope of Assessment

- 8.4.1 The assessment presented within this chapter follows the principles set out in CIEEM guidelines (2018) and has been undertaken in recognition of design evolution and embedded mitigation measures, as detailed in full within **Chapter 2: Proposed Development** and standard practices and construction environmental management included within **Chapter 17: Schedule of Mitigation**.
- 8.4.2 The assessment therefore considers the following main potential impacts upon ornithological features associated with wind farm developments:
 - Disturbance/displacement – the displacement of birds from the wind farm, and surrounding areas as a result of the construction and operation of the wind farm; and,
 - Collision mortality – mortality resulting from collision or interaction with operational turbine blades.
- 8.4.3 CIEEM guidelines (2018) and NatureScot guidance (2022a) advise that it is not necessary to carry out a detailed assessment of impacts upon ecological (and ornithological) features that are sufficiently widespread, unthreatened and resilient to impacts of a development proposal. As such, the assessment presented within this chapter considers the potential for significant effects upon ornithological features, which are considered important on the basis of relevant guidance, baseline information and professional judgement.
- 8.4.4 Where ornithological features are not considered so important as to warrant a detailed assessment, or where they will not be significantly affected on the basis of available guidance of baseline information, the potential for significant adverse effects upon such species are 'scoped-out' of assessment. Mitigation and/or 'good practice' measures for such features may however, still be outlined as appropriate to reduce and/or avoid any potential adverse effects or to ensure legislative compliance.
- 8.4.5 The potential for significant adverse effects upon ornithological features is assessed for the Proposed Development, and also cumulatively at the regional Natural Heritage Zone (NHZ) 6 'Western Seaboard' scale, within which the Proposed Development is located and in accordance with NatureScot guidance (2018a).

- 8.4.6 In consideration of two alternative construction programme scenarios under consideration by the Applicant (see **Chapter 2: Proposed Development**), a worst-case scenario approach has been taken for assessment of impacts to important ornithological features, with a single assessment that captures the worst-case for either construction scenario, as outlined below. This allows for a precautionary assessment which is also proportionate to the likelihood of significant effects to ornithological features arising from either scenario.

Construction

- 8.4.7 Scenario 1 (construction of the extension and the repower carried out concurrently) will extend the area over which disturbance is happening at a single point in time. Scenario 2 (a phased construction of the extension followed by the repower) will extend the construction timeframe and therefore the duration of potential construction disturbance to ecological features.
- 8.4.8 As such, Scenario 1 is the worst-case scenario for disturbance in a spatial context, and Scenario 2 is the worst-case in a temporal context. To capture this within an assessment that allows for either construction scenario to be adopted, construction impacts are assessed based on a worst-case scenario that the construction works for both phases are undertaken as one, within a defined extended area and over an extended timeframe, i.e., undertaking assessment based on the whole development spatial area (extension and repower) but extending the timeframe for impacts to that which is applicable to Scenario 2.
- 8.4.9 The existing operational Ben Aketil Wind Farm forms part of the existing baseline, and so construction works for both the extension and the repower would be carried out in an area already subject to disturbance. In view of this, any displacement of ornithological features due to construction impacts would not be additive with displacement that may already have arisen due to the presence of the operational turbines, as it is not possible to displace a feature that is already displaced.

Operation

- 8.4.10 Operational effects are defined as effects following the construction of the Proposed Development. Operational effects generally relate to disturbance of adjacent habitats or species, on either a temporary or permanent basis. Some effects may reduce with habituation or remain for the lifetime of the Proposed Development.
- 8.4.11 During the operational phase, with the application of good practice measures relating to wind farm operation and maintenance activities, it is considered that potential adverse impacts are restricted to collision mortality risks and disturbance/displacement.
- 8.4.12 Whilst in practice one development may be built and commissioned first, and then decommissioned first, assessment has been undertaken based on the worst-case scenario that all proposed turbines become operational at the same time and the operational life for both development phases (as applied to assessment of collision mortality risk impacts) is obtained from the date at which the latter constructed development reaches the end of its operational life. In the context of impact assessment, this would extend the lifetime of the extension by c. seven years where this development is constructed first.

Effects Scoped-Out

- 8.4.13 The following effects are scoped-out of detailed consideration within the assessment, as they are either implicitly assessed and/or would not likely be significant for any ornithological feature on the basis of current guidance, embedded scheme design and ‘good practice’ measures included as part of the Proposed Development and detailed in ‘**Design Basis and Assumptions**’ below.

Decommissioning Phase Effects

- 8.4.14 Decommissioning phase effects are considered to result in no greater scope and magnitude of effects upon ornithological features than would occur during the construction phase of the Proposed Development, albeit occurring over a shorter timescale.
- 8.4.15 As such, decommissioning phase effects upon ornithological features are not considered explicitly within this assessment but assumed to be of a similar magnitude and significance as construction phase effects.

Direct Habitat Loss (Construction)

- 8.4.16 The construction of the Proposed Development will result in small permanent and temporary losses of existing moorland habitats within the Site and therefore loss of potentially suitable nesting and foraging opportunities for moorland bird species.
- 8.4.17 These habitats will, however, be reinstated following the completion of construction works (full details of habitat losses are detailed in **Chapter 7: Ecology**). Suitable habitats and therefore nesting and foraging opportunities will remain abundant within the Site, the immediate and wider surrounding area.
- 8.4.18 In addition, the Proposed Development will include for a Construction Environmental Management Plan (CEMP) and Habitat Management Plan (HMP), to be finalised on the basis of **Chapter 17: Schedule of Mitigation and the Outline HMP (OHMP)** presented as **Technical Appendix 7.6** in consultation with THC, NatureScot and other stakeholders. The HMP will include for measures aimed at the enhancement of foraging and nesting opportunities for bird species, including breeding waders and foraging raptors away from proposed infrastructure.
- 8.4.19 Good practice measures, in relation to the protection of breeding birds during construction works will also be included within the Proposed Development’s CEMP. The absence of potentially significant adverse effects upon any ornithological features can therefore be reasonably be concluded, without further detailed assessment.

Effects from Turbine Lighting (Operational)

- 8.4.20 As outlined in NatureScot guidance (2020), there is little evidence to suggest that lights on turbines are likely to present an existential risk to the viability of species populations attributable to the Site, at any spatial scale. Impacts from turbine lighting are therefore not considered to result in potentially significant adverse effects upon ornithological any features relevant to the Site and are scoped out of further assessment.

Effects upon Passerines (Construction/Operation)

- 8.4.21 As outlined in NatureScot guidance (SNH, 2017) it is generally considered that passerine species (small perching birds) are not significantly impacted by wind farm developments and baseline surveys for these species are not therefore recommended.
- 8.4.22 Passerines have therefore not been included as target species for baseline survey and recording and the potential for significant adverse effects upon such species in relation to the construction or operation of the Proposed Development is scoped out of the assessment.

Assessment Methodology

- 8.4.23 The assessment presented within this chapter has been undertaken following the principals of CIEEM guidelines (2018) and includes the following stages:
- determination and evaluation of important ornithological features;
 - identification and characterisation of impacts;
 - outline of mitigating measures to avoid and reduce significant impacts;
 - assessment of the significance of any residual effects after such measures; and,
 - identification of appropriate compensation measures to offset significant residual effects.

Value of Receptors

- 8.4.24 The sensitivity (or importance) of ornithological features has been determined with reference to Annex 1 'Priority bird species for assessment when considering the development of onshore wind farms in Scotland' of NatureScot guidance (SNH, 2018a) and according to criteria based on the conservation status of individual bird species presented in **Table 8.2**.
- 8.4.25 It should be noted that importance does not necessarily relate solely to the level of legal protection that a feature receives and ecological features may be important for a variety of reasons, such as their connectivity to a designated site, rarity of species or the geographical location of species relative to their known range.
- 8.4.26 Similarly, whilst a particular feature may be associated with a nearby internationally designated site, the feature is not automatically assigned a value of "International" importance.

Table 8.2: Receptor Value and Sensitivity

Value	Description
Very High (International)	An internationally designated site i.e., Special Protection Area (SPA) and/ or Ramsar site or candidate site (cSPA). A regularly occurring species present in internationally important numbers (>1% of its biogeographic population) listed under Annex 1 of the Birds Directive, or regularly occurring migratory species listed under Annex 2 of the Birds Directive connected to an internationally designated site for this species.
High (National)	A nationally designated site e.g. Site of Special Scientific Interest (SSSI), or area meeting criteria for national level designations.

Value	Description
	A regularly occurring species present in nationally important numbers (>1% of its Scottish population) and listed as a UK Biodiversity Action Plan (BAP), SBL priority species, Red-listed Bird of Conservation Concern (Stanbury <i>et al.</i> , 2021) and listed under Schedule 1 of the Wildlife & Countryside Act or Annex 1 of the Birds Directive.
Medium (Regional)	A regularly occurring species present in regionally important numbers i.e., >1% of its relevant Natural Heritage Zone (NHZ) population or appropriate alternative and listed as a UK BAP, SBL priority species, Red-listed Birds of Conservation Concern (Stanbury <i>et al.</i> , 2021) or listed on Schedule 1 of the Wildlife & Countryside Act or Annex 1 of the Birds Directive.
Low (Local)	All other species that are widespread and common and which are not present in regionally or nationally important numbers, but which do contribute to the local breeding/ wintering bird assemblage.

Magnitude of Impact (change)

- 8.4.27 Potential effects upon ornithological features are described with reference to their magnitude and their direction (adverse or beneficial), duration and reversibility where this is relevant to understanding the nature of an effect and determining its significance.
- 8.4.28 For the purposes of this assessment the temporal nature of potential effects are described as follows:
- negligible: of inconsequential duration;
 - short-term: for 1-5 years;
 - medium-term: for 5-10 years;
 - long-term: for 10-35 years; and
 - permanent: >35 years.
- 8.4.29 The likelihood or probability that an effect will occur is also described as far as possible based on best available information and where relevant. The likelihood of an impact occurring is referred to using the following terms: 'certain', 'likely', 'unlikely' or 'highly unlikely', where appropriate.
- 8.4.30 The criteria used to determine the magnitude of change is presented in **Table 8.3**.

Table 8.3: Definition of Impact Magnitude

Magnitude	Summary
Very High	The impact (either on its own or in-combination with other proposals) may result in the permanent total or almost complete loss of a site and/ or species status or productivity. e.g. affecting >80% of an NHZ population.
High	The impact (either on its own or in-combination with other proposals) may adversely affect the conservation status of a site and/ or species population, in terms of the coherence of its ecological structure and function (integrity), across its whole area, that enables it to sustain the habitat, complex of habitats and/ or the population levels of species of interest. e.g. affecting >30-80% of an NHZ population.

Magnitude	Summary
Medium	The impact (either on its own or in-combination with other proposals) would not adversely affect the conservation status of a site and/ or species, but some element of the functioning might be affected and impacts could potentially affect its ability to sustain some part of itself in the long term e.g. affecting >10-30% of an NHZ population.
Low	The impact (either on its own or in-combination with other proposals) would not adversely affect the conservation status of a site and/ or species, but some element of the functioning might be affected and impacts could potentially affect its ability to sustain some part of itself in the long term. e.g. affecting 1%-10% of the relevant Regional NHZ population.
Negligible	A very slight (indiscernible) reduction in a site and/ or species status or productivity and/ or no observable impact. e.g. affecting ≤1% of the relevant NHZ population.

Determination of Significance

- 8.4.31 For the purposes of assessment, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important features' at a defined geographic scale, or for biodiversity in general. Unless otherwise stated, all effects are assumed to be adverse.
- 8.4.32 The predicted significance of effects has been determined through a standard method of assessment based on professional judgement, a combination of sensitivity and magnitude of change as detailed in **Table 8.4** below and has been further informed by relevant information on bird species ecology, population trends and evidence from the studies of bird and wind farm interactions, as referenced herein.
- 8.4.33 **Major** and **moderate** effects are considered significant in the context of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

Table 8.4: Significance criteria

Significance		Definition
Significant	Major Adverse / Beneficial	A medium or high, medium or long-term adverse or beneficial effect upon the integrity of an ornithological feature at a national (Scottish) or international level.
	Moderate Adverse / Beneficial	A high or very high, long-term or permanent adverse or beneficial effect upon the integrity of an ornithological feature at a regional level or above.
Non-Significant	Minor Adverse / Beneficial	The impact (either on its own or in-combination with other proposals) would not adversely affect the conservation status of a site and/ or species, but some element of the functioning might be affected and impacts could potentially affect its ability to sustain some part of itself in the long term.
	Negligible or Low	A negligible or low adverse or beneficial effect upon the integrity of an ornithological feature, typically at a site level or below.

Significance		Definition
	Adverse/ Beneficial	

Requirements for Avoidance, Mitigation, Compensation and Enhancement

- 8.4.34 Mitigation measures are necessary to address likely **significant** adverse environmental effects. However, it is also good practice to propose measures to reduce likely non-significant effects and to provide overall biodiversity enhancements associated with the Proposed Development.
- 8.4.35 The mitigation hierarchy has been adopted to avoid, mitigate and compensate for impacts upon ornithological features arising to significant effects as a result of the Proposed Development:
- avoidance is used where an impact has been avoided e.g. through changes in Proposed Development design;
 - mitigation is used to refer to measures to reduce or remedy a specific adverse impact *in situ*;
 - compensation describes measures taken to offset residual effects, i.e. where mitigation *in situ* is not possible; and
 - enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.
- 8.4.36 Note that in this chapter these are referred to collectively as 'mitigation' for brevity when discussing generalities, though with the form of mitigation specified as appropriate in discussion of any specific requirements.

Assessment of Cumulative Effects

- 8.4.37 The assessment of potentially significant cumulative effects has been undertaken with reference to NatureScot guidance (SNH, 2018a) for important ornithological features subject to a detailed assessment.
- 8.4.38 The cumulative assessment includes consideration of:
- existing wind farm developments, either operational or under construction;
 - consented wind farm developments, awaiting implementation; and
 - wind farm applications awaiting determination within the planning process with design information in the public domain.
- 8.4.39 Those developments which have been withdrawn and/or refused are not considered, unless an appeal is currently in progress and information is available.
- 8.4.40 Small wind farm developments, including those with three turbines or less, have also been scoped out of consideration for potentially significant cumulative effects as applications for such developments do not generally consider the potential for impacts upon ornithological features in sufficient detail.
- 8.4.41 With regards to the spatial extent of the cumulative assessment, NatureScot guidance (2018a) recommends that cumulative effects should typically be assessed at the relevant Regional NHZ scale. The potential for significant cumulative effects is therefore assessed

at the NHZ 6 geographical scale, where sufficient information is available for those relevant developments to allow for a meaningful assessment.

- 8.4.42 The scale at which potentially significant cumulative effects is assessed is also revised where justified, to allow for the inclusion of biologically reasonable constraints, also for the purposes of a meaningful and precautionary assessment.
- 8.4.43 The significance of cumulative effects has been assessed following the criteria detailed in **Table 8.3** and **8.4**.

8.5 Baseline Methodology

Study Area

- 8.5.1 In accordance with NatureScot guidance (SNH, 2017) the main study area within which baseline information relating to the presence and distribution of ornithological features has been collated has extended to at least 500m beyond the Site boundary, including 500 m either side of the proposed access track route.
- 8.5.2 In accordance with NatureScot guidance (SNH, 2017) study areas for the identification of nest and display sites of the following species and/or species groups have also been extended out to the following distances beyond the Site boundary:
 - 2 km for Schedule 1 raptors and owls; and,
 - at least 6 km for golden eagle and white-tailed eagle.
- 8.5.3 The study area has also included the Site boundary and out to 10 km for statutory designated sites for nature conservation with ornithological qualifying interests, extended to 20 km for sites with migratory goose qualifying interests.
- 8.5.4 The study area of flight activity surveys within which to quantify the level of flight activity for input into collision mortality risk estimates has comprised the turbine locations of the Proposed Development and areas out to 500 m, in accordance with NatureScot guidance (SNH, 2017).
- 8.5.5 Full details of ornithological desk study and field survey areas are presented in **Technical Appendix 8.1** and illustrated on **Figures 8.1 to 8.4**.

Desk Study

- 8.5.6 A desk study has been undertaken to determine the proximity of the Site to designated sites for nature conservation with ornithological interests and obtain existing ornithological records within the Site and surrounding areas.
- 8.5.7 The following key sources have been consulted to obtain existing ornithological information:
 - NatureScot Sitelink;
 - Highland Biological Recording Group (HBRG);
 - Royal Society for the Protection of Birds (RSPB);
 - Highland Raptor Study Group (HRSG) including additional local raptor worker consultation;
- 8.5.8 The Proposed Development includes for the repowering of the operational Ben Aketil and Ben Aketil (two turbine) Extension Wind Farms, which in accordance with Condition 17

and Condition 15 of respective planning consents require the completion of post-construction ornithological monitoring (PCM).

- 8.5.9 Previous investigations into a wind farm development within the Site, known as the Gleann Eoghainn Wind Farm, have also been undertaken and which included baseline ecological and ornithological studies between 2014 and 2016 (see **Technical Appendix 7.7**).
- 8.5.10 A review of existing ornithological information for the Site and surrounding area derived from post-construction ornithological monitoring for the operational Ben Aketil Wind Farm (2002-2012 and 2017) and baseline ornithological information gathered in relation to the Gleann Eoghainn Wind Farm (2014-2016), has therefore been undertaken.
- 8.5.11 Post-construction ornithological monitoring data for the operational Ben Aketil Wind Farm from 2022, has also been made available for the purposes of assessment.
- 8.5.12 Reference has also been made to additional pieces of guidance and peer reviewed literature as referred to.
- 8.5.13 Further details of desk studies undertaken and results obtained are presented in **Technical Appendix 8.1**.

Field Survey

- 8.5.14 Existing ornithological information obtained through desk study and detailing the presence, distribution and flight activity of ornithological species within the Site and surrounding area is extensive, and is reviewed in **Technical Appendix 8.1**.
- 8.5.15 The following additional ornithological field surveys have, however, been completed to update the existing baseline data and inform the design and assessment of the Proposed Development, in accordance with NatureScot guidance (SNH, 2017):
 - Vantage Point (VP) Flight Activity Surveys (March 2021 – April 2022);
 - Moorland Breeding Bird Surveys (MBBS) (2021 and 2022); and,
 - Breeding Schedule 1 Raptor and Owl Searches (2021 and 2022).
- 8.5.16 All surveys have been undertaken in accordance with NatureScot guidance (SNH, 2017) and species-specific guidance referenced therein, and have been completed by experienced and professional ornithologists.
- 8.5.17 Detailed survey methodologies, target species for survey and recording and survey areas are presented within **Technical Appendix 8.1** and illustrated in **Figures 8.3 to 8.4**.

Difficulties and Uncertainties

- 8.5.18 No difficulties or uncertainties in relation to the availability of baseline ornithological information have been identified that would prevent an informed decision to be taken in relation to the identification and assessment of the potential for significant effects on ornithological features.
- 8.5.19 Further discussion is provided in **Technical Appendices 8.1 and 8.2**.

Design Basis and Assumptions

- 8.5.20 The Proposed Development has been subject to a number of design iterations and evolution in response to constraints identified as part of the baseline studies, intended to reduce environmental effects. The following design considerations have been incorporated to specifically reduce and/or otherwise avoid adverse impacts upon ornithological features.
- 8.5.21 Full details of measures embedded within the design of the Proposed Development to avoid and/or minimise the potential for significant environmental effects are detailed in **Chapter 2 (Section 2.5)**.

Land-take

- 8.5.22 The Proposed Development has been designed to minimise the requirement for land-take, reducing the potential for loss of foraging and nesting opportunities for bird species.
- 8.5.23 The proposed repowered turbines are located in the area of the Site containing the operational Ben Aketil Wind Farm, and so in an area that is already subject to disturbance and habitat loss. In so far as is possible, taking account of the larger turbines proposed for the repower, infrastructure from the existing wind farm will be reused or upgraded to prevent the need for new land-take. Following scoping, the proposed Southern Access route has been re-routed to make greater use of the existing crofters track, and to reduce the requirement for completely new track.
- 8.5.24 The Proposed Development will include for a Habitat Management Plan (HMP) and which will seek to restore areas of degraded habitat elsewhere within the Site to compensate for any loss of habitat which cannot be avoided through sensitive siting of infrastructure.
- 8.5.25 The Golden Eagle Topographical (GET) Model (Fielding *et al.*, 2019) has also been used to identify the requirement for any amendments to scheme design to avoid the potential for significant effects upon breeding and dispersing golden eagles as a result of indirect operational habitat loss (displacement). The assessment of the potential for operational habitat losses (displacement) to golden eagles using the GET model is presented within confidential **Technical Appendix 8.7**.

Good Practice Measures

- 8.5.26 A Construction Environmental Management Plan (CEMP) will be prepared for the Proposed Development in consultation with THC, NatureScot and other relevant stakeholders, based on the Schedule of Mitigation, presented in **Chapter 17**.
- 8.5.27 The CEMP, once finalised, will include for all standard measures to ensure the Proposed Development is constructed in accordance with industry good practice applicable at the time of commencement. The CEMP will also include for habitat restoration measures following the cessation of construction works.
- 8.5.28 With specific reference to the protection of ornithological features during the construction and operation of the Proposed Development, the CEMP will include for a Breeding Bird Protection Plan (BBPP). All wild birds in the UK are protected under the provisions of the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to intentionally or recklessly kill, injure or take any wild bird or take, damage or destroy the nest (whilst being built or in use) or its eggs. In addition, all wild birds listed on Schedule

1 of the Act receive additional legal protection which makes it an offence to intentionally or recklessly disturb these species while building a nest or are using or near a nest containing eggs or young; or to disturb their dependent young.

- 8.5.29 Species listed on Schedule A1 of the Act receive further protection for their habitually used nest sites, with species listed on Schedule 1A of the Act protected from harassment at any time of year.
- 8.5.30 Prior to the commencement of construction activities a BBPP will be prepared and submitted for agreement in consultation with THC and NatureScot. Once finalised, the BBPP will include details of pre-commencement survey methods and protocols, including consultation with relevant consultees, to enable the protection of breeding birds over the course of construction works, and where required during operational maintenance works, in accordance with NatureScot guidance (2022b) or best available species guidance applicable at the time.
- 8.5.31 The implementation of the BBPP, which will form part of the Proposed Development's CEMP, will be overseen by a suitably competent ecologist or environmental manager.
- 8.5.32 The Proposed Development will also include for a HMP which will be prepared in consultation with THC, NatureScot and other relevant stakeholders, based on the Outline HMP (OHMP), presented as **Technical Appendix 7.6**.
- 8.5.33 The OHMP proposed the following four aims:
 - Aim 1: Enhancement of Peatland Habitats;
 - Aim 2: Enhancement of Riverine Habitats;
 - Aim 3: Enhancement of Opportunities for Otter; and,
 - Aim 4: Reduction in Attraction Risks for Eagles.
- 8.5.34 Specifically, Aim 1 will serve to enhance habitats within the Site, away from Proposed Development infrastructure for moorland breeding birds and which are considered to sufficiently offset habitat losses for these species as a result of the construction and operation of the Proposed Development.
- 8.5.35 Aim 4, will serve to reduce the attractiveness of habitats within proximity to operational turbines to foraging white-tailed eagle and additional scavenging species, through the monitoring and removal of carrion. The prescriptive measures proposed to achieve Aim 4, will be determined in consultation with the landowner, THC and NatureScot post-consent and secured by appropriate planning condition.
- 8.5.36 The success of management prescriptions in achieving the aims and objectives of the HMP will be monitored, with the results reported to an advisory group, in accordance with timings and protocols to be agreed with THC and NatureScot. The HMP once finalised will be a live document, with the measures implemented being adaptive throughout the lifetime of the proposed development in response to the findings of ongoing monitoring.

8.6 Existing Environment

- 8.6.1 This section provides a summary of baseline ornithological conditions in relation to:
 - Statutory designated sites nature conservation with ornithological interests;
 - Target species "at collision risk" flight activity; and

- Distributions and abundances of breeding bird species as recorded during baseline ornithology surveys and established from desk study.

8.6.2 Detailed information regarding desk study records and field survey results is presented in **Technical Appendix 8.1** and **8.3**.

Designated Sites for Nature Conservation

8.6.3 The Site is not located within 10 km of any statutory designated site for nature conservation with ornithological qualifying interests, or within 20 km of any European site with qualifying migratory waterfowl interests.

8.6.4 In accordance with NatureScot guidance (SNH, 2016), the Site is therefore located beyond the core foraging ranges of ornithological species populations associated with any statutory designated site.

Vantage Point (VP) Flight Activity Surveys

8.6.5 “At collision risk” target species flight activity for use in collision mortality risk estimates using the NatureScot Collision Risk Model (CRM) has been identified from VP flight activity surveys undertaken as part of additional ornithology surveys between March 2021 and April 2022, and post-construction ornithological monitoring for the operational Ben Aketil Wind Farm between January 2022 and December 2022.

8.6.6 Full details are presented in **Technical Appendix 8.1** and **8.2**.

8.6.7 VP flight activity surveys between March 2021 and December 2022 recorded flight activity of the following target species:

- Pink-footed goose;
- Whooper swan;
- Golden plover;
- Snipe;
- Red-throated diver;
- Grey heron;
- Golden eagle;
- Hen harrier;
- White-tailed eagle; and,
- Merlin.

8.6.8 Full details of target species flight activity recorded is presented in **Technical Appendix 8.1** and **8.5** and illustrated in **Figures 8.5a-d**.

Collision Mortality Risks

8.6.9 The NatureScot CRM has been used to estimate collision mortality risks for those target species, where sufficient “at collision risk” flight activity has been identified for the Proposed Development, to suggest the potential for significant risks.

8.6.10 For the purposes of assessment “at collision risk” flight activity has been identified as flight activity occurring at a height of 20-200 m above the ground, and within 200 m of proposed turbine locations, and was identified for the following target species:

- Pink-footed goose;

- Snipe;
- Grey heron;
- Golden eagle;
- White-tailed eagle; and,
- Merlin.

- 8.6.11 Following a review of “at collision risk” flight activity, detailed analysis of collision mortality risks using the NatureScot CRM has been undertaken for snipe, golden eagle, and white-tailed eagle.
- 8.6.12 No other target species had more than three “at collision risk” flights. As such, potential collision mortality risks upon those species can reasonably be concluded, without further detailed analysis, as being very small (Negligible) and very unlikely to be significant at any population level. The potential for significant collision mortality risks upon these species is therefore scoped-out of further assessment.
- 8.6.13 **Table 8.5** presents a summary of collision mortality risks for the Proposed Development, estimated for snipe, golden eagle and white-tailed eagle. Full details are presented in **Technical Appendix 8.2**.

Table 8.5: Collision mortality risks.

Species	Occupancy	Avoidance Rate	Annual Collision Mortality Risk(s)
Snipe	Breeding	98%	0.054
Golden eagle	All year	99%	0.089-0.129
White-tailed eagle	All year	95%	0.456-0.512

Moorland Breeding Birds

- 8.6.14 During survey in 2021 and 2022, the Site and wider survey area was found to support a narrow assemblage of moorland breeding bird species, restricted to a small number of snipe, golden plover, common sandpiper, oystercatcher, ringed plover and eider territories as illustrated in **Figure 8.6**.
- 8.6.15 The maximum number of estimated breeding territories located within 500 m of proposed turbine locations and access track route is summarised in **Table 8.6**, and which represents a very small proportion of currently stated regional NHZ 6 breeding population estimates.
- 8.6.16 Overall the moorland breeding bird assemblage recorded within and surrounding the Site is assessed as being of **Low** sensitivity (importance) in accordance with the criteria presented in **Table 8.2**.

Table 8.6: Moorland breeding bird territories within 500m of the Proposed Development

Species	Max No. of Breeding Territories	Regional NHZ 6 Population (Wilson <i>et al.</i> , 2015)	Sensitivity (Importance)
Snipe	12 (2021)	2,025 pairs	Low, <1% of regional NHZ population
Golden plover	2 (2021)	1,606 pairs	Low, <1% of regional NHZ population)
Common sandpiper	4 (2021)	n/a	Low, small number of territories for a species not listed on Annex 1 of NatureScot guidance (SNH, 2018a)
Oystercatcher	1 (2021)	n/a	Low, small number of territories for a species not listed on Annex 1 of NatureScot guidance (SNH, 2018a)
Ringed plover	1 (2021/2022)	n/a	Low, small number of territories for a species not listed on Annex 1 of NatureScot guidance (SNH, 2018a)
Eider	1 (2021)	n/a	Low, small number of territories for a species not listed on Annex 1 of NatureScot guidance (SNH, 2018a)

Annex 1 / Schedule 1 Breeding Raptor and Owls

- 8.6.17 Desk studies and additional ornithology surveys undertaken in 2021 and 2022, did not identify the presence of any Annex 1 / Schedule 1 raptor or owl breeding sites within the Site.
- 8.6.18 Desk study records and consultation with species recording groups did identify that the Site is located within 10 km of three known golden eagle breeding ranges and five white-tailed eagle breeding territories. Detailed information regarding the locations of breeding sites could however not be obtained.

- 8.6.19 Ornithology surveys undertaken in 2021 and 2022, recorded single breeding sites of hen harrier and white-tailed eagle within 2 km of the Site, both within the north western extent of survey areas adopted for survey.
- 8.6.20 No definitive breeding evidence of merlin or peregrine was identified within 2 km of the Site during desk studies or ornithology surveys, but breeding peregrine territories are known to occur within 10 km of the Site and merlin may likely breed locally in suitable habitats.
- 8.6.21 In review of species observations and flight activity recorded, the Site is not considered to form an important part of any occupied golden eagle range. Whilst activity of adult birds was recorded, including territorial display, the majority of species activity related to non-breeding sub-adult and/or dispersing birds.
- 8.6.22 **Table 8.7** summarises the number of breeding territories of Annex 1/Schedule 1 raptors identified within or overlapping a 2 km radius of the Site (10 km for eagle species) and species sensitivity in accordance with **Table 8.2** and professional judgement.

Table 8.7: Breeding Annex 1/Schedule 1 raptor territories within 2 km (10 km for eagles).

Species	No. of Breeding Territories	Regional NHZ 6 Population (Wilson <i>et al.</i> , 2015)	Sensitivity (Importance)
Hen harrier	1-2	38	Medium c.3-6% of the most recently published NHZ 6 population.
White-tailed eagle	5	34	High c.15% of the most recently published NHZ 6 breeding population, and >1% of the most recently published National (Scottish) population (123 home ranges occupied by pairs ¹⁷).
Golden eagle	3	74	Medium c. 4% of the most recently published NHZ 6 breeding population, but <1% of the most recently censused National (Scottish) population (503 home ranges occupied by pairs in 2015 ¹⁸).

8.7 Future Baseline

- 8.7.1 In the absence of the Proposed Development, or assuming a gap between baseline surveys and the commencement of the Proposed Development, changes in baseline ornithology conditions (i.e. distributions and populations) are most likely to result from habitat modifications within or surrounding the Site or due to land management practices.
- 8.7.2 The construction or commencement of other nearby wind farms may also occur however, it would be expected that such development would also include for measures to ensure

¹⁷ See Challis *et al.*, (2022).

¹⁸ See Challis *et al.* (2016).

the protection of sensitive bird species, and as such, any impacts on local species populations and distributions would be temporary.

- 8.7.3 In the absence of the Proposed Development, the habitats within the Site are considered to remain under the existing management regime, largely comprising grazing by livestock and deer, in the presence of the operational wind farm, until the current turbines are decommissioned.
- 8.7.4 The Site is not subject to any other development pressures or management, including woodland creation or management, which may have the potential to affect habitats and species in such a way to substantially alter the baseline reported here.
- 8.7.5 Breeding bird densities would therefore reasonably be expected to remain at comparable levels with those recorded during field surveys and identified through desk study.
- 8.7.6 The establishment of breeding raptor territories within the Site is considered highly unlikely, given the general absence of suitable nesting opportunities such as deep heather swards, scree and mature woodland. The national golden eagle and white-tailed eagle populations have increased in recent years and whilst new territories may be established, this is considered unlikely to be within proximity to the Site in the presence of the nearest known and likely establishing territories.
- 8.7.7 Golden eagle habitat within the Site and immediate surrounding is also relatively fragmented.
- 8.7.8 Whilst short-term and small-scale variability in ornithological populations and distributions may occur, and revisions to conservation statuses and designations are possible, such changes would be unlikely to qualitatively alter the conclusions of the assessment and have been accounted for through application of a precautionary approach and appropriate mitigation.

Climate Change

- 8.7.9 The UKCP18 climate change projections show a general trend towards warmer, wetter winters and hotter, drier summers. These factors are likely to result in an extended breeding bird season with earlier in the year (and likely more) nesting attempts (which has potential to increase breeding productivity, although this will be dependent on prey availability), but contrary to this the increased rainfall is likely to result in higher rates of fledgling mortality.
- 8.7.10 The opposing potential effects of climatic change on ornithology receptors makes predicting future likely outcomes difficult. There is no reason to consider that the breeding bird assemblage presently using the Site will change substantially over the lifespan of the Proposed Development due to climate change. However, breeding productivity for some species, given the predicted substantially higher rates of average precipitation across the lifespan of the Proposed Development (according to the UKCP18 climate change projections) may reduce, and this may have notable effects for ground-nesting species recorded, such as breeding waders.
- 8.7.11 Potential effects on ornithology receptors detailed in this chapter are not predicted to substantively change in relation to climate change over the lifespan of the Proposed Development.

8.8 Predicted Effects

8.8.1 This section presents an assessment of effects upon important ornithological features, in the absence of non-embedded design mitigation both as a result of the Proposed Development alone and cumulatively in-combination with other wind farm developments.

8.8.2 The following potential impacts are assessed:

- Disturbance to birds during construction due to vehicular traffic, operating plant and the presence of construction workers;
- Disturbance to birds during the operation of the turbines, vehicular traffic and the presence of people during operations; and,
- Collision mortality of birds with turbine blades and other infrastructure.

Important Ornithological Features

8.8.3 A summary of identified important ornithological features is provided in **Table 8.8**. The level of importance assigned to each species is based upon the criteria outlined in **Table 8.2**, baseline information and professional judgement.

8.8.4 Ornithological features which are unlikely to be affected or which are considered sufficiently widespread, unthreatened or resilient to impacts from the Proposed Development, and hence will remain viable and sustainable, have not been subject to a detailed assessment and have been "scoped-out".

8.8.5 Good practice measures are however outlined as appropriate to ensure legislative compliance.

8.8.6 Following the review of baseline information, and in consideration of committed design considerations, only potential effects upon golden eagle and white-tailed eagle are assessed in relation to operational collision mortality risks and construction and operational disturbance/displacement.

Table 8.8: Summary of Important Ornithological Features.

Ornithological Feature	Importance	Justification
Designated sites for nature conservation	International/National	<p>The Proposed Development does not form part of any statutory designated site for nature conservation with ornithological qualifying interests.</p> <p>With reference to NatureScot guidance (SNH, 2016) the potential for connectivity between the Site and the ornithological qualifying interests of any statutory designated site is not identified and the potential for impacts upon designated sites scoped-out of assessment within this chapter.</p> <p>Ornithological species identified during baseline studies are therefore considered to form part of wider countryside populations, with subsequent assessments of effects undertaken at the regional NHZ population level, in accordance with NatureScot guidance (2018).</p> <p>Scoped out of detailed assessment.</p>
Golden eagle	Medium	<p>The Site is known to be located within 10km of three golden eagle ranges, representing 4% of the most recently published NHZ 6 population (Wilson <i>et al.</i>, 2015). Flight activity recorded throughout the year, of both adult and juvenile birds with the potential for collision mortality risks and operational displacement.</p> <p>Scoped into detailed assessment.</p>
Hen harrier	Medium	<p>Between 1-2 breeding hen harrier territories known to occur within 2 km of the Site, although variable between years. Species flight activity recorded but typically below rotor sweep height, with a very low level of “at collision risk” flight activity recorded. Collision mortality risks can therefore be reasonably concluded as negligible without further detailed analysis and species is generally considered to be of low sensitivity to onshore wind farm developments (e.g. Whitfield and Madders, 2006; Haworth and Fielding, 2012).</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in ‘Design Basis and Assumptions’ above) are considered adequate to avoid any potentially significant adverse effects upon hen harrier.</p>

Ornithological Feature	Importance	Justification
		Scoped out of detailed assessment.
Red-throated diver	Local	<p>No suitable breeding sites located within 1 km of the Site, and very low levels of flight activity suggesting the Site and Proposed Development turbine locations do not lie within an important foraging route for the species. Collision mortality risks can therefore be reasonably concluded as negligible.</p> <p>Scoped out of detailed assessment.</p>
Merlin	Local	<p>No confirmed breeding sites identified within 2 km of the Site, although species is likely to breed in the wider area surrounding the Site. Very low levels of flight activity recorded, and collision mortality risks can therefore be reasonably concluded as negligible.</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in 'Design Basis and Assumptions' above) are considered adequate to avoid any potentially significant adverse effects upon merlin.</p> <p>Scoped out of detailed assessment.</p>
White-tailed eagle	High	<p>The Site is known to be located within 10 km of five white-tailed eagle ranges, representing 15% of the most recently published NHZ 6 population (Wilson <i>et al.</i>, 2015) and >1% of the most recently published national population (Challis <i>et al.</i>, 2022). Flight activity recorded throughout the year, but primarily during the breeding season, of both adult and juvenile birds with the potential for collision mortality risks and operational displacement.</p> <p>Scoped into detailed assessment.</p>
Moorland Breeding Birds	Local	<p>Very small numbers of breeding moorland wader and waterfowl territories recorded within the Site and adjacent habitats, together with very low levels of flight activity.</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in 'Design Basis and Assumptions' above) are considered adequate to avoid any potentially significant adverse effects upon all moorland breeding waders.</p>

Ornithological Feature	Importance	Justification
		Scoped out of detailed assessment.
Migratory waterfowl		<p>Site is not located within 20 km of any internationally designated site for migratory waterfowl, and is not located within an area of known importance for foraging birds. Very low levels of pink-footed goose and whooper swan flight activity recorded and for which collision mortality risks can reasonably be concluded as negligible.</p> <p>Scoped out of detailed assessment.</p>
All other raptor and owl species		<p>No further breeding evidence of Annex I/Schedule 1 raptors or owls during the survey period.</p> <p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in 'Design Basis and Assumptions' above) are considered adequate to avoid any potentially significant adverse effects upon all other raptor and owl species.</p> <p>Scoped out of detailed assessment.</p>
All other wetland species	Local	<p>Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in 'Design Basis and Assumptions' above) are considered adequate to avoid any potentially significant adverse effects upon all other wetland species.</p> <p>Scoped out of detailed assessment.</p>

Golden Eagle

Disturbance/Displacement (Construction)

- 8.8.7 Construction works associated with the Proposed Development will occur at a sufficient distance from any known golden eagle breeding site, to preclude the likelihood of disturbance to nesting pairs (upper limit of 750-1000 m disturbance buffers for breeding birds based on current NatureScot guidance, 2022b).
- 8.8.8 As such, the potential for disturbance to golden eagles at their breeding sites, is not predicted to occur.
- 8.8.9 There may be some level of disturbance to individual birds which choose to utilise habitats in the vicinity of working areas over the course of construction works.
- 8.8.10 The Site within which construction works would occur, is however not considered to comprise an important part of an occupied breeding golden eagle range and is subject to disturbance from the currently operational Ben Aketil Wind Farms.
- 8.8.11 Such impacts would therefore primarily impact non-breeding and/or dispersing birds, be no more than temporary-short-term depending on the construction scenario, and would constitute an effect of Low adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

Disturbance/Displacement (Operation)

- 8.8.12 Studies have extensively evidenced the displacement of golden eagles from operational wind farms in Scotland, including a single long-term study of potential displacement effects upon the species at the adjacent Edinbane and operational Ben Aketil Wind Farms, suggesting the decrease of spatial use of habitats within 500 m of operational turbines (Haworth Conservation, 2015).
- 8.8.13 More recent analyses in Fielding *et al.* (2021 and 2022), including comprehensive research from analysed movements of Scottish GPS tagged golden eagles, demonstrates that there remains clear evidence that golden eagles are displaced from suitable habitat by operational wind farm developments, but suggests that 500 m is too conservative to quantify potential habitat losses and that displacement distances are not the same for all turbines. Turbine diameter has also not been demonstrated as a prediction of how close satellite tracked birds approach operational turbines (Fielding *et al.*, 2022).
- 8.8.14 On the basis of best and currently available evidence at Scottish wind farm developments, a fixed displacement distance of 300 m around proposed turbine locations has been adopted for the purposes of assessing potential operational displacement effects upon both range holding and dispersing golden eagles as a result of the Proposed Development. This is considered to be a conservative approach, as actual displacement may be less for some turbines, particularly those in or surrounded by good eagle habitat.
- 8.8.15 The GET model (Fielding *et al.*, 2019) has subsequently been used to identify available 'good' golden eagle habitat in proximity to the Proposed Development and quantify potential losses. 'Good' golden eagle habitat is defined as Open GET 6+ habitat i.e. that with GET model score of 6 and which is not assumed lost to forestry and/or other wind farm developments.

- 8.8.16 Full details of the assessment are presented in confidential **Technical Appendix 8.6**.
- 8.8.17 On review, very little of the immediate landscape within 5 km of the Proposed Development (and existing operational Ben Aketil Wind Farm) is potentially 'good' golden eagle habitat. There are some localized but disconnected areas of 'good' habitat, around Ben Aketil, Ben Sca, Beinn a Chlerich and An Cleireach however, extensive continuous areas of 'good' golden habitat are primarily located >10 km from the Proposed Development.
- 8.8.18 No known golden eagle breeding sites have been identified within 6 km of the Proposed Development, but it is understood that the ranges of three territories overlap with a wider 10 km radii. On this basis, combined with the largely topographically unsuitable habitats for golden eagle within proximity to the Proposed Development, use of habitats within 300 m of the Proposed Development by range holding birds can be reasonably concluded as being very minimal.
- 8.8.19 The potential for significant operational habitat losses for golden eagles, is therefore considered to apply only to non-range holding, or dispersing golden eagles.
- 8.8.20 Adopting a 300 m fixed displacement distance around proposed turbine locations, this equates to an exclusion area of 488 ha, of which 63 ha is open GET 6+ habitat (i.e. 'good' golden eagle habitat not already lost due to forest cover or other wind turbines). However, much of this 'good habitat' is already assumed to be lost to the operational Ben Aketil Wind Farm turbines, with only 22 ha of additional good habitat being lost to the repowered turbines.
- 8.8.21 Dispersing golden eagles in Scotland cover enormous areas, including across regional NHZ boundaries. An assessment of potential habitat losses for dispersing golden eagles at an NHZ scale, could therefore be reasonably concluded as trivial without any complex analysis. However, for the purposes of applying biologically reasonable constraints, and adopting a conservative dispersing range of 10 km around proposed turbine locations, a loss of 22 ha would equate to a 0.2% loss of 'good' golden eagle habitat from the dispersing range, with 63 ha equating to a 0.7% loss.
- 8.8.22 Using previous and precautionary assumptions of a 5% significance threshold loss adopted in assessments of golden eagle range loss using the Predicting Aquilla Territories (PAT) model (SNH, 2014 and McLeod *et al.*, 2002), a <1% loss would not be significant.
- 8.8.23 As the Proposed Development lies in an area generally comprised of small, fragmented 'good' golden eagle habitat, turbine locations would not be considered to disrupt any important movement patterns for golden eagles.
- 8.8.24 Operational disturbance/displacement effects on golden eagles, whilst permanent, are therefore considered to be of Negligible adverse magnitude on a Medium importance species, resulting in an effect that is of Minor adverse significance which is Not Significant in the context of the EIA Regulations.

Collision Mortality Risks (Operation)

- 8.8.25 Evidence from current research identifies the main impact of wind farms in Scotland to golden eagles as habitat loss through operational disturbance/displacement, with the probability of collision mortality considered to be very low, although not precluded. It is

understood that there have been five reported golden eagle fatalities at operational wind farms in Scotland between 2018 and 2022.

- 8.8.26 Annual golden eagle collision mortality risks for the Proposed Development using the NatureScot CRM have been estimated as 0.089-0.129 birds. Full details are provided in **Technical Appendix 8.2**.
- 8.8.27 Annual collision mortality risks of up to 0.129 birds, assuming all collisions may be adult breeding birds, represents <1% (0.09) of the most recently understood published NHZ 6 breeding golden eagle population (assuming 74 breeding pairs, 148 breeding birds). This is considered a precautionary assessment, in the absence of the known number of non-breeding, non-territorial dispersing birds, which are also likely to form part of the Skye (and NHZ 6) population and for which flight activity was recorded.
- 8.8.28 On the basis of evidence for the displacement of golden eagles from onshore wind farms collision mortality risks to golden eagle from the Proposed Development are considered very unlikely and of Negligible adverse magnitude on a species of Medium importance, giving an effect of no more than **Low** adverse significance, which is **Not Significant**.

White-tailed Eagle

Disturbance/Displacement (Construction)

- 8.8.29 Ornithological surveys in 2021 recorded evidence of a white-tailed eagle breeding attempt to the north-west of the Proposed Development. The exact location of the breeding site was not confirmed, but it's most likely location was considered to be >1 km from the nearest operational Ben Aketil wind turbine. No evidence confirming a consecutive breeding attempt in the same location was recorded during ornithological surveys in 2022.
- 8.8.30 Whilst there are five known white-tailed eagle territories within a 10 km radius of the Proposed Development, no additional breeding sites have been recorded within 2 km of the Site and there are no suitable nesting opportunities for the species within the Site itself (absence of mature woodland and crags).
- 8.8.31 The most likely location of breeding site associated with the nearest known breeding attempt to the Proposed Development, is located at a sufficient distance to preclude the likelihood of disturbance to breeding pairs that may adopt the breeding site in future years (upper limit of 500 m disturbance buffers for breeding birds based on current NatureScot guidance, 2022b).
- 8.8.32 In the absence of mitigation and assuming the nearest known breeding attempt recorded to the north-west of the Proposed Development continues to establish, there is potential for construction disturbance to breeding white-tailed eagle depending upon the location of breeding sites in future years.
- 8.8.33 This would reasonably be likely to affect up to one breeding pair, and result in the potential temporary loss of foraging habitat for the pair and non-breeding birds within proximity to construction working areas. Such losses would be considered reasonably small for any breeding pair, and it is evident that the presence of the operational Ben Aketil Wind Farm has not precluded use of habitats within the Site by the species.
- 8.8.34 Potential temporary losses resulting from disturbance to non-breeding birds, given the large areas such birds may roam across Scotland, would be trivial.

- 8.8.35 Overall construction phase disturbance to white-tailed eagle is considered to be of no more than a temporary **Low** magnitude effect and would be **Not Significant** in the context of the EIA Regulations.
- 8.8.36 White-tailed eagle are afforded additional protection against disturbance at their breeding sites and at any time of year under the provisions of the Wildlife and Countryside Act 1981 (as amended). A BBPP is therefore proposed as part of the Proposed Development, to enable the protection of breeding birds, including white-tailed eagle, within proximity to construction works and over the operational and decommissioning phases of the Proposed Development.

Disturbance/Displacement (Operation)

- 8.8.37 There is no current evidence to suggest white-tailed eagles are displaced by onshore wind turbines, and the presence of the operational Ben Aketil Wind Farm has not precluded species foraging within the Site, or breeding attempts occurring locally.
- 8.8.38 The potential for significant operational habitat loss effects upon white-tailed eagle is therefore considered highly unlikely, and likely equating to no more than an effect of **Low** magnitude.

Collision Mortality Risks (Operation)

- 8.8.39 Annual white-tailed eagle collision mortality risks for the Proposed Development using the NatureScot CRM have been estimated as 0.456-0.512 birds. Full details are provided in **Technical Appendix 8.2**.
- 8.8.40 Annual collision mortality risks of up to 0.512 birds, represents <1% (0.75%) of the most recently understood published NHZ 6 breeding white-tailed eagle population (assuming 34 breeding pairs, 68 breeding birds), assuming all collisions would be of adult breeding birds.
- 8.8.41 This is considered a precautionary assessment, in the absence of the known number of non-breeding, non-territorial dispersing birds, which are also likely to form part of the Skye (and NHZ 6) population.
- 8.8.42 Collision mortality risks to white-tailed eagle from the Proposed Development are therefore assessed as being of no more than of Low magnitude on an ornithological feature of Medium importance, giving an effect of Minor significance which is Not Significant in the context of the EIA Regulations.
- 8.8.43 White-tailed eagles are known to be susceptible to collision mortality risks from operational wind farms, as recognised by the relatively low avoidance rate recommended for use in the NatureScot CRM (95% in SNH, 2018b). It is understood there have been seven reported white-tailed eagle fatalities at operational wind farms in Scotland between 2018 and 2021 however, this does not appear to have curtailed regional or national population growths reported in recent monitoring and the species has typically high productivity rates (Challis *et al.*, 2022).
- 8.8.44 Good practice measures to reduce potential collision mortality risks to white-tailed eagle, will be included as part of the Proposed Developments HMP, Aim 4: Reduction in Attraction Risks for Eagles. The prescriptive measures proposed to achieve Aim 4, will

be determined in consultation with the landowner, THC and NatureScot post-consent and secured by appropriate planning condition.

- 8.8.45 The general absence of white-tailed eagles over the winter months in proximity to the Proposed Development will also substantially reduce the chance of collision during that period.

8.9 Mitigation

- 8.9.1 No potentially significant adverse effects have been identified upon ornithological features as a result of the construction and operation of the Proposed Development.
- 8.9.2 No additional mitigation measures are therefore outlined.

Monitoring

- 8.9.3 Post-construction ornithological monitoring is currently a planning condition requirement for the operational Ben Aketil Wind farm. Information gathered from this monitoring has been helpful in furthering the understanding of species behavioural responses to operational wind farm infrastructure, notably in relation to golden eagle, white-tailed eagle and hen harrier.
- 8.9.4 It is acknowledged that the continuation of monitoring in its current form as required by Conditions 17 and 15 of the operational Ben Aketil and Ben Aketil (two turbine) Extension Wind Farms respectively would remain valuable, however, it is also considered that current monitoring prescriptions could be amended to meet emerging species research needs and/or provide funding for coordinated regional species population monitoring on the Isle of Skye.
- 8.9.5 Monitoring would also be used to measure the effectiveness of embedded mitigation.
- 8.9.6 Subject to the receipt of consent for the Proposed Development, it is therefore proposed that an alternative ornithological monitoring strategy would be prepared for golden eagle, white-tailed eagle and hen harrier to include:
- Population monitoring; and,
 - Carcass searches.
- 8.9.7 Where agreed in consultation with NatureScot, RSPB Scotland and other stakeholders, the strategy would replace current post-construction monitoring for the operational Ben Aketil Wind Farm and be implemented for the operational lifetime of the Proposed Development.
- 8.9.8 The strategy would be subject to regular review to ensure monitoring information remains appropriate to identifying potential reactive mitigation requirements for the Proposed Development and responds timely to changes in national species research and regional monitoring needs.
- 8.9.9 In the event an alternative monitoring strategy cannot be agreed, monitoring to be included as part of the Proposed Development and secured by way of a suitably worded planning condition will include for the continuation of post-construction monitoring prescriptions under the requirements of Condition 17 and 15 of the operational Ben Aketil and Ben Aketil (two turbine) Extension Wind Farms respectively.

- 8.9.10 This will comprise Vantage Point (VP) Flight Activity Surveys in years 1-3, 5 and 10 of operation, with a focus on golden eagle and white-tailed eagle flight activity.

8.10 Summary of Effects

- 8.10.1 No significant effects have been identified for ornithological features in this assessment as a result of the construction and operation of the Proposed Development.

8.11 Cumulative Effects

- 8.11.1 This section considers the potential for significant operational effects upon golden eagle and white-tailed eagle in-combination with other wind farm developments at the regional NHZ 6 scale, in accordance with NatureScot guidance (2018a).
- 8.11.2 Potentially significant effects on all other ornithological features as a result of the Proposed Development have been scoped out of detailed assessment, with no potential to contribute to potentially significant cumulative effects in-combination with other wind farm developments in NHZ 6.
- 8.11.3 The potential for significant construction phase effects upon golden eagle and white-tailed eagle, are also not considered, as such effects would be temporary and localized.
- 8.11.4 The potential for significant cumulative operational displacement/disturbance effects upon white-tailed eagle are not considered, as there is currently no evidence to suggest the species is displaced by operational wind farms.

Disturbance/Displacement (Golden Eagle)

- 8.11.5 Cumulative operational disturbance/displacement effects to golden eagle are inherently considered in the quantification of the loss of Open' GET 6+ habitat for the species i.e. that already lost to existing wind farms or forestry (see **Technical Appendix 8.6**).
- 8.11.6 Potential cumulative operational disturbance/displacement effects to golden eagle therefore remain of Low adverse magnitude on a Medium importance species, resulting in an effect that is of **Minor** significance which is **Not Significant** in the context of the EIA Regulations.

Collision Mortality Risks

- 8.11.7 On the basis of the species evidenced avoidance of operational wind farms, the rarity of reported collisions and the very low levels of collision mortality risk estimated for the Proposed Development, the potential for the Proposed Development to contribute to significant regional cumulative collision mortality risks to golden eagle is considered highly unlikely and is not considered in further quantitative detail within this assessment.
- 8.11.8 In accordance with NatureScot guidance (2018a), cumulative predicted collision risks for white-tailed eagle predicted for wind farm developments located within NHZ 6 which are either operational, under construction, consented or at the planning application stage are summarised in **Table 8.9**. Cumulative risks from developments which are at scoping stage and/or have been refused and for which no appeal proceedings have been formally submitted, are not included given the lack of available data or as it is reasonably unknown whether these developments will proceed further.

- 8.11.9 Figures presented for other wind farm developments have not been checked or amended to reflect avoidance rates used within the assessment (where relevant). Where it is stated N/A i.e. "Not Assessed", the wind farm development was not supported by an assessment of collision mortality risks to white-tailed using the NatureScot CRM and as such, no (or negligible) collision mortality risks have been assumed.
- 8.11.10 Collision mortality risks for the operational Ben Aketil Wind Farm are not included, as the Proposed Development includes for the repowering of the currently operational turbines.
- 8.11.11 The cumulative annual collision mortality risk to white-tailed eagle within NHZ 6, using available information from all wind farms considered, is estimated as 1.195 birds and which represents c.1.76% of the most recently published regional NHZ 6 breeding population (assuming 34 pairs, 68 breeding adults).
- 8.11.12 As previously detailed, the most recently published NHZ 6 breeding population (as per Wilson *et al.*, 2015) does not include the unknown number of non-breeding, or unpaired non-territorial birds, which are also likely to form part of the NHZ 6 species' population. This number is very likely to be high, given the species high productivity rates (1.2 young fledged per successful pair, as per Challis *et al.*, 2022).
- 8.11.13 Cumulative collision mortality risks to white-tailed eagle at the regional NHZ 6 population level are therefore concluded to be of no more than of Low magnitude on a species of Medium importance, giving an effect of **Minor** significance, which is **Not Significant** in the context of the EIA Regulations.

Table 8.9: Cumulative NHZ 6 Collision Mortality Risks for White-tailed Eagle.

Wind Farm	Status	THC Planning Ref.	Estimated Annual Collision Mortality Risk
Glen Ullinish	Consented	14/03964/FUL	0.130 (95%)
Edinbane	Operational	02/00089/FULSL	n/a
Ben Sca	Consented	20/0013/FUL	0.234 (95%)
Beinn Mheadhonach	Consented	18/03214/FUL modified by 20/04065/S42	0.319 (95%)
Existing Cumulative			0.683
Proposed Development (max)			0.512
Total Cumulative			1.195

8.12 References

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9 HYDROLOGY, GEOLOGY, HYDROGEOLOGY AND PEAT

9.1 Introduction

- 9.1.1 This section of the Environmental Impact Assessment Report (EIAR) describes the existing geological, hydrogeological, hydrological and peat conditions within the Site. This section also identifies and assesses the potential impacts that may be caused by The Repowered and Extended Ben Aketil Wind Farm (hereafter the Proposed Development). The potential impact includes preparation, construction works, restoration of construction works, operation and decommissioning phases. The mitigation measures that could be employed to address any adverse effects are also set out in this section.
- 9.1.2 This chapter is supported by **Figures 9.1 to 9.6 in Volume 2**.
- 9.1.3 This chapter is supported by a number of Technical Appendices (included in **Volume 3**) which provide additional in-depth information on relevant aspects of the Proposed Development. These include:
- **Technical Appendix 9.1 Peat Slide Risk Assessment;**
 - **Technical Appendix 9.2 Peat Management Plan;**
 - **Technical Appendix 9.3 Groundwater-Dependent Terrestrial Ecosystems Assessment;**
 - **Technical Appendix 9.4 Drainage Impact Assessment and Watercourse Crossing Inventory;** and
 - **Technical Appendix 9.5 Borrow Pit Assessment.**
- 9.1.4 Key findings of these Appendices are summarised within this chapter.

9.2 Scope and Methodology

Study Area

- 9.2.1 Within this chapter, 'the Site' refers to everything within the application red line boundary, and 'the Developable Area' refers to an area within the red line boundary defined by the applicant as the area where the turbines and associated infrastructure would be located. A 'Study Area' around the application boundary has been considered for some constraints and sensitivities; this distance is specified within the relevant sections and Technical Appendices.
- 9.2.2 For most constraints and sensitivities, the study area is considered to be up to 2 km from the application boundary.
- 9.2.3 Geological sensitivities do not transmit over any significant distance, except potential considerations relating to mining activity. For mining, activities up to 5 km from the application boundary have been considered. For other geological considerations, the study area is 1 km from the application boundary.
- 9.2.4 For hydrological concerns, areas downstream up to 5 km have been considered, as impacts such as pollution events can be transmitted downstream for greater distances.

Construction Scenarios

- 9.2.5 As two construction options are being considered by the applicant; the assessment has taken into account the combination of both scenarios. The two scenarios are as follows:
- Scenario 1: construction of the extension turbines and the construction of the repowering turbines undertaken at the same time, resulting in construction in an extended area; and
 - Scenario 2: the four extension turbines are constructed first, followed by the decommissioning of the existing, operational Ben Aketil Wind Farm, followed by construction of the five repowering turbines, resulting in construction over an extended time-frame.
- 9.2.6 In order to assess all possible effects resulting from construction, a 'worst case scenario' combining the extended area of Scenario 1 and the extended time-frame of Scenario 2 has been assessed.

Assessment Method

- 9.2.7 The assessment is undertaken through a desk study and site inspection of existing geological, hydrogeological, hydrological and peat-related features within and surrounding the Site. The existing conditions are described and potential risks that may be associated with the Proposed Development are identified and assessed. This includes:
- potential risks from rock extraction to form aggregate;
 - water contamination from particulates and suspended solids;
 - modification to groundwater flow paths;
 - soil erosion and compaction;
 - changes in or contamination of water supply to vulnerable receptors;
 - water contamination from fuels, oils, concrete batching or foul drainage;
 - peat instability; and
 - increased downstream flood risk.
- 9.2.8 As there are no recorded mine workings within or near the Site, impacts arising from former mine workings were scoped out and therefore do not require assessment.
- 9.2.9 The initial desk studies were undertaken to determine and verify the baseline conditions through review and collation of available and relevant information relating to hydrology, geology, hydrogeology and peat. This included a review of published mapping, including OS topographical mapping at 1:25,000 and 1:50,000 scales, BGS geological mapping, Scotland's Soils soil and peat mapping, geological and hydrogeological reports and digital terrain models (DTM) to provide slope data. Private water supply (PWS) data from The Highland Council (THC) was reviewed.
- 9.2.10 A site visit and reconnaissance survey were undertaken to:
- verify the information collected during the baseline desk study;
 - undertake a visual assessment of the main surface waters, and verify any PWS, including intakes that could be affected by the Proposed Development;
 - identify drainage patterns, areas vulnerable to erosion or sediment deposition, and any pollution risks;

- allow appreciation of the Site including awareness of gradients, access route, options including potential watercourse crossings, prevailing ground conditions, and to assess the relative location of all the components of the Proposed Development; and
 - collection of peat and substrate information where exposures are present, for example in watercourse channels and alongside existing infrastructure.
- 9.2.11 The reconnaissance survey was undertaken on 1-2 November 2022. On the first day the weather was mainly dry and sunny with a light breeze and some showers. The second day was wet with low cloud and intermittent heavy showers with a gusty and variable wind. Ground conditions were very wet on both days, reflecting previous wet weather.
- 9.2.12 As well as the site visit and reconnaissance survey, phase 1 and phase 2 peat depth and condition surveys were undertaken. The phase 1 survey, undertaken in June 2022, involved taking peat depth measurements with a hand-held probe on a 100 m grid across the Site to identify areas of peat and natural variation in the peat substrate across the area. Phase 2 surveys were undertaken in August and November 2022 and involved peat probing at 50 m points along all proposed new access tracks, offset probing every 50 m either side of existing access tracks proposed for upgrading and crosshair probing at 25 m at proposed turbine locations. Additional probing was undertaken in areas proposed for additional infrastructure such as turbine hardstandings, substation and construction compounds, BESS and borrow pits, to ensure sufficient peat depth information was available to support the infrastructure design process and related studies on peat excavation, reuse and instability.
- 9.2.13 The information obtained from the review of existing data, site surveys and guidance documentation formed the basis of assessment of the potential effects associated with the Proposed Development. Where potential likely significant effects were identified, mitigation measures have been proposed.
- 9.2.14 A peat slide risk assessment (PSRA) was undertaken in accordance with the Scottish Government's Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Developments (Scottish Government, 2017). The PSRA was informed by the reconnaissance survey, peat depth surveys, geomorphological mapping and terrain data. The assessment used a combined qualitative (contributory factor) and quantitative (factor of safety) approach to determine the likelihood of peat landslides. Areas with the highest likelihood were compared with identified receptors to identify risks and determine appropriate mitigation measures. The assessment is provided in **Technical Appendix 9.1**.
- 9.2.15 A peat management plan (PMP) was prepared to investigate the volumes of peat anticipated to require removal for the project and appropriate reuses within the Site for the excavated material. The PMP was informed by the collated peat depth probing described above, combined with a full appraisal of potential reuse opportunities, for example reinstatement and landscaping requirements associated with infrastructure, mapping of drainage ditches and peat haggings. Where opportunities were identified to integrate the PMP with wider environmental enhancement measures, such as peatland restoration, the PMP identifies the volume and type of peat to be used for this activity. The assessment is provided in **Technical Appendix 9.2**.
- 9.2.16 An assessment of groundwater-dependent terrestrial ecosystems (GWDTE) was undertaken based on the National Vegetation Classification (NVC) mapping undertaken

by the ecology team. Where these areas of potentially moderate or highly GWDTE were identified in proximity to proposed infrastructure, additional investigation was undertaken to identify if the wetland areas are truly groundwater-dependent, refine their mapped extent, conceptualise the hydrogeology and assess any potential effects on these areas. The assessment is provided in **Technical Appendix 9.3**.

- 9.2.17 A drainage infrastructure and watercourse-crossing assessment (DIWCA) was undertaken to assess drainage requirements and manage surface runoff and potential downstream flood risk for the Proposed Development. The assessment also includes an inventory of all proposed watercourse crossings, both for new structures and for existing crossings that may require upgrading. The assessment is provided in **Technical Appendix 9.4**.
- 9.2.18 A borrow pit assessment (BPA) was undertaken by a suitably qualified and experienced engineer to quantify the volume of aggregate required for the Proposed Development, identify appropriate locations within the site from which this material can be sourced and address the suitability of the material for the required purpose. Potential impacts from aggregate extraction, processing and transportation are considered and assessed in the BPA Report, attached as **Technical Appendix 9.5**. Design and mitigation measures to avoid or minimise these impacts are set out in the BPA Report, along with good construction practices which would be employed during all construction works.
- 9.2.19 A number of data sources were considered in writing this chapter; the main sources are detailed below:
- Ordnance Survey (OS) topographical mapping;
 - British Geological Survey (BGS) geological mapping, superficial and bedrock;
 - BGS online borehole records;
 - Centre for Ecology and Hydrology (CEH) Flood Estimation Handbook Web Service;
 - THC's private water supplies records;
 - Scotland's Soils mapping; and
 - Scottish Environment Protection Agency's A functional wetland typology for Scotland.

Effects Evaluation

- 9.2.20 The significance of potential effects has been classified taking into account three principal factors:
- the sensitivity of the receiving environment;
 - the potential magnitude of the effect; and
 - the likelihood of that effect occurring.
- 9.2.21 This approach is based on guidance contained within the joint Scottish Natural Heritage (now NatureScot)/Historic Environment Scotland publication Environmental Impact Assessment Handbook v5 (SNH/HES, 2018).

Receptor Sensitivity

- 9.2.22 The sensitivity of a receptor represents its ability to absorb the anticipated effect without resulting in perceptible change. Four levels of sensitivity have been used, as defined in **Table 9.1:**.

Table 9.1: Sensitivity Ratings

Sensitivity	Definition
Very high	The receptor has very limited ability to absorb change without fundamentally altering its present character, is of very high environmental value and/or is of international importance e.g. Special Areas of Conservation (SAC), Ramsar sites.
High	The receptor has limited ability to absorb change without significantly altering its present character, is of high environmental value and/or is of national importance e.g. National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI).
Moderate	The receptor has moderate capacity to absorb change without significantly altering its present character, has moderate environmental value and/or is of regional importance e.g. Geological Conservation Review sites.
Low	The receptor is tolerant of change without detriment to its present character, is of low environmental value and/or of local importance e.g. Local Nature Reserves, Local Geodiversity Sites.

Effect Magnitude

- 9.2.23 The magnitude of effects includes the timing, scale, size and duration of the potential effect. Four levels of magnitude have been used, as defined in **Table 9.2:**.

Table 9.2: Magnitude Ratings

Magnitude	Definition
Substantial	Substantial changes, over a significant area, to key characteristics or to the geological/hydrogeological/peatland classification or status for more than 2 years.
Moderate	Noticeable but not substantial changes for more than 2 years or substantial changes for more than 6 months but less than 2 years, over a substantial area, to key characteristics or to the geological/hydrogeological/peatland classification or status.
Slight	Noticeable changes for less than 2 years, substantial changes for less than 6 months, or barely discernible changes for any length of time.
Negligible or no change	Any change would be negligible, unnoticeable or there are no predicted changes.

Likelihood of Effect

- 9.2.24 The Likelihood of an effect occurring is evaluated to three levels: Unlikely, Possible or Likely.

Effects Significance

- 9.2.25 The findings in relation to the three criteria discussed above have been brought together to provide an assessment of significance for each potential effect. Potential effects are concluded to be of Major, Moderate, Minor or Negligible significance. Potential effects are assessed taking into account the proposed embedded and additional mitigation measures. The assessment concludes with a review of various effects to determine if they would be significant. Effects assessed as major or moderate are deemed to be significant; those assessed as minor or negligible are deemed to be not significant, as defined in **Table 9.3**.

Table 9.3: Effects Significance Matrix

Sensitivity	Magnitude	Likelihood	Significance
Very High	Substantial	Likely	Major
		Possible	Major
		Unlikely	Moderate
	Moderate	Likely	Major
		Possible	Moderate
		Unlikely	Moderate
	Slight	Likely	Moderate
		Possible	Minor
		Unlikely	Minor
	Negligible/no change	Likely	Minor
		Possible	Negligible
		Unlikely	Negligible
High	Substantial	Likely	Major
		Possible	Major
		Unlikely	Moderate
	Moderate	Likely	Moderate
		Possible	Moderate
		Unlikely	Minor
	Slight	Likely	Minor
		Possible	Minor
		Unlikely	Minor
	Negligible/no change	Likely	Minor
		Possible	Negligible
		Unlikely	Negligible
Moderate	Substantial	Likely	Major
		Possible	Moderate
		Unlikely	Minor

Sensitivity	Magnitude	Likelihood	Significance
	Moderate	Likely	Moderate
		Possible	Minor
		Unlikely	Minor
	Slight	Likely	Minor
		Possible	Minor
		Unlikely	Negligible
	Negligible/no change	Likely	Negligible
		Possible	Negligible
		Unlikely	Negligible
Low	Substantial	Likely	Moderate
		Possible	Minor
		Unlikely	Negligible
	Moderate	Likely	Minor
		Possible	Minor
		Unlikely	Minor
	Slight	Likely	Minor
		Possible	Negligible
		Unlikely	Negligible
	Negligible/no change	Likely	Negligible
		Possible	Negligible
		Unlikely	Negligible

9.2.26 In addition to the sensitivity, magnitude and likelihood of an effect, effects can be direct and indirect; primary or secondary; cumulative; transboundary; short-term, medium-term and long-term; permanent and temporary; and positive and negative.

Difficulties and Uncertainties

9.2.27 The site visit followed a standard 'reconnaissance' level survey to obtain an overview of the conditions present within the Site. This involves walking through and around an area to gather visual information concerning elements such as slope, rock outcrop, ground conditions, nature and type of watercourses, and the presence or absence of springs or groundwater seepages. No ground investigation was undertaken as part of the site visit. As a result, information is limited to detail that can be gathered from a visual survey of this kind.

9.2.28 Uncertainties may arise as a result of preceding weather conditions; e.g. very wet preceding conditions, as was the case for this Site, may cause an over-estimation of the watercourse nature or ground bogginess than would be considered 'normal' for the area.

9.2.29 The information gathered has been combined with information derived from surveys to map peat depths, as well as details from other disciplines such as vegetation surveys, and photography to give as full a picture of conditions within the Site as possible. All

reasonable attempts were made to ensure that good coverage of the Site was included; however, it is possible from the surveys undertaken that some information was not collected. The number of site visits and professional experience indicates that difficulties and uncertainties are unlikely to have had any effect on the assessment or its conclusions.

9.3 Consultation Undertaken

- 9.3.1 Consultation in relation to issues concerning hydrology, geology, hydrogeology and peat has been undertaken with several statutory and non-statutory consultees and interested parties including the Scottish Government, the Highland Council, the Scottish Environment Protection Agency (SEPA), Scottish Water and local stakeholders including local landowners and members of the public. No responses were received from the following consultees: Scottish Forestry, British Horse Society, Civil Aviation Authority, Fisheries Management Scotland, John Muir Trust, ScotWays, Scottish Wildlife Trust, Visit Scotland, Dunvegan Community Council, Struan Community Council, Portree and Braes Community Council, Kyle Community Council and Skeabost and District Community Council. Responses received to the EIA Scoping Report with relevance to hydrology, geology, hydrogeology and peat are provided in

Table 9.4: Consultee Responses Relevant to Hydrology, Geology, Hydrogeology and Peat

Name of Stakeholder/ Consultee	Key Concerns	Response
The Highland Council	The developer should undertake a specific peat assessment to inform the siting, design, or other mitigation in order to overcome significant effects on Carbon Rich Soils, Deep Peat, and Priority Peatland Habitat (CPP).	Peat slide risk assessment is contained in Technical Appendix 9.1 and a Peat Management Plan is contained in Technical Appendix 9.2 .
	The EIAR should address the likely impacts on the nature conservation interests of all the designated sites in the vicinity of the Proposed Development.	Designated sites are identified in Section 9.5 and impacts are discussed in Section 9.8 .
	The EIAR needs to address the aquatic interests within local watercourses, including downstream interests that may be affected by the development, for example increases in silt and sediment loads resulting from construction works; pollution risk / incidents during construction; obstruction to upstream and downstream migration both during and after construction; disturbance of spawning beds / timing of works; and other drainage issues. The EIAR should evidence consultation input from the local fishery board(s) where relevant.	A baseline for the hydrology of the Site is described in Section 9.5. Potential impacts are discussed in Section 9.8 . A Drainage Impact & Watercourse Crossing Assessment is contained in Technical Appendix 9.4 . Fisheries information is considered in Chapter 7 (Ecology) .
	The EIAR should include an assessment of the effects on Ground Water Dependent Terrestrial Ecosystems (GWDTE).	Impacts upon GWDTE are considered in Technical Appendix 9.3 .
	The EIAR needs to address the nature of the hydrology and hydrogeology of the site, and of the potential impacts on water courses, water supplies including private supplies, water quality, water quantity and on aquatic flora and fauna. Impacts on watercourses, lochs, groundwater, other water features and sensitive	The nature of the hydrology and hydrogeology of the Site are described in Section 9.5 and the impacts of the development on water resources are addressed in Section 9.8 . Mitigation measures to prevent erosion, sedimentation or discolouration are provided in Section 9.8 .

Name of Stakeholder/ Consultee	Key Concerns	Response
	receptors, such as water supplies, need to be assessed. Measures to prevent erosion, sedimentation or discolouration will be required, along with monitoring proposals and contingency plans.	Impacts on aquatic fauna and flora are considered in Chapter 7 (Ecology) .
	If culverting should be proposed, either in relation to new or upgraded tracks, then it should be noted that SEPA has a general presumption against modification, diversion or culverting of watercourses. Schemes should be designed to avoid crossing watercourses, and to bridge watercourses where this cannot be avoided.	Noted. A watercourse crossing assessment is provided in Technical Appendix 9.4 .
	The EIAR must consider the risks of engineering instability relating to presence of peat on the site. A comprehensive peat slide risk assessment in accordance with the Scottish Government Best Practice Guide for Developers will be expected. Assessment should also address pollution risk and environmental sensitivities of the water environment. It should include a detailed map of peat depth and evidence that the scheme minimises impact on areas of deep peat. The EIAR should include site-specific principles on which construction method statements would be developed for engineering works in peat land areas, including access roads, turbine bases and hard standing areas, and these should include particular reference to drainage impacts, dewatering and disposal of excavated peat.	A peat slide risk assessment is contained in Technical Appendix 9.1 . A peat management plan is contained in Technical Appendix 9.2 .
	The EIAR should include a full assessment on the impact of the development on peat. The assessment of the impact on peat must include peat probing for all areas where development is proposed.	A peat management plan is provided in Technical Appendix 9.2 .

Name of Stakeholder/ Consultee	Key Concerns	Response
	<p>The EIAR should fully describe the likely significant effects of the development on the local geology including aspects such as borrow pits, earthworks, site restoration and the soil generally including direct effects and any indirect.</p> <p>Where borrow pits are proposed the EIAR should include information regarding the location, size and nature of these borrow pits including information on the depth of the borrow pit floor and the borrow pit final reinstated profile. This can avoid the need for further applications.</p>	<p>The impact of the development on the local geology is described in Section 9.5.</p>
THC Flood Risk Management Team	Water crossings in the form of culverts or bridges, or upgrades to existing crossings must be designed to accommodate to 1 in 200 year flood event, plus climate change;	Noted. Water crossings are addressed in Technical Appendix 9.4 .
SEPA	In order to fully assess the environmental impacts, this needs to quantitatively detail issues such as volume of peat disturbed, number of watercourse crossings and other environmental receptors and explain why the proposed site layout is the optimal layout.	A peat management plan detailing the quantity of peat disturbed is contained in Technical Appendix 9.2 . A drainage impact and watercourse crossing assessment is provided in Technical Appendix 9.4 .
	The planning submission must a) demonstrate how the layout has been designed to minimise disturbance of peat and consequential release of CO ₂ and b) outline the preventative/mitigation measures to avoid significant drying or oxidation of peat through, for example, the construction of access tracks, drainage channels, cable trenches, or the storage and re-use of excavated peat.	Information on peat depths and mitigation of the development impacts on peatland are addressed in Technical Appendix 9.2 . Release of CO ₂ is addressed in Chapter 15 (Climate Change Mitigation) .
	The submission must include: a) A detailed map of peat depths (this must be to full depth and follow the survey	Information on peat depths in compliance with the Scottish Government's Guidance on Developments on Peatland -

Name of Stakeholder/ Consultee	Key Concerns	Response
	requirement of the Scottish Government's Guidance on Developments on Peatland - Peatland Survey (2017)) with all the built elements (including peat storage areas) overlain to demonstrate how the development avoids areas of deep peat and other sensitive receptors such as Groundwater Dependent Terrestrial Ecosystems.	Peatland Survey (2017) as well as information on peat storage areas are detailed in Technical Appendix 9.2 .
	GWDTE are protected under the Water Framework Directive and therefore the layout and design of the development must avoid impact on such areas. The following information must be included in the submission: a) A map demonstrating that all GWDTE are outwith a 100m radius of all excavations shallower than 1m and outwith 250m of all excavations deeper than 1m and proposed groundwater abstractions. If micro-siting is to be considered as a mitigation measure the distance of survey needs to be extended by the proposed maximum extent of micro-siting. The survey needs to extend beyond the site boundary where the distances require it.	GWDTE are addressed in Technical Appendix 9.3 .
	The submission must include: a) A map demonstrating that all existing groundwater abstractions are outwith a 100m radius of all excavations shallower than 1m and outwith 250m of all excavations deeper than 1m and proposed groundwater abstractions. If micro-siting is to be considered as a mitigation measure the distance of survey needs to be extended by the proposed maximum extent of micro-siting. The survey needs to extend beyond the site boundary where the distances require it.	Private water supplies are identified in Section 9.5 and assessed in Section 9.8 . A site walkover to obtain additional information was conducted.

Name of Stakeholder/ Consultee	Key Concerns	Response
	Map and site layout of borrow pits to be submitted with application.	<p>The location of the borrow pits is shown on Figure 2.3 of the EIA.</p> <p>A borrow pit assessment report is attached as Technical Appendix 9.5.</p> <p>The BPA report includes the layout of each proposed borrow pit.</p>
Scottish Water	<p>For reasons of sustainability and to protect our customers from potential future sewer flooding, Scottish Water will not accept any surface water connections into our combined sewer system.</p> <p>There may be limited exceptional circumstances where we would allow such a connection for brownfield sites only, however this will require significant justification from the customer taking account of various factors including legal, physical, and technical challenges.</p>	<p>Concerns over surface water flooding are addressed in Section Error! Reference source not found.</p> <p>There are no plans to connect surface water drainage into the combined sewerage system; surface water drainage will be dealt with on site.</p>
NatureScot	The larger turbines will necessitate wider spacing and it will not be possible to re-use all of the existing infrastructure. However, we recommend that the design should seek to maximise the reuse of infrastructure in-situ in the first instance and failing that re-use the materials for the new infrastructure. Where peat disturbance is unavoidable, it is preferable to re-use previously disturbed sites (e.g. site compounds, track edges) rather than undisturbed bog.	Existing infrastructure <i>in situ</i> will be reused in the first instance and where this is impossible, materials will be upcycled for the new infrastructure as much as safely possible.
	We recommend early consideration of degraded peatland areas that could be included in a Habitat Management Plan as part of any compensatory and enhancement measures.	Information on peat depth and peatland enhancement are addressed in Technical Appendix 9.2 .

Name of Stakeholder/ Consultee	Key Concerns	Response
	<p>The EIA should include details of peat depth, and habitat condition, along with an assessment of the feasibility and prospects for improvement.</p> <p>Opportunities for mitigating impacts should be considered, such as use of floating roads and careful planning of drainage. Plans for compensation and habitat enhancement should be presented as part of a Habitat Management Plan.</p>	

9.4 Statutory and Planning Context

9.4.1 In preparing this section of the EIAR, consideration has been given to relevant statutory requirements and planning guidance at all levels. This includes, but is not limited to, the following:

- The European Water Framework Directive (2000/60/EC) and associated daughter Directives including the Groundwater Daughter Directive (Protection of Groundwater Against Pollution, 2006/118/EC);
- The European Mining Waste Directive (2006/21/EC);
- The European Floods Directive (2007/60/EC);
- The Environmental Protection Act 1990 (as amended);
- The Water Environment and Water Services (Scotland) Act 2003;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended);
- The Pollution Prevention and Control (Scotland) Regulations 2012;
- SEPA's Position Statement WAT-PS-10-01: Assigning Groundwater Assessment Criteria for Pollutant Inputs;
- National Planning Framework 4;
- Scottish Renewables *et al.* (2019) Good Practice during Wind Farm Construction 4th Edition
- Scottish Government's Planning Advice Notes (PAN):
 - PAN 51: planning, environmental protection and regulation, 2006;
 - PAN 61: sustainable urban drainage systems, 2001;
 - PAN 69: flood risk, 2015; and
 - PAN 79: water and drainage, 2006.
- Scottish Environment Protection Agency's Guidance for Pollution Prevention (GPP & PPG):
 - GPP 1: Understanding your environmental responsibilities – good environmental practices, 2013;
 - GPP 2: Above ground oil storage tanks, 2017;
 - GPP 3: Use and design of oil separators in surface water drainage systems, 2006;
 - GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer, 2017;
 - GPP 5: Works and maintenance in or near water, 2017;
 - GPP 8: Safe storage and disposal of used oils, 2017;
 - GPP 13: Vehicle washing and cleaning, 2017;
 - PPG 18: Managing fire water and major spillages, 2000;
 - GPP 21: Pollution incident response planning, 2017;
 - GPP 22: Dealing with spills, 2018; and

- Code of Practice for Using Plant Protection Products in Scotland.

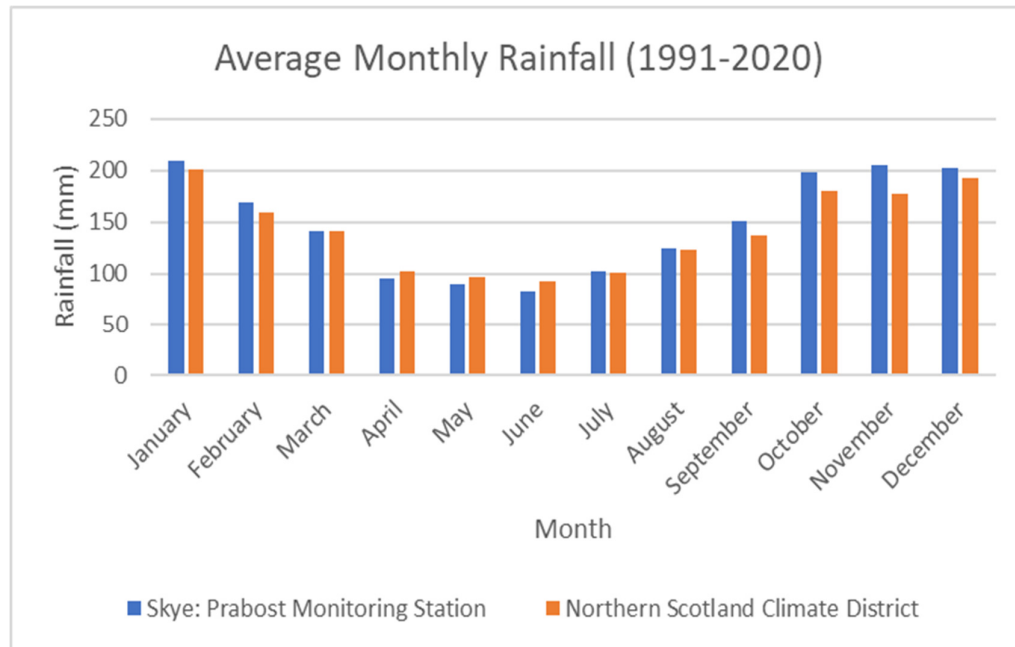
9.5 Existing Environment

Meteorology and Climate

- 9.5.1 The Proposed Development is located approximately 15 km west of Portree and 5 km east of Dunvegan, on the Isle of Skye. The Isle of Skye is part of the Highland Council area and is situated within the UK Meteorological (Met) Office's Northern Scotland climate district (Met Office, 2016). Much of Northern Scotland is exposed to the rain-bearing westerly winds associated with Atlantic depressions which pass close to, or across the UK. Scotland's Western Isles and north-west coast are, on average, the windiest in the UK and are fully exposed to the Atlantic weather fronts.
- 9.5.2 Northern Scotland is characterised by steep mountains, glens and sea-lochs which contribute to the changeable weather patterns and temperatures in the region. Temperatures are highly variable depending on the combination of topography and distance from the coast. On average, annual temperatures are around 9°C in areas of lower altitude, including the Western Isles, and 1°C on some of the higher summits.

Rainfall

- 9.5.3 The Proposed Development is around 10 km south-west of the Prabost climate monitoring station (Met Office, 2023). Rainfall patterns at the Site are expected to be similar to those observed at the Prabost monitoring station.
- 9.5.4 Average annual rainfall from 1991-2020 for the Prabost monitoring station is 1,769.05 mm compared to 1,702.52 mm for the Northern Scotland climate district. The altitude at the Prabost monitoring station is 67 m above Ordnance Datum (AOD). **Graph 9.1** shows the average monthly rainfall distribution for the Prabost monitoring station and, to compare, the Northern Scotland climate district for the period 1991-2020.



Graph 9.1: Monthly rainfall averages at Prabost monitoring station and Northern Scotland climate district averages. Figures cover the period 1991-2020 (Met Office, 2023).

Geology

- 9.5.5 Geological information is derived from the BGS GeoIndex online geological mapping at a 1:50,000 scale (BGS, 2023a) and the BGS Lexicon of Named Rock Units (BGS, 2023b). Geological mapping is shown on **Figures 9.1a** and **9.1b**.

Bedrock Geology

- 9.5.6 The Site is underlain by basalt lavas from the Skye Lava Group varying in composition from alkali basalt to hawaiite and mugearite, all of Palaeogene age. Some lavas include larger crystals of feldspar and are described as feldspar-phyric. The majority of the bedrock has a finely crystalline and relatively uniform texture and dark grey to brown colour.
- 9.5.7 A series of dykes is present across the Site. These form part of the North Britain Palaeogene Dyke Suite and consist of basalt and microgabbro. The dykes all trend in a north-west to south-east direction and are associated with the Skye Central Complex that forms the Cuillin hills.
- 9.5.8 The area is cut by a series of north-west to south-east trending extensional faults cross-cut by later north-south or north-east to south-west trending faults, relating to a period of folding and basin formation. The faults are not geologically active and recent seismic activity in the area is very limited. No earthquakes have been recorded within the Site. Within 5 km of the Site one minor earthquake was recorded in 1986, with a Richter local magnitude (RML) of 1.5.

Mineral Extraction

- 9.5.9 The Coal Authority Interactive Map (Coal Authority, 2023) and BGS GeoIndex (2023a) maps show no records of active or historic mining within or near the Site.
- 9.5.10 A number of gravel pits have been identified within 2 km of the Site; these include:
- Balmeanach, 1.8 km to the south-east of the Site;
 - Rosgill Bridge, 1.7 km to the west of the Site; and
 - Ben Crokaig, 1.6 km to the north-west of the Site.

Superficial Geology

- 9.5.11 BGS GeoIndex (2023a) indicates that the Site is dominated by extensive peat deposits in most areas, which appear slightly sparser in the east and south.
- 9.5.12 Small pockets of Devensian diamaction till are distributed around the Site, particularly around watercourses. Till is described as highly variable glacial sediment consisting of unsorted material ranging in size from clay to boulders, usually with a matrix of clay to sand.
- 9.5.13 Alluvium consisting of clay, silt, sand and gravel is also present within the Site, particularly around the Caroy River where it appears relatively extensive.
- 9.5.14 No artificial ground was identified within the Site.

Soils and Peat

- 9.5.15 The Soil Survey of Scotland (1981a) digital soils mapping indicates that soil coverage within the Site predominantly consists of peat, peaty gleys and peaty podzols of the Darleith Association. Areas of brown earth soils are present, particularly near the Caroy River. Two areas of blanket peat are identified: in the north-west of the Site, and south of the Aketil Burn in the south-east of the Site. Further details on soils found within the Site are provided in **Table 9.5**.

Table 9.5: Soils within the Site (Soil Survey of Scotland, 1981b)

Soil Assoc.	Parent Materials	Component Soils	Landforms	Vegetation	Area (%)
Darleith	Drifts derived from basaltic rocks	Peaty gleys, peat; some peaty podzols	Terraced hills with gentle and strong slopes; slightly to moderately rocky	Atlantic and bog heather moor; Blanket and upland blanket bog; Flying bent bog and grassland	80
		Brown forest soils; some brown rankers	Hills and valley sides, frequently terraced, with gentle and strong slopes; slightly rocky	Arable and permanent pastures; Bent-fescue grassland; Herb-rich Atlantic heather moor	10
Organic Soils	Organic deposits	Blanket peat	Uplands and northern lowlands with gentle and strong slopes	Blanket and flying bent bog; Northern and upland blanket bog	10

- 9.5.16 According to NatureScot's Carbon and Peatland Map (2016), the majority of the Site is underlain by Class 1 soils and peatland, defined as 'nationally important carbon-rich soils, deep peat and priority peatland habitat' which are considered to be areas likely to be of high conservation value.
- 9.5.17 Elsewhere in the Site, Class 0 soils are found around the Caroy River. Some minor areas of the Site are underlain by Classes 2, 3 and 5 soils or peatland. The areas of each carbon and peatland class within the Site are provided in **Table 9.6** and shown on **Figure 9.2**.

Table 9.6: Carbon and Peatland Classes Present within the Site (NatureScot, 2016)

Peatland Class	Description	Area (%)
Class 1	Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value.	86.8
Class 2	Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential.	0.6
Class 3	Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat.	1.4
Class 5	Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat.	1.3
Class 0	Mineral soil - Peatland habitats are not typically found on such soils.	9.8

- 9.5.18 A Phase 1 peat depth survey of the Site was undertaken in June 2022. A Phase 2 peat depth and condition survey was undertaken in August and November 2022 for areas of proposed infrastructure and access tracks.
- 9.5.19 Peat depth surveys indicate that peat cover across the Site is very extensive. In the north of the Site there are only small areas with soil depths of less than 0.5 m, with some slightly larger areas towards the south of the Site. The majority of the Site has peat that is between 0.5-1.5 m deep, although peat depths are generally variable throughout the Site. Surveys recorded the deepest peat depth values in the north-west of the Site.
- 9.5.20 Further details of peat depth and peat depth variation are provided in **Technical Appendix 9.2**. An overview map of the peat depth distribution within the Site is provided in **Figure 9.3**.

Geomorphology

- 9.5.21 The Proposed Development lies on relatively low undulating ground which slopes gently from north-east to south-west, as can be seen in **Figure 9.1.2**. Elevations in the Site range from around <5 m AOD in the southernmost part of the Site, to 268 m AOD near the eastern margin.

- 9.5.22 From Ben Aketil, the ground slopes down to the north, west and south. The westernmost part of the site begins to rise again on the western side of the Caroy River. The southernmost part of the site is just above sea level, near where the Caroy River flows into the sea loch Loch Caroy.
- 9.5.23 The Northern Site Access slopes down from the existing Ben Aketil Wind Farm and joins the A850 at approximately 50 m AOD.
- 9.5.24 Within the main part of the Site, the existing Ben Aketil Wind Farm lies along a shallow ridge that runs from Ben Aketil and Ben Sca (283 m AOD), north-westwards towards Ben Horneval (264 m AOD) and Strone Geers (185 m AOD). This ridge forms a watershed between the Caroy River, draining south, and the Red Burn, draining north.

Hydrogeology

- 9.5.25 The Site is underlain by bedrock forming part of the Skye North groundwater body. This is classed as a low productivity aquifer with small amounts of groundwater in the near-surface weathered zone and secondary fractures. Flow is virtually all through fractures and discontinuities (Scottish Government, 2023).
- 9.5.26 The Skye North groundwater body is considered to have good water quality and is in good overall status (Scottish Government, 2023).
- 9.5.27 Regional groundwater flow will tend to mimic the natural topography, predominantly flowing south and west from the slopes of Ben Aketil toward the Caroy River and Loch Caroy. In the area around the Northern Site Access, groundwater flow would mainly be towards the north-west and the Red Burn.
- 9.5.28 The superficial deposits within the Site are predominantly peat. Peat bodies will hold some groundwater but drainage is impeded and poor. Flow within peat is known to be extremely slow, although it can contribute some limited baseflow to local streams and burns. The diamicton till, alluvium and alluvial fan deposits may hold groundwater but their restricted area indicates that they would not be able to hold significant volumes.
- 9.5.29 There are no superficial aquifers within the application boundary.

Groundwater Vulnerability

- 9.5.30 Groundwater vulnerability is described by Dochartaigh *et al.* (2011) as 'the tendency and likelihood for general contaminants to move vertically through the unsaturated zone and reach the water table after introduction at the ground surface'. Groundwater vulnerability classes range from 1, only vulnerable to conservative pollutants in the long term when continuously and widely discharged/leached, to 5, vulnerable to most pollutants, with rapid impact in many scenarios (Dochartaigh *et al.*, 2011).
- 9.5.31 Groundwater vulnerability mapping identifies that the Site is generally assigned Class 4a, with areas in the centre of the Site assigned Class 4b. Both Classes 4a and 4b are considered to be vulnerable to pollutants not readily absorbed or transformed. Class 4a is less likely to have clay present in superficial deposits and may also have low permeability soil, while Class 4b is more likely to have clay present in superficial deposits.

Groundwater-Dependent Terrestrial Ecosystems

- 9.5.32 GWDTE are defined by UKTAG (2004) as:

- 9.5.33 A terrestrial ecosystem of importance at Member State level that is directly dependent on the water level or flow of water from a groundwater body (that is, in or from the saturated zone). Such an ecosystem may also be dependent on the concentrations or substances (and potentially pollutants) within that groundwater body, but there must be a direct hydraulic connection with the groundwater body.
- 9.5.34 In line with the guidance provided in UKTAG (2004), a dual approach to identifying GWDTE has been used. This involves detailed study of vegetation communities in order to determine the potential level of groundwater dependency, combined with detailed hydrogeological study in order to identify locations where groundwater reaches the surface and is able, therefore, to provide a source of water to associated habitats.
- 9.5.35 A habitat mapping exercise was completed as part of the ecology baseline assessment, which was used to identify potential GWDTE within the Site. The results of the habitat mapping exercise are discussed in **Chapter 7: Ecology**.
- 9.5.36 Within the Site, potentially groundwater-dependent NVC communities identified are:
- M23 *Juncus effusus* – *Galium palustre* rush-pasture
 - M10 *Carex dioica* – *Pinguicula vulgaris* mire
 - M9 *Carex rostrata* – *Calliergon cuspidatum/giganteum* mire
 - M6 *Carex echinata* – *Sphagnum recurvum/auriculatum* mire
 - W7 *Alnus glutinosa* – *Fraxinus excelsior* – *Lysimachia nemorum* woodland
 - M15 *Scirpus cespitosus* – *Erica tetralix* wet heath
 - M25 *Molinia caerulea* – *Potentilla erecta* mire
 - M27 *Filipendula ulmaria* – *Angelica sylvestris* mire
 - MG10 *Holcus lanatus* – *Juncus effusus* rush-pasture
 - MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland
 - U6 *Juncus squarrosus* – *Festuca ovina* grassland
- 9.5.37 NVC Communities identified by SEPA as being potentially highly or moderately groundwater-dependent, depending on the hydrogeological setting, are listed in SEPA's publication 'Planning guidance on onshore windfarm developments' (SEPA, 2017). M23, M10, M9, M6 and W7 have potentially high groundwater dependency in Scottish situations. M15, M27 MG10, MG9 and U6 have potentially moderate groundwater dependency and M25 has potentially low groundwater dependency in Scottish situations, dependent on the hydrogeological setting.
- 9.5.38 Further details regarding GWDTE are provided in **Technical Appendix 9.3**. An overview map of potential GWDTE habitats within the Site is provided in **Figure 9.3.1**.

Hydrology

- 9.5.39 The Site lies across two catchment areas: the Caroy River and the Red Burn catchments (CEH, 2023). The majority of the Site and the Developable Area are located within the Caroy River catchment, while the Northern Site Access is located in the Red Burn catchment. A small area in the south-east of the Site lies within the Allt nan Cat catchment, which is part of the Isle of Skye coastal catchment between the Caroy River and the River Ose (SEPA, 2023a). Catchment areas are shown in **Figure 9.4**.
- 9.5.40 The catchment wetness index (PROPWET) for both the Caroy River and Red Burn is 0.73, indicating that soils in the Site are wet for 73% of the time. Both catchments have a

baseflow index (BFI HOST19) of 0.26, indicating a very low input of groundwater baseflow to surface watercourses. The standard percentage runoff (SPR HOST) is 55-57%, indicating that this percentage of rainfall onsite is converted into surface runoff from rainfall events; this represents a high runoff risk where soils have a limited capacity to store rainfall and/or a slow infiltration rate and will quickly saturate, leading to rapid runoff.

- 9.5.41 Catchment statistics derived from the Flood Estimation Handbook Web Service (CEH, 2023) are provided in **Table 9.7**. Catchment statistics have only been provided for the main catchments within the Site.

Table 9.7: Catchment Statistics

Catchment Name	Catchment Wetness Index (PROPWET)	Base Flow Index (BFI HOST19)	Standard Percentage Runoff (SPR HOST)	Site Area (%)
Caroy River	0.73	0.26	55.45%	86.6
Red Burn	0.73	0.26	57.07%	10.0
Allt nan Cat	Not available			3.4

Watercourses

- 9.5.42 Watercourses within the Site appear mainly to be in natural or near-natural condition, with relatively high levels of sinuosity, defined as having lots of meanders. In the south of the Site, some watercourses appear to have been modified.
- 9.5.43 Key watercourses within the catchments are shown in **Figure 9.4**.

Caroy River Catchment

- 9.5.44 The Caroy River catchment has a total area of 13.06 km² and drains 86.6% of the Site.
- 9.5.45 The Caroy River which flows southwards through the Site, provides the main drainage within this catchment. Several smaller tributaries drain into the Caroy River in the north of the Site around Gleann Eoghainn and in the south around Upper Feorlig. In the centre of the Site, the Rageary Burn and associated tributaries drain west into the Caroy River. In the south of the Site, the Aketil Burn drains south-west into the Caroy River.
- 9.5.46 The northern area of the Caroy River catchment is an upland region characterised by heather moorland, peatland, and minor areas of forestry. The south is characterised by lower lying ground, peatland, and areas of agricultural land.
- 9.5.47 The Caroy River channel has been modified in the area around the existing track crossing. A straight channel has been constructed and the old meandering channel largely blocked off. This appears to have had negative effects for the watercourse as the straight channel shows signs of regular dredging to ensure it continues to operate as designed. The existing crossing provides a width constraint on the modified channel.

Red Burn Catchment

- 9.5.48 The Red Burn catchment has a total area of 13.21 km² and drains 10.0% of the Site.

- 9.5.49 The Red Burn and its tributaries provide drainage for the north-west of the Site and the Northern Site Access. The Allt a' Choire and several associated tributaries drain north-westwards out of the Site towards the Red Burn. The Northern Site Access crosses the Allt a' Choire and two other minor tributaries which drain westwards towards the Red Burn: the Allt Donachaidh and an unnamed tributary.
- 9.5.50 The southern part of the Red Burn catchment is an upland area characterised by peatland and moorland; the rest of the catchment predominantly comprises areas of commercial forestry and rough open land, with some evidence of lazy bed cultivation in the lower reaches.

Water Quality

Surface Waterbodies

- 9.5.51 SEPA's Water Environment and Water Classification Hubs (SEPA 2023b & SEPA 2023c) have been consulted to determine the existing baseline water quality for the main watercourses and waterbodies within the Site. The details are summarised in **Table .**

Table 9.8: Summary of Baseline Surface Water Quality Status

Waterbody Name and ID	Status		Pressures
Caroy River (ID 20726)	Condition in 2014	Overall: Good Water flows & levels: High Physical condition: Good Water quality: Good	None
	Classification in 2020	Overall: Good Biology (fish): High Hydromorphology: Good	
Red Burn (ID 20729)	Condition in 2014	Overall: Good Water flows & levels: High Physical condition: High Water quality: Good	None
	Classification in 2020	Overall: Good Biology (fish): High Hydromorphology: Good	

Groundwater

- 9.5.52 Scotland's Environment groundwater classification map (SEPA, 2023d) was also consulted for groundwater quality information. The Skye North groundwater body is classified as having 'good' overall status.

Receiving Waterbodies

- 9.5.53 SEPA's Water Environment and Water Classification Hubs (SEPA 2023b & SEPA 2023c) have also been consulted to determine the existing baseline water quality for the Site's receiving waterbodies. The details are summarised in **Table** .
- 9.5.54 The Caroy River drains southwards into Loch Caroy, and then Loch Bracadale. The Red Burn drains northwards into Loch Greshornish.

Table 9.9: Summary of Receiving Waterbody Quality Status

Waterbody Name and ID	Status		Pressures
Loch Bracadale (ID 200357)	Condition in 2014	Overall: High Physical condition: High Water quality: High	None
	Classification in 2020	Overall: High Biology: High Hydromorphology: High	
Loch Greshornish (ID 200133)	Condition in 2014	Overall: Good Physical condition: High Water quality: Good	None
	Classification in 2020	Overall: Good Biology: Good Hydromorphology: High	

Water Resources

- 9.5.55 Within 2 km of the Site BGS GeoIndex (2023a) identifies several boreholes which are located either side of the A850. OS mapping also identifies one well (133841, 851117) and one spring (132957, 843683) within 2 km of the Site. The location of the spring is likely to be the PWS identified at 8 Balmeanach (PWS 7).
- 9.5.56 Data obtained from the THC (2021) regarding PWS indicates that none are identified within the Site, and seven are identified within 2 km of the Site. Details of PWS identified are provided below in **Table 9.10:** and shown on **Figure 9.5.**

Table 9.10: Private Water Supplies Within 2 km of the Site Boundary

No.	Supply Name	Source Location	Source Type	Distance from Site	Linkage
1	Glen View, 12 Upper Feorlig	129937, 845119	Borehole	220 m S	No linkage located within separate sub-catchment
2	Caoran Na Mara	130765, 843170	Spring	0.7 km SE	No linkage; located within separate catchment
3	1 Balmeanach	130930, 842997	Spring	0.9 km S	No linkage; located within separate catchment
4	Spindrift, 4 Balmeanach	132063, 843486	Spring	1.2 km SE	No linkage; located within separate catchment
5	Balmeanach House	132067, 843472	Spring	1.2 km SE	No linkage; located within separate catchment
6	12 Ose	131114, 842611	Spring	1.3 km SE	No linkage; located within separate catchment
7	8 Balmeanach	132956, 843608	Spring	1.8 km SE	No linkage; located within separate catchment

Flood Risk

- 9.5.57 SEPA's Indicative Flood Map (2023e) was consulted to gain an overview of the likelihood of flooding within and downstream of the Application Boundary. Flood risk within the Application Boundary is shown to be minimal, with some localised regions of river (fluvial) and surface water (pluvial) flood risk.
- 9.5.58 These areas are confined to the main channels of the Caroy River, Red Burn and Aketil Burn, all of which have a high likelihood of flooding, defined as having a 10% chance of a flooding in a given year. Additionally, there are a few very minor isolated locations of high pluvial flood risk scattered across the Site, mainly associated with tributaries.

Designated Sites

- 9.5.59 Designated sites of relevance to geology, hydrogeology and hydrology that are located within 5 km of the Site are identified within **Table 9.11**. Data were collated from NatureScot's SiteLink map (NatureScot, 2023) and SEPA's designated sites information (SEPA, 2023f). Sites reviewed include Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC) and Ramsar sites (internationally recognised wetlands). Geological Conservation Review (GCR) sites were also reviewed; these do not have a statutory designation but identify sites of national importance due to their geological features.

Table 9.11: Designated Sites Relevant to Hydrology, Geology, Hydrogeology and Peat

Site Name	Qualifying Features	Distance From Site	Linkage
An Cleireach SSSI, GCR	Tertiary igneous intrusion of significant petrogenetic importance; example of gabbroic-anorthosite sheet	0.95 km SE	No linkage

9.5.60 In addition, sites designated for reasons that may be affected by changes to the hydrological regime have been identified. These include shellfish water protected areas. Designated areas within 5 km of the Site boundary are identified in **Table 9.12**.

Table 9.12: Designated Sites That May Be Affected by Changes to Hydrology

Site Name	Qualifying Features	Distance From Site	Linkage
Loch Caroy SWPA	Shellfish waters protected area	0.8 km S of Southern Access	Potential; the Caroy River flows into Loch Caroy
Loch Snizort SWPA	Shellfish waters protected area	1.2 km NE of Northern Access	Potential; the Red Burn flows into Loch Greshornish/Loch Snizort

9.6 Influence on Design

9.6.1 The importance of hydrology, geology, hydrogeology and peat has been recognised throughout the Proposed Development design process. The design principles and evolution are described in Section 2.5 of **Chapter 2: Proposed Development**. Key features that have had a considerable influence on design are:

- Peatland and peat depth;
- Watercourses and waterbodies;
- Potential GWDTE;
- Private Water Supplies; and
- Designated Sites.

9.7 Mitigation

9.7.1 While outlined and accounted for within the assessment below, this section provides a detailed summary of the mitigation that would be adopted for the Proposed Development.

Mitigation by Design

9.7.2 All excavation works requiring removal of bedrock or superficial deposits have been kept to a practical minimum by good site design.

9.7.3 Careful and informed infrastructure design forms a key measure for prevention of induced instability in peat. The collated peat depth information has been used to inform the proposed infrastructure layout throughout the design process. Incursion into areas of

deeper peat has been kept to a practical minimum by careful design and would be further reduced by local micro-siting, where possible, in order to minimise disruption to peatland ecosystems and hydrology, and to avoid the risk of induced peat instability. Where incursion into deeper peat has been required, floating road construction is proposed where ground conditions are suitable.

- 9.7.4 Access tracks are anticipated to be constructed using established cut-and-fill and floating road construction methods. Any peat present along the routes proposed for cut-and-fill track would be excavated and stored for use in reinstatement of elements of project infrastructure where appropriate.

Mitigation Commitments

Soils and Peat

- 9.7.5 Soil stripping would be undertaken by the Principal Contractor with care and would be restricted to as small a working area as practicable. Topsoil would be removed and laid in a storage bund, up to 2 m in height, on unstripped ground adjacent to the working area. It would be attempted to retain the turf layer vegetation-side-up where possible, although ground conditions may make this challenging. Subsoils and superficial geological deposits would be removed subsequently and laid in storage bunds, also up to 2 m in height, clearly separated from the topsoil bund. Care would be taken to maintain separate bunds for separate soil types in order to preserve soil quality.
- 9.7.6 For work within areas of peat, acrotelmic peat (the uppermost 0.5 m) would be removed as for the topsoil. It would be attempted to retain the acrotelm vegetation-side-up where possible, although ground conditions may make this challenging.
- 9.7.7 The underlying catotelmic peat would be stored in bunds up to 1 m in height. Catotelmic peat is sensitive to handling, and loses its internal structure easily, so would be transported as short a distance as possible to its storage location. Excavation of catotelmic peat has been limited by careful infrastructure design.
- 9.7.8 Limited smoothing or 'blading' of stockpiled soils and catotelmic peat would be undertaken by the Principal Contractor to help shed rainwater and prevent ponding of water on the stockpile. Bunds on notably sloping ground would have sediment control measures installed near the base, on the downslope side, to collect and retain any sediment mobilised by rainfall. Stockpiles would be located on flat or nearly flat ground where possible.
- 9.7.9 Excavated soil and peat would be used in restoration and rehabilitation at the end of the construction period, in order to promote fast re-establishment of vegetation cover on worked areas and areas of bare soil or peat that are not required for the operational phase. Excavated soil and peat may be used for surface reinstatement of borrow pits. Soils and peat would be stored for as short a time as practicable, in order to minimise degradation through erosion and desiccation.
- 9.7.10 Should prolonged periods of dry weather occur, a damping spray would be employed to maintain surface moisture on the soil and peat bunds. This would help to maintain vegetation growth in the turves and retain the soil structure.
- 9.7.11 Construction work would make use of the current best practice guidance relating to developments in peatland areas (Scottish Renewables *et al.*, 2019). A risk management

system, such as a geotechnical risk register, would be compiled and maintained at all stages of the Proposed Development and developed as part of the post-consent detailed design works, and would be updated as new information becomes available.

- 9.7.12 Micrositing would be used to avoid possible problem areas identified during ground investigation or other detailed design works. This would be assisted by additional verification of peat depths, to full depth, in any highlighted areas where construction work is required.
- 9.7.13 Construction activities would be restricted during periods of wet weather, particularly for any work occurring within 20 m of a watercourse or within areas of identified deeper peat. Careful track design would ensure that the volume and storage timescale for excavated materials would be minimised as far as practicable during construction works.
- 9.7.14 Vegetation cover would be re-established as quickly as possible on track and infrastructure verges and cut slopes, by re-laying of excavated peat acrotelm, to improve slope stability and provide erosion protection. Additional methods, including hydroseeding and/or use of a biodegradable geotextile, would be considered if necessary in specific areas.
- 9.7.15 During construction, members of the construction staff would undertake advance inspections and carry out regular monitoring for signs of peat landslide indicators. A geotechnical specialist would be on call to provide advice should any peat landslide indicators be identified.
- 9.7.16 Construction staff would be made aware of peat slide indicators and emergency procedures. Emergency procedures would include measures to be taken in the event that an incipient peat slide is detected.

Surface Watercourses and Groundwater

- 9.7.17 Silt fencing or appropriate alternative sediment control protection would be installed on the downslope side of excavations to prevent inadvertent discharge of silty water into, or towards, any watercourse within the Site.
- 9.7.18 All engineering works adjacent to watercourses, including access tracks and watercourse crossing structures, would have appropriate sediment control measures established prior to any groundworks.
- 9.7.19 Vegetation would be retained along watercourse banks to act as additional protection to the watercourses.
- 9.7.20 Monitoring would begin prior to any construction works, to allow pre-construction baseline quality to be determined. Details would be agreed with SEPA, but are anticipated to include at least the following:
 - visual checks for entrained sediment; and
 - *in situ* measurements of pH, temperature and specific conductivity.
- 9.7.21 *In situ* measurement of turbidity and dissolved oxygen may be recommended by SEPA or the environmental manager for locations with particular sensitivity, if relevant.
- 9.7.22 Pre-construction monitoring would be undertaken by the Principal Contractor on a monthly basis for a minimum period of three months prior to any work taking place.

- 9.7.23 During construction, monitoring would be undertaken by the environmental manager or suitably experienced alternative. Any change from baseline conditions of pH and/or specific conductivity would potentially indicate an incident and additional investigation would be required in order to identify the origin of the change. Control locations (WQC1, WQC2, WQC3 and WQC4) are intended to help differentiate between incidents arising from, and those unrelated to, the Proposed Development.
- 9.7.24 Recommended frequency of monitoring for the different locations are provided in **Table 9.13**.
- 9.7.25 Proposed monitoring locations are shown on **Figure 9.6**.
- 9.7.26 Groundwater monitoring boreholes would be established by the Principal Contractor within the proposed borrow pit areas prior to any construction work commencing, to a depth of at least 1 m below the deepest expected excavation. Groundwater level monitoring would be undertaken by the Principal Contractor to determine whether groundwater is present within the borrow pit areas and, if it is, at what level the seasonally highest groundwater table stands. Any groundwater within a borrow pit area would be managed in line with best practice, with discharge via a settlement pond to allow any entrained sediment to be removed prior to discharge. Any required discharge licence would be obtained prior to excavation commencing.
- 9.7.27 All works through and adjacent to wetland areas would be supervised by a suitably qualified and experienced environmental manager.

Table 9.13: Proposed Water Quality Monitoring Locations and Recommended Monitoring Frequency by Phase of Development (Figure 9.6)

ID	Location	Rationale	Grid Reference	Monitoring Schedule
WQ1	Red Burn, north of the A850	To monitor impacts arising from works at the Northern Site Access	132060, 851204	Baseline: Monthly, min. 3 months Construction: Twice daily at all construction works at the Northern Site Access; otherwise monthly.
WQ2	Allt a' Choire, adjacent to the northern borrow pit search area	To monitor impacts arising from the north-east of the Site, around T4, T5 and the northern borrow pit	131824, 848380	Baseline: Monthly, min. 3 months Construction: Twice daily at all construction works at the northern borrow pit area, T4, T5, northern construction compounds and associated tracks; otherwise monthly.
WQ3	Tributary of the Caroy River, between T8 and T9	To monitor impacts arising from the north-west of the	130689, 847878	Baseline: Monthly, min. 3 months Construction: Twice daily at all construction works at T1, T2, T3,

ID	Location	Rationale	Grid Reference	Monitoring Schedule
		Site, around T1 and T2		substation, BESS and associated tracks; otherwise monthly.
WQ4	Caroy River, between Rageary Burn and Aketil Burn	To monitor impacts arising from the Proposed Development located in the north of the Site	130289, 845878	Baseline: Monthly, min. 3 months Construction: Twice daily at all construction works at T6, T7, T8, T9 associated construction compounds and tracks and the southern borrow pit area; otherwise monthly.
WQ5	Caroy River at southern Site boundary	To monitor impacts arising from the Southern Site Access, in the Caroy River catchment area	130193, 843990	Baseline: Monthly, min. 3 months Construction: Twice daily at all construction works at the Southern Site Access; otherwise monthly.
WQ6	Allt nan Cat at southern Site boundary	To monitor impacts arising from the Southern Site Access and temporary construction compound in the Allt nan Cat catchment area	130600, 843883	Baseline: Monthly, min. 3 months Construction: Twice daily at all construction works at the southern construction compound and associated tracks; otherwise monthly.
Controls¹⁹				
ID	Location		Grid Reference	Monitoring Schedule
WQC 1	Tributary of the Allt a' Choire, adjacent to T5		132560, 846976	Baseline: Monthly, min. 3 months Construction: Twice daily at all construction works at the northern borrow pit area, T4, T5, northern construction compounds and associated tracks; otherwise monthly.

¹⁹ Control locations have been selected to help differentiate between incidents arising from, and those unrelated to, the Proposed Development.

ID	Location	Rationale	Grid Reference	Monitoring Schedule
WQC 2	Maesweyn's Burn, between T1 and T9		130326, 848327	Baseline: Monthly, min. 3 months Construction: Twice daily at all construction works at T1, T2, T3, substation, BESS and associated tracks; otherwise monthly.
WQC 3	Unnamed tributary, adjacent to T6		132105, 846363	Baseline: Monthly, min. 3 months Construction: Twice daily at all construction works at T6, T7, T8, T9 and associated construction compounds and tracks; otherwise monthly.
WQC 4	Aketil Burn, adjacent to the eastern Site boundary		131757, 845347	Baseline: Monthly, min. 3 months Construction: Twice daily at all construction works at the southern borrow pit area and associated tracks; otherwise monthly.

Drainage Infrastructure

- 9.7.28 Track drainage would be installed in accordance with published good practice documentation and would be no longer or deeper than necessary to provide the required track drainage.
- 9.7.29 Cross-drains under tracks would be installed at an appropriate frequency to mimic natural drainage patterns and to minimise concentration of flows.
- 9.7.30 All drainage infrastructure would be designed with a capacity suitable for a rainfall intensity of a 1-in-200 year storm event plus allowance for climate change.
- 9.7.31 Where track sections cross wetland or bog areas, cross-drainage would be provided within the track construction to ensure continuity of flow. This may take the form of a drainage layer within the track, suitably closely-spaced drainage pipes, or both as appropriate. These would be determined on a case-by-case basis to suit each individual area.
- 9.7.32 All required licences for watercourse crossings and construction works would be in place prior to construction commencing.
- 9.7.33 All long-term and temporary drainage infrastructure would be established on a running basis ahead of excavation works. This includes temporary bunding and cut-off drains around turbine bases, hardstanding areas and borrow pits. Trackside drainage will be installed in line with track construction progress.

- 9.7.34 Temporary water control measures would be implemented as necessary adjacent to larger areas of excavation. These would include borrow pit sites and may also include turbine base excavations and hardstanding areas. These measures would take the form of temporary settlement ponds, filter drains or proprietary treatment measures such as Siltbusters. Detail would be provided within the Pollution Prevention Plan(s) prepared for the Construction Runoff Permit and suitability would be determined following appropriate on-site soil tests.
- 9.7.35 All earthmoving activity would be restricted during periods of wet weather, particularly for work occurring within 20 m of a watercourse, to minimise mobilisation of sediment in heavy rainfall. The 'stop' conditions provided in **Table 9.14** are recommended to guide all earthmoving activity at all stages of the Proposed Development.

Table 9.14: Recommended 'Stop' Conditions for Earthmoving Activities

'Stop' Rule	Requirement
High intensity rainfall	Rainfall during construction greater than 10 mm per hour
Long duration rainfall	Rainfall in the preceding 24 hours greater than 25 mm
7-day cumulative rainfall (1)	Preceding 7 days of rainfall greater than 50% of the monthly average
7-day cumulative rainfall (2)	Preceding 7 days of rainfall greater than 50 mm

- 9.7.36 Long-term drainage infrastructure would have a monitoring and maintenance programme established, to include regular visual inspection of drainage infrastructure to check for blockages, debris or damage that may impede flow. Remediation would be undertaken immediately by the Principal Contractor. Routine maintenance would be scheduled where possible for dry weather.

Excavations

- 9.7.37 Any water collecting within excavations would be pumped out prior to further work within the excavation. The water is likely to require treatment to remove suspended solids prior to discharge to ground.
- 9.7.38 Cable trenches would be laid in disturbed trackside material. In areas where cable routes cross up or down steep slopes, clay bunds or an alternative impermeable barrier would be placed for every 0.5 m change in elevation along the length of the trench to minimise in-trench groundwater flow.
- 9.7.39 Vegetation cover would be re-established as quickly as possible on all areas of stripped ground, once activity involving these areas is complete. This would include track verges, screening bunds, cut slopes and much of the Site and Site Accesses during decommissioning and restoration works. Where possible this would be achieved using excavated peat acrotelm. Additional measures including hydroseeding and/or use of a biodegradable geotextile would be considered if insufficient peat turf is available and for areas of particular sensitivity that require immediate protection.
- 9.7.40 Rock testing would be undertaken by the Principal Contractor on appropriate samples from the borrow pit areas to determine its suitability for unbound track and hardstanding construction. This would include testing to determine likely degradation patterns during

the lifespan of the Proposed Development. Should the tests identify problems with parts of the rock within the borrow pit footprints, care would be taken to ensure that unsuitable material is not used for construction, but would be retained for use in borrow pit restoration.

- 9.7.41 Any unused or remaining unsuitable aggregate material, plus any spare rock material arising from hardstanding or track reinstatement, may be used to reinstate the borrow pits to a suitable profile.
- 9.7.42 Only tracked or low ground pressure vehicles would be permitted to access unstripped ground.

Proposed Development Traffic

- 9.7.43 Tracks and hardstanding areas would be monitored on a regular basis by the Principal Contractor, particularly following periods of heavy or prolonged rainfall or after snow clearance. Any sections of track or hardstanding showing signs of excessive wear would be repaired as necessary with suitable rock from the borrow pits or external sources.
- 9.7.44 The bridge structures at watercourse crossings would have appropriate splash control measures as part of their design, to prevent silty water splashing into the watercourses from vehicle movements. The splash controls would be monitored regularly by the Principal Contractor to ensure they remain effective and have not become damaged in any way.
- 9.7.45 Routine monitoring checks of project infrastructure, including track and hardstanding surfaces and all drainage infrastructure, would be undertaken by the Principal Contractor on a quarterly basis throughout operation. Monitoring would involve visiting all aspects of the infrastructure and undertaking a visual inspection to identify the following:
 - areas where track surfaces or hardstanding areas show evidence of erosion or surface damage;
 - any areas where surface water is ponding or collecting on tracks or hardstanding areas; and
 - any areas where drainage infrastructure is damaged, blocked or inadequate.
- 9.7.46 Any areas of track or hardstanding surface showing signs of damage, erosion or excessive wear would be repaired as necessary. Drainage features would be repaired, reinstated or replaced as necessary to ensure continued efficient operation.
- 9.7.47 Site-specific mitigation, including track drainage segregation to avoid 'flushing' from excavation works, and micro-siting to avoid specific higher sensitivity areas, would be identified and established where appropriate.
- 9.7.48 All traffic routes would be clearly demarcated and vehicles would not be permitted access outwith these areas.

Pollution Prevention

- 9.7.49 Oil and fuel storage and handling on-site would be undertaken by the Principal Contractor in compliance with SEPA's Guidance on Pollution Prevention 2 – Above ground oil storage tanks and with the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).

- 9.7.50 Risk assessments would be undertaken by the Principal Contractor and all hazardous substances and non-hazardous pollutants that would be used and/or stored within the Site and Site Accesses would be identified. Hazardous substances likely to be within the Site and Site Accesses include oils, fuels, hydraulic fluids and anti-freeze. No non-hazardous pollutants have been identified as likely to be used within the Site.
- 9.7.51 All deliveries of oils and fuels would be supervised by the Principal Contractor.
- 9.7.52 All storage tanks would be located within impermeable, bunded containers where the bund is sufficient to contain 110% of the tank's capacity. For areas containing more than one tank, the bund would be sufficient to contain 110% of the largest tank's capacity or 25% of the total capacity, whichever is greater.
- 9.7.53 Any valve, filter, sight gauge, vent pipe or other ancillary equipment would be located within the containment area.
- 9.7.54 Waste oil would not be stored within the Site, but would be removed to dedicated and suitably licensed storage or disposal facilities.
- 9.7.55 Management procedures and physical measures would be put in place to deal with spillages, such as spill kits and booms.
- 9.7.56 Maintenance procedures and checks would ensure the minimisation of leakage of fuels or oils from plant.
- 9.7.57 Refuelling and servicing would be undertaken by the Principal Contractor in a designated area or location with adequate precautions in place, such as a dedicated impermeable surface with lipped edges to contain any contaminants.
- 9.7.58 Where vehicle maintenance is necessary in the field, owing to breakdown, additional precautions would be taken to contain contaminants, such as spill trays or absorbent mattresses.
- 9.7.59 The access track would be designed and constructed to promote good visibility where possible and two-way access where visibility is restricted, to minimise risk of vehicle collisions.
- 9.7.60 It is anticipated that the construction phase welfare facilities would use a suitably sized holding tank with waste water removed from the Proposed Development by tanker for disposal at a licensed disposal facility. Operational phase welfare facilities may use a similar procedure, or would install a waste treatment package plant with associated discharge. All relevant water environment authorisations would be put in place should there be any requirement for these.
- 9.7.61 The Site Spillage and Emergency Procedures would be prominently displayed at the Site office and staff would be trained in their application. The Procedures document would incorporate guidance from the relevant SEPA Guidance Notes.
- 9.7.62 In the event of any spillage or discharge that has the potential to be harmful to or to pollute the water environment, all necessary measures would be taken to remedy the situation. These measures would include:
 - Identifying and stopping the source of the spillage;
 - Containing the spillage to prevent it spreading or entering watercourses by means of suitable material and equipment;

- Absorbent materials, including materials capable of absorbing oils, would be available within the Site to mop up spillages. These would be in the form of oil booms and pads and, for smaller spillages, quantities of proprietary absorbent material;
 - Spill kits would be available within site vehicles and staff trained in their use;
 - Sand bags would also be readily available for use to prevent spread of spillages and create dams if appropriate;
 - Where an oil/fuel spillage may have soaked into the ground, the contaminated ground would be excavated and removed from the Site by a licensed waste carrier to a suitable landfill facility;
 - The emergency contact telephone number of a specialist oil pollution control company would be displayed within the Site; and
 - Sub-contractors would be made aware of the guidelines for handling of oils and fuels and of the spillage procedures at the Site including notifying of the environmental manager and logging incidents.
- 9.7.63 SEPA would be informed of any discharge or spillage that may be harmful or polluting to the water environment. Written details of the incident and its resolution would be forwarded to SEPA no later than 14 days after the incident.
- 9.7.64 All works through and adjacent to wetland areas would be supervised by the environmental manager.

9.8 Predicted Impacts

Proposed Development Characteristics

- 9.8.1 The construction phase would involve a number of different elements. **Chapter 2** of the EIAR describes the Proposed Development elements in detail. The elements with particular relevance to hydrology, geology, hydrogeology and soils are as follows:
- construction of access routes and watercourse crossings;
 - excavation and construction of turbine foundations and associated crane pads;
 - creation of construction compounds, substations, BESS and laydown areas;
 - excavation of borrow pits and processing of excavated rock;
 - installation of drainage features around permanent infrastructure;
 - batching of concrete (if required);
 - excavation, handling and temporary storage of peat and soils; and
 - temporary welfare facilities and site utilities including water supply and foul water disposal.
- 9.8.2 During operation of the project, activities with particular relevance to hydrology, geology, hydrology and soils are as follows:
- surface water drainage, including treatment and discharge of surface drainage;
 - maintenance of tracks and trackside drainage;
 - long-term drainage around permanent infrastructure; and
 - additional extraction and processing of rock for necessary maintenance.

Predicted Impacts During Construction

Physical Changes to Overland Drainage and Surface Water Flows

- 9.8.3 Changes to overland drainage patterns would arise principally from construction of the access track network with subsidiary effects from construction of the turbine foundations, crane hardstandings and ancillary infrastructure.
- 9.8.4 The new access track would require installation of trackside drainage and cross-drains to protect the tracks from water damage. Modifications to the existing access track would require relocation of some trackside drainage, where track widening is required, and additional cross-drains may be necessary. Constructed drains would be no longer or deeper than necessary to provide the required track drainage. Cross-drains would be installed at an appropriate frequency to minimise concentration of flows from above the track, to minimise changes to the hydrological regime. All drainage infrastructure would be designed with suitable capacity for a rainfall intensity of a 1-in-200-year storm event, plus allowance for climate change, as per SEPA and THC requirements.
- 9.8.5 All long-term and temporary drainage infrastructure would be established on a running basis ahead of excavation works. This includes temporary bunding and cut-off drains around turbine bases, hardstanding areas and borrow pits. Trackside drainage will be installed in line with track construction progress.
- 9.8.6 A number of watercourses would be crossed by the access track. Nineteen crossings of regulated watercourses have been identified and details are provided in **Technical Appendix 9.4**. Five of these crossings would require upgrading of existing structures, while 14 crossings would be new structures.
- 9.8.7 One existing crossing, of the Caroy River on the crofters' track, would require replacement of the existing structure as the track design requires the crossing to be relocated. The river channel has been straightened in this location to permit installation of the current bridge structure. In parallel with replacement of the crossing, the opportunity to restore the river's natural course would be investigated as part of the detailed design in consultation with SEPA and local landowners, with the associated potential for environmental enhancements. Further details are provided in **Technical Appendix 9.4**.
- 9.8.8 A number of minor, unregulated watercourses would also require a crossing to be installed or upgraded. These crossings would be designed with sufficient capacity for rainfall intensity of a 1-in-200-year storm event, plus allowance for climate change.
- 9.8.9 All necessary permissions required for watercourse crossing works would be obtained prior to commencement of associated works.
- 9.8.10 The receptor, Site surface watercourses, is considered to be of **High** sensitivity. With appropriate mitigation measure in place, as described, the magnitude of effect is considered to be **Slight**. The likelihood of effect is considered to be **Likely**.
- 9.8.11 The effect of physical changes to overland drainage from construction works is assessed as **Minor**, long-term, adverse and **Not Significant**.

Water Contamination from Particulates and Suspended Solids

- 9.8.12 All site work involving earthmoving operations would generate loose sediment, which could potentially gain access to surface watercourses and waterbodies through

entrainment in surface runoff. This could potentially have an adverse effect on the downstream watercourses through damage to fish spawning habitat and changes to dissolved oxygen, nutrient levels and water colour in watercourses and waterbodies. Surface water from the areas surrounding the turbine bases, all hardstanding areas (including crane hardstandings, substation, construction compounds and laydown areas) and borrow pits would be prevented from entering the working areas by appropriate use of peripheral bunding and cut-off drains. These would help to divert clean water around and away from the working areas.

- 9.8.13 During excavation works for turbine foundations, cut sections of track, cut areas for hardstandings and borrow pits, silt fencing or appropriate alternative sediment control protection would be installed on the downslope side of the excavation to prevent inadvertent discharge of silty water into any of the Site's watercourses. Pre-construction installation of long-term drainage would provide an additional level of sediment control.
- 9.8.14 All engineering work adjacent to watercourses, including track construction and installation of watercourse crossings, would have appropriate sediment control measures established prior to any groundworks. Vegetation would be retained along watercourse banks to act as additional protection. There are 14 new watercourse crossings required for the Proposed Development and five which would require upgrading. Watercourse crossings may require minor in-stream works to remove existing culverts and replace them with bottomless arches or box culverts.
- 9.8.15 For all in-stream works associated with watercourse upgrading works, works would be undertaken using a temporary dam to control flow while the crossing extensions are added. Over-pumping would only be used if flow conditions require this.
- 9.8.16 For areas of larger excavation, such as turbine bases, crane hardstandings and borrow pit excavations, temporary water control measures would be used. These would include use of temporary settlement ponds and/or the use of proprietary treatment systems such as Siltbusters, as appropriate.
- 9.8.17 Construction activities would be restricted during periods of wet weather, particularly for any work occurring within 20 m of a watercourse or within areas of identified deeper peat, to minimise mobilisation of sediment in heavy rainfall. The 'stop' conditions in **Table 9.14** are recommended to guide construction activity (CH2M & Fairhurst, 2018).
- 9.8.18 Monitoring for rainfall for 'stop' conditions would require access to a suitable local source of data, such as the Met Office's monitoring station at Prabost, to allow identification of these conditions being exceeded in order to allow appropriate action to be taken.
- 9.8.19 Any water collecting within excavations would be pumped out prior to further work in the excavation. This water may require treatment to remove suspended soils prior to discharge to ground.
- 9.8.20 Vegetation cover would be re-established as quickly as possible on track verges and cut-slopes, by re-laying of excavated peat acrotelm to improve slope stability and provide erosion protection. Additional methods, including hydroseeding and/or use of a biodegradable geotextile, would be considered if necessary, in specific areas and areas of particular sensitivity.
- 9.8.21 All necessary permission relating to construction works, plus accompanying pollution prevention plans, would be obtained prior to any construction work beginning within the

Site. All the management and control measures, including emergency response procedures, would be set out in a Construction Environment Management Plan (CEMP) produced by the appointed Contractor prior to any works beginning. This would be a live document and would be updated as required throughout construction.

- 9.8.22 A water quality monitoring programme would be established at key locations around the Site. Monitoring would begin prior to any construction works, to allow pre-construction baseline quality to be determined. Details are provided in **Table 9.13**.
- 9.8.23 The receptor, surface watercourses within the Site, is considered to be of **High** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Slight**. The likelihood of the effect is considered to be **Likely**.
- 9.8.24 The effect of particulates and suspended solids from construction works is assessed as **Minor**, temporary, adverse and **Not Significant**.

Water Contamination from Fuels, Oils or Foul Drainage

- 9.8.25 Spillage of fuels, oils, wet concrete or concrete washout water could have an adverse effect on surface water quality, and major spillages could have a potential influence on the Caroy River and Red Burn catchments.
- 9.8.26 Oil and fuel storage handling within the Site would be undertaken following published guidance, in particular Guidance on Pollution Prevention 2 – Above ground oil storage tanks (NetRegs, 2018) and in compliance with the *Water Environment (Controlled Activities) (Scotland) Regulations 2011* and the *Water Environment (Miscellaneous) (Scotland) Regulations 2017*. The details would be contained in the CEMP and are summarised as follows:
 - risk assessments would be undertaken by the Principal Contractor and all hazardous substances and non-hazardous pollutants that would be used and/or stored within the Site would be identified. Hazardous substances likely to be within the Site include oils, fuels, hydraulic fluids and anti-freeze. No non-hazardous pollutants have been identified as likely to be used within the Site. Herbicides would not be used;
 - all deliveries of oils and fuels would be supervised by the Site manager or nominated deputy;
 - all storage tanks would be located within impermeable, bunded containers where the bund is sufficient to contain 110% of the tank's capacity. For areas containing more than one tank, the bund would be sufficient to contain 110% of the largest tank's capacity or 25% of the total capacity, whichever is the greater;
 - any valve, filter, sight gauge, vent pie or other ancillary equipment would be located within the containment area;
 - waste oil would not be stored within the Site, but would be removed to dedicated storage or disposal facilities;
 - management procedures and physical measures would be put in place to deal with spillages, such as spill kits and booms;
 - maintenance procedures and checks would ensure the minimisation of leakage of fuels or oils from plant;
 - refuelling and servicing would be undertaken in a designated area or location with adequate precautions in place, such as a dedicated impermeable surface with lipped edges to contain any contaminants. This area would have self-contained

drainage system fully separated from the main drainage system within the compound;

- where vehicle maintenance is necessary in the field, owing to breakdown, additional precautions would be taken to contain contaminants, such as spill trays or absorbent mattresses; and
- the access track would be designed and constructed to promote good visibility where possible and two-way access where visibility is restricted, to minimise risk of vehicle collisions.

9.8.27 It is anticipated that Site welfare facilities would include a suitably sized holding tank, which would be emptied by tanker and removed from the Site on an appropriate timescale for disposal at a suitably licensed facility.

9.8.28 Spillage and emergency procedures would form part of the CEMP and would be prominently displayed at the Site and staff would be trained in their application. The Procedures document would incorporate guidance from the relevant SEPA Guidance Notes.

9.8.29 In the event of any spillage or discharge that has the potential to be harmful to or to pollute the water environment, all necessary measures would be taken to remedy the situation. These measures would include:

- identifying and stopping the source of the spillage;
- containing the spillage to prevent it spreading or entering watercourses, by means of suitable material and equipment;
- absorbent materials, including materials capable of absorbing oils, would be available on-site to mop up spillages. These would be in the form of oil booms and pads and, for smaller spillages, quantities of proprietary absorbent materials. Sandbags would also be readily available for use to prevent spread of spillages and create dams if appropriate;
- where an oil/fuel spillage may have soaked into the ground, the contaminated ground would be excavated and removed from the Site by a licensed waste carrier to a suitable landfill facility;
- the emergency contact telephone number of a specialist oil pollution control company would be displayed within the Site;
- sub-contractors would be made aware of the guidelines for handling of oils and fuels and of the spillage procedures at the Proposed Development; and
- spillage incidents would be recorded.

9.8.30 SEPA would be informed of any discharge or spillage that may be harmful or polluting to the water environment. Written details of the incident would be forwarded to SEPA no later than 14 days after the incident, in line with SEPA's requirements.

9.8.31 A water quality monitoring programme would be established at key locations around the Proposed Development. Monitoring would begin prior to any construction works, to allow pre-construction baseline quality to be determined. Details are provided in **Table 9.13**.

9.8.32 The receptor, Site surface watercourses, is considered to be of **High** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Slight**. The likelihood of effect is considered to be **Unlikely**.

9.8.33 The effect of water contamination from fuels, oils, concrete batching or foul drainage from construction works is assessed as **Minor**, temporary, adverse and **Not Significant**.

Changes in Contamination of Water Supply to Vulnerable Receptors

- 9.8.34 Vulnerable receptors that have the potential to be affected by proposed development works have been identified. These include designated sites and potential GWDTE (**Table 9.10; Figure 9.5, Figure 9.3.1**). Each vulnerable receptor is considered in more detail below.
- 9.8.35 PWS have been scoped out of assessment as there are no identified PWS with a possible linkage to the Proposed Development.

Designated Sites

- 9.8.36 Three designated sites have been identified within 5 km of the Proposed Development. An Cleireach SSSI and GCR is located 950 m south-east of the Site and has no linkage as it is located in a different catchment from the Site. The other two designated sites, Loch Caroy SWPA and Loch Snizort SWPA, are identified as having potential linkage to the Proposed Development.
- 9.8.37 Precautions would be taken during construction to ensure that any potentially contaminating materials would not be permitted to enter any project area watercourses, particularly those that drain into the Loch Caroy and Loch Snizort SWPAs. All works that have potential to affect the SWPAs would be supervised by an environmental manager and additional levels of protection would be installed if advised by the environmental manager during Site works.
- 9.8.38 Dust suppression sprays would be used as required in dry weather. Water monitoring locations at key points downstream of proposed works would be included in the project water quality monitoring programme.
- 9.8.39 Designated sites with hydrological linkage are considered to be of **High** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of the works is considered to be **Slight**. The likelihood of effect is considered to be **Unlikely**.
- 9.8.40 The effect of changes in or contamination of water supply to designated sites from construction works is assessed as **Minor**, temporary, adverse and **Not Significant**.

GWDTE

- 9.8.41 A detailed assessment of the interactions between the Proposed Development and potential GWDTE has been undertaken. Eleven potentially groundwater-dependent NVC habitats have been identified within the Site: M15 wet heath, M27 mire, M25 mire, MG9 grassland, MG10 rush-pasture and U6 grassland have potentially moderate groundwater dependency, and M9 mire, M10 mire, M23 rush-pasture, M6 mire and W7 woodland have potentially high groundwater dependency in Scottish situations, dependent on the hydrogeological setting. Although some of the NVC communities identified are relatively small in extent, they are of high conservation importance and, therefore, measures should be taken to mitigate habitat loss and/or disruption where possible.
- 9.8.42 The potentially groundwater-dependent habitats are widely distributed around the Site making it impossible to avoid them in places. Some areas of identified habitat types are located within 100 m of excavations less than 1 m in depth and/or within 250 m of excavations deeper than 1 m.

- 9.8.43 The potentially groundwater-dependent habitats have been assessed specifically within the context of the Proposed Development, considering the local bedrock and superficial geology, peat distribution and local observations. No groundwater discharges were identified at any location within the Site. The superficial deposits, consisting mainly of peat with smaller areas of till and alluvium, would largely act to insulate the groundwater in the bedrock from the ground surface, effectively preventing groundwater discharge at surface. The bedrock is noted to have very limited groundwater potential and no indications of groundwater at surface were apparent during any of the Site surveys.
- 9.8.44 It is determined, as a result of the above, that none of the eleven potentially groundwater-dependent communities identified within the Proposed Development are actually groundwater-dependent, but are likely to rely on a mix of surface water, shallow throughflow in surface vegetation and rainwater.
- 9.8.45 Details of the GWDTE assessment are provided in **Technical Appendix 9.3**.
- 9.8.46 The potential GWDTE within the Site are considered to be of **High** sensitivity as a result of the conservation importance of the habitats. With appropriate mitigation measures in place, as above, the magnitude of effect is considered to be **Slight**. The likelihood of effect is considered to be **Unlikely**.
- 9.8.47 The effect of changes in or contamination to water supply to GWDTE from construction works is assessed as **Minor**, temporary, adverse and **Not Significant**.

Increased Flood Risk

- 9.8.48 The Site infrastructure is not at risk of flooding from any source.
- 9.8.49 The drainage installed around long-term Proposed Development infrastructure would be designed to minimise concentration of flows. This would be achieved by the implementation of embedded mitigation measures in line with best practice, including:
- use of cut-off drains to divert runoff around necessary 'hard' infrastructure such as turbine bases and hardstanding areas;
 - use of regular cross-drains underneath access tracks. These would be installed in line with natural terrain, making use of low points where runoff would naturally be focused. Cross-drains under existing tracks would be maintained;
 - use of a slight gradient on installed 'hard' infrastructure to encourage drainage into a filter drain or swale, for infiltration into vegetated areas and as shallow through-flow;
 - long-term drainage would be installed ahead of related construction works or excavations taking place, to ensure that drainage can be controlled appropriately; and
 - any areas which have to be left unvegetated during the construction phase, such as turbine foundations, hardstanding areas and borrow pits, would have settlement ponds put in place to attenuate flow until vegetation can be re-established at the end of the construction period.
- 9.8.50 With the appropriate mitigation measures in place, as described above, runoff during construction of the Proposed Development would not be greater than natural pre-development runoff. Details are provided in **Technical Appendix 9.4**.
- 9.8.51 The receptors, infrastructure and property downstream of the Proposed Development, are considered to be of **Very High** sensitivity. With appropriate mitigation measures in

place, as described, the magnitude of any increased flood risk is considered to be **Negligible**. The likelihood of effect is considered to be **Unlikely**.

- 9.8.52 The effect of increase in flood risk resulting from the construction works is assessed as **Negligible** and **Not Significant**.

Physical Removal of Bedrock

- 9.8.53 Bedrock and superficial materials would require to be removed to form turbine foundations, platforms for construction of hardstanding areas, cut-and-fill access tracks and to facilitate development of borrow pits in order to provide aggregate for the construction works.
- 9.8.54 These works would require permanent modification to the natural geology within the Site. As the footprint of the works within the overall Site area is small, overall changes to the geological character of the Site would be limited.
- 9.8.55 Rock testing would be undertaken by the Principal Contractor on appropriate samples from the borrow pit areas to determine their suitability for unbound track and hardstanding construction. This would include testing to determine likely degradation patterns during the lifespan of the development. Should the tests identify problems with parts of the rock within the borrow pit footprints, care would be taken to ensure that unsuitable material is not used for construction but would be retained for use in borrow pit restoration.
- 9.8.56 The bedrock receptor is considered to be of **Low** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Slight**. The likelihood of effect is considered to be **Likely**.
- 9.8.57 The effect of physical removal of bedrock from construction works is assessed as **Minor**, long-term, adverse and **Not Significant**

Modification to Groundwater Flow Paths

- 9.8.58 Physical changes to the shallow subsurface as a result of all excavation work have the potential to interrupt shallow groundwater flow paths. This would include cut-and-fill track sections, turbine foundations, hardstanding areas, substation, laydown area, BESS, construction compounds and cable trenches.
- 9.8.59 Physical changes to the deeper subsurface (>5 m below ground surface) have potential to interrupt deeper groundwater flow paths. This would include borrow pit excavations and potentially some turbine foundations.
- 9.8.60 The bedrock within the Site is noted to be a low productivity aquifer. There is likely to be some limited groundwater flow via weathered zones and fracture networks within the bedrock. Superficial deposits are noted to be predominantly peat which would store some groundwater but contribute very little to groundwater flow. Additionally, there is likely to be some limited groundwater present in the glacial till and alluvium.
- 9.8.61 Groundwater monitoring boreholes would be established within the borrow pit areas prior to any construction work beginning, to a depth at least 1 m below the deepest expected excavation. Groundwater level monitoring would be undertaken by the Principal Contractor to determine whether groundwater is present within the proposed borrow pit areas and, if it is, at what level the seasonally highest groundwater table stands. Any groundwater within the borrow pit areas would be managed in line with best practice, with

discharge via a settlement pond to allow any entrained sediment to be removed prior to discharge. Any required discharge licence would be obtained prior to excavation commencing.

- 9.8.62 Excavation of cable trenches could lead to groundwater flow between catchments if the trenches act as preferential flow paths. This can be avoided by laying cables in disturbed ground adjacent to access tracks. In areas where cable routes cross up or down notable slopes, clay bunds or an alternative impermeable barrier would be placed for every 0.5 m change in elevation along the length of the trench to minimise in-trench groundwater flow.
- 9.8.63 The groundwater receptor is considered to be of **Moderate** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Slight**. The likelihood of effect is considered to be **Likely**.
- 9.8.64 The effect of modification to groundwater flow paths from construction works is assessed as **Minor**, long-term, adverse and **Not Significant**.

Soil Erosion and Compaction

- 9.8.65 Proposed construction activity, particularly plant and vehicle movements, soil stripping and stockpiling, would affect the nature of the soils within the Site. Plant movements would act to compact soils through movements over unstripped ground. All activity requiring removal, transport and stockpiling of soils would have potential to lead to soil erosion and loss of structure, resulting in overall soil degradation.
- 9.8.66 All traffic routes would be clearly demarcated, and vehicles would not be permitted access outwith these areas.
- 9.8.67 Only tracked or low ground pressure vehicles would be permitted access to unstripped ground. Existing tracks have been incorporated into the Proposed Development as far as possible and use of these would help to keep additional soil disturbance to a minimum.
- 9.8.68 Soil stripping would be undertaken with care by the Principal Contractor and would be restricted to as small a working area as practicable. Topsoil would be removed and laid in a storage bund, up to 2 m in height, on unstripped ground adjacent to the working area. It would be attempted to retain the turf layer vegetation-side-up where possible, although ground conditions may make this challenging. Subsoils and superficial geological deposits would be removed subsequently and laid in storage bunds, also up to 2 m in height, clearly separated from the topsoil bund. Care would be taken to maintain separate stockpiles for separate soil types in order to preserve the soil quality.
- 9.8.69 For work within areas of peat, acrotelmic peat (the uppermost 0.5 m) would be removed as for the topsoil. It would be attempted to retain the acrotelm vegetation-side-up where possible, although ground conditions may make this challenging.
- 9.8.70 The underlying catotelmic peat would be stored in bunds up to 1 m in height. Catotelmic peat is sensitive to handling, and loses its internal structure easily, so would be transported as short a distance as possible to its storage location. Excavation of catotelmic peat has been limited by careful infrastructure design and use of floating road construction on areas of deeper peat.
- 9.8.71 Limited smoothing or 'blading' of stockpiled soils and catotelmic peat would be undertaken by the Principal Contractor to help shed rainwater and prevent ponding of water on the stockpile. Bunds on notably sloping ground would have sediment control

measures installed near the base, on the downslope side, to collect and retain any sediment mobilised by rainfall. Stockpiles would be located on flat or nearly flat ground where possible.

- 9.8.72 Excavated soil and peat would be used in reinstatement and rehabilitation at the end of the construction period, in order to promote fast re-establishment of vegetation cover on worked areas and areas of bare soil or peat that are not required for the operational phase. Some of the excavated peat would be reserved for peatland restoration in parts of the Site. Soils and peat would be stored for as short a time as practicable, in order to minimise degradation through erosion and desiccation. Further details regarding peat excavation are provided in **Technical Appendix 9.2**.
- 9.8.73 Should prolonged periods of dry weather occur, a damping spray would be employed to maintain surface moisture on the soil and peat bunds. This would help to maintain vegetation growth in the turves and to retain the soil structure.
- 9.8.74 The receptor, soils and peat within the Site, is considered to be of **High** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Slight**. The likelihood is considered to be **Likely**.
- 9.8.75 The effect of soil erosion and compaction from construction works is considered to be **Minor**, temporary, adverse and **Not Significant**.

Peat Instability

- 9.8.76 Construction activity on peat can affect the natural stability of the peat deposits in areas near to or associated with construction works. Particular risk areas are associated with works at or near breaks-in-slope, areas where natural peat instability has been recorded and locations where the peat has degraded through, for example, erosion processes, drying out or overgrazing.
- 9.8.77 A detailed PSRA has been undertaken for the Proposed Development and is provided in **Technical Appendix 9.1**. The key effects assessment findings are provided below.
- 9.8.78 The PSRA found that the majority of the Site has a negligible or low risk of peat landslide. A number of areas were flagged with potential moderate risk of peat landslide; these were all appraised individually in greater detail, taking into account location-specific details. In all cases, the apparent risk was found to be an artefact of the assessment method and the revised risk was negligible or low.
- 9.8.79 The receptors for peat landslide hazard are the peat soil, peatland habitat, the water environment including surface water and groundwater, Proposed Development infrastructure and construction personnel.
- 9.8.80 The peat soil, peatland habitat, water environment and Proposed Development infrastructure receptors are considered to be of **High** sensitivity. Construction personnel are considered to be a **Very High** sensitivity receptor.
- 9.8.81 With appropriate design constraints and mitigation measures in place, as described in **Technical Appendix 9.1**, the magnitude of effect is considered to be **Slight**. The likelihood of effect is considered to be **Unlikely**.
- 9.8.82 For all receptors, the effect of peat instability is assessed as **Minor**, long-term, adverse and **Not Significant**.

Predicted Impacts During Operation

Physical Changes to Overland Drainage and Surface Water Flows

- 9.8.83 No additional changes to overland drainage and surface water flows are anticipated during the operational phase of the Proposed Development. Trackside and infrastructure drainage would remain in place during operation. A monitoring and maintenance programme would be put in place for the drainage infrastructure, to include regular visual inspection of drainage ditches, crossing structures and cross-drains to check for blockages, debris or damage that might impede water flow. Any identified blockage, including build-up of sediment that may lead to future blockage, or damage to structures would be remediated immediately. Where practicable, routine maintenance would be undertaken during dry weather; where this is not practicable, additional sediment control measures may need to be established to manage silty water arising from the work.
- 9.8.84 The receptor, surface watercourses within the Site, is considered to be of **High** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Negligible**. The likelihood of effect is considered to be **Unlikely**.
- 9.8.85 The effect of physical changes to overland drainage from operational works is assessed as **Negligible** and **Not Significant**.

Water Contamination from Particulates and Suspended Solids

- 9.8.86 The main operational phase work of the Proposed Development would involve track and hardstanding maintenance and repair. Regular monitoring of the track and hardstanding condition would be undertaken, particularly following periods of heavy or prolonged rainfall and after snowfall and clearance, if relevant. Any sections of the track showing signs of excessive wear would be repaired as necessary with suitable rock from on-site borrow pits or external sources.
- 9.8.87 The drainage network would also be subject to regular monitoring to ensure that it remains fully operational, as water build-up can cause considerable damage to unbound track construction.
- 9.8.88 All bridge structures would have appropriate splash control measures as part of their design, to prevent silty water splashing into the watercourse from vehicle movements. These splash controls would be monitored regularly to ensure they remain effective and have not become damaged in any way.
- 9.8.89 The receptor, surface watercourses within the Site, is considered to be of **High** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Slight**. The likelihood of effect is considered to be **Possible**.
- 9.8.90 The effect of particulates or suspended solids from operational works is assessed as **Minor**, temporary, adverse and **Not Significant**.

Water Contamination from Fuels, Oils or Foul Drainage

- 9.8.91 The risk of water contamination from fuels or oils is considerably lower during operation of the Proposed Development than during construction, as there are significantly decreased levels of activity on-site. The majority of potential pollutants would no longer be present on-site. Lubricants for turbine gearboxes, transformer oils and maintenance

vehicle fuels would remain present in small quantities. There are no plans for herbicide use during operation; physical cutting of vegetation would be the preferred form of management, where required.

- 9.8.92 The pollution prevention plan and spillage and emergency procedures, as set out above, would remain in force throughout the operational phase of the Proposed Development. There would be no concrete batching on-site.
- 9.8.93 It is anticipated that welfare facilities at the substation control building would use one of the following:
- a suitably sized holding tank with waste water removed from the Proposed Development by tanker for disposal at a licensed disposal facility, in line with construction phase proposals;
 - a waste treatment package plant with associated discharge would be installed as a longer-term alternative; or
 - waterless composting toilet facilities with bottled water provided for washing and drinking.
- 9.8.94 All relevant water environmental authorisations would be put in place should there be any requirement for these.
- 9.8.95 The receptor, surface watercourses within the Site, is considered to be of **High** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Negligible**. The likelihood of effect is considered to be **Unlikely**.
- 9.8.96 The effect of water contamination from fuels or oils from operational works is assessed as **Negligible** and **Not Significant**.

Changes in or Contamination of Water Supply to Vulnerable Receptors

- 9.8.97 Only minor works would take place within the Site during the operational phase, to allow necessary maintenance activities to be undertaken. Additional works affecting designated sites would be negligible.
- 9.8.98 Additional works affecting GWDTE would be negligible.
- 9.8.99 The designated sites identified are considered to be of **High** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Negligible**. The likelihood of effect is considered to be **Unlikely**.
- 9.8.100 The potential GWDTE identified are considered to be of **High** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Negligible**. The likelihood of effect is considered to be **Unlikely**.
- 9.8.101 The effect of changes in or contamination of water supply to vulnerable receptors is assessed as **Negligible** and **Not Significant**.

Increased Flood Risk

- 9.8.102 Infrastructure drainage would remain in place during the operational phase. A regular monitoring and maintenance programme for all the drainage infrastructure would be implemented to ensure that it remains fully operational and in good condition. Where practicable, routine maintenance would be undertaken during dry weather, to help ensure that drainage operation during wet weather is fully functional.

- 9.8.103 Post-development runoff would be designed such that there is no change from natural pre-development runoff.
- 9.8.104 The receptors, infrastructure and property downstream of the Proposed Development, are considered to be of **Very High** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Negligible**. The likelihood of effect is considered to be **Unlikely**.
- 9.8.105 The effect of increase in flood risk resulting from operational works is assessed as **Negligible** and **Not Significant**.

Physical Removal of Bedrock

- 9.8.106 Although most physical removal of bedrock would have occurred during construction, the ongoing requirement for track and hardstanding maintenance would require some extraction of rock from the borrow pit sites during the operational phase of the Proposed Development. These operations would be very limited in nature.
- 9.8.107 The bedrock receptor is considered to be of **Low** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of effect is considered to be **Negligible**. The likelihood of effect is considered to be **Likely**.
- 9.8.108 The effect of physical removal of bedrock from operational works is assessed as **Negligible** and **Not Significant**.

Modification to Groundwater Flow Paths

- 9.8.109 There would be a minor ongoing requirement for additional rock extraction at the borrow pit sites during operation, for track and hardstanding maintenance. These operations would be very limited in nature.
- 9.8.110 The groundwater receptor is considered to be of **Moderate** sensitivity. With appropriate mitigation measures in place, as described, the magnitude of the works is considered to be **Negligible**. The likelihood of effect is assessed as **Possible**.
- 9.8.111 The effect of modification to groundwater flow paths from operational works is assessed as **Negligible** and **Not Significant**.

Soil Erosion and Compaction

- 9.8.112 There are no soil stripping or stockpiling activities planned for the operational phase of the Proposed Development.
- 9.8.113 Ongoing monitoring and maintenance work at the development would require vehicle activity on-site. This would be much reduced from the construction phase and would mostly involve significantly lighter vehicles than heavy construction plant. The ongoing vehicle activity would have some effect on soil and peat compaction below access tracks, although at a significantly lower level than during construction.
- 9.8.114 The receptor, soils and peat within the Site, is considered to be of **High** sensitivity. The magnitude of effect is considered to be **Negligible**. The likelihood of effect is considered to be **Possible**.
- 9.8.115 The effect of soil erosion and compaction from operational works is considered to be **Negligible**, temporary, adverse and **Not Significant**.

Peat Instability

- 9.8.116 No changes to the proposed infrastructure are anticipated during the operational phase of works.
- 9.8.117 The peat soil, peatland habitat, water environment and Proposed Development infrastructure receptors are considered to be of **High** sensitivity. Construction personnel are considered to be a **Very High** sensitivity receptor.
- 9.8.118 With appropriate design constraints and mitigation measures in place, as described in **Technical Appendix 9.1**, the magnitude of effect is considered to be **Negligible**. The likelihood of effect is considered to be **Unlikely**.
- 9.8.119 For all receptors, the effect of peat instability is assessed as **Negligible**, long-term, adverse and **Not Significant**.

9.9 Summary of Effects

- 9.9.1 This assessment is based on a site-specific risk assessment method following recommended environmental impact assessment techniques. Potential effects, both positive and negative, long-term or temporary, adverse or beneficial, to the geological, hydrogeological, hydrological and peat regime have been considered.
- 9.9.2 **Table 9.15** summarises the assessment of effects during the construction and operational phases, taking into account the embedded and additional mitigation proposed.

Table 9.15: Summary of Residual Effects During Construction and Operation

Effect	Phase	Receptor	Receptor Sensitivity	Magnitude of Effect	Likelihood of Effect	Assessment Consequence	Effect Significance
Physical changes to overland drainage and surface water flows	Construction	Surface watercourses within the Site	High	Slight	Likely	Minor, long-term and adverse	Not significant
	Operation			Negligible	Unlikely	Negligible	Not significant
Water contamination from particulates and suspended solids	Construction	Surface watercourses within the Site	High	Slight	Likely	Minor, temporary and adverse	Not significant
	Operation			Slight	Possible	Minor, temporary and adverse	Not significant
Water contamination from fuels, oils or foul drainage	Construction	Surface watercourses within the Site	High	Slight	Unlikely	Minor, temporary and adverse	Not significant
	Operation			Negligible	Unlikely	Negligible	Not significant
Changes in or contamination of water supply to vulnerable receptors	Construction	Designated sites	High	Slight	Unlikely	Minor, temporary and adverse	Not significant
		GWDTE	High	Slight	Unlikely	Minor, temporary and adverse	Not significant
	Operation	Designated sites	High	Slight	Unlikely	Negligible	Not significant
		GWDTE	High	Negligible	Unlikely	Negligible	Not significant
Increased flood risk	Construction	Infrastructure and property downstream of the Proposed Development	Very High	Negligible	Unlikely	Negligible	Not significant
	Operation		High	Negligible	Unlikely	Negligible	Not significant

Effect	Phase	Receptor	Receptor Sensitivity	Magnitude of Effect	Likelihood of Effect	Assessment Consequence	Effect Significance
Physical removal of bedrock	Construction	Bedrock	Low	Slight	Likely	Minor, long-term and adverse	Not significant
	Operation			Negligible	Likely	Negligible	Not significant
Modification to groundwater flow paths	Construction	Groundwater	Moderate	Slight	Likely	Minor, long-term and adverse	Not significant
	Operation			Negligible	Possible	Negligible	Not significant
Soil erosion and compaction	Construction	Soils and peat within the Site	High	Slight	Likely	Minor, temporary and adverse	Not significant
	Operation			Negligible	Possible	Negligible	Not significant
Peat instability	Construction	Peatland habitat, water environment and Proposed Development infrastructure	High	Slight	Unlikely	Minor, long-term and adverse	Not significant
		Construction personnel	Very High	Slight	Unlikely	Minor, long-term and adverse	Not significant
	Operation	Peatland habitat, water environment and Proposed Development infrastructure	High	Negligible	Unlikely	Negligible	Not significant
		Construction personnel	Very High	Negligible	Unlikely	Negligible	Not significant

Effects During Decommissioning

- 9.9.3 Potential effects of decommissioning the Proposed Development are anticipated to be similar to those encountered in the construction phase, although generally with lower magnitude as the level of activity within the Site is lower.
- 9.9.4 Discussions would be held with the applicant and appropriate Regulatory Authorities prior to decommissioning to agree an appropriate Decommissioning Strategy.

Indirect and Secondary Effects

- 9.9.5 No indirect or secondary effects relating to hydrology, hydrogeology, geology or peat have been identified for any phase of the Proposed Development.

Cumulative Effects

- 9.9.6 The potential for the Proposed Development to contribute to cumulative effects in relation to other projects within 5 km was assessed. Operational projects within 5 km of the Site are not considered for cumulative effects as these are already taken into consideration as part of the existing baseline.
- 9.9.7 Four developments, Ben Sca Wind Farm, Balmeanach Wind Farm, Glen Ullinish Wind Farm and Glen Ullinish II Wind Farm, were identified within 5 km of the Site. Ben Sca Wind Farm and Glen Ullinish Wind Farm are consented and awaiting construction; they are located approximately 1.2 km north-east and 4.1 km south-east of the Proposed Development respectively (Wind2, 2019; Muirhall Energy, 2020). As these wind farms are consented it is likely that construction would occur ahead of construction of the Proposed Development, therefore, there are no anticipated cumulative effects relating to Ben Sca and Glen Ullinish Wind Farms.
- 9.9.8 Balmeanach Wind Farm is located within 1 km north-east of the Proposed Development and is at scoping stage (Wind2, 2022). Glen Ullinish II Wind Farm is located approximately 2 km south-east of the Proposed Development and is also at scoping stage. Should the wind farm be consented it would replace the consented Glen Ullinish Wind Farm (Muirhall Energy, 2020).

Geology and Soils

- 9.9.9 For cumulative effects on geology and soils only those projects located within 1 km of the Proposed Development are considered as effects relating to geology and soils are very localised and do not transmit over any noticeable distance. Balmeanach Wind Farm lies within 1 km of the Proposed Development, meaning there may be potential cumulative effects. However, assuming that all construction, operation and decommissioning works at both developments abide by good work practices with relation to geology and soils, cumulative effects on geology and soils are considered to be **Negligible** and **Not Significant**.

Hydrogeology

- 9.9.10 Effects on hydrogeology are confined to shallow groundwater found within the same hydrological catchments as the Proposed Development.

- 9.9.11 One turbine from the proposed Balmeanach Wind Farm is located in the Caroy River catchment, approximately 0.6 km from the Proposed Development's application boundary. Should Balmeanach Wind Farm be consented it is possible that construction may coincide with the construction phase of the Proposed Development, leading to cumulative effects on hydrogeology.
- 9.9.12 Although small parts of the application boundaries for the Proposed Development, Balmeanach Wind Farm and Glen Ullinish II Wind Farm all fall within the Allt nan Cat catchment, none of the proposals include any construction activity within this catchment area. As a result, no cumulative effects are possible within the Allt nan Cat catchment.
- 9.9.13 Thus, assuming that all construction, operation and decommissioning works at both developments abide by good work practices with relation to hydrogeology, cumulative effects on hydrogeology are considered to be **Negligible** and **Not Significant**.

Hydrology and Designated Areas

- 9.9.14 Effects on hydrology are generally confined to developments located within the same hydrological catchment as the Proposed Development, or that drain into the same receiving waterbodies. As hydrological effects can be transmitted for significant distances downstream projects are considered up to a distance of 5 km downstream of the Proposed Development.
- 9.9.15 As one turbine from the proposed Balmeanach Wind Farm is located in the Caroy River catchment, it is possible, should construction coincide with the construction phase of the Proposed Development, for cumulative effects on hydrology to occur.
- 9.9.16 Additionally, the proposed Glen Ullinish II Wind Farm would drain into Loch Caroy, via the River Ose catchment, and into Loch Snizort via the Treaslane River and Allt Garbh catchments. Both Loch Caroy and Loch Snizort are shellfish water protected areas. Therefore, it is possible, should construction coincide with the construction phase of the Proposed Development, for limited cumulative effects on Loch Caroy and Loch Snizort to occur.
- 9.9.17 Assuming that all construction, operation and decommissioning works at each of the developments abide by good work practices with relation to hydrology, sediment management and pollution prevention, cumulative effects on hydrology and designated sites are considered to be **Negligible** and **Not Significant**.

Summary

- 9.9.18 Balmeanach Wind Farm and Glen Ullinish II Wind Farm are located within 5 km of the Proposed Development. Should these wind farms be consented it is possible that their construction phases may overlap with that of the Proposed Development which could lead to cumulative effects on geology, hydrogeology, hydrology and peat. Assuming that best practice construction methods, including best practice surface water and sediment management techniques, are put in place for all developments, cumulative effects on geology, hydrogeology, hydrology and peat are considered to be **Negligible** and **Not Significant**.

9.10 References

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10 ARCHAEOLOGY AND CULTURAL HERITAGE

10.1 Introduction

10.1.1 This chapter considers the environmental effects of the Proposed Development on archaeology and cultural heritage (historic environment sites and features, archaeology and built heritage); hereafter referred to as 'heritage assets'. The chapter details the results of a desk-based assessment by CFA Archaeology Ltd (CFA) and draws on comments provided by Historic Environment Scotland (HES) and The Highland Council: Historic Environment Team (THC: HET). The assessment considers the potential direct effects on assets within the Site (Inner Study Area) and the operational effects of the Proposed Development on the settings of heritage assets in the wider landscape (Outer Study Area).

10.1.2 The specific objectives of the study were to:

- identify the cultural heritage baseline within and in the vicinity of the Site;
- assess the Site in terms of its archaeological potential;
- consider the potential effects of the construction, operation and decommissioning of the Proposed Development on heritage assets, within the context of the relevant legislation and planning guidance; and
- consider the potential cumulative effects of the Proposed Development in combination with other existing or proposed developments, upon cultural heritage assets.

10.1.3 This chapter is supported by the following figures and technical appendices (which are referenced in the text where relevant):

- **Figure 10.1:** Cultural Heritage: Inner Study Area;
- **Figure 10.2:** Cultural Heritage: Outer Study Area;
- **Figure 10.3:** Cultural Heritage: Cumulative Developments and Visualisation Locations;
- **Figures 10.4 to 10.14:** Cultural Heritage Visualisations (Listed **Table 10.6**);
- **Technical Appendix 10.1:** Heritage Assets in the Inner Study Area; and
- **Technical Appendix 10.2:** Designated Heritage Assets in the Outer Study Area

10.2 Statutory and planning context

10.2.1 Relevant legislation, planning policy and guidance documents have been reviewed and taken into account as part of this assessment - refer to **Table 10.1**, below.

Table 10.1: Legislation and guidance relevant to Cultural Heritage

Document	Summary
Legislation	
The Ancient Monuments and	Scheduled Monuments are protected under statute, the detail of which is contained within The Ancient Monuments and Archaeological Areas

Document	Summary
Archaeological Areas Act (1979)	Act 1979, Part 1, Section 2 Control of works affecting Scheduled Monuments, which states (in part): <i>"If any person executes or causes or permits to be executed any works to which this section applies he shall be guilty of an offence unless the works are authorised under this Part of this Act."</i>
Planning (Listed Buildings and Conservation Areas) (Scotland) Act (1997)	Legislation regarding Listed Buildings and Conservation Areas is contained in The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997(as amended by Town and Country Planning (Historic Environment Scotland) Amendment Regulations 2015). The 1997 Act places a duty on the planning authority with respect to Listed Buildings and Conservation Areas, and their settings. Section 59 of the 1997 Act states (in part): <i>"In considering whether to grant planning permission for development which affects a listed building or its setting, a planning authority or the Secretary of State, as the case may be, shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses."</i> Section 64 states: <i>"(1) In the exercise, with respect to any buildings or other land in a conservation area, of any powers under any of the provisions in subsection (2), special attention shall be paid to the desirability of preserving or enhancing the character or appearance of that area.</i> <i>(2) Those provisions are -</i> <i>a) The planning Acts, and</i> <i>b) Part I of the Historic Buildings and Ancient monuments Act 1953."</i>
The Historic Environment Scotland Act (2014)	The Historic Environment Scotland Act 2014 defines the role of, Historic Environment Scotland (HES), and the processes for the designation of heritage assets, consents, and rights of appeal. Part 1, Section 2, states in part: <i>"In exercising its general function, Historic Environment Scotland has the following particular functions -</i> <i>c) identifying and recording the historic environment,</i> <i>d) understanding and interpreting the historic environment,</i> <i>e) learning about, and educating others about, the historic environment,</i> <i>f) protecting and managing the historic environment,</i> <i>g) conserving and enhancing the historic environment."</i>
The Electricity Act (1989)	The Electricity Act (1989) covers cultural heritage in Schedule 9 (paragraph 3), which states (in part): <i>"In formulating any relevant proposals, a licence holder or a person authorised by an exemption to generate or supply electricity -</i> <i>a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and</i> <i>b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."</i>

Document	Summary
Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013	<p>Cultural heritage is also covered under the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 (as amended by Town and Country Planning (Historic Environment Scotland) Amendment Regulations 2015), in Schedule 5 which requires consultation with Historic Environment Scotland where:</p> <p><i>“a) development of land which is situated within 800 metres from any Royal Palace or Park, and might affect the amenities of that Palace or Park;</i></p> <p><i>(b) development which may affect -</i></p> <p><i>(i) a World Heritage Site;</i></p> <p><i>(ii) a historic garden or designed landscape;</i></p> <p><i>(iii) the site of a scheduled monument or its setting; or</i></p> <p><i>(iv) a category A listed building or its setting; or</i></p> <p><i>c) development (other than householder development) which may affect a historic battlefield.”</i></p>
Electricity Works (Environmental Impact Assessment) (Scotland) Regulations (2017)	<p>The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 Schedule 3 requires screening to take consideration of <i>“landscapes and sites of historical, cultural or archaeological significance”</i> as part of the environmental sensitivity of geographical areas likely to be affected by development.</p> <p>In Schedule 4 (paragraph 4) it requires, for inclusion in Environmental Impact Assessment Reports, <i>“A description of the factors specified in regulation 4(3) likely to be significantly affected by the development.”</i> included in this list is <i>“cultural heritage, including architectural and archaeological aspects”</i>.</p> <p>Schedule 4 (paragraph 5) requires <i>“a description of the likely significant effects of the development on the environment resulting from, inter alia: ... the risks to human health, cultural heritage or the environment.”</i></p>
Planning Policy	
Historic Environment Policy for Scotland (HEPS) (2019)	<p>HEPS is a policy statement directing decision-making that affects the historic environment. It is non-statutory, which means that it is not required to be followed as a matter of law or statute, but it is relevant to a wide range of decision-making at national and local levels and is supported by detailed policy and related guidance.</p> <p>HEPS contains six policies and core principles (HEP1 to HEP6) for managing the historic environment. These core principles are reflected in national and local policies.</p>
National Planning Framework 4 (NPF4 2022)	<p>The key policy of NPF4 in respect of the historic environment is Policy 7: Historic assets and places of NPF4 (p45) which intends to:</p> <p><i>“protect and enhance historic environment assets and places, and to enable positive change as a catalyst for the regeneration of places.”</i></p> <p>NPF4 suggests this is to be achieved by:</p> <p><i>a) Development proposals with a potentially significant impact on historic assets or places will be accompanied by an assessment which is based on an understanding of the cultural significance of the historic asset and/or place. The assessment should identify the likely visual or physical impact of any proposals for change, including cumulative effects and provide a sound basis for managing the impacts of change. Proposals should also be informed by national policy and guidance on</i></p>

Document	Summary
	<i>managing change in the historic environment, and information held within Historic Environment Records.</i>
Planning Advice Note 2/2011: Planning and Archaeology (PAN 2/2011)	<p>Planning Advice Note 2/2011 (PAN 2) advises that, in determining planning applications, planning authorities should take into account the relative importance of archaeological sites (para 5).</p> <p>It also notes that, in determining planning applications that may impact on archaeological features or their setting, planning authorities may on occasion have to balance the benefits of development against the importance of archaeological features (para 6).</p> <p>The desirability of preserving a monument (whether scheduled or not) is a material consideration and the objective should be to assure the protection and enhancement of monuments by preservation <i>in situ</i>, in an appropriate setting. When preservation <i>in situ</i> is not possible, recording and/or excavation followed by analysis and publication of the results (para 14).</p>
Highland-wide Local Development Plan (2012)	<p>Relevant policy for cultural heritage interests in the Local Development Plan applicable in the case of the Proposed Development is Policy 57 Natural, Built and Cultural Heritage which, in part, states:</p> <p><i>“All development proposals will be assessed taking into account the level of importance and type of heritage features, the form and scale of the development, and any impact on the feature and its setting.”</i></p>
Guidance	
Environmental Impact Assessment Handbook (SNH and HES, 2018)	<p>The Handbook provides those involved in the Environmental Impact Assessment (EIA) process with practical guidance and a ready source of information about the process.</p> <p>It illustrates or concentrates on the treatment of natural and cultural heritage issues but, even where there is such a focus, the principles are often more widely applicable to other environmental topics.</p> <p>It is intended to help all of those involved in the process to make it more effective and therefore lead to better informed decisions.</p> <p>Appendix 1 provides guidance relating to the assessment of a proposal's impacts upon cultural heritage in the context of the EIA process.</p>
Standard and Guidance for Historic Environment Desk-Based Assessment (ClfA, 2014, updated 2020)	<p>This guidance seeks to define good practice for the execution and reporting of desk-based assessment in line with the regulations of ClfA, in particular the Code of conduct.</p>
Principles of Cultural Heritage Impact Assessment in the UK (IEMA, 2021)	<p>This document provides guidance for cultural heritage practitioners in regard to the principles of Cultural Heritage Impact Assessment. These are:</p> <ul style="list-style-type: none"> A. understanding cultural heritage assets; and B. evaluating the consequences of change
Designation Policy and Selection	<p>This document sets out the policy and selection guidance used by HES when they designate historic sites and places at the national level.</p> <p>This document stands alongside the Historic Environment Policy for Scotland (2019) (HEPS). It aims to deliver the vision and objectives of</p>

Document	Summary
Guidance (HES, 2019)	the Historic Environment Strategy for Scotland Our Place in Time (2015), the National Outcomes, and national planning policies.
Managing Change in the Historic Environment: Setting (HES, 2016)	<p>This document is part of a series by HES the aim of which is to identify the main issues which can arise in different situations, to advise how best to deal with these, and to offer further sources of information. They are also intended to inform planning policies and the determination of applications relating to the historic environment.</p> <p>This note sets out the principles that apply to developments affecting the setting of historic assets or places, including scheduled monuments, listed buildings, Inventory historic gardens and designed landscapes, World Heritage Sites, conservation areas, historic battlefields, Historic Marine Protected Areas and undesignated sites.</p>
Highland Council: Standards for Archaeological Work (THC, 2012)	<p>This document seeks to set practical Standards for a consistent approach to the management of the historic environment in Highland. The Standards for Archaeological Work details a range of archaeological procedures that may be required as part of the planning process and sets the minimum standards required by the Planning Authority for all fieldwork, reporting and post-excavation procedures.</p> <p>The Standards are intended for use by all those involved in the planning process and land management – to inform planners and developers of the specific requirements of a particular piece of archaeological work and to ensure historic environment practitioners conduct fieldwork to an acceptable and consistent standard.</p>
Historic Environment Strategy; Supplementary Planning guidance (THC, 2013)	<p>Supplementary Guidance to the Highland-wide Local Development Plan, specifically Policy 57 Natural, Built and Cultural Heritage.</p> <p>The purpose of this document is to define Highland Council's approach to the protection of the historic environment through the planning process. This document will, through the implementation of the strategic aims, ensure that there is a proactive and consistent approach to the protection of the historic environment. The Historic Environment Strategy is a material consideration when proposals for development are being considered.</p>

10.3 Consultation undertaken

- 10.3.1 In undertaking the assessment, consideration has been given to pre-application and scoping responses from THC: HET and HES. Further advice was provided through post-scoping follow-up consultations. Summaries of the responses are set out in **Table 10.2**, below.

Table 10.2: Consultation

Consultee	Response	Comment/ action taken
HES (30 September 2022)	<p>Requested focus on:</p> <ul style="list-style-type: none"> • Barpannan, Two Chambered Cairns, Vatten Duirinish - SM893 • Dun Feorlig, Broch 230m NNE of Feorlig Farm (SM3494) • Ardmore, Chapel & Burial Ground 230m SW of (SM3884) • Dun Neill, Dun 420m SW of Ardmore (SM3885) • Abhainn Bhaile Mheadhonaich, Broch & Standing Stone 145m SE of An Cairidh (SM13664) • Dun Arkaig, Broch (SM13662) • Ullinish, Fort, Bracadale (SM930) • Dun Flashader, Broch, Skye (SM911) • Dun Osdale, Broch 850m N of Osdale (SM3493) • St Mary's Church & Burial Ground, Dunvegan (SM9249) 	<p>Noted.</p> <p>These Scheduled Monuments, along with all designated assets within the Outer Study Area, are included in the assessment (Technical Appendix 10.2).</p> <p>A focussed assessment of the impact on these monuments is included in Section 10.6 Predicted Effects (paragraphs 10.6.8 - 10.6.87).</p>
	<p>Requested visualisations for at least:</p> <ul style="list-style-type: none"> • Barpannan, Two Chambered Cairns, Vatten Duirinish - SM893 • Dun Neill, Dun 420m SW Of Ardmore (SM3885) • St Mary's Church & Burial Ground, Dunvegan (SM9249) 	<p>Visualisations included for the ten Scheduled Monuments which HES requested focus on above (Table 10.6: Cultural heritage assets given detailed assessment, Figures 10.4 – 10.13).</p>
	<p>Requested an additional visualisation from sea-level in Loch Bracadale looking towards the above monuments and the development, from around 126271 834013.</p>	<p>Visualisation included Figure 10.14.</p> <p>A revised location of the viewpoint was chosen as 126324, 838714. This is one of the few locations on Loch Bracadale where the Proposed Development would be seen in combination with the scheduled monuments, due to the screening of local topography and islands.</p>
The Highland Council (20 September 2022)	<p>Requested the identification of all designated sites which may be affected by the development either.</p>	<p>Noted.</p> <p>All designated and non-designated sites which may be affected by the development are included in the assessment (Section 10.5 Existing Environment, Section 10.6 Predicted Effects, Technical Appendices 10.1 and 10.2).</p>

Consultee	Response	Comment/ action taken
	Requested a full appreciation of the setting of these historic environment assets and the likely impact on their settings with appropriate visualisations.	Noted. All designated assets within the Outer Study Area, are included in the assessment and setting impacts considered (Technical Appendix 10.2). Visualisations are included for 10 Scheduled Monuments and the seaward approach at Loch Bracadale (Table 10.6: Cultural heritage assets given detailed assessment, Figures 10.4 – 10.13).
HES (Teams Meeting 30 November 2022)	Discussed proposed viewpoints, confirmed happy for a wireframe from seascape location.	Noted. Seascape wireframe included (Figure 10.14).
HES (Follow up email 10 November 2022)	Confirmed content with the proposed visualisation locations, but recommended that the proposed visualisation for the Barpannan, Two Chambered Cairns, Vatten Duirinish (SM893) is upgraded to a 360-degree photomontage centred on point 129835, 843991, from centre of southern cairn scheduled area.	Noted. Visualisations included for the ten Scheduled Monuments and the seascape (Table 10.6: Cultural heritage assets given detailed assessment, Figures 10.4 – 10.14) as agreed with HES.

10.4 Approach to the assessment

Study area

10.4.1 Following the approach proposed in the Scoping Report, the archaeology and cultural heritage assessment has adopted the following defined study areas:

- The Inner Study Area (**Figure 10.1**): the Proposed Development site (the Site), defined by the Site red line boundary, within which turbines and associated infrastructure are proposed, forms the study area for the identification of heritage assets that could receive direct effects arising from the construction of the Proposed Development; and
- The Outer Study Area (**Figure 10.2**): a wider study area, extending 10 km from the outermost finalised proposed turbine locations, has been used for the identification of cultural heritage assets whose settings may be affected by the Proposed Development (including cumulative effects). Views towards any assets identified as having settings sensitive to change were also considered, even where no visibility has been predicted from the asset. The wider Zone of Theoretical Visibility (ZTV) was assessed to identify any designated assets beyond 10 km that have settings that may be especially sensitive to the Proposed Development (none were identified that warranted inclusion).

Desktop Study

10.4.2 The following information sources were consulted as part of the desk-based assessment:

- Historic Environment Scotland Spatial Data Warehouse (HES, 2022): provided up-to-date data on the locations and extents of Scheduled Monuments, Listed Buildings, Conservation Areas, Inventory status Garden and Designed Landscapes and Inventory status Historic Battlefields. (digital data downloaded 12/12/2022);
- The Highland Council Historic Environment Record (HER): digital data extract received 09/08/2022;
- The National Record for the Historic Environment (NRHE; Canmore) (HES, 2022): for any information additional to that contained in the HER;
- Relevant bibliographic references were consulted to provide background and historic information;
- Map Library of the National Library of Scotland: for Ordnance Survey maps and other historical map resources;
- Historic Land-Use Assessment Data for Scotland (HLAMap) (HES, 2022): for information on the historic land use character of the Site and the surrounding area; and
- Modern vertical aerial photographic imagery (Google Earth, Bing Maps, and ESRI World Imagery) was examined to obtain information on current land-use and evidence for continuing survival of sites and features identified through other desk-based resources.

Field survey

- 10.4.3 This area was comprehensively surveyed in 2002, in advance of the original Ben Aketil Wind Farm (Wildgoose, 2002), the survey area covered most of the current Inner Study Area. Therefore, a targeted walk-over field survey was carried out on the 30th August 2022, by two archaeological surveyors in overcast conditions, with good visibility.
- 10.4.4 The survey focussed attention on the areas to be affected by the Proposed Development and to visiting sites (or elements of sites) previously recorded by Wildgoose that lie within the micro-siting allowance for the Proposed Development.
- 10.4.5 Site visits to heritage assets in the Outer Study Area were undertaken on the 31st August 2022 to assess, with the aid of draft wireframe visualisations, the potential impact of the Proposed Development on their settings. Site visits included those assets specifically identified by consultees (HES, THC: HET) as requiring assessment and those identified through analysis of the blade tip height ZTV where it was considered, on the basis of professional judgement, that the impact on their settings could be significant.

Assessment of potential effect significance

- 10.4.6 The effects of the Proposed Development on heritage assets have been assessed based on their type (direct effects, impacts on setting and cumulative impacts) and nature (adverse or beneficial). The assessment takes into account the relative value/sensitivity of the heritage asset, and its setting, and the magnitude of the predicted impact. The following types of effects are identified as part of the assessment:
- adverse effects are those that detract from or reduce cultural significance or special interest of heritage assets.
 - beneficial effects are those that preserve, enhance or better reveal the cultural significance or special interest of heritage assets.

Assigning sensitivity to heritage assets

- 10.4.7 Cultural heritage assets are given weight through the designation process. Designation ensures that sites and places are recognised by law through the planning system and other regulatory processes. The level of protection and how a site or place is managed varies depending on the type of designation and its laws and policies (HES, 2019b). **Table 10.3**, below, summarises the relative sensitivity of key heritage assets relevant to the Proposed Development (it excludes World Heritage Sites, Inventory Historic Battlefields, and maritime heritage assets).

Table 10.3: Receptor value and sensitivity

Sensitivity	Description / Criteria
High	Assets valued at an international or national level, including: <ul style="list-style-type: none"> Scheduled Monuments. Category A Listed Buildings. Inventory Gardens and Designed Landscapes; and Non-designated assets that meet the relevant criteria for designation.
Medium	Assets valued at a regional level, including: <ul style="list-style-type: none"> Archaeological sites and areas that have regional value (contributing to the aims of regional research frameworks) Category B Listed Buildings. Non-Inventory Designed Landscapes (NIDL), and Conservation Areas.
Low	Assets valued at a local level, including: <ul style="list-style-type: none"> Archaeological sites that have local heritage value. Category C listed buildings; and Unlisted historic buildings and townscapes with local (vernacular) characteristics.
Negligible	Assets of little or no intrinsic heritage value, including: <ul style="list-style-type: none"> Artefact find-spots (where the artefacts are no longer <i>in situ</i> and where their provenance is uncertain); and Poorly preserved examples of particular types of minor historic landscape features (e.g., quarries and gravel pits, dilapidated sheepfolds, etc).

Magnitude of impact (change)

- 10.4.8 The magnitude of impact (adverse or beneficial) has been assessed in the categories 'high', 'medium', 'low' and 'negligible' as described in **Table 10.4**, below.

Table 10.4: Definition of impact magnitude

Magnitude	Definition/Criteria	
	Adverse	Beneficial
High	Changes to the fabric or setting of a heritage asset resulting in the complete or near-complete loss of the asset's cultural significance. Changes that substantially detract from how a heritage asset is understood, appreciated, and experienced.	Preservation of a heritage asset <i>in situ</i> where it would otherwise be completely or almost completely lost. Changes that appreciably enhance the cultural significance of a heritage asset and how it is understood, appreciated, and experienced.
Medium	Changes to those elements of the fabric or setting of a heritage asset that contributes to its cultural significance such that this quality is appreciably altered. Changes that appreciably detract from how a heritage asset is understood, appreciated, and experienced.	Changes to important elements of a heritage asset's fabric or setting, resulting in its cultural significance being preserved (where this would otherwise be lost) or restored. Changes that improve the way in which the heritage asset is understood, appreciated, and experienced.
Low	Changes to those elements of the fabric or setting of a heritage asset that contribute to its cultural significance such that this quality is slightly altered. Changes that slightly detract from how a heritage asset is understood, appreciated, and experienced.	Changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed. Changes that result in a slight improvement in the way a heritage asset is understood, appreciated, and experienced.
Negligible	Changes to fabric or setting of a heritage asset that leave its cultural significance unchanged and do not affect how it is understood, appreciated, and experienced	

Assessment of effects on setting

- 10.4.9 The SNH/HES EIA Handbook (2018)²⁰ Appendix 1, paragraph 42 advises that:
- 10.4.10 "In the context of cultural heritage impact assessment, the receptors are the heritage assets and impacts will be considered in terms of the change in their cultural significance".
- 10.4.11 Historic Environment Scotland's guidance document²¹, 'Managing Change in the Historic Environment: Setting' (HES 2016), notes that:

²⁰ Scottish Natural Heritage (2018), Environmental Impact Assessment Handbook. Available at: <https://www.nature.scot/sites/default/files/2018-05/Publication%202018%20-%20Environmental%20Impact%20Assessment%20Handbook%20V5.pdf>, (accessed February 2023).

²¹ HES (2016), Managing Change in the Historic Environment: Setting. Available at: <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationid=80b7c0a0-584b-4625-b1fd-a60b009c2549> (accessed February 2023).

- 10.4.12 "Setting can be important to the way in which historic structures or places are understood, appreciated and experienced. It can often be integral to a historic asset's cultural significance."
- 10.4.13 "Setting often extends beyond the property boundary or 'curtilage' of an individual historic asset into a broader landscape context".
- 10.4.14 The guidance also advises that:
- 10.4.15 "If proposed development is likely to affect the setting of a key historic asset, an objective written assessment should be prepared by the Applicant to inform the decision-making process. The conclusions should take into account the significance of the asset and its setting and attempt to quantify the extent of any impact. The methodology and level of information should be tailored to the circumstances of each case".
- 10.4.16 The guidance recommends that there are three stages in assessing the impact of a development on the setting of a historic asset or place:
- Stage 1: identify the historic assets that might be affected by the Proposed Development.
 - Stage 2: define and analyse the setting by establishing how the surroundings contribute to the ways in which the historic asset or place is understood, appreciated and experienced.
 - Stage 3: evaluate the potential impact of the proposed changes on the setting, and the extent to which any negative impacts can be mitigated.
- 10.4.17 The SNH/HES EIA Handbook (2018) Appendix 1, paragraph 43 advises that:
- 10.4.18 "When considering setting impacts, visual change should not be equated directly with adverse impact. Rather the impact should be assessed with reference to the degree that the proposal affects those aspects of setting that contribute to the asset's cultural significance".
- 10.4.19 Following these recommendations, the turbine blade tip height and hub height ZTVs for the Proposed Development have been used to identify those heritage assets from which there would be theoretical visibility of one or more of the proposed wind turbines and to assess the degree of potential visibility (see **Technical Appendix 10.2** and **Figure 10.2**). Additionally, turbine blade tip and hub height ZTVs with screening, (created using buildings and woodland blocks taken from the OS OpenMap Local vector dataset. Buildings used an assumed height of 7 m and woodland 10 m) have been used to identify those heritage assets from which there would be theoretical visibility of one or more of the proposed wind turbines and to further assess the degree of potential visibility. Consideration was also given to designated heritage assets where there is no predicted visibility from the asset, but where views of or across the asset are important factors contributing to its cultural significance. In such cases, consideration was given to whether the Proposed Development could appear in the background to those views. The following are included in the assessment:
- Scheduled Monuments, Category A and B Listed Buildings, Conservation Areas, and Inventory Gardens and Designed Landscapes within 10 km of the outermost turbines, are included in the assessment.
 - Category C Listed buildings, which are of local value (low sensitivity) and generally have only localised settings within 5 km of the outermost turbines have been included in the assessment.

- 10.4.20 Where it has been determined that the setting of an asset is such that there is no potential for it to be affected by the presence of the Proposed Development (including all assets of negligible sensitivity and Category C Listed Buildings more than 5 km from the Proposed Development), the asset has not been considered further. For the remaining assets, the magnitude of impact on the setting was assessed according to the thresholds in set out in **Table 10.4**.

Criteria for Assessing the Significance of Effects

- 10.4.21 The sensitivity of the asset (**Table 10.3: Receptor value and sensitivity**) and the magnitude of the predicted impact (**Table 10.4: Definition of impact magnitude**) have been used to assess the potential significance of the resultant effect. **Table 10.5** summarises the criteria for assigning significance of effect. Where two outcomes are possible through application of the matrix, professional judgement supported by reasoned justification, has been employed to determine the level of significance.

Table 10.5: Significance criteria

Sensitivity	Magnitude			
	High	Medium	Low	Negligible
High	Major	Major / Moderate	Moderate / Minor	Minor / Negligible
Medium	Major / Moderate	Moderate	Moderate / Minor	Minor / Negligible
Low	Moderate / Minor	Moderate / Minor	Minor	Negligible
Negligible	Minor / Negligible	Minor / Negligible	Negligible	Negligible

- 10.4.22 Major and moderate effects are considered to be 'significant' in the context of Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations)²². Minor and negligible effects are considered to be 'not significant'.

Cumulative Impact Assessment

- 10.4.23 The assessment of cumulative effects on heritage assets is based upon consideration of the effects of the Proposed Development on the settings of assets with statutory and non-statutory designations, in addition to the likely effects of other operational, under construction, consented, and proposed (at the application stage) developments.
- 10.4.24 For this assessment, operational and consented developments that are under construction, are taken to form part of the baseline against which the effect of the Proposed Development is assessed. Other proposed developments that have validated planning applications including those consented, but not in construction are considered to form part of the potential cumulative baseline.
- 10.4.25 Proposed developments that are at the scoping stage are excluded from the assessment as there is insufficient information on the proposed scale and size or configuration to

²² Scottish Government (2017), Electricity Works (Environmental Impact Assessment) (Scotland) Regulations.

reliably assess the potential cumulative impact, and uncertainty over whether they will be progressed to a formal application.

- 10.4.26 The assessment takes into account the relative scale (i.e., size and number of turbines) of the identified developments, their distance from the affected assets, and the potential degree of visibility of the various developments from the assets under consideration.

Requirements for mitigation

- 10.4.27 Planning Advice Note 1/2013²³: Environmental Impact Assessment (PAN1/2013) describes mitigation as a hierarchy of measures: prevention, reduction, compensatory (offset) measures. Prevention and reduction measures can be achieved through design, whilst compensatory measures can offset impacts that have not been prevented or reduced through design.
- 10.4.28 The emphasis in Planning Advice Note (PAN) 2/2011²⁴: Planning and Archaeology (PAN2) is for the preservation of important remains *in situ* where practicable and by record where preservation is not possible. The mitigation measures presented below (**Section 10.7**) therefore take into account this planning guidance and provide various options for protection or recording and ensuring that, where practical, surviving assets are preserved intact to retain the present historic elements of the landscape.
- 10.4.29 Historic Environment Policy for Scotland 2019 (HEPS)²⁵ also contains policies (notably HEP2 and HEP4) that are relevant for conservation and preservation of the historic environment.
- HEP2 requires that decisions affecting the historic environment should ensure that its understanding and enjoyment as well as its benefits are secured for present and future generations.
 - HEP4 requires that changes to specific assets and their context should be managed in a way that protects the historic environment. Opportunities for enhancement should be identified where appropriate. If detrimental impact on the historic environment is unavoidable, it should be minimised. Steps should be taken to demonstrate that alternatives have been explored, and mitigation measures should be put in place.
- 10.4.30 This guidance has therefore been taken into account in the consideration of appropriate mitigation set out below: in **Section 10.7**.

Assessment of residual effect significance

- 10.4.31 The assessment of the significance of residual effects takes into account the mitigation proposed and the effectiveness of that mitigation to avoid, reduce, or offset the predicted effects:
- Where a predicted impact is avoided, through micro-siting, the Proposed Development would result in no residual effect.
 - Where an asset cannot be avoided, but where the proposed mitigation would ensure that the affected asset is subject to an appropriate level of archaeological

²³ Scottish Government (2013), Planning Advice Note 1/2013: Environmental Impact Assessment.

²⁴ Scottish Government (2011), Planning Advice Note 2/2011: Environmental Impact Assessment.

²⁵ HES (2019), Historic Environment Policy for Scotland 2019 (HEPS).

investigation and recording, resulting in its preservation by record, the significance of residual effect is accordingly reduced.

- Where an asset (usually one of little or no heritage importance and negligible sensitivity) is lost without any mitigation, the residual effect remains the same as the predicted effect. In all such cases, the residual effect (major magnitude impact (**Table 10.4: Definition of impact magnitude**) on an asset of negligible sensitivity (**Table 10.3: Receptor value and sensitivity**) would be no more than minor adverse (not significant in EIA terms).

Difficulties and uncertainties of the assessment

- 10.4.32 This assessment has been completed using data derived from HES's Spatial Warehouse and from the Highland Council's HER. It is assumed that, at the time of the acquisition of the data in August 2022 the information provided was accurate and up-to-date, and that there has been no substantive change to the baseline character and condition, and cultural significance of the heritage assets since their original discovery or their last recorded visit, whichever is the more recent.
- 10.4.33 The assessment also relies in part on the results of field surveys carried out across the Site by Martin Wildgoose in 1997 and in 2002. It is assumed that the data gathered during those surveys is an accurate reflection of the baseline character and condition of those sites.

Embedded mitigation

- 10.4.34 As set out in **Chapter 2: Proposed Development**, the overarching principles influencing the design of the Proposed Development included maximising the amount of renewable energy generation, while minimising the potential impacts on sensitive receptors, wherever possible.
- 10.4.35 This was built into the design with the location and sensitivity of all identified cultural heritage assets being mapped and appropriate buffers around them were agreed at design iteration Layout C. The following buffers were applied during the design of the Proposed Development:
- 500 m minimum (1 km optimal) avoidance buffer from scheduled monuments;
 - 30 m avoidance buffer from non-designated heritage assets.
- 10.4.36 Additionally, where possible the existing wind farm infrastructure has been incorporated into the design, reducing the requirement for fresh ground-breaking in these areas and hence reducing the potential for direct construction impacts on cultural heritage assets.

10.5 Existing environment

Character of the Inner Study Area

- 10.5.1 The Proposed Development Site (**Figure 10.1**) is located 3.5 km south of Edinbane, on the Isle of Skye. The proposed turbine locations and associated infrastructure are sited in an area of rough grazing largely to the immediate south-west of the operational Ben Aketil Wind Farm with the proposed access tracks following the routes of the existing tracks for much of their length.

- 10.5.2 According to HLAmap, current land-use within the majority of the Site comprises rough grazing (HES, 2022), with an area of power generation demarcated where the current Ben Aketil turbines are located. HLAmap also records areas of 'Medieval/Post Medieval Shielings' and 'Medieval/Post Medieval Settlement and Agriculture' within the Site. These areas largely correlate with the HER assets recorded within the Site and are located along the course of the Caroy River (shown as green areas on **Figure 10.1**).

Historic maps

- 10.5.3 Blaeu's map (1654) is the first map to show the location of the Inner Study Area, but that map does not record any detail other than the names of settlements. Thomson and Johnston (1820) show some topographic detail, recording the rivers and hills within the Site of which 'Ben Ackadale (sic)' is named.
- 10.5.4 Within the Inner Study Area, the Ordnance Survey first edition 6-inch map (1880) depicts the small, roofed farmstead of Cnocantoul (**7**) with a second farmstead (**14**) comprising two unroofed buildings to its south. Both farmsteads are located on the side of a track which survives within the south of the Inner Study Area and which has since been extended north-east to the area of the existing Ben Aketil Wind Farm.
- 10.5.5 By the date of the second edition map (1903) the first farmstead (**7**) is no longer roofed and only one unroofed building of the second farmstead (**14**) is depicted. The track is not shown on this map.
- 10.5.6 The Ordnance Survey Map of 1965 shows several previously unrecorded assets, including a group of approximately 16 shieling huts (**6**) within the north-west part of the Inner Study Area, two unroofed farmsteads with associated banks and enclosures (**22**, **23** and **24**) in the area to the south of Aketil Burn, and a single unroofed building on the north bank of the Rageary Burn (**11**). Site visits to these assets confirmed that typologically they predate the 1960s and are probably of post-medieval date. It is very likely that these structures were present at the time of the first and second edition Ordnance Survey maps and that their depiction only on the later map is more telling of the working methods / interests of the Ordnance Survey Surveyors. On all three Ordnance Survey maps the Inner Study Area is depicted as unenclosed moorland.

Aerial photography

- 10.5.7 The study of modern aerial photography and satellite imagery of the Site (using Bing Maps, Google Earth and ESRI World Imagery) confirmed the survival of several features recorded on the HER, and of those identified by the previous fieldwork (Wildgoose, 1997 & 2002), within the Inner Study Area. No previously unrecorded structural remains (farmsteads, field boundary dykes, buildings or shielings) were identified within the Site boundary, but areas of cultivation and lazy beds are visible. The extent of these areas, which were also observed on the ground during field survey, have been transcribed from the aerial photography and satellite imagery and are included on **Figure 10.1**.

Previous Investigations

- 10.5.8 The HER records details of three previous investigations within the Inner Study Area. These were undertaken between 1997 and 2009 and comprise desk-based assessments (DBAs) and walkover surveys.

- 10.5.9 A pre-afforestation survey (Wildgoose, 1997) included three parcels of land within the Inner Study Area. Six archaeological features within the Inner Study Area were identified during that survey including shieling huts (**3**, **12** and **19**), a possible hut circle (**5**), and a 'mound' of unknown origin (**4**).
- 10.5.10 A DBA and a walkover survey (Wildgoose, 2002) were carried out in support of the original Ben Aketil Wind Farm. The survey was carried out by a team of three archaeologists over an eight day period and systematically covered the development area of the original Ben Aketil Wind Farm. The extent of this 2002 survey covers the majority of the Inner Study Area and the full extent of the construction footprint, the only exception being the area of the construction compound at the southern limit of the Site. This survey recorded that most of the archaeological features within the Site are related to post medieval farming and crofting activities.
- 10.5.11 A second DBA (CFA Archaeology, 2009) was undertaken to inform a previous extension of Ben Aketil Wind Farm and, drawing on the results of the earlier work by Wildgoose, no site visit was undertaken as part of that work.
- 10.5.12 The results of these previous studies and surveys inform this assessment.

Heritage Assets in the Inner Study Area (Figure 10.1; Technical Appendix 10.1)

Designated heritage assets

- 10.5.13 There are no Scheduled Monuments or Listed Buildings within the Inner Study Area, and no part of the Inner Study Area falls within a Conservation Area, Inventory Garden and Designed Landscape, or Inventory Historic Battlefield.

Non-designated heritage assets

- 10.5.14 There are 25 non-designated heritage assets within the Inner Study Area. Numbers in brackets and in bold in the following text refer to these heritage assets which are shown on **Figure 10.1**, and described in detail in **Appendix 10.1: Heritage Assets in the Inner Study Area**.

Prehistoric period

- 10.5.15 A possible (but dubious) very degraded prehistoric burial cist (**15**) was recorded during the course of Wildgoose's 2002 survey. It survives as a small pile of stones with what appears to be a cist comprised of three slabs of stone measuring 0.4 m square with the east slab missing. The surveyor noted that this may possibly be a clearance cairn. Giving some weight to the fact that the surveyor recorded this asset as a possible burial cairn it is assessed as such and has the potential to increase information on burial and ritual activities in the Bronze Age. Accordingly, it is assessed as an asset potentially of value at a regional level and of medium sensitivity.
- 10.5.16 There are three possible hut-circles (**5**, **9** and **13**) recorded within the Inner Study Area (Wildgoose 1997 & 2002). Hut circles are generally interpreted as being farming homesteads of late Bronze Age to Iron Age date, whether these were static homes surrounded by farmland, or represent episodic occupation, is subject to debate (SCARF, Accessed December 2022). The three possible hut circles recorded within the Inner Study

Area are relatively ephemeral circular features, two being recorded under the remains of a sheiling hut (5) and an enclosure (9), and the third (13) being 4 m in diameter with indistinguishable walls. However, as possible prehistoric settlement sites these are assessed to be potentially of value at a regional level and of medium sensitivity.

- 10.5.17 Glen Heysdal broch (21) is located on a rocky knoll, in the south-west of the Site. When first recorded by the Royal Commission on Ancient and Historical Monuments of Scotland (RCAHMS) in 1928, it was noted that the broch had been reduced to its foundation course, and subsequent visits by RCAHMS in 1961 and 1985 and by Wildgoose in 2002 confirmed that the broch has been subject to extensive stone robbing though sufficient remains survive to indicate its dimensions. It had an internal diameter is 10.5 m and the surviving wall is approximately 3.6 m thick. Brochs are Iron Age structures typically thought of as large drystone round towers. They are thought not necessarily to be militarily defensive structures, and not all would have been of the archetypal tall, circular tower form. They are now more commonly thought of as 'Complex Atlantic Roundhouses', of which true broch towers are a small subset (Geddes, 2006). As the significantly robbed remains of a broch this asset retains the potential to inform on prehistoric settlement and economy in this area. It is therefore assessed as an asset of value at a regional level and of medium sensitivity.

Medieval and post medieval period

- 10.5.18 There are five farmsteads (7, 14, 20, 22 and 23) and 15 sheiling huts or groups of shieling huts (1-7, 10-12, 16-19 and 25), and two animal pens (8 and 24) within the Site.
- 10.5.19 The five small farmsteads (7, 14, 20, 22 and 23) are the remains of small and simple crofts, which survive as the turf and stone remains of a farm building and smaller outbuildings and enclosures. As relatively simple farmsteads they have some archaeological potential relating to agricultural practices and domestic life in the late 18th and 19th centuries and are components of the local historic landscape. As such, they are assessed as being of value at a local level and to be of low sensitivity.
- 10.5.20 The 15 shielings records vary in size from single shielings (2, 3, 4, 5, 7, 11 and 18) to small groups of two to five shielings (1, 10, 17 and 19) and include larger groups of up to thirty shielings (6, 12, 16 and 25). Shieling huts are typically associated with medieval to post-medieval summer grazing activity, with the shepherds staying on the higher grounds with their stock, in small huts.
- 10.5.21 Two possible shielings (3 and 4) were visited on the field survey for this assessment and, while mounds are present in these locations, it could not be confidently stated these are not natural mounds. There was little evidence on the ground to assign these mounds the remains of shieling huts, so these two assets are assessed as being of little or no intrinsic heritage value and of negligible sensitivity.
- 10.5.22 The remaining 13 shielings (1, 2, 5-7, 10-12, 16-19 and 25) are considered to be components of the local historical landscape and are assessed to be of heritage value at the local level and of low sensitivity.
- 10.5.23 The two animal pens (8 and 24) are evidence of stock management associated with the crofts within the Inner Study Area and, as components of the local historical landscape, they are assessed to be of heritage value at the local level and of low sensitivity.

- 10.5.24 Across the lower ground of the Inner Study Area and either side of an existing southern track, which follows the route of the Caroy River, there is a large area of cultivation (26) which survives to a varying degree and includes areas of lazy beds and field banks. As an example of relict cultivation this forms part of the local historic landscape and is assessed to be of heritage value at local level and of low sensitivity.

Archaeological potential

- 10.5.25 The desk-based assessment, previous field surveys (Wildgoose, 1997 and 2002) and targeted walkover survey for this assessment have shown that the majority of heritage assets within the Inner Study Area are of medieval to post-medieval date and relate to upland farming practices and livestock management. Of the five assets recorded as being of prehistoric date, only one, Glen Heysdal broch (21), is confidently dated, the remaining possible cist (15) and three hut circles (5, 9 and 13) are recorded as very degraded or ephemeral features – without ground truthing (through excavation) any date for these assets remains speculative.
- 10.5.26 Taking into account the current land-use and the evidence for occupation and settlement within the Inner Study Area, the archaeological potential is assessed that there is low to moderate potential for hitherto undiscovered archaeological remains. Such assets are most likely to be of post-medieval date and associated with crofting practices.

Designated heritage assets within the Outer Study Area

- 10.5.27 Within 10 km of the Proposed Development there are 23 Scheduled Monuments of heritage value at national level and of high sensitivity. 18 of these have predicted theoretical visibility of the Proposed Development. Three Category A Listed Buildings are of heritage value at national level and of high sensitivity. None have predicted theoretical visibility of the Proposed Development. Sixteen Category B Listed Buildings are of heritage value at regional level and of medium sensitivity. Three have predicted theoretical visibility of the Proposed Development. One Inventory Garden and Designed Landscape is of heritage value at national level and of high sensitivity and has no predicted visibility of the Proposed Development. One Conservation Area of heritage value at a regional level and of medium sensitivity has limited theoretical visibility of the Proposed Development.
- 10.5.28 Within 5 km of the Proposed Development there are four Category C Listed Buildings of value at a local level and of low sensitivity. Two have predicted theoretical visibility of the Proposed Development.

10.6 Predicted effects

Construction impacts

- 10.6.1 Any ground-breaking activities associated with the construction of the Proposed Development, (such as those required for turbine bases and crane hardstandings, battery storage, access tracks, cable routes, compounds, borrow pits, etc.) have the potential to disturb or destroy features of cultural heritage interest within the Site. Other construction activities, such as vehicle movements, materials storage, soil and overburden storage and landscaping also have the potential to cause permanent and irreversible effects.

10.6.2 The Proposed Development layout has been designed to avoid impacts on heritage assets as far as possible (**Figure 10.1**). However, one heritage asset would be directly affected as a result of construction impacts associated with the Proposed Development. This is:

- Remains of the area of cultivation (26), of low sensitivity, would be crossed by the southern access track. The proposed southern access track largely follows the route of the existing crofters' track north of 130063, 845360 and south of 130352, 844317 (**Figure 10.1**). Between these two points, the proposed track crosses an area of cultivation which is best preserved to, the south of the Ben Aketil Burn (south of 130312, 844918) where it is denuded but includes traces of former lazy-beds and field banks. The direct impact on the area of cultivation (26) from upgrading of the track would be of low magnitude, resulting in an effect of **minor significance (not significant)** in EIA terms) through a slight increase in fragmentation of the field system. Mitigation measures at the construction stage to offset the effect are outlined in **Section 10.7: Mitigation**.

10.6.3 It has been assessed that there is a low to moderate potential for hitherto undiscovered archaeological remains to be present either within the Site or along either of the proposed access routes. Remains of prehistoric date could be encountered, but it is more likely that any remains encountered will be of post-medieval date and associated with agrarian activities.

10.6.4 Taking into account the assessed low sensitivity of most of the known archaeological remains on the Site and along the access tracks, and assuming potential impacts of high magnitude arising from construction works, it is assessed that, without mitigation, any adverse direct effects on buried archaeological remains could be of **moderate significance (significant)** in the context of the EIA regulations). Mitigation measures at the construction stage are outlined in **Section 10.7: Mitigation**.

Operational impacts

10.6.5 The Proposed Development could result in adverse effects on the settings of cultural heritage assets within the Outer Study Area (which includes the Inner Study Area), although, such effects would diminish with increasing distance from the Site. At distances greater than 10 km, it is considered that, in most instances, the Proposed Development would not appreciably alter characteristics of the settings of the heritage assets that contribute to their cultural significance. Neither would it appreciably alter how a heritage asset is understood, appreciated, and experienced.

10.6.6 **Technical Appendix 10.2: Designated Heritage Assets in the Outer Study Area**, contains tabulated assessments of the predicted effects on the settings of designated heritage assets with cogitation of the degree of predicted theoretical visibility of the Proposed Development based on analysis of the hub and blade tip height ZTVs, with and without screening.

10.6.7 There are no designated heritage assets beyond 10 km from the Proposed Development that have been identified through appraisal of the blade tip ZTV or notified through consultation with HES and THC:HET that require consideration of potential impacts on their settings.

10.6.8 The assessment of operational effects on the settings of heritage assets has been carried out with reference to the layout of the Proposed Development and the locations of the cultural heritage assets shown on **Figure 10.2**. The criteria detailed in **Table 10.3, Table**

10.4 and **Table 10.5** have been used to assess, in combination with professional judgement, the nature and magnitude of the effects set out in the Technical Appendices.

- 10.6.9 The following discussion addresses those assets where potentially significant adverse effects have been identified through the tabulated assessment, and those assets identified by HES as requiring detailed consideration, even where the significance of the predicted effect is assessed as being not significant in EIA terms. The assessments are supported with cultural heritage visualisations (**Table 10.6, Figures 10.4 -10.14**). The visualisations are referenced in the tabulated assessment set out in **Technical Appendix 10.2**, where relevant, and are referenced where relevant in the assessment below.
- 10.6.10 There are ten designated heritage assets with the Outer Study Area (**Table 10.6**, below) that HES requested be focused upon in the assessment. Each of these is discussed in detail below. The tabulated assessment in **Technical Appendix 10.2** has identified no other heritage assets, where a significant adverse effect is anticipated, that require detailed discussion.

Table 10.6: Cultural heritage assets given detailed assessment

Reference No.	Designation Title	Visualisations Figure No.
SM 893	Barpannan, Two Chambered Cairns, Vatten Durnish	Figure 10.4 a-f
SM 911	Dun Flashader, Broch, Skye	Figure 10.5 a-b
SM 930	Ullinish, Fort, Bracadale	Figure 10.6 a-f
SM 3493	Dun Osdale, Broch 850 m N of Osdale	Figure 10.7 a-f
SM 3494	Dun Feorlig, broch 230 m NNE of Feorlig Farm	Figure 10.8 a-b
SM 3884	Ardmore, Chapel and Burial Ground 230 m SW of	Figure 10.9 a-f
SM 3885	Dun Neil, Dun 420 m SW of Ardmore	Figure 10.10 a-b
SM 9249	St Mary's Church and Burial Ground, Dunvegan	Figure 10.11 a-c
SM 13662	Dun Arkaig, Broch	Figure 10.12a-c
SM 13664	Abhainn Bhaile Mheadhonaich, broch and standing stone 145m SE of An Cairidh	Figure 10.13 a-b

Barpannan, Two Chambered Cairns, Vatten Duirnish (SM 893) Figure 10.2, Figures 10.4 a – f

- 10.6.11 Two chambered cairns, burial monuments of Neolithic date, lie in an area of rough pasture approximately 500 m north-west of the top of Loch Caroy and 1.5 km to the east of Loch Vatten on the isthmus of the Harlosh peninsula. As a Scheduled Monument, the chambered cairns are of heritage value at national level and are assets of high sensitivity.
- 10.6.12 The chambered cairns are located approximately 75 m apart and without excavation it is not possible, from their typology alone, to confidently state if they were in contemporary use. The proximity of the cairns is, however, a significant part of their setting, they were either contemporarily or subsequently sited in relation to each other.

- 10.6.13 The cairns are located on the plateau of a small hillock, to the north-west of the summit. To the south-west the view is along the Harlosh peninsula with Loch Caroy to its east and Loch Vatten to the west. Beyond the peninsula, to the south, the wider expanse of Loch Bracdale is visible on the horizon. To the west, beyond a small area of higher ground which blocks the westward view to Loch Vatten, are the rising hills of the Durnish peninsula of which MacLeod's Tables is the most prominent. To the south-east the Cuillin hills are a prominent feature in the distant view their height and ruggedness being in marked contrast to the intervening gentle low rolling hills and coastline. To the north the view is over gently rising moorland hills, to the north-east is Glen Heysdale and the route of the Caroy River to the rising ground of Ben Aketil on which the operational turbines of the existing Ben Aketil and Edinbane Wind Farms are visible (**Figure 10.4 a**).
- 10.6.14 To the west the MacLeod's Tables on the Durnish peninsula are high conical mountains with flat tops which sit approximately 2 km apart on a north to south-east alignment (**Figure 10.4 d**). It may be suggested that the two cairns mirror the morphology of these mountains, being of a similar shape and in a similar arrangement, and hence the view from these cairns to these mountains is of importance.
- 10.6.15 The Cuillin Hills, are a prominent feature of the landscape, over 26 km to the south-east (Shown on **Figure 10.4 b**, though light conditions at time of photography obscure the Cuillins. **Landscape and Visual Assessment Figure 3.b** shows the relationship between the cairns and the Cuillins more clearly). Analysis, using topographic 3D modelling available in Google Earth Pro, indicates that, at the mid-winter solstice, the rising sun rises behind the Cuillins, rising along their northern flank. It is unlikely that this is a purely coincidental solar event, and it may be that the cairns were in part placed to capture this event.
- 10.6.16 Located to the north of the summit of the hillock, on a flat plateau, these chambered cairns appear to have been intentionally built not to take the more prominent position on the hillock's summit, and they are not prominent features when viewed from the southern part of the peninsula. They are, however, relatively prominent features, skylined in the view to the west from the top of Loch Caroy where it meets the River Caroy. They are also visible in views south along Glen Heysdal and from the north; albeit to a lesser degree than in the view from the top of Loch Caroy.
- 10.6.17 From the analysis, it appears that those aspects of the setting that contribute most to the chambered cairns' cultural significance can be summarised as being their relationship to each other, their proximity to Loch Caroy and their location on the isthmus of the Harlosh peninsula, the view towards them from the west and north-west, and the potentially ritual visual associations with the Cuillins, to the south-east, and the MacLeod's Tables to the west.
- 10.6.18 The chambered cairns lie 3.3 km to the south-west of the nearest proposed turbine (T6). The photomontage (**Figure 10.4 f**) shows that, from the cairns, nine turbines would be visible at hub height.
- 10.6.19 The introduction of the Proposed Development would result in the proposed turbines being visible on and beyond the skyline in the view to the north-east from the monument. However, the key views from the cairns would remain largely unchanged. The view from the chambered cairn, to the south-east towards the Cuillins (**Figure 10.4b**), would not be affected and it would remain possible for any visitor to experience the midwinter sunrise behind the Cuillins and understand and appreciate the monument's association with that

annual solar event. The other key view that to the west and the MacLeod's Tables (**Figure 10.4d**), which the cairns mirror, would also not be affected. Additionally, the view towards the cairns from the east at the top of Loch Caroy and that from the north-west on the public road would also be retained and it would remain possible for any visitor to experience and appreciate those relationships. As such, the integrity of these key aspects of the monument's setting would be retained, unaffected by the Proposed Development.

- 10.6.20 Overall, as a result of the change to their wider surroundings, the Proposed Development would have an impact of low magnitude on the setting of the Barpannan, Chambered Cairns, an asset of high sensitivity. Based on professional judgement, given that the key views of cultural significance to the cairns would remain unchanged it is assessed that this would result in an effect that is assessed as **minor** adverse significance and **not significant** in EIA terms.

Dun Flashader, Broch, Skye (SM 911), Figure 10.2, Figures 10.5 a –c

- 10.6.21 The remains of this Iron Age broch survive as a dilapidated stone wall surmounting a rocky outcrop on the south-east side of Loch Greshornish. As a Scheduled Monument, Dun Flashader, broch is of heritage value at national level and is an asset of high sensitivity.
- 10.6.22 Dun Flashader broch is sited on the summit of a precipitous hillock which rises approximately 8 m above the surrounding ground (Atlas of Hillforts: Skye, Dun Flashader (ox.ac.uk), accessed 22/11/2022). The area surrounding it is low-lying fertile land and the defining view from the broch is to the north over Loch Greshornish, in particular over the horseshoe bay at Kildonan. To the east, west and south the wider views are to rising hills, with the turbines of the existing Ben Aketil and Edinbane Wind Farms visible on the hills to the south-west (**Figure 10.5a**).
- 10.6.23 While this broch may originally have been prominent within its topographic setting it is now little more than a low mound and not readily distinguishable from the hillock it sits on from any distance. However, as a building perhaps intended to be prominent and visible in the landscape, views towards the broch from its surroundings and its coastal approach are important to the appreciation of its cultural significance.
- 10.6.24 From the analysis, it appears that those aspects of the setting that contribute most to the broch's cultural significance can be summarised as the naturally defensive hillock on which it stands, the view north towards Loch Greshornish, and the views towards this broch from the surrounding landscape.
- 10.6.25 Dun Flashader lies 6.4 km to the north-east of the nearest proposed turbine (T3). The wireframe (**Figure 10.5 c**) predicts that, from the broch, nine turbines would be visible at hub height.
- 10.6.26 The introduction of the Proposed Development would result in the proposed turbines being visible on and beyond the skyline in the view to the south-west from the monument. However, the key views from Dun Flashader, over Loch Greshornish and the horseshoe bay at Kildonan, would remain unchanged. As such, the integrity of that key aspect of the monument's setting would be retained, unaffected by the Proposed Development, and it would remain possible for any visitor to experience and appreciate those relationships. The view towards the broch from the northern seaward approach would include the

turbines, but they would be sufficiently distant, and in a separate landscape area, not to compete with the broch for prominence.

- 10.6.27 Overall, as a result of the change to its wider surroundings, the Proposed Development would have an impact of low magnitude on the setting of the Dun Flashader, an asset of high sensitivity. Based on professional judgement, given that the key views of cultural significance to the broch would remain largely unchanged it is assessed that this would result in an effect that is assessed as **minor** adverse significance and not significant in EIA terms.

Ullinish, Fort, Bracadale (SM 930) Figure 10.2, Figure 10.6 a- f

- 10.6.28 The remain of this Iron Age promontory fort survive as turf-covered banks on a rocky coastal promontory on the east coast of Loch Bracadale, to the south-west of Ullinish. As a Scheduled Monument, Ullinish Fort is of heritage value at national level and is an asset of high sensitivity.
- 10.6.29 As a promontory fort, the prominent views from Ullinish Fort are over and along Loch Bracadale, to the relatively mountainous Durnish Peninsula to the west, north-west to Harlosh Island and the Harlosh peninsula, and to the south-west and the seaward entrance to Loch Bracadale between the islands of Oransay and Wiay (**Figure 10.6 c**). It is this view to the seaward entrance to Loch Bracadale which is presumed to have been of most importance to this fort as it gives the location both strategic and defensive value.
- 10.6.30 While the fort may originally have been prominent within its topographic setting it is now little more than a low earthwork banks and it is not readily distinguishable from any distance from the natural promontory on which it stands. However, as a site likely to have been intended to be prominent and visible in the landscape, views towards the fort from its surroundings and its coastal approach are important to appreciation of its cultural significance.
- 10.6.31 From the analysis, it appears that those aspects of the setting that contribute most to the broch's cultural significance can be summarised as its naturally defensive promontory position, the views over and along Loch Bracadale and in particular to the seaward entrance to the south, and the views towards this broch from the surrounding landscape and seascape.
- 10.6.32 Ullinish Fort lies 9.1 km to the south of the nearest proposed turbine (T6). The photomontage (**Figure 10.6 f**) shows that, from the fort, nine turbines would be visible at hub height.
- 10.6.33 The introduction of the Proposed Development would result in the proposed turbines being visible on and beyond the skyline in the view to the north from the monument (**Figure 10.6 f**). However, the key views from Ullinish Fort, south-west to the seaward entrance to Loch Bracadale would remain unchanged. As such, the integrity of that aspect of the monument's setting would be retained, unaffected by the Proposed Development, and it would remain possible for any visitor to experience and appreciate those relationships. The view towards this fort from the south-west seaward approach would include the turbines (**Figure 10.14**), however, they would be sufficiently distant and in a separate landscape area not to compete with the fort for prominence.
- 10.6.34 Overall, as a result of the change to its wider surroundings, the Proposed Development would have an impact of low magnitude on the setting of the Ullinish Fort, an asset of

high sensitivity. Based on professional judgement, given that the key views of cultural significance to the fort would remain largely unchanged it is assessed that this would result in an effect that is assessed as **minor** adverse significance and not significant in EIA terms.

Dun Osdale, broch 850m N of Osdale (SM 3493) Figure 10.2, Figure 10.7 a -f

- 10.6.35 The remains of this Iron Age broch survive as a dilapidated stone wall on top of a rocky knoll at the north-west end of a small ridge, on the Durnish peninsula. As a Scheduled Monument, Dun Osdale, broch is of heritage value at national level and is an asset of high sensitivity.
- 10.6.36 The knoll on which Dun Osdale broch is sited is surrounded by low-lying farmland to the north, east and west. To the south is the rising ground of Dun Chlach. To the north-east is Dunvegan bay, beyond which is the settlement of Dunvegan. In that view, on the hill tops to the south of Dunvegan, the turbines of the existing Ben Aketil wind farm are visible.
- 10.6.37 The broch may originally have been prominent within its topographic setting but today, although it survives to a greater height than many of the brochs in the Outer Study Area, it is not readily distinguishable from the rocky knoll on which it stands. However, as a building likely intended to be prominent and visible in the landscape, views towards the broch from its surroundings, and from its coastal approach, are important to the appreciation of its cultural significance.
- 10.6.38 From the analysis, it appears that those aspects of the setting that contribute most to the broch's cultural significance can be summarised as the naturally defensive nature of the knoll, proximity to surrounding flat fertile ground, the view north towards the Dunvegan Bay, and the views towards the broch from the surrounding landscape and approach through Dunvegan Bay.
- 10.6.39 Dun Osdale broch lies 6.2 km to the west of the nearest proposed turbine (T9). The photomontage (**Figure 10.7 f**) shows that, from the broch, nine turbines would be visible at tip height (eight at hub height) with some screening of the Proposed Development provided by the topography of intervening hills.
- 10.6.40 The introduction of the Proposed Development would result in the proposed turbines being visible on and beyond the skyline in the view to the east from the monument. However, the key views from Dun Osdale broch, north towards Dunvegan Bay, would remain largely unchanged as would the views to and from the surrounding low ground around the broch, and views to and from Dunvegan Bay. As such, the integrity of these aspect of the monument's setting would be retained, unaffected by the Proposed Development, and it would remain possible for any visitor to experience and appreciate those relationships. The turbines would be in distant views to the east, not a key view from the broch.
- 10.6.41 Overall, as a result of the change to its wider surroundings, the Proposed Development would have an impact of low magnitude on the setting of the Dun Osdale, an asset of high sensitivity. Based on professional judgement, given that the key views of cultural significance to the broch would remain unchanged it is assessed that this would result in an effect that is assessed as **minor** adverse significance and not significant in EIA terms.

Dun Feorlig, broch 230m NNE of Feorlig Farm (SM 3494) Figure 10.2, Figure 10.8 a-b

- 10.6.42 The remains of this probable late-Iron Age broch survive as an overgrown circular mound, on the west side of Loch Caroy on the Harlosh peninsula. As a Scheduled Monument, Dun Feorlig Broch is of heritage value at national level and is an asset of high sensitivity.
- 10.6.43 The broch is sited on a rocky promontory which juts into the west side of Loch Caroy. Prominent views from this broch are therefore, over and along Loch Caroy to the rising low hills on the east shore, to the top of the loch to the north where it meets the River Caroy, and south along the loch towards the wider Loch Bracadale. Also of importance to the setting of the broch are the view to the west and to the low-lying ground of the Harlosh peninsula which it can be presumed was the land farmed by its occupiers. Wider views beyond Loch Caroy and its surrounding shores are not a prominent feature of the broch's setting.
- 10.6.44 On the opposite side of Loch Caroy, 1 km to the north-east, on the hillside above the shore is Abhainn Bhaile Mheadhonaich, broch (SM 13664). Today, this broch survives as a low stony overgrown mound and is not readily visible from Dun Feorlig Broch. However, it is possible that these two brochs were contemporary (at least to some degree in their occupation) and when in use they would have been prominent features in the landscape and intervisibility would have existed between them. These brochs were, therefore, potentially sited in relation to one another and this view north-east across Loch Caroy is of importance to the setting of Dun Feorlig.
- 10.6.45 While the broch may originally have been prominent within its topographic setting it is now little more than a low mound and not readily distinguishable from any distance from the natural rocky outcrop on which it stands. However, as a building likely to have been intended to be prominent and visible in the landscape, views towards the broch from its surroundings and from its coastal approach through Loch Caroy are important to appreciation of its cultural significance.
- 10.6.46 From the analysis, it appears that those aspects of the setting that contribute most to the broch's cultural significance can be summarised as its naturally defensive rocky promontory position, its proximity to surrounding flat fertile ground, the previous intervisibility with Abhainn Bhaile Mheadhonaich broch (SM 13664), the view over and along Loch Caroy, and the views towards the broch from the surrounding landscape and seascape.
- 10.6.47 The broch lies 4.7 km to the south, south-west of the nearest proposed turbine (T6). The wireframe (Figure 10.8 b) predicts that, from the broch, nine turbines would be visible at hub height.
- 10.6.48 The introduction of the Proposed Development would result in the proposed turbines being visible on and beyond the skyline in the view to the north, north-east from the monument. However, the key views from the broch would remain largely unchanged. The key views from the broch, east over and along Loch Caroy would remain unchanged as would the key view to the north-east towards Abhainn Bhaile Mheadhonaich broch (SM 13664). As such, the integrity of that aspect of the monument's setting would be retained, unaffected by the Proposed Development. The views towards the broch from the Harlosh peninsula on which it sits would also remain unchanged. It would remain possible for any visitor to experience and appreciate those relationships and the aspects of the broch's setting that contribute to its cultural significance. The view towards the

broch from the south-easterly seaward approach along Loch Caroy would include the turbines, but they would be sufficiently distant and in a separate landscape area not to compete with the broch for prominence.

- 10.6.49 Overall, as a result of the change to its wider surroundings, the Proposed Development would have an impact of low magnitude on the setting of the Dun Feorlig broch, an asset of high sensitivity. Based on professional judgement, given that the key views of cultural significance to the broch would remain largely unchanged it is assessed that this would result in an effect that is assessed as **minor** adverse significance and not significant in EIA terms.

Ardmore, Chapel & Burial Ground 230m SW of (SM 3884) Figure 10.2, Figure 10.9 a-f

- 10.6.50 The remains of this medieval chapel and burial ground survive as turf-covered foundations on the summit of a small hillock near the south end of the Harlosh peninsula. As a Scheduled Monument, Ardmore, Chapel and Burial Ground is of heritage value at national level and is an asset of high sensitivity.
- 10.6.51 From Ardmore, Chapel & Burial Ground, the view to the north is to the settlements of Ardmore and Balmore around the small bay of Camas Ban. Beyond these settlements are distant views of the rising hills to the north on which the existing Ben Aketil and Edinbane wind farms are visible (**Figure 10.9a**). To the south of the chapel is a larger hillock which effectively blocks much of the view from and to the chapel from south Loch Bracadale (**Figure 10.9c**). Prominent seaward views from the chapel are, therefore, south-west through to north-west over and along Loch Bharcasaig, to the relatively mountainous Durnish Peninsula to the west, and south-east over Loch Bracadale to Tarnier Island, the rolling hills of Skye mainland. The Cuillins (**Figure 10.9b**, Cuillins obscured by weather conditions at time of photography) are a notable distant landmark feature in these distant views.
- 10.6.52 Also of importance to the cultural significance of the chapel is its hilltop position, which would have given the chapel a visual prominence over the surrounding land of the Harlosh peninsula on which its parishioners may have lived and worked. However, surviving now as only turf-footings, it is no longer a prominent feature in the surrounding landscape and is only visible from the immediate surrounding hilltop; although its location is likely still known to those who live and work on and around the peninsula.
- 10.6.53 From analysis, it appears that those aspects of the setting that contribute most to the chapel and burial ground's cultural significance can be summarised as its hilltop position and the views to and from this asset over the surrounding Harlosh peninsula, and its historical cultural links with the local community.
- 10.6.54 Ardmore, Chapel & Burial Ground lies 6.8 km to the south-west of the nearest proposed turbine (T6). The photomontage (**Figure 10.9 f**) shows that nine turbines would be visible at hub height.
- 10.6.55 The introduction of the Proposed Development would result in the proposed turbines being visible on and beyond the skyline in the view to the north north-east from the monument. However, the key views from Ardmore, Chapel & Burial Ground to and from the surrounding ground of the Harlosh peninsula would remain largely unchanged, as would its affinity with the local community. As such, the integrity of these aspects of the

monument's setting would be retained, unaffected by the Proposed Development, and it would remain possible for any visitor to experience and appreciate those relationships.

- 10.6.56 Overall, as a result of the change to its wider surroundings, the Proposed Development would have an impact of low magnitude on the setting of Ardmore Chapel & Burial Ground, an asset of high sensitivity. Based on professional judgement, given that the key views of cultural significance to the broch would remain largely unchanged it is assessed that this would result in an effect that is assessed as **minor** adverse significance and not significant in EIA terms.

Dun Neill, Dun 420 m SW of Ardmore (SM 3885) Figure 10.2, Figure 10.10 a-b

- 10.6.57 The remains of this late Iron Age dun and earlier Iron Age fort are located on the east coast of Loch Bharcasaig, towards the south end of the Harlosh peninsula. The fort survives as a low wall which encloses the summit of a natural rocky promontory and the dun occupies the east, north-east end and is better preserved. As a Scheduled Monument, Dun Neill is of heritage value at national level and is an asset of high sensitivity.
- 10.6.58 Dun Neill is sited on a low, yet precipitous, rock stack which forms a coastal promontory on the east coast of Loch Bharcasaig. Prominent views from the site are those over and along Loch Bharcasaig, to the relatively mountainous Durnish Peninsula to the west, north to the top of the Loch, rolling low hills and the settlement of Ardroag, and south to Loch Baracadale and the open sea beyond. Also of importance to the setting of the dun would be the view to the east and the low-lying fertile ground of the Harlosh peninsula, which it can be presumed was the land farmed by its occupiers. Wider views beyond Loch Bharcasaig and its surrounding shores are not a prominent feature of this asset's setting.
- 10.6.59 While this dun and fort may originally have been prominent within its topographic setting, it is now little more than a low mound and not readily distinguishable from any distance from the natural rocky outcrop on which it stands. However, as a site likely to have been intended to be prominent and visible in the landscape, views towards the broch from its surroundings and from its coastal approach, are important to appreciation of its cultural significance.
- 10.6.60 From the analysis, it appears that those aspects of the setting that contribute most to the Dun Neill's cultural significance can be summarised as its naturally defensive rocky promontory position, its proximity to neighbouring flat fertile ground, the views over and along Loch Bharcasaig, and the views towards the dun and fort from the fertile ground of the Harlosh peninsula.
- 10.6.61 Dun Neill lies 6.9 km to the south south-west of the nearest proposed turbine (T6). The wireframe (**Figure 10.10 b**) predicts that, from the dun, nine turbines would be visible at hub height.
- 10.6.62 The introduction of the Proposed Development would result in the proposed turbines being visible on and beyond the skyline in the view to the north north-east from the monument. However, the key views from Dun Neill, over and along Loch Bharcasaig, would remain unchanged. The views towards the broch from the Harlosh peninsula on which it sits would also remain unchanged. As such, the integrity of these aspects of the monument's setting would be retained, unaffected by the Proposed Development, and it would remain possible for any visitor to experience and appreciate those relationships.

The view towards the dun and fort from the south-west seaward approach (**Figure 10.14**) would include the turbines, but they would be sufficiently distant and in a separate landscape area not to compete with the Dun for prominence.

- 10.6.63 Overall, as a result of the change to its wider surroundings, the Proposed Development would have an impact of low magnitude on the setting of the Dun Neill, an asset of high sensitivity. Based on professional judgement, given that the key views of cultural significance to the broch and fort would remain largely unchanged it is assessed that this would result resulting in an effect that is assessed as **minor** adverse significance and not significant in EIA terms.

St Mary's Church and Burial Ground, Dunvegan (SM 9249) Figure 10.2, Figure 10.11 a-c

- 10.6.64 St Mary's Church and Burial Ground, Dunvegan is the remains of a post medieval parish church, which stands to roof height (unroofed), and its associated burial ground which occupy the site of an earlier medieval church of which there are three medieval carved grave slabs within the burial ground. As a Scheduled Monument, St Mary's Church and Burial Ground is of heritage value at national level and is an asset of high sensitivity.
- 10.6.65 St Mary's Church and Burial Ground, is sited on a south facing hillside at the west end of the settlement of Dunvegan. To the south the view is over the settlement of Dunvegan with the Cuillin Mountains in the distance. To the west the view is over Dunvegan and Dunvegan Bay to the mountains of Durnish. The view to the north is relatively restricted by rising ground and to the north-west is a small hillock surmounted by the Durnish Stone, a stone raised in 2000 as a marker of the millennium. The view to the east is restricted by the slightly rising ground and the tree belts of neighbouring dwellings.
- 10.6.66 St Mary's Church predates much of the settlement of Dunvegan. However, the church would have been built to serve this local community and the view to and from the settlement is, therefore, of importance.
- 10.6.67 The church also has connections with the MacLeods of Dunvegan Castle, and while it was not the principal burial ground for the MacLeod chiefs, which was St Clement's Church Rodel, some were buried here (Miers, 2008). While there is no intervisibility with Dunvegan Castle, it is possible that the site of the church was in part chosen by the MacLeods for the clear view it affords of the MacLeod's Tables hills of Healabhal Mhor and Healabhal Beag, to the south-west.
- 10.6.68 St Mary's Church predates much of the settlement of Dunvegan, but the settlement of Dunvegan grew next to this church and the view to and from the settlement is of importance as for a large part of its past it would have been the settlement in which its parishioners lived.
- 10.6.69 From the analysis, it appears that those aspects of the setting that contribute most to the church and burial ground's cultural significance can be summarised as its hillside position, the views to and from the church to the settlement of Dunvegan, and the view to the south-west and MacLeod's Tables.
- 10.6.70 St Mary's Church and Burial Ground lies 4.7 km to the west of the nearest proposed turbine (T9). The photomontage (**Figure 10.10c**) shows that, from the church, nine turbines would be visible at tip height and six at hub height; the Proposed Development being afforded considerable screening by the topography of intervening hills.

- 10.6.71 The introduction of the Proposed Development would result in the proposed turbines being visible on and beyond the skyline in the view to the east from the monument. However, the key views from St Mary's Church and Burial Ground to and from the settlement of Dunvegan would remain largely unchanged as would the key view to the MacLeod's Tables to the south-west. As such, the integrity of those aspects of the monument's setting would be retained, unaffected by the Proposed Development, and it would remain possible for any visitor to experience and appreciate those relationships.
- 10.6.72 Overall, as a result of the change to its wider surroundings, the Proposed Development would have an impact of low magnitude on the setting of the St Mary's Church and Burial Ground, an asset of high sensitivity. Based on professional judgement, given that the key views of cultural significance to the church and burial ground would remain largely unchanged it is assessed that this would result resulting in an effect that is assessed as **minor** adverse significance and not significant in EIA terms.

Dun Arkaig, broch (SM 13662) Figure 10.2, Figure 10.12 a-c

- 10.6.73 The remains of this Iron Age broch survives as a relatively well preserved structure on the east side of Glen Colbost. As a Scheduled Monument, Dun Arkaig, broch is of heritage value at national level and is an asset of high sensitivity.
- 10.6.74 Dun Arkaig broch is sited on a natural rock outcrop on the south-east slopes of Glen Colbost. The broch stands in a prominent position with views afforded to the north, west and east; concentrated particularly along Glen Colbost. Views to the south are more constrained by rising topography. Views to the north include the operational Edinbane Wind Farm and the operational Edinbane substation.
- 10.6.75 The inland position of the broch is unusual, and it has deliberately been sited so as to be a prominent feature within the glen, which may have been the territory directly associated with, or controlled from, the broch. Sited within a prominent position in Glen Colbost, the broch may have been positioned to control movement between the east and west coast of the island as the glen provides the shortest route across Skye, from Loch Bracadale in the west to Loch Snizort Beag in the east; hence the siting of the broch may have been strategically important.
- 10.6.76 Dun Arkaig broch lies 4.9 km to the south-west of the nearest proposed turbine (T6). The wireframe (**Figure 10.12 c**) predicts that, from the broch, four turbines would be visible at tip height and three turbines visible at hub height.
- 10.6.77 The introduction of the Proposed Development would result in the proposed turbines being visible on and beyond the skyline in the view to the north-east from the monument. However, the key views from Dun Arkaig would remain largely unchanged. The key views east and west along Glen Colbost would remain unchanged, as would the views from within the glen towards the broch. As such, the integrity of these aspects of the monument's setting would be retained, unaffected by the Proposed Development, and it would remain possible for any visitor to experience and appreciate those relationships. The turbines would be in distant views to the north-west, not a key view from or of this asset.
- 10.6.78 Overall, as a result of the change to its wider surroundings, the Proposed Development would have an impact of negligible magnitude on the setting of the Dun Osdale, an asset of high sensitivity. Based on professional judgement, given that the key views of cultural

significance to the broch would remain largely unchanged it is assessed that this would result in an effect that is assessed as **negligible** adverse significance and not significant in EIA terms.

Abhainn Bhaile Mheadhonaich, broch and standing stone 145m SE of An Cairidh (SM 13664) Figure 10.2, Figure 10.13 a-c

- 10.6.79 The remains of this Iron Age broch survive as an overgrown circular mound and associated earthworks, on the east side of Loch Caroy. To the south-west of the broch is a standing stone of presumed Late Neolithic or Bronze Age date. As a Scheduled Monument, Abhainn Bhaile Mheadhonaich, broch and standing stone is of heritage value at national level and are assets of high sensitivity.
- 10.6.80 Abhainn Bhaile Mheadhonaich broch is sited on the summit of a natural rock outcrop bounded by steep, exposed rock to the east and by two terraces to the south-west hillside on the east coast of Loch Croy. The standing stone is located on a terrace approximately 45 m to the south-west of the broch. The prominent views from these assets are those over and along Loch Croy, to the west are the low-lying fields of the Harlosh peninsula, beyond which are the mountains of Durnish. There are also views of importance to the north, towards the top of Loch Caroy and the low rolling low hills of the glen of Abhainn Bhaile Mheadhonaich, and south to Loch Baracadale and the open sea beyond. The view to the east is limited by rising ground in that direction. Notable to the setting of Abhainn Bhaile Mheadhonaich today is its position at the south end of the settlement of Balmeanach, approximately 70 m upslope from the route of the A863 road. As the broch builders and occupiers did not reuse or remove the earlier standing stone, it can be presumed that they had respect for this artefact and therefore, there is some value in the association between these assets.
- 10.6.81 On the opposite side of Loch Caroy, 1 km to the south-west, on the shoreline, is Dun Feorlig Broch (**SM 3494**). Although Dun Feorlig survives only as a low stony overgrown mound, the rock outcrop on which it stands enables its location to be recognised from Abhainn Bhaile Mheadhonaich. As previously discussed, it is possible that these two brochs were contemporary and when they were in use they would have been prominent features in the landscape and intervisibility would have existed between the two. These brochs were, therefore, potentially sited in relation to one another and this view across Loch Caroy is an importance aspect of the setting of both.
- 10.6.82 While this broch may originally have been prominent within its topographic setting it is now little more than a low mound and not readily distinguishable from any distance beyond the immediate hillside it sits on. However, as a building likely to have been intended to be prominent and visible in the landscape, views towards the broch from its surroundings and its coastal approach are important to the appreciation of its cultural significance.
- 10.6.83 Although the standing stone would not have been as prominent a feature in the landscape as the broch, it is probable that it was positioned when erected to be viewed and to be a visible feature of its immediate landscape. As such, views towards the standing stone from its surroundings are important to the appreciation of its cultural significance.
- 10.6.84 From the analysis, it appears that those aspects of the setting that contribute most to this asset's cultural significance can be summarised as its views over and along Loch Caroy, the broch's previous intervisibility with Dun Feorlig Broch (**SM 3494**) on the Harlosh

peninsula, the relationship between the broch and the standing stone, and the views towards the broch from the surrounding landscape.

- 10.6.85 The asset lies 4.6 km to the south of the nearest proposed turbine (T6). The wireframe (**Figure 10.13c**) predicts that, from the broch and standing stone, nine turbines would be visible at hub height.
- 10.6.86 The introduction of the Proposed Development would result in the proposed turbines being visible on and beyond the skyline in the view to the north from the monument. However, the key views from the broch would remain largely unchanged. The key view from over and along Loch Caroy would remain unchanged, as would the key view to the west towards Dun Feorlig, broch (**SM 3494**). The views towards and between, the broch and standing stone from the surrounding landscape would also largely remain unchanged. As such, the integrity of these important aspects of the monument's setting would be retained, unaffected by the Proposed Development, and it would remain possible for any visitor to experience and appreciate those relationships. The view towards the broch and standing stone from the south-west seaward approach will include the turbines (**Figure 10.14**), but they would be sufficiently distant not to distract from the view towards the location of the broch and standing stone.
- 10.6.87 Overall, as a result of the change to its wider surroundings, the Proposed Development would have an impact of low magnitude on the setting of the Abhainn Bhaile Mheadhonaich, broch and standing stone, an asset of high sensitivity. Based on professional judgement, given that the key views of cultural significance to the broch would remain largely unchanged it is assessed that this would result in an effect that is assessed as **minor** adverse significance and not significant in EIA terms.

Decommissioning impacts

- 10.6.88 As decommissioning works would be carried out within the construction footprint, utilising the as-built access tracks and associated infrastructure, no direct impacts on cultural heritage assets during the decommissioning phase are predicted.
- 10.6.89 Decommissioning of the proposed turbines including their removal would remove identified operational impacts on the setting of cultural heritage assets.

10.7 Mitigation

- 10.7.1 All mitigation works presented in the following paragraphs would take place prior to, or, where appropriate, during, the construction of the Proposed Development. The scope of works would be detailed in one or more Written Scheme(s) of Investigation (WSI) developed in consultation with (and subject to the agreement of) The Highland Council: Historic Environment Team (THC:HET).
- 10.7.2 A professionally qualified Archaeological Contractor would be appointed to act as an Archaeological Clerk of Works (ACoW) for the duration of the construction phase. The role of the ACoW would be to provide advice to the appointed Construction Contractor regarding micro-siting of development components, where there is a possibility of intersecting with identified heritage assets, and to undertake archaeological monitoring of topsoil stripping operation in areas designated and approved by the Council's Archaeological Advisors (THC:HET). The activities of the ACoW would be carried out

according to the scope of work and terms specified under the WSI and approved by THC:HET.

Construction phase

Preservation in situ

- 10.7.3 Four heritage assets (**20** and **22-24**) have been identified as lying close to the route of the proposed southern access track. Glen Heysdal farmstead (**20**) lies to the immediate east of the existing crofters' track, which would be upgraded to form the southern access track, while the River Caroy farmsteads (**22** and **23**) and enclosure (**24**) are within an area of proposed new access track. As the remains of farmsteads and enclosures the four assets (**20** and **22-24**) are of low sensitivity, although they add value to the character of the historic landscape.
- 10.7.4 These assets would be marked out for avoidance during the construction phase. The features would be identified by placing high visibility markers 5 m from the outer limit of the visible remains, facing the working area. Any required micro-siting of the access track would be managed to avoid the visible remains and the demarcated areas. The markers would be left in place for the duration of the construction phase and removed on completion of the Proposed Development.
- 10.7.5 There is no requirement for any measures to ensure preservation *in situ* of any of the other identified heritage assets within the Proposed Development site.

Watching briefs

- 10.7.6 The Applicant would seek to agree the scope of the archaeological watching brief with THC:HET in advance of development works. The scope of the agreed works would be confirmed in a WSI to be signed-off prior to the commencement of the construction works, including enabling works.
- 10.7.7 Taking account of the avoidance through the design, and the character of identified cultural heritage baseline, it is proposed that watching briefs would be carried out at the following location:
- Asset (**26**): south of Ben Aketil burn (between 130312, 844918 and 130352, 844317) where the proposed southern access track crosses an area containing remains of a historic field system. The purpose of the watching brief here would be to record the character of any field banks crossed and identify any evidence for historic cultivation (lazy-beds) that may remain as buried features and record any sequential development of cultivation (overlapping rigs, alternate alignments, or varying rig widths) and recover any artefactual evidence that may be present or any underlying archaeological features of earlier date.
- 10.7.8 Based on the results of the desk-based study and the field survey, there are no other specific areas where construction works could be expected to encounter buried archaeological remains. It has though, been assessed that there is a low to moderate potential for hitherto undiscovered archaeological remains to be present within the Site or along the proposed access routes. Therefore, if required under the terms of a condition of consent, the scope of any other required archaeological watching brief(s) would be agreed through consultation with THC:HET in advance of development works commencing and would be set out in the WSI.

Post-excavation assessment and reporting

- 10.7.9 If new, archaeologically significant discoveries are made during archaeological monitoring, and it is not possible to preserve the discovered remains *in situ*, provision would be made for the excavation where necessary, of any archaeological deposits encountered. The provision would include the consequent production of written reports on the findings, with post-excavation analysis and publication of the results of the works, where appropriate.

Construction guidelines

- 10.7.10 Written guidelines would be issued for use by all construction contractors, outlining the need to avoid causing unnecessary damage to known heritage assets. The guidelines would set out arrangements for calling upon retained professional support if buried archaeological remains of potential archaeological interest (such as building remains, human remains, artefacts, etc.) should be discovered during any construction activities.
- 10.7.11 The guidelines would make clear the legal responsibilities placed upon those who disturb artefacts or human remains.

Operational phase

- 10.7.12 As the as-built infrastructure would be used to facilitate maintenance, repair and replacement activities, no mitigation is required in relation to cultural heritage during the operational lifetime of the Proposed Development.

Decommissioning phase

- 10.7.13 As the as-built infrastructure would be used to facilitate decommissioning, no mitigation is required in relation to cultural heritage.

Table 10.7: Summary of cultural heritage mitigation

Reference No.	Mitigation
Cultural Heritage (general)	Appointment of Archaeological Clerk of Works (ACoW) for the duration of the construction phase to provide advice to the appointed Construction Contractor
Cultural Heritage (general)	Written guidelines would be issued for use by all construction contractors, outlining the need to avoid causing unnecessary damage to known heritage assets.
Glen Heysdal farmstead (20), River Caroy farmsteads and enclosure (22, 23,24),	To ensure preservation in-situ, assets would be marked out for avoidance during the construction phase
Area of Cultivation (26)	Watching brief for the section of the proposed southern access track (between 130312, 844918 and 130352, 844317) which crosses an area containing remains of a historic field system.

10.8 Summary of effects

Construction effects

- 10.8.1 Taking account of the mitigation proposals set out above, the following residual construction effects have been identified:
- Residual effect of no more than **negligible** significance (not significant in EIA terms) on the cultivation remains (**26**), as a consequence of investigation and recording to a standard acceptable to THC: HET.
 - Residual effects of no more than **minor** significance (not significant in EIA terms) on any buried remains revealed through archaeological watching briefs and investigated and recorded to a standard acceptable to THC: HET.

Operational effects

- 10.8.2 During its operational lifetime, there would be no significant residual direct effects on any of the cultural heritage assets identified within the site.
- 10.8.3 During its operational lifetime, the residual effects of the Proposed Development on the settings of heritage assets in the Outer Study Area would be the same as the predicted effects.
- 10.8.4 All impacts, affecting the settings of heritage assets in the surrounding landscape, would give rise to effects that are either of minor or negligible significance (not significant in EIA terms).

Decommissioning effects

- 10.8.5 All operational effects identified would be fully reversible upon decommissioning of the Proposed Development.

10.9 Cumulative effects

Construction effects

- 10.9.1 Construction of the Proposed Development would not give rise to any cumulative direct effects on cultural heritage assets.

Operational effects

- 10.9.2 The Proposed Development could, in combination with other wind farm developments in the area that are operational, consented, or are the subject of valid planning applications, result in adverse cumulative effects on the setting of cultural heritage assets.
- 10.9.3 Operational and under construction developments are considered as part of the baseline and are taken to be such for the assessment of effects on the settings of heritage assets described above. Developments that are consented, but not yet under construction and those that are the subject of valid planning applications are considered as being potential additions to the baseline and are considered in the cumulative impact assessment.
- 10.9.4 In accordance with the assessment undertaken in the **Landscape and Visual Assessment Chapter (Chapter 6)**, those proposed wind farms that are at the scoping stage with a Proposal of Application Notice (PAN) are included and those at scoping

without PAN are excluded because there is insufficient information of the size and scale of the development proposed and uncertainty over whether they would be progressed to a formal application. Following this approach, the proposed Balmeanach Wind Farm and Beinn Mheadhonach Alteration Wind Farm, are considered to potentially form part of the future cumulative scenario.

- 10.9.5 **Figure 10.3** shows the Proposed Development and heritage assets within 10 km, along with the locations of other operational and consented or under construction wind farms, and those that are currently proposed (in planning). The existing Ben Aketil Wind Farm is not included in this figure or in the assessment as it would be decommissioned and removed prior to the construction of the Proposed Development.
- 10.9.6 Based on the list of cumulative developments agreed with THC and NatureScot (**Chapter 6: Landscape and Visual Assessment**), those other developments that are either consented, but not yet under construction or are in planning and most likely in combination with the proposed to give rise to cumulative effects on heritage assets development are:
- Ben Sca – consented development; includes Ben Sca and Extension (seven and two turbines, 135 m and 149.9 m to tip);
 - Glen Ullinish Wind Farm – consented development (eleven turbines, 149.9 m to tip); and
 - Balmeanach Wind Farm – Scoping with PAN development (ten turbines, 149.9 m to tip).
- 10.9.7 Where visible from the designated heritage assets described above (paragraphs 10.6.11 - 10.6.87), the three cumulative developments listed above are shown on the wireframes provided to support the assessment (**Figures 10.4 – 10.14**). Those further afield, but which would have little or no adverse effect on the settings of cultural heritage assets affected by the Proposed Development, are also shown on the wireframes.
- 10.9.8 Cumulative impacts are assessed for the ten designated assets assessed in detail above (**Figure 10.3, Table 10.6**, paragraphs 10.6.8 - 10.6.87). It is considered that the remaining assets within the Outer Study Area (**Technical Appendix 10.2**) have no potential for significant cumulative operational impacts as a result of the Proposed Development in combination with any of the three cumulative developments considered and they are, therefore, not considered further.

Barpannan, Two Chambered Cairns, Vatten Duirnish (SM 893)

- 10.9.9 **Figure 10.4a** shows that the Proposed Development would be seen together with, and in front of, the consented Ben Sca Wind Farm in the view to the north north-east from the Barpannan Cairns (see also **Figure 10.3**). The proposed Balmeanach Wind Farm would continue this line of turbines on the skyline to the south-east of the summit of Ben Aketil. **Figure 10.4b** shows that the consented Glen Ullinish Wind farm (4.1 km distant) would be visible, largely backdropped against low hills in views to the south-east of the cairns. Beyond the consented Glen Ullinish Wind Farm, the Beinn Mheadonach Wind Farms (10 km and 11.1 km distant) may also be visible.
- 10.9.10 The cumulative impact on the setting of the Barpannan Cairns from adding the Proposed Development to a baseline including the consented Ben Sca and Extension Wind Farm and the proposed Balmeanach Wind Farm (**Figure 10.4a**) is assessed as being of low

magnitude and **minor significance** (not significant in EIA terms). As these developments would effectively form a group to the north north-east of the cairns, the combined effect of the Proposed Development with the consented Ben Sca and Extension and the proposed Balmeanach Wind Farms would be no greater than that assessed for the Proposed Development alone (**minor significance**: not significant in EIA terms). Although more turbines would be visible, it has been assessed above (paragraph 10.6.11 - 10.6.20) that this view is not one of those that contributes to appreciation of the cultural significance of the cairns.

- 10.9.11 The cumulative effect with Glen Ullinish Wind Farm and Beinn Mheadonach Wind Farms, would be of negligible magnitude and **negligible significance** (not significant in EIA terms). The photography in **Figure 10.4b** demonstrates that the visibility of the Glen Ullinish Wind Farm and Beinn Mheadonach Wind Farms is likely to be limited as they are largely backdropped by hills. They are not in locations that would interrupt the association with the solar event at mid-winter solstice, where the sun rises along the northern flank of the Cuillins when seen from the cairns.
- 10.9.12 In each case, key views from Barpannan Cairns to the Cuillins to the south-east and the MacLeod's Tables to the west and the view towards the cairns from the west and north-west would remain unchanged. As such, the integrity of the setting of the cairns would not be compromised and their cultural significance would not be appreciably diminished by the cumulative impact.

Dun Flashader, Broch, Skye (SM 911)

- 10.9.13 **Figure 10.5a** shows that the Proposed Development would be seen together with and behind the consented Ben Sca Wind Farm in the view to the south-west from Dun Flashader broch. The proposed Balmeanach Wind Farm would continue this line of turbines eastwards along the skyline and visually join with the operational Edinbane Wind Farm, creating a line of turbines on the skyline (see also **Figure 10.3**). Glen Ullinish Wind Farm and Beinn Mheadonach Wind Farms are not visible from Dun Flashader.
- 10.9.14 The cumulative impact on the setting of Dun Flashader from adding the Proposed Development to a baseline including the consented Ben Sca and Extension and the proposed Balmeanach Wind Farm (**Figure 10.4a**) is assessed as being of negligible magnitude and **negligible significance** (not significant in EIA terms). As these developments would effectively form a skyline group to the south-west of the broch, the combined effect of the Proposed Development with the consented Ben Sca and Extension and the proposed Balmeanach Wind Farm would be no greater than that assessed for the Proposed Development alone (**minor significance**: not significant in EIA terms). The greater visual impact would derive from the consented Ben Sca Wind Farm as evidenced by **Figure 10.5a**.
- 10.9.15 The key view from Dun Flashader over Loch Greshornish and the horseshoe bay at Kildonan would remain unchanged as would the view from and to the surrounding lower lying ground around the broch. The northern seaward approach to the broch would include the cumulative developments (including the Proposed Development), but they would form one group sufficiently distant and in a separate landscape area not to compete with the broch for prominence. As such, the integrity of the setting of the broch would not be compromised and its cultural significance would not be appreciably diminished by the cumulative impact.

Ullinish, Fort, Bracadale (SM 930)

- 10.9.16 **Figure 10.6a** shows that the Proposed Development would be seen to the west of Ben Sca Wind Farm (of which there is limited visibility) and the proposed Balmeanach Wind Farm, in the view to the north from the Ullinish Fort. The operational Edinbane Wind Farm would continue this line of turbines and visually join with the consented Glen Ullinish Wind Farm creating a line of turbines on and behind the skyline (see also **Figure 10.3**).
- 10.9.17 The cumulative impact on the setting of Ullinish Fort from adding the Proposed Development to a baseline including the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm (**Figure 10.6a**) is assessed as being of negligible magnitude and **negligible significance** (not significant in EIA terms). As these developments would effectively form a skyline group to the north of the broch, the combined effect of the Proposed Development with the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm would be no greater than that assessed for the Proposed Development alone (**minor significance**: not significant in EIA terms).
- 10.9.18 The cumulative effect with the Beinn Mheadhonach Wind Farms, would also be of **negligible significance** and not significant in EIA terms. The Beinn Mheadhonach schemes lie in a different part of the viewshed from Ullinish Fort and would not interact visually with the Proposed Development.
- 10.9.19 The key view from Ullinish Fort south-west to the seaward entrance to Loch Bracadale would remain unchanged. The south-west seaward approach to the fort would include Ben Sca and Extension, Glen Ullinish and the proposed Balmeanach Wind Farms (**Figure 10.14a**), but, as described above, they would largely form one group sufficiently distant and on a separate landscape area not to compete with the fort for prominence. As such, the integrity of the setting of the broch would not be compromised and its cultural significance would not be appreciably diminished by the cumulative impact.
- 10.9.20 Dun Osdale, broch 850m N of Osdale (**SM 3493**)
- 10.9.21 **Figure 10.7a** shows that the Proposed Development would be seen together with, and in front of, the consented Ben Sca Wind Farm (of which there is limited visibility), and the proposed Balmeanach Wind Farm, in the view to the east from Dun Osdale. The consented Glen Ullinish and proposed Mheadhonach Wind Farms would continue this line of turbines southwards along the skyline; although, backdropped by the mid-distance hills (see also **Figure 10.3**). The visibility of Glen Ullinish and Beinn Mheadhonach Wind Farms is likely to be limited.
- 10.9.22 The cumulative impact on the setting of Dun Osdale from adding the Proposed Development to a baseline including the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach and Beinn Mheadhonach Wind Farms (**Figure 10.6a**) is assessed as being of low magnitude and **minor significance** (not significant in EIA terms). As the developments would effectively form a group to the west of the broch, the combined effect of the Proposed Development with the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach and Beinn Mheadhonach Wind Farms would be no greater than that assessed for the Proposed Development alone (**minor significance**: not significant in EIA terms).
- 10.9.23 The key view from Dun Osdale north towards Dunvegan Bay would remain unchanged, as would the views to and from the surrounding low-lying ground around the broch. As

such, the integrity of the setting of the broch would not be compromised and its cultural significance would not be appreciably diminished by the cumulative impact.

Dun Feorlig, broch 230 m NNE of Feorlig Farm (SM 3494)

- 10.9.24 Figure 10.8a shows that the Proposed Development would be seen together and in front of the consented Ben Sca Wind Farm (of which there is limited visibility) with the proposed Balmeanach Wind Farm also visible in the view to the north-east from Dun Feorlig (see also **Figure 10.3**). There is limited predicted visibility of the consented Glen Ullinish Wind Farm to the further to the east.
- 10.9.25 The cumulative impact on the setting of Dun Feorlig from adding the Proposed Development to a baseline including the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm is assessed as being of low magnitude and **minor significance** (not significant in EIA terms). As the developments would largely form a group to the north-east of the broch, the combined effect of the Proposed Development with the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm would be no greater than that assessed for the Proposed Development alone (**minor significance**: not significant in EIA terms).
- 10.9.26 The key view from the Dun Feorlig, over and along Loch Caroy would remain largely unchanged as would the key view to the east towards Abhainn Bhaile Mheadhonaich, broch (**SM 13664**). As such, the integrity of the setting of the broch would not be compromised and its cultural significance would not be appreciably diminished by the cumulative impact.

Ardmore, Chapel & Burial Ground 230m SW of (SM 3884)

- 10.9.27 **Figure 10.9a** shows that the Proposed Development would be seen in front of, together with and to the west of, Ben Sca Wind Farm in the view to the north north-east from the chapel. The proposed Balmeanach Wind Farm would continue this group of turbines along the skyline to the east of the summit of Ben Aketil, seen in combination with the operational Edinbane Wind Farm (see also **Figure 10.3**). The consented Glen Ullinish Wind Farm would further extend this line of turbines eastwards.
- 10.9.28 The cumulative impact on the setting of Ardmore, Chapel & Burial Ground from adding the Proposed Development to a baseline including the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm (**Figure 10.6a**) is assessed as being of negligible magnitude and **negligible significance** (not significant in EIA terms); the Proposed Development being added to cluster of consented turbines of Ben Sca. As these cumulative developments would largely form a skyline group to the north-east of the asset, the combined effect of the Proposed Development with the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm be no greater than that assessed for the Proposed Development alone (**minor significance**: not significant in EIA terms).
- 10.9.29 The key views from Ardmore, Chapel & Burial Ground to and from the surrounding ground of the Harlosh peninsula would remain largely unchanged. As such, the integrity of the setting of Ardmore would not be compromised and its cultural significance would not be appreciably diminished by the cumulative impact.

Dun Neill, Dun 420 m SW Of Ardmore (SM 3885)

- 10.9.30 **Figure 10.10a** shows that the Proposed Development would be seen in front of, together with and to the west of, Ben Sca Wind Farm in the view to the north north-east from the Dun. The tips of two of the proposed Balmeanach Wind Farm are theoretically visible to the east of these. The consented Glen Ullinish would not be visible.
- 10.9.31 The cumulative impact on the setting of Dun Neil from adding the Proposed Development to a baseline including the consented Ben Sca and Extension and the proposed Balmeanach Wind Farm (**Figure 10.10a**) is assessed as being of negligible magnitude and **negligible significance** (not significant in EIA terms); the Proposed Development being added to cluster of consented turbines of Ben Sca. As these cumulative developments would largely form a skyline group to the north-east of the asset, the combined effect of the Proposed Development with the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm would be no greater than that assessed for the Proposed Development alone (**minor significance**: not significant in EIA terms).
- 10.9.32 The key views from Dun Neil the views over and along Loch Bharcasaig, and the views towards the dun and fort from the fertile ground of the Harlosh peninsula would remain largely unchanged. As such, the integrity of the setting of Dun Neil would not be compromised and its cultural significance would not be appreciably diminished by the cumulative impact.

St Mary's Church and Burial Ground, Dunvegan (SM 9249)

- 10.9.33 **Figure 10.11a** shows that the Proposed Development would be seen in front of the consented Ben Sca Wind Farm (of which there is limited visibility of the tips of the turbines) and the proposed Balmeanach Wind Farm, all three of which are largely hidden from view behind the intervening hills in the view to the east from the church and burial ground. The consented Glen Ullinish would not be visible.
- 10.9.34 The cumulative impact on the setting of St Mary's Church and Burial Ground from adding the Proposed Development to a baseline including the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm (**Figure 10.11a**) is assessed as being of negligible magnitude and negligible significance (not significant in EIA terms). As these developments would largely form a skyline group to the north-east of the asset, the combined effect of the Proposed Development with the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm would be no greater than that assessed for the Proposed Development alone (**minor significance**: not significant in EIA terms).
- 10.9.35 The key views from St Mary's Church and Burial Ground to and from the surrounding settlement of Dunvegan would remain largely unchanged, as would the key view to the south-west to the MacLeod's Tables. As such, the integrity of the setting of St Mary's Church and Burial Ground would not be compromised and its cultural significance would not be appreciably diminished by the cumulative impact.

*Abhainn Bhaile Mheadhonaich, broch and standing stone 145m SE of An Cairidh
(SM 13664)*

- 10.9.36 **Figure 10.12a** shows that the Proposed Development would be seen in front of the consented Ben Sca Wind Farm (of which there is limited visibility) with the proposed Balmeanach Wind Farm to the east beyond the summit of Ben Aketil (see also **Figure 10.3**). The consented Glen Ullinish would mostly be screened from view from the broch.
- 10.9.37 The cumulative impact on the setting of Abhainn Bhaile Mheadhonaich, broch and standing stone from adding the Proposed Development to a baseline including the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm (**Figure 10.11a**) is assessed as being of negligible magnitude and **negligible significance** (not significant in EIA terms). As these developments would largely form a group to the north of the asset, the combined effect of the Proposed Development with the consented Ben Sca and Extension and Glen Ullinish Wind Farms and the proposed Balmeanach Wind Farm would be no greater than that assessed for the Proposed Development alone (**minor significance**: not significant in EIA terms).
- 10.9.38 The key view from Abhainn Bhaile Mheadhonaich, broch and standing stone, over and along Loch Caroy, and the key view to the west towards Dun Feorlig broch (**SM 3494**) would remain largely unchanged as would the views towards, and between, the broch and standing stone from the surrounding landscape. As such, the integrity of the setting of Abhainn Bhaile Mheadhonaich broch and standing stone would not be compromised and its cultural significance would not be appreciably diminished by the cumulative impact.
- 10.9.39 Dun Arkaig, broch (**SM 13662**)
- 10.9.40 **Figures 10.13a** and **10.13b** show that Dun Arkaig, broch would be surrounded on its north-east, east, south and south-west sides by the consented Glen Ullinish Wind Farm (**Figure 10.3**). The Proposed Development (**Figure 10.13a**) would be mostly screened by the hill topography west of Glen Colbost, therefore, the addition of the Proposed Development to any combination of the cumulative developments would not result in a greater impact on the broch's setting and the cumulative impact from the Proposed Development in combination with other consented or proposed wind farm developments is therefore not considered further.

10.10 References

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11 TRAFFIC AND TRANSPORT

11.1 Introduction

- 11.1.1 This chapter assesses the potential effects of the Proposed Development on the road network (in transport terms) and its users. This chapter should be read in conjunction with **Chapter 2: Proposed Development**.
- 11.1.2 The chapter describes the assessment methodology that has been adopted and identifies how baseline conditions have been established. The access, traffic and transport receptors have been identified within a defined assessment area (the 'Study Area'), which has the potential to be adversely or positively impacted by the Proposed Development.
- 11.1.3 The assessment detailed within this chapter includes worst case assumptions made for the purpose of forming a robust assessment of the Proposed Development within the parameters identified elsewhere within the Environmental Impact Assessment Report (EIAR), as well as a more realistic scenario.
- 11.1.4 An assessment has been made of the potential effects of the Proposed Development, with a focus on the construction phase on the basis that this will have the greatest impact on the local transport network within the Study Area. Where required, mitigation measures have been defined to reduce any **Significant** effects.
- 11.1.5 The following figures and technical appendices have been prepared to support the chapter:
- **Figure 11.1** – Traffic Study Area;
 - **Figure 11.2** – Traffic Count Points;
 - **Figure 11.3** – Traffic Accident Data (2017-2021);
 - **Figure 11.4** – Indicative Northern Access Junction Modifications
 - **Figure 11.5** – Indicative Southern Access Junction Modifications
 - **Technical Appendix 11.1** – Abnormal Load Route Assessment; and
 - **Technical Appendix 11.2** – Construction Traffic Management Plan.

11.2 Statutory and Planning Context

- 11.2.1 This chapter has been prepared taking cognisance of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations) and relevant documents set out in **Chapter 5: Planning Policy Context** of this EIAR.
- 11.2.2 The following policy documents, data sources and guidelines, specific to the Traffic and Transport subject matter, have been used to inform this assessment:
- Institute of Environmental Management and Assessment (IEMA) (1993). Guidelines for the Environmental Assessment of Road Traffic;
 - LA104, Environmental assessment and monitoring, Design Manual for Roads and Bridges (DMRB) (Standards for Highways, 2020);
 - Transport Scotland (2012) Transport Assessment Guidance; and

- Highland Council (2016), Adopted Onshore Wind Energy Supplementary Guidance.

11.2.3 Relevant National, Regional and Local Policies are as follows:

National Policy

11.2.4 The Scottish Government's vision for transport at a national and regional level is set out in National Policy Frameworks which include:

- Scotland's National Transport Strategy (2020): This sets out the objectives, priorities and plans for the long-term future for transport in Scotland; and
- The Scottish Government – 'National Planning Framework' (NPF4).

Regional Policy

11.2.5 The Highlands and Islands Regional Transport Strategy 2008 – 2022 (RTS) was approved by Scottish Ministers in 2008. It was informed and influenced by public and stakeholder consultation. The RTS, projects and horizontal themes form the associated delivery plan, set out the key policies and proposals required to deliver THC's vision for transport in the region.

11.2.6 The RTS Refresh published in 2017, captures the projects that are now committed to improve the transport of the region, and also highlights the further action that is required to support sustainable economic growth and to reduce barriers to participation in employment, learning, social, leisure, health and the wealth of cultural activities that the region has to offer.

Local Policy

11.2.7 The Highland Council Local Transport Strategy (LTS) aims to set direction of transport at a local level. The LTS provides a framework to guide the relationship between new developments and transport needs. The principal themes at the heart of the LTS are:

- Safety;
- Sustainability;
- Economic development; and
- Integration.

11.3 Consultation Undertaken

11.3.1 Table 11.1 summarises the consultation responses regarding traffic and transport matters and provides information on where and/or how they have been addressed in this assessment. The following regulatory bodies made comment on transport matters during Scoping dialogue held in 2022:

- The Highland Council (THC) (as local roads agency); and
- Transport Scotland (TS) (as trunk road agency).

Table 11.1: Consultation Summary

Consultee and Date	Summary of Key Issues	Action taken
The Highland Council 20 th September 2022	The Transport Assessment should include an Abnormal Load Assessment of the roads utilised to convert abnormal loads to the site. The assessment will need to confirm the proposed port of entry for AIL components and justify the adequacy of the route for transporting them to the site.	An abnormal load route assessment has been carried out for the delivery of the candidate turbine components from Kyle of Lochalsh to the site utilising the following roads: A87, A863 and A850. This is included with the EIAR as Technical Appendix 11.1 .
	The Transport Assessment should include a framework Construction Traffic Management Plan aimed at minimising the impact of construction traffic. It shall include measures to ensure development traffic adheres to the approved routes and establish protocols for the movement of HGVs on minor roads. Measures to address the cumulative effect of construction traffic from other developments utilising the same route/s should be included. Routes that can and can't be used by construction traffic from this development should be clarified. Note that the structural impact of the increase (particularly in HGV traffic) is of importance as well as the environmental impact and the threshold value for significance is 10% rather than the 30% for the environmental issues.	Mitigation measures to control potential impacts of construction traffic associated with the Proposed Development will be proposed as necessary and will include the implementation of a CTMP (a draft CTMP is included in Technical Appendix 11.2). The use of the threshold value for significance of 10% rather than the 30% for the environmental issues is accepted and applied to the part(s) of the study network maintained by THC.
	Consultation with the local community and Local Area Roads Office will be required regarding the detailed content and implantation of the Construction Traffic Management Plan.	Contact will be made with the local community and Local Area Roads Office regarding the content and implementation of the Construction Traffic Management Plan post securing planning consent for the Proposed Development.
	Liaison with THC structures should be undertaken.	Contact will be made with THC structures, post securing planning consent for the Proposed Development.
	An assessment in line with Transport Assessment Guidance should be undertaken with High National Traffic Forecast applied.	Noted and provided. Use of NTRF high factor accepted – applied to THC maintained road network of the A863 and A850 only.
	A detailed scoping for the Transport Assessment to include items such as the location and duration of the counts shall be agreed in writing with Highland Council and with Transport Scotland.	The Traffic and Transport EIAR Chapter has been prepared in line with the scoping responses from THC and TS.

Consultee and Date	Summary of Key Issues	Action taken
	Details of any new site access should be clearly set out on dimensioned drawings related to OS data and include confirmation of geometry, construction form, drainage details to prevent water running out onto the public road and evidence that appropriate visibility splays can be achieved.	Noted and provided in Figure 11.4 and Figure 11.5 .
	Vehicle swept paths should also be provided to evidence that the proposed junction form will be suitable for its intended use.	Noted and provided in Figure 11.4 and Figure 11.5 .
	Details of reinstatement of any temporary site access at its junction with the public road, post construction is also required.	Noted and provided in Figure 11.4 and Figure 11.5 .
	A schedule of proposals to mitigate the impact of the traffic and transport generated by the construction and decommissioning of the scheme shall be clearly set out as part of the TA submission. This shall identify any items which do not fall within the existing public road boundary or the red line boundary of the application.	The Traffic and Transport EIAR Chapter sets out the assessment of relevant effects and provides details of the mitigation proposed to reduce or remove any significant effects identified.
	Detailed and dimensioned plans showing the mitigation proposals on and adjacent to the public road will be required to be agreed prior to any works commencing on site.	Detailed mitigation plans and information will be prepared post securing planning consent for the Proposed Development for the purposes of securing the relevant minor works/ Road Construction Consents.
	In order to protect the interest of the Council as the Roads Authority, a suitable agreement relating to Section 96 of the Roads (Scotland) Act 1984 and appropriate planning legislation may be necessary. An appropriate Road Bond or similar security may also be required.	Noted, more details provided in paragraph 11.10.7.
	Need to consider grid connection works and the associated traffic with these works.	Grid connection works will be considered under a separate application for consent, by the grid provider.
	The EIAR must also consider the implications on the Trunk Road network as part of the EIAR process.	The Traffic and Transport EIAR Chapter has been prepared in line with the scoping responses from THC and TS.
Transport Scotland 29 th August 2022	The Scoping Report presents the proposed methodology for the assessment of Traffic and Transport associated with the construction of the proposed development. This indicates that the thresholds as indicated within the Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic are to be used as a screening process for the assessment. Transport Scotland is in agreement with this approach.	Acknowledgement of the proposed methodology as being robust is noted.

Consultee and Date	Summary of Key Issues	Action taken
	The Scoping Report also indicates that potential trunk road related environmental impacts such as severance, driver delay, pedestrian delay and amenity, safety etc will be considered and assessed where appropriate (i.e., where Institute of Environmental Management and Assessment Guidelines for further assessment are breached).	Environmental assessment of the trunk road network affected by the Proposed Development has been carried out in accordance with IEMA guidance and is summarised by this chapter in Section 11.9: Potential Effects. Where IEMA thresholds are exceeded further appropriate assessment has been carried out in respect of the particular environmental effect.
	The Scoping Report states that 24-hour Automatic Traffic Count (ATC) data will be obtained from the Department for Transport (DfT), Transport Scotland or the Highland Council and where not available / suitable, ATC surveys will be undertaken. Transport Scotland considers this acceptable, but would add that base traffic should be factored to the peak construction year using National Road Traffic Forecasts (NRTF) Low Growth.	Use of NRTF low growth factors accepted for Trunk Roads (A87).
	Transport Scotland will require to be satisfied that the worst-case scenario has been assessed, with the potential impact associated with the removal of existing infrastructure and the construction of the new turbines being considered.	The traffic and transport effects of the Proposed Development during construction, including cumulative, have been assessed and include a worst-case scenario whereby all construction materials are imported to site from off-site locations: see Section 11.7: Predicted Impacts.
	It is noted that any impacts associated with the operational phase of the development are to be scoped out of the EIA. We would consider this to be acceptable in this instance.	Noted.
	Transport Scotland will require to be satisfied that the increased size of turbines proposed can negotiate the selected route and that their transportation will not have any detrimental effect on structures within the trunk road route path. A full Abnormal Loads Assessment report should be provided that identifies key pinch points on the trunk road network. Swept path analysis should be undertaken and details provided with regard to any required changes to street furniture or structures along the route.	An abnormal load routing assessment for the transport of wind turbine components has been carried out for the candidate wind turbine and will be included as Technical Appendix to the EIAR Chapter (Technical Appendix 11.1).

11.4 Summary of Proposed Development

Alternative Construction Phasing

- 11.4.1 The Proposed Development is described fully in **Chapter 2: Proposed Development**. A summary is provided here highlighting those features pertinent to the assessment of traffic and transport.
- 11.4.2 The applicant is considering two alternative construction phasing options, as follows:
- **Option 1** proposes that the construction of the extension turbines and the construction of the repowering turbines is undertaken at the same time;
 - **Option 2** proposes that the four extension turbines are constructed first, followed by the decommissioning of the existing, operational Ben Aketil Wind Farm, followed by construction of the five repowering turbines.
- 11.4.3 During the construction period, the following traffic will require access to the site:
- staff transport (cars or staff minibuses);
 - construction equipment and materials, deliveries of machinery and supplies such as crushed rock and concrete; and
 - abnormal loads consisting of the wind turbine sections and also heavy lift crane, transported to site in sectional loads. The access from the port of Kyle of Lochalsh is highly constrained and a blade lifting trailer would be required to exit the port. The blade lifting trailer and a Superwing carrier will be used along the route to the site.
- 11.4.4 It is estimated that construction would take the following approximate times to complete:
- **Option 1:** 18 months;
 - **Option 2:** Construction of the four extension turbines (approximately 1 year), followed by decommissioning and removal of the existing wind turbines and associated infrastructure (approximately 1 year), followed in turn by construction of the five repowering turbines (approximately 1 year) – total of 3 years. There would be a potential delay between the completion of construction of the first five turbines and the start of construction of the second five turbines of no more than 5 years.

Construction Materials

- 11.4.5 It is anticipated that all of the aggregate required to construct tracks and hardstanding areas will be obtained from the existing hardstanding areas of the existing turbines and on-site borrow pits, as stated in the Borrow Pit Assessment (**Technical Appendix: 10.3**). However, aggregate would need to be imported to site for the construction of initial tracks to reach the southern borrow pit (BP1). The northern borrow pit (BP2) is being held as a contingency that will be used only if insufficient rock is available from BP1.
- 11.4.6 Any imported materials used for upgrading/extending existing access tracks/hardstanding and new tracks and hardstanding and structural fill material are likely to be sourced from nearby quarries on Skye. For example, the Highland Council's Sconser Quarry which is located 35-45 km by road south-east of the Site produces aggregates, asphalt, and earthworks materials. Ready mixed concrete or constituent materials for on-site batching for permanent structures can also potentially be sourced locally from Leith's Quarry located south of Torrin.

- 11.4.7 The Proposed Development would require the transportation of a range of construction materials to the site. The key elements of construction work which would result in the generation of vehicular trips have been summarised in **Table 11.2**.

Table 11.2: Construction Activities Requiring Vehicle Trips

Key Work Element	Details and Assumptions	Conventional HGVs	Abnormal Loads
Site establishment	Delivery of site cabins and plant for construction activities at commencement of construction and later removal from site	Yes	No
Import of material from quarry	Delivery of materials that are not able to be extracted from within the site	Yes	No
Borrow pit	Delivery of plant associated with establishing borrow pit	Yes	No
Access track upgrade and construction	Delivery of materials related to the upgrade of existing track and new onsite track	Yes	No
Turbine foundations and crane hardstandings	Delivery of plant associated with construction of crane hardstandings. Delivery of plant and materials including concrete, aggregate and reinforcement materials for turbine foundations	Yes	No
Control building and control building compound/substation	Delivery of material for construction of building foundations, structure and finishings. Delivery of electrical equipment and storage of batteries	Yes	No
Electrical installation	Delivery of sand and cables to connect turbines to substation	Yes	No
Wind turbine delivery	Delivery of turbine components to Site. Delivery of crane equipment to erect turbines. Includes escort vehicles associated with movement of abnormal loads	Yes	Yes

11.5 Scope and Methodology

Study Area

- 11.5.1 The study area for the assessment will focus on the routes used for access by construction vehicles and Abnormal Indivisible Loads (AILs). The geographic scope was

determined through the review of OS plans and an assessment of the potential origin locations of construction staff and supply locations for construction materials.

- 11.5.2 The study area is focused only on the immediate roads surrounding and leading to the Proposed Development, as it is expected that traffic flows outwith this area would be dissipated on the wider road network without any significant effect. This chapter therefore only considers the likely increases in traffic along these routes. The Study Area is shown on Figure 11.1.
- 11.5.3 Both construction options being considered by the applicant for the Proposed Development will either use the existing Ben Aketil Wind Farm access track to the north from the A850, or a new southern access via the A863 and the Feorlig crofters road, or both.
- 11.5.4 For the northern access route, hereinafter referred to as Scenario 1, the study area includes, and extends no further than the following:
 - A87 between Kyle of Lochalsh and A87/A836 Junction;
 - A87 between Sligachan and the A87/A850 Junction; and
 - A850 between the A87/A850 Junction and the northern site access.
- 11.5.5 For the southern access route, hereinafter referred to as Scenario 2, the preliminary study area includes, and extends no further than the following:
 - A87 between Kyle of Lochalsh and A87/A836 Junction;
 - A863 between Sligachan and Upper Feorlig Road; and
 - A863 south of Dunvegan.
- 11.5.6 An Abnormal Load Route Assessment (ALRA) has been undertaken and it is anticipated that AILs would journey north-west from the Port of Kyle of Lochalsh. The ALRA is included as a **Technical Appendix 11.1** to the EIAR.
- 11.5.7 The proposed delivery route for AILs would follow one of two routes:
 - Accessing the Site from the north:
 - loads would depart the port and turn left onto the A87 before crossing onto the Isle of Skye via the Skye Bridge;
 - loads would continue north on the A87 before turning left onto the A850 at Borge; and
 - loads would continue west on the A850 and proceed to the site access west of Edinbane.
 - Accessing the Site from the south:
 - loads would depart the port and turn left onto the A87 before crossing onto the Isle of Skye via the Skye Bridge;
 - loads would continue north on the A87 before turning left onto the A863; and
 - loads would continue north on the A863 until Feorlig where they would turn right into a new site access junction.

Baseline Data Collection

- 11.5.8 A desk-based review of the impacts arising from the construction of the Proposed Development was undertaken, including the following:

- collection and analysis of available road traffic accident data over the study area;
 - using a preliminary construction programme, quantifying construction phase trips based on the quantity of material required for the Proposed Development (including generation as a result of potential forestry removal, commercial or otherwise) and the duration of each specific construction phase activity;
 - determination of a traffic baseline, taking account of measured existing traffic flow and other developments that have been identified for inclusion within the cumulative assessment; and
 - quantification of the relative increases in traffic resulting from the construction phase of the Proposed Development.
- 11.5.9 A visual inspection of the study areas was carried out to ensure a full understanding of the local area and to identify all sensitive receptors.
- 11.5.10 To determine the baseline conditions against which the effects of the Proposed Development have been assessed using data from the Department for Transport (DfT) website for the A87, A863 and A850. Annual traffic statistics for the study area have been accrued through, either; estimations using previous year's Annual Average Daily Flows (AADFs), manual counts or permanent Automatic Traffic Counters (ATCs) maintained by the local and trunk road authorities. The location of the count sites is shown on **Figure 11.2**.
- 11.5.11 In addition to the above, road traffic collision data for the most recent five-year period from 2017 – 2021 were obtained from the DfT. The locations of the accidents in the Study Area are illustrated by **Figure 11.3**.
- 11.5.12 Baseline traffic data gathered and processed for the traffic and transport assessment was also prepared in a suitable format to inform the Noise impact assessment in **Chapter 12: Noise**, of this EIAR.
- 11.5.13 An assessment of the Site has been undertaken to establish suitable areas on site that can be used as borrow pits for material for the tracks and hardstanding areas. Allowances, following this investigation, have been made in the Scenario 1B and Scenario 2B (i.e. most-likely and best-case Scenario for each construction option) transport movements associated with construction activities which would be reduced as a result of the use of onsite borrow pits.

Effects Scoped In

- 11.5.14 The scope of the assessment has been informed by consultation responses summarised in Table 11.1 and the following guidelines/policies:
- Institute of Environmental Management and Assessment (IEMA) (1993). Guidelines for the Environmental Assessment of Road Traffic;
 - LA104, Environmental assessment and monitoring, Design Manual for Roads and Bridges (DMRB) (Standards for Highways, 2020);
 - Transport Scotland (2012) Transport Assessment Guidance;
 - Scottish Government (2023) National Planning Framework; and
 - Highland Council (2016), Adopted Onshore Wind Energy Supplementary Guidance.

11.5.15 Potentially significant environmental effects associated with access and traffic and transport may result from two forms of potential impacts:

- transport configurations made for the movement of turbines including blade, tower sections, and nacelle of the wind turbines that are transported as abnormal loads. Abnormal loads are those which exceed the length, weight or height criteria defined in 'Abnormal Load Movements – A brief guide to Notification and Authorisation requirements' (Transport Scotland, June 2007); and
- general construction traffic (personnel) and import of materials transported via 'conventional' heavy goods vehicles (HGVs) and low loaders.

11.5.16 This chapter does not focus on the transport configurations made for the movement of wind turbine components to the site entrance. The off-site delivery routes have been considered in the supporting ALRA (**Technical Appendix 11.1**), which includes swept path analysis and a detailed review of the preferred route for access where this relates to Trunk roads.

Effects Scoped Out

Operation

11.5.17 A wind farm is designed to operate automatically and unmanned, but a small number of staff will be based on site during normal working hours to carry out typical duties on-site, including: routine maintenance; such as planned servicing; safety checks; and repairing faults. These visits would normally require light vans or similar vehicles and would use the same routes as those used during construction and the frequency of these visits would depend on the turbine manufacturer. As such, the trips generated by the operational activities onsite would be no greater than those expected to occur in the normal background daily variations to existing traffic flows. Negligible traffic flows would be indistinguishable from normal daily traffic flows and, therefore, assessment of operational effects has been scoped out of this assessment, as was agreed by Transport Scotland in their consultation response.

11.5.18 As the operational impacts of the Proposed Development on the Study Area is indiscernible, the operational cumulative effects have not been assessed.

11.5.19 Trip generation associated with the operational phase would not exceed the levels presented in the assessment of construction impacts and, therefore, has been scoped out of this assessment.

Decommissioning

11.5.20 As the application seeks planning consent for an operational life of the extension and repowering turbines of 35 years, decommissioning will be required. However, any effects of decommissioning would be less than those resulting from construction of the Proposed Development and are, therefore, scoped out of this assessment.

Approach to Assessment of Effects

11.5.21 The following outlines the steps taken in the assessment to establish the effects on road users due to traffic associated with the construction of the Proposed Development:

- an assessment of the existing baseline conditions based on publicly available Department for Transport (DfT) traffic data;

- an assessment of the surrounding road network to determine its suitability to accommodate the anticipated volume of construction traffic e.g. HGVs;
- an assessment of the increase in traffic compared to baseline traffic flows for the opening year of construction (assumed to be 2025) for the roads included in the Study Area. The approach for this has been to define the level of traffic anticipated to access the Proposed Development during its construction phase, calculated from first principles and distributed over the anticipated construction programmes; and
- an assessment of operational traffic. This provides a brief summary of typical maintenance activities and the types of vehicles used as traffic impacts during the operation of the Proposed Development are minimal.

11.5.22 For a worst-case assessment, the following assumptions have been made:

- all construction materials (not including the material from the existing wind farm that will be reused) are assumed to be sourced from offsite locations (i.e. outside of the application boundary), including all aggregate required for track construction, thus ensuring that the estimated level of trip generation is considered as a maximum worst-case. This scenario is, however, unlikely as sufficient useable material from on-site borrow pits is anticipated based on preliminary assessments undertaken, but this ensures a robust approach; and
- future traffic increases associated with the construction of the Proposed Development have been measured against baseline flows with a low National Road Traffic Forecast (NRTF) growth factor (Trunk Roads) and a high NRTF growth factor (Local Authority maintained roads e.g. A863) applied.

11.5.23 The approach to this assessment is based upon the IEMA guidelines, referring to the varying criteria depending on the type of impact being assessed. The assessment is primarily based upon the change in total traffic flows or the change in heavy goods vehicle (HGV) flows along a specific section of road. Professional judgement must also be taken into account, particularly where the baseline traffic flow may be low and, therefore, a small increase in traffic may result in a high relative increase. Hence, in these instances the absolute value must be considered in the overall assessment of significance.

11.5.24 The IEMA guidance suggests that a day-to-day traffic flow of plus or minus 10% is expected to be the baseline situation and that projected traffic flow changes of less than 10% would be imperceptible to the general public and create no discernible environmental impact. Therefore, increases in traffic levels below 10% are considered insignificant.

11.5.25 Based on the IEMA guidance, the following factors have been identified as being the most discernible potential environmental effects likely to arise from changes in traffic movements. Therefore, these are considered in the assessment of potential effects which may arise from changes in traffic flows resulting from the Proposed Development:

- driver severance and delay – the potential delays to existing drivers and their potential severance from other areas;
- community severance and delay – the potential delays to pedestrians in their movements and ability to crossroads;
- pedestrian delay and amenity – the potential impact of local amenity and delay in movement around and between communities;
- noise – the potential effect caused by additional traffic on sensitive receptors, which in this case relate to residential properties near the road. This is considered by separate assessment contained in **Chapter 12: Noise** of the EIAR;

- vulnerable road users and road safety – the potential effect on vulnerable users of the road (e.g. pedestrians and cyclists);
- hazardous and dangerous loads – the potential effect on road users and local residents caused by the movement of abnormal loads; and
- dust and dirt – the potential effect of dust, dirt and other detritus being brought onto the road.

11.5.26 In addition to the effects listed here, human health effects are considered in transport terms with reference to pedestrians within the vulnerable road user and road safety effects.

11.5.27 The significance of likely effects has been determined by consideration of the sensitivity of receptors to change, taking account of the specific issues relating to the Study Area, and then the magnitude of that change.

Sensitivity of Receptors

11.5.28 The potential sensitivity of receptors to change in traffic levels has been determined by considering the Study Area and the presence of receptors in relation to each potential impact.

11.5.29 The IEMA guidelines provide two thresholds when considering predicted increase in traffic, whereby a full assessment of impact would be required:

- Where the total traffic would increase by over 30% or more (10% in sensitive areas); and/or
- Where the HGV traffic would increase by over 30% or more (10% in sensitive areas).

11.5.30 At request from the THC during Scoping, the use of the threshold value for significance of 10% rather than the 30% for the traffic and transport issues has been used for roads where THC is the Local Road Authority (LRA) (i.e. A863 and A850).

11.5.31 In this context, the IEMA guidelines do not define the value placed on the receptors and therefore their sensitivity; therefore, the assessor makes a professional judgement based on experience and the nature of the Study Area. Each receptor has been assessed individually to determine its sensitivity and the assessment criteria chosen are shown in **Table 11.3** below.

Table 11.3: Receptor Sensitivity

Impact	Low Sensitivity	Medium Sensitivity	High Sensitivity
Driver Severance & Delay	Road Network not affected	Road Network not experiencing congestion at peak times	Road Network experiencing congestion at peak times
Community Severance & Delay	No presence of existing communities severed by road	Presence of existing communities with a moderate level of existing severance (subjective assessment)	Presence of communities with existing severance (subjective assessment)
Noise	No sensitive receptors	Presence of sensitive receptors near to the road	Presence of sensitive receptors adjacent to the road

Impact	Low Sensitivity	Medium Sensitivity	High Sensitivity
Road Safety	High sensitivity receptor		
Vulnerable Road Users	High sensitivity receptor		
Wider Disruption due to dangerous loads	No hazardous or dangerous loads on the road network	Some hazardous or dangerous loads on the road network. Loads are generally permitted on UK roads	Abnormal and oversized loads to use road network
Dust & Dirt	Limited presence of sensitive receptors (subjective assessment)	Low to Medium presence of sensitive receptors (subjective assessment)	High presence of sensitive receptors (subjective assessment)

Magnitude of Impact

11.5.32 The magnitude of impact has been undertaken by considering the parameters of the Proposed Development, establishing the scope of the receptors that may be affected and quantifying these effects utilising IEMA Guidelines and professional judgement. The magnitude of impact or change has been considered according to the criteria defined in **Table 11.4**.

Table 11.4: Magnitude of Impact

Impact	Negligible	Minor	Moderate	Major
Driver Severance & Delay	< 10% Increase in traffic	Quantitative assessment of road capacity based on existing traffic flows and predicted future levels		
Community Severance & Delay	< 10% Increase in traffic	>10% and <30% Increase in traffic	30% - 60% Increase in traffic	> 60% Increase in traffic
Noise	< 25% Increase in traffic	> 25% Increase in traffic. Quantitative assessment based on predicted increase in traffic against measured baseline (See Chapter 12: Noise)		
Road Safety	< 10% Increase in traffic	Quantitative assessment of road capacity based on existing traffic flows and predicted future levels		
Vulnerable Road Users	< 10% Increase in traffic	Quantitative assessment of road capacity based on existing traffic flows and predicted future levels		
Wider Disruption due to dangerous loads	0% Increase in traffic	>10% and <30% Increase in traffic	30% - 60% Increase in traffic	> 60% Increase in traffic
Dust & Dirt	< 10% Increase in traffic	>10% and <30% Increase in traffic	30% - 60% Increase in traffic	> 60% Increase in traffic

11.5.33 Significance of Effect

- 11.5.34 Sensitivity and magnitude of change as assessed under the detailed criteria have then been considered collectively to determine the potential effect and their significance. The collective assessment is an assessment undertaken by the assessor, based on the likely sensitivity of the receptor to the change (e.g., is receptor present which would be affected by the change), and then the magnitude of that change. **Table 11.3** sets out receptor sensitivity. **Table 11.4** sets out the levels of magnitude of impact. The Significance of Effect in **Table 11.5** is reached by combining the Sensitivity of Receptor against the Magnitude of Impact. **Table 11.5** is used as a guide to determine the level of effect. **‘Major’** and **‘Moderate’** effects are considered to be ‘Significant’ in terms of the relevant guidance.

Table 11.5: Significance of Effect

Sensitivity of receptor	Magnitude of Impact			
	Negligible	Minor	Moderate	Major
Low	None	Slight	Slight	Moderate
Medium	Slight	Slight	Moderate	Major
High	Slight	Moderate	Major	Major

Potential Cumulative Effects

- 11.5.35 An assessment of the cumulative effect on the Study Area of all relevant developments, including local wind farms, within a 5 km radius of the site (either in planning system or under construction) which may utilise the same access routes as the Proposed Development, has been undertaken.
- 11.5.36 Assessment Difficulties and Uncertainties
- 11.5.37 At this early stage, there are still some uncertainties regarding the numbers and types of vehicles to be used during construction, which access route will be used (if not both), where materials will be sourced from, etc. These details will be established post-consent. However, it is possible to conduct an impact assessment based on assumptions. For the purposes of this EIA, a precautionary approach has been taken to the impact assessment, i.e., for each scenario assessed, a worst-case has been used in the assessment, so that any deviation from the worst-case is expected to have a lower impact.
- 11.5.38 The assessment has been undertaken based on the assumption that good construction practices will be employed, including the following:
- all vehicles delivering plant and materials to the site would be roadworthy, maintained, with loads sheeted, as required;
 - suitable traffic management would be deployed for the movement of HGVs and other site traffic;
 - banksmen and police escort would be deployed for the movement of abnormal loads as required; and
 - HGV loads would be managed to ensure part-load deliveries would be minimised where possible, to limit the overall number of loads.
- 11.5.39 The construction working hours for the Proposed Development would be 07:00 to 19:00 Monday to Friday and 08:00 to 17:00 on Saturdays, unless otherwise agreed with THC.

Certain activities, such as electrical works in the substation, abnormal load deliveries, large concrete pours or turbine erection in the event of delays due to high winds, may require to be undertaken outwith these hours. However, they would not be undertaken without prior approval from THC.

- 11.5.40 The assessment is based upon an assumed construction programmes (**Chapter 2: Proposed Development**) for the Proposed Development and is based upon average traffic flows. There may be localised peaks with construction days where flows can be higher for a specific hour, such as shift change on-site.
- 11.5.41 It should be noted that, in the scenario that the Proposed Development did not proceed, traffic growth will still occur.

11.6 Existing Environment

- 11.6.1 The Site lies to the south of the A850 and north of the A836, which are principal roads connecting Dunvegan Castle, the town of Dunvegan and the north of the island with the A87 trunk road for Portree and Kyle of Lochalsh. They are high-quality rural single carriageway roads which change to more urban character with the provision of contiguous footways through settlements. Further information on the existing local road network can be found in **Section 2.2 of Technical Appendix 11.2.**

Baseline Traffic Surveys

- 11.6.2 Annual traffic statistics for the study area have been accrued through, either estimations using previous year's AADFs, manual counts or permanent Automatic Traffic Counters (ATCs). These are all maintained by the local and trunk road authorities.
- 11.6.3 The counts sites that have been used are as follows:
 - A87 between Kyleakin roundabout and Stoney Rd, Kyle of Lochalsh (80594);
 - A87 between A851 and Kyleakin roundabout (10943);
 - A87 between B8083 and A851 (80387);
 - A87 between A863 and B8083 (20940);
 - A87 between A863 and B883 (50928);
 - A87 between B883 and A855 (1131);
 - A87 between A855 and A850 (30944);
 - A850 between A87 and B836 (10944);
 - A850 between C-road to Horneval and B836 (40944);
 - A850 between A863 and C-road to A863 (20944);
 - A863 between B8009 and A87 (50916);
 - A863 between B885 and B8009 (1139);
 - A863 between C-road to Horneval and B885 (30952);
 - A863 between B884 and C-road to A850 at Horneval (10952); and
 - A863 between A850 and B884 (40952).

- 11.6.4 The locations of the traffic count sites used in this assessment are illustrated in **Figure 11.2**. The DfT traffic data allows the traffic flows to be split in vehicle classes. The data has been summarised into Cars/Light Good Vehicles (LGVs) and HGV's).
- 11.6.5 The NRTF low growth factor for 2019 to 2022 is 1.022. The NRTF high growth factor for 2019 to 2022 is 1.042. These factors were applied to the 2019 survey data to estimate the baseline 2022 traffic flows on the road network.
- 11.6.6 Construction of the Proposed Development could commence during 2025 if consent is granted and, for the purposes of the assessment, is anticipated to take up to 18 months depending on weather conditions and ecological considerations.
- 11.6.7 To assess the likely effects during the construction, Construction Year baseline traffic flows were determined by applying a National Road Traffic Forecast (NRTF) growth factor to the 2022 traffic flows.
- 11.6.8 The NRTF low growth factor for 2022 to 2025 is 1.016. The NRTF high growth factor for 2022 to 2025 is 1.037. These factors were applied to the calculated 2022 baseline data to estimate the 2025 Construction Year baseline traffic flows shown in Table 11.7 which are used in the Construction Peak Traffic Impact Assessment.
- 11.6.9 **Table 11.6** summarises the Annual Average Daily Traffic (AADT) traffic conditions for 2019, 2022 and 2025 for the study area, identifying the relevant traffic growth rate applied to the 2019 survey data.

Table 11.6: 2019, 2022 & 2025 Annual Average Daily Traffic (AADT) Traffic Conditions

Survey Location (Count Point ID)	Cars & LGVs			HGVs			Total		
	2019	2022	2025	2019	2022	2025	2019	2022	2025
80594 (low factor)	4537	4637	4711	206	211	214	4743	4847	4925
10943 (low factor)	3723	3805	3866	197	201	205	3920	4006	4070
80387 (low factor)	6391	6532	6636	192	196	199	6583	6728	6835
20940 (low factor)	3036	3103	3152	195	199	202	3231	3302	3355
50928 (low factor)	2603	2660	2703	190	194	197	2793	2854	2900
1131 (low factor)	3879	3964	4028	135	138	140	4014	4102	4168
30944 (low factor)	3357	3431	3486	119	122	124	3476	3552	3609
10944 (high factor)	1275	1329	1378	18	19	19	1293	1347	1397
40944 (high factor)	923	962	997	13	14	14	936	975	1011
20944 (high factor)	1072	1117	1158	25	26	27	1097	1143	1185
50916 (high factor)	1143	1191	1235	42	44	45	1185	1235	1280
1139 (high factor)	546	569	590	65	68	70	611	637	660
30952 (high factor)	793	826	857	14	15	15	807	841	872
10952 (high factor)	1014	1057	1096	28	29	30	1042	1086	2199
40952 (high factor)	1142	1190	1234	30	31	32	1172	1221	2490

Baseline Road Safety Review

- 11.6.10 The time period for the accident analysis includes the five-year period between 2017 and 2021 (inclusive). The locations of recorded accidents are shown on **Figure 11.3**.
- 11.6.11 The accident analysis is used to inform the review of the proposed route where any deficiencies in the road layout and condition are identified. A total of 68 accidents were recorded across the study area during the five-year period. Of these, 54 resulted in slight injury (e.g. slight shock with occurrences of sprains or bruises), 13 resulted in serious injury (e.g. breakages, lacerations, concussion, or hospital admittance) and 1 resulted in fatal injury (resulted in a mortality/death within 30 days after the accident).
- 11.6.12 For the purposes of the accident review, the study area has been split into three sections of road network. These are:
- Section A – A87 between Kyle of Lochalsh and A87/A863;
 - Section B – A87 between A87/A863 and A87/A850;
 - Section C – A850 between A87/A850 and the A850/A863 at Dunvegan;
 - Section D – A863 between Sligachan and the southern site access; and

- Section E – A863 between Dunvegan and the southern site access.

11.6.13 The number and severity of accidents recorded in the Study Area is provided in **Table 11.7** below:

Table 11.7: Number and Severity of Accidents Summary

Section	Slight	Serious	Fatal
A	25	4	0
B	11	5	1
C	10	3	0
D	6	1	0
E	2	0	0

Baseline Sustainable Travel Infrastructure Review

- 11.6.14 Some pedestrian footways are provided on the principal roads through the main settlement, such as Portree, to one side as a minimum.
- 11.6.15 Initial investigations have determined that there are no Highland Council Core Path networks which traverse the Site. Core paths intersect with the external road network at various locations, illustrated in **Figure 13.1**.
- 11.6.16 There are no special provisions for bicycle friendly roads/lanes along the A850 or A863 in the vicinity of the Site.
- 11.6.17 There are no public transport services close to the Site with the nearest bus stops being located in Edinbane and Lonmore providing access to Portree.

11.7 Predicted Impacts

Proposed Development Parameters – Traffic and Transport

- 11.7.1 The precise quantities of construction materials required for the Proposed Development would depend on the presence of on-site borrow pits.
- 11.7.2 Whilst preliminary investigations indicate that the necessary aggregate material for the construction of, for example, new access tracks, upgrading of existing tracks, crane hardstanding etc. can be obtained from the borrow pits (see **Borrow Pit Assessment Technical Appendix 10.3**), an assessment of a worst-case scenario has been included in the environmental assessment of traffic and transport effects. Accordingly, the potential impact of the transportation of construction plant and materials and general construction traffic such personnel movements to the site have been assessed using the following scenarios:

Scenario 1 – Northern Access Route

- Worst-case Scenario (1A): All traffic to utilise the northern access. 100% of the aggregate requirement to be sourced from off-site locations, including all aggregate required for track construction and upgrade, thus ensuring that the estimated level of trip generation is considered as a worst-case;

- Best-case Scenario (1B): All traffic to utilise the northern access. 14,000 m³ of aggregate material used for formation, capping and subbase materials are to be sourced from the on-site borrow pits (excluding new track needed to reach the southern borrow pit) with all remaining construction materials, specifically concrete for turbine bases, are assumed to be sourced from off-site locations;

Scenario 2 – Southern Access Route

- Worst-case Scenario (2A): All traffic to utilise the southern access. 100% of the aggregate requirement to be sourced from off-site locations, including all aggregate required for track construction and upgrade, thus ensuring that the estimated level of trip generation is considered as a worst-case; and
- Best-case Scenario (2B): All traffic to utilise the southern access. All aggregates used for formation, capping and subbase materials are assumed to be sourced from the on-site borrow pits (excluding new track needed to reach the southern borrow pit) with all remaining construction materials, specifically concrete for turbine bases, are assumed to be sourced from off-site locations.

11.7.3 It is the applicant's intention to re-use stone from the existing hardstanding's for the construction of the proposed repowering turbines. It is estimated that approximately 3,240 m³ of the existing hardstanding material will be re-used for this purpose. This amount has been included in both scenarios.

11.7.4 It is noted that the two construction phasing options being considered by the client have different construction programmes, with Option 1 occurring over a period of 18-months and Option 2 occurring over a longer period of time with a delay in between its two staggered phases. In order to provide a worst-case assessment, an 18-month programme will be utilised in the analysis of both access route scenarios to illustrate the greatest possible impact of construction traffic from the Proposed Development on the local highway network. A staggered or longer programme, as well as delay between programme phases, will lessen the impact of construction traffic on the local highway network.

11.7.5 Traffic Generation

LGV Trip Generation

11.7.6 Light goods vehicles (LGVs) (i.e., smaller vehicles such as cars and vans, which would typically be associated with the workforce) have been calculated to provide total two-way vehicle movements predicted to arise from the Proposed Development.

11.7.7 At peak, light vehicle trips would be generated by approximately 50 workers who would be working on the site during the construction phase, with a maximum of 100 two-way movements daily, based on single car occupancy.

HGV Trip Generation

11.7.8 **Table 11.8** and **Table 11.9** show the predicted worst-case and alternative case two-way vehicle movements during the construction phase for each Scenario, respectively.

Table 11.8: Predicted Traffic Generation during Construction Phase – Scenario 1

Infrastructure Item		Worst-Case (Scenario 1A)		Best-Case (Scenario 1B)	
		No of Loads	Two-Way Movements	No of Loads	Two-Way Movements
Site Mobilisation		10	20	10	20
Access tracks	New on-site access track	5216	10,432	445	890
Construction Compound	BESS	91	182	0	0
	Substation (extension)	65	130	0	0
	Substation (repower)	65	130	0	0
	Construction Compound (wind farm)	320	640	0	0
	Construction Compound (south)	200	400	0	0
	Construction Compound (on hardstands)	320	640	80	160
Turbine Foundations	Turbine Bases – formation only	131	262	0	0
	Fill above turbine bases	630	1260	630	1260
	Hardstanding areas/Crane pads	2752	5504	0	0
	Blinding	93	186	93	186
	Installation of Can/Bolts	1	2	1	2
	Reinforcement	32	64	32	64
	Formwork	4	8	4	8
	Ducts (200mm diameter)	1	2	1	2
	Ducts (75mm diameter)	1	2	1	2
	Transformer plinths	1	2	1	2
	Step plinths	9	18	9	18
Turbine Bases	Concrete	1722	3444	1722	3444
BESS, Substation and Control Building	Concrete	643	1286	643	1286
Electrical	Sand layer	205	410	205	410
	Cable	2	6	3	6
Control Building	Reinforcement	1	2	1	2
BESS Equipment Delivery	53-foot ISO Containers	22	44	22	44
Turbine Delivery, Erection and Commissioning		90	180	90	180

Infrastructure Item		Worst-Case (Scenario 1A)		Best-Case (Scenario 1B)	
		No of Loads	Two-Way Movements	No of Loads	Two-Way Movements
Decommissioning of existing turbines	Tower section (steel) HH 64m	43	86	43	86
	Blades (m) GRP	19	38	19	38
	Nacelle rotor generator (ton)	12	24	12	24
	Stairs (external)	1	2	1	2
	Foundations concrete top 0.5m	76	152	76	152
	Rebar (13% or volume)	34	68	34	68
Reinstatement and Restoration		20	40	20	40
Total		12,829	25,658	4,195	8,390

Table 11.9: Predicted Traffic Generation during Construction Phase –Scenario 2

Infrastructure Item		Worst-Case (Scenario 2A)		Best-Case (Scenario 2B)	
		No of Loads	Two-Way Movements	No of Loads	Two-Way Movements
Site Mobilisation		10	20	10	20
Access tracks	New on-site access track	5216	10,432	683	1366
Construction Compound	BESS	91	182	0	0
	Substation (extension)	65	130	0	0
	Substation (repower)	65	130	0	0
	Construction Compound (wind farm)	320	640	0	0
	Construction Compound (south)	200	400	200	400
	Construction Compound (on hardstands)	320	640	0	0
Turbine Foundations	Turbine Bases – formation only	131	262	0	0
	Fill above turbine bases	630	1260	630	1260
	Hardstanding areas/Crane pads	2752	5504	0	0
	Blinding	93	186	93	186

Infrastructure Item		Worst-Case (Scenario 2A)		Best-Case (Scenario 2B)	
		No of Loads	Two-Way Movements	No of Loads	Two-Way Movements
	Installation of Can/Bolts	1	2	1	2
	Reinforcement	32	64	32	64
	Formwork	4	8	4	8
	Ducts (200mm diameter)	1	2	1	2
	Ducts (75mm diameter)	1	2	1	2
	Transformer plinths	1	2	1	2
	Step plinths	9	18	9	18
Turbine Bases	Concrete	1722	3444	1722	3444
BESS, Substation and Control Building	Concrete	643	1286	643	1286
Electrical	Sand layer	205	410	205	410
	Cable	2	6	2	6
Control Building	Reinforcement	1	2	1	2
BESS Equipment Delivery	53-foot ISO Containers	22	44	22	44
Turbine Delivery, Erection and Commissioning		90	180	90	180
Decommissioning of existing turbines	Tower section (steel) HH 64m	43	86	43	86
	Blades (m) GRP	19	38	19	38
	Nacelle rotor generator (ton)	12	24	12	24
	Stairs (external)	1	2	1	2
	Foundations concrete top 0.5m	76	152	76	152
	Rebar (13% or volume)	34	68	34	68
Reinstatement and Restoration		20	40	20	40
Total		12,829	25,658	4,554	9,108

11.7.9 Preliminary investigations indicated that the borrow pits onsite will be able to supply aggregate for access tracks (new/upgraded), construction compounds and other hardstanding areas. Therefore, Scenario 1B and Scenario 2B are considered realistic. However, for the purposes of this environmental assessment based on the findings of a worst-case scenario has been carried out as requested by TS.

Construction Programme

11.7.10 The two-way movements for HGVs have been distributed over the anticipated construction programme according to the relevant site activity. The total two-way trip

generation has been divided by the number of operational days in each month to provide daily two-way trip generation for both scenarios. Scenario 1A and Scenario 2A are summarised in **Table 11.10**. Scenario 1B is summarised in **Table 11.11**. Scenario 2B is summarised in **Table 11.12**.

- 11.7.11 For all Scenarios the month with the highest volume of traffic has been highlighted in blue.
- 11.7.12 For Scenario 1A and Scenario 2A, months 3-5 are predicted to generate the most traffic, with 332 two-way vehicle movements daily.
- 11.7.13 For Scenario 1B and Scenario 2B, month 8 is expected to generate the most traffic, with 224 two-way vehicle movements daily.

Table 11.10: Scenario 1A and Scenario 2A– Two-way Movements by Construction Vehicles (Worst-Case)

Activity	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site mobilisation/demobilisation	20																	
Construction of construction compounds and access points		1680																
Track and hardstanding construction			5313	5313	5313													
Decommissioning of existing Turbines						185	185											
Construction of turbine foundations							2625	2625										
Substation and BESS construction								444	444	444	444							
Excavating trenches and laying electrical and communications cables										104	104	104	104					
Site restoration														20	20			
Turbine delivery and installation															90	90		
Turbine fit out and grid connection																	5	5
Turbine commissioning																	10	
General Site Traffic (Personnel)	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
Monthly ALL Total	2320	3980	7613	7613	7613	2485	5110	5369	2744	2848	2848	2404	2404	2320	2410	2390	2315	2305
Daily ALL Total	102	174	332	332	332	110	224	234	120	124	124	106	106	102	106	104	102	102
Monthly HGV Total	20	1680	5313	5313	5313	185	2810	3069	444	548	548	104	104	20	110	90	15	5
Daily HGV Total	2	74	232	232	232	10	124	134	20	24	24	6	6	2	6	4	2	2

Table 11.11: Scenario 1B – Two-way Movements by Construction Vehicles (Best-Case)

Activity	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site mobilisation/demobilisation	20																	
Construction of construction compounds and access points		160																
Track and hardstanding construction			297	297	297													
Decommissioning of existing Turbines						185	185											
Construction of turbine foundations							2494	2494										
Substation and BESS construction								333	333	333	333							
Excavating trenches and laying electrical and communications cables										104	104	104	104					
Site restoration														20	20			
Turbine delivery and installation															90	90		
Turbine fit out and grid connection																	5	5
Turbine commissioning																	10	
General Site Traffic (Personnel)	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
Monthly ALL Total	2320	2460	2597	2597	2597	2485	4979	5127	2633	2737	2737	2404	2404	2320	2410	2390	2315	2305
Daily ALL Total	102	108	114	114	114	110	218	224	116	120	120	106	106	102	106	104	102	102
Monthly HGV Total	20	160	297	297	297	185	2679	2827	333	437	437	104	104	20	110	90	15	5
Daily HGV Total	2	8	14	14	14	10	118	124	16	20	20	6	6	2	6	4	2	2

Table 11.12: Scenario 2B – Two-way Movements by Construction Vehicles (Best-Case)

Activity	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site mobilisation/demobilisation	20																	
Construction of construction compounds and access points		400																
Track and hardstanding construction			456	456	456													
Decommissioning of existing Turbines						185	185											
Construction of turbine foundations							2494	2494										
Substation and BESS construction								333	333	333	333							
Excavating trenches and laying electrical and communications cables										104	104	104	104					
Site restoration														20	20			
Turbine delivery and installation															90	90		
Turbine fit out and grid connection																	5	5
Turbine commissioning																	10	
General Site Traffic (Personnel)	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
Monthly ALL Total	2320	2700	2756	2756	2756	2485	4979	5127	2633	2737	2737	2404	2404	2320	2410	2390	2315	2305
Daily ALL Total	102	118	120	120	120	110	218	224	116	120	120	106	106	102	106	104	102	102
Monthly HGV Total	20	400	456	456	456	185	2679	2827	333	437	437	104	104	20	110	90	15	5
Daily HGV Total	2	18	20	20	20	10	118	124	16	20	20	6	6	2	6	4	2	2

HGV Trip Generation Summary

11.7.14 The maximum level of two-way trips generated for Scenario 1 and the two construction material sourcing scenarios are as follows:

- Scenario 1A: the maximum number of daily two-way HGV movements is 232; and
- Scenario 1B: the maximum number of daily two-way HGV movements is 124.

11.7.15 The maximum level of two-way trips generated for Scenario 1 and the two construction material sourcing scenarios are as follows:

- Scenario 2A: the maximum number of daily two-way HGV movements is 232; and
- Scenario 2B: the maximum number of daily two-way HGV movements is 124.

Total Trip Generation

11.7.16 The total trip generation (maximum daily and average) for HGVs and LGVs is set out in Table 11.13 and Table 11.14.

Table 11.13: Scenario 1: Maximum and Average Daily Two-way Vehicle Movements

	Scenario 1A: Worst-Case			Scenario 1B: Best-Case		
	HGV	LGV	Total	HGV	LGV	Total
Maximum	232	100	332	124	100	224
Average	64	100	164	22	100	122

11.7.17 Under Scenario 1A, construction HGV traffic flows would be spread across the working day (Monday-Friday 07:00-19:00 or Saturday 08:00-17:00), which at peak would equate to a maximum of 26 two-way trips per hour, or 13 HGVs in each direction, equivalent to one every 4 minutes in each direction. On average across the 18-month programme this reduces to 8 two-way trips per hour, or 4 HGVs in each direction, equivalent to one every 15 minutes in each direction.

11.7.18 Under Scenario 1B, construction HGV traffic flows would be spread across the working day (Monday-Friday 07:00-19:00 or Saturday 08:00-17:00), which at peak would equate to a maximum of 14 two-way trips per hour, or 7 HGVs in each direction, equivalent to one every 8 minutes. On average across the 18-month programme this reduces to 4 two-way trips per hour, or 2 HGVs in each direction, equivalent to one every 30 minutes in each direction.

Table 11.14: Scenario 2: Maximum and Average Daily Two-way Vehicle Movements

	Scenario 2A: Worst-Case			Scenario 2B: Best-Case		
	HGV	LGV	Total	HGV	LGV	Total
Maximum	232	100	332	124	100	224
Average	64	100	164	24	100	124

- 11.7.19 Under Scenario 2A, construction HGV traffic flows would be spread across the working day (Monday-Friday 07:00-19:00 or Saturday 08:00-17:00), which at peak would equate to a maximum of 26 two-way trips per hour, or 13 HGVs in each direction, equivalent to one every 4 minutes in each direction. On average across the 18-month programme this reduces to 8 two-way trips per hour, or 4 HGVs in each direction, equivalent to one every 15 minutes in each direction.
- 11.7.20 Under Scenario 2B, construction HGV traffic flows would be spread across the working day (Monday-Friday 07:00-19:00 or Saturday 08:00-17:00), which at peak would equate to a maximum of 14 two-way trips per hour, or 7 HGVs in each direction, equivalent to one every 8 minutes. On average across the 18-month programme this reduces to 4 two-way trips per hour, or 2 HGVs in each direction, equivalent to one every 30 minutes in each direction.

Trip Distribution

- 11.7.21 The distribution of construction trips on the network will vary depending on the types of loads being transported.
- 11.7.22 For Scenario 1A and 2A (worst-case scenarios) it is assumed that aggregates and ready-mix concrete will be supplied from local sources. For example, the assessment has assumed that Sconser Quarry, which is located 35-45 km by road south-east of the Site, will provide aggregates and earthworks materials. Ready mixed concrete or constituent materials for on-site batching for permanent structures can potentially be sourced locally from Leith's Quarry located south of Torrin.
- 11.7.23 General construction, building supply deliveries, geotextile, cable and reinforcement deliveries will be made from the A850 via the A87 for Scenario 1 and from the A863 via the A87 for Scenario 2.
- 11.7.24 It has been assumed that staff working at the construction site would either live locally, based at Roag, Skeabost, Flashander, Portree, Broadford, Kyleakin and Dunvegan, or stay in bed and breakfast, guest houses or hotels for the duration of the construction programme. For Scenario 1, it has been assumed that all HGV traffic would arrive from the east along the A87 and A850, using the northern access, for the purpose of the assessment. It has also been assumed that LGVs and staff traffic can arrive from both the east and west of the site via the A850. For Scenario 2, it has been assumed that all HGV traffic would arrive from the east along the A87 and A863, using the southern access, for the purpose of the assessment. It has also been assumed that LGVs and staff traffic can arrive from both the north and south of the southern access junction via the A863.

11.8 Construction Traffic Impacts

- 11.8.1 The increase in traffic flow along the A87 and A850 (for vehicle movements other than the abnormal loads) has been calculated for Scenarios 1A, 1B, 2A and 2B for the following two cases:
- The maximum trip generation occurring during the peak month of construction; and
 - The average trip generation throughout the entire active construction period.

11.8.2 **Table 11.15** and **Table 11.16** show the predicted daily total and HGV traffic increases for the two cases above for Scenario 1. **Table 11.17** and **Table 11.18** show the predicted daily total and HGV traffic increases for the two cases above for Scenario 2. The baseline traffic flows are those presented in **Table 11.6**.

Table 11.15: Predicted Increases in Traffic – Scenario 1A

Link		2025 Baseline		2025 Baseline + Construction		Increase %	
		Total	HGVs	Total	HGVs	Total	HGVs
A87 between Kyle of Lochalsh and Kyleakin Roundabout	Max	5,017	214	5,102	214	1.69%	0.00%
	Avg			5,102	214	1.69%	0.00%
A87 between Kyleakin Roundabout and A851	Max	4,185	205	4,270	205	2.03%	0.00%
	Avg			4,270	205	2.03%	0.00%
A87 between A851 and B8083	Max	6,936	199	7,021	199	1.23%	0.00%
	Avg			7,021	199	1.23%	0.00%
A87 between B8083 and A863	Max	3,550	202	3,635	202	2.39%	0.00%
	Avg			3,635	202	2.39%	0.00%
A87 between A863 and B883	Max	3,128	197	3,445	429	10.14%	117.60%
	Avg			3,277	261	4.76%	32.44%
A87 between B883 and A855	Max	4,247	140	4,564	372	7.46%	165.50%
	Avg			4,396	204	3.51%	45.66%
A87 between A855 and A850	Max	3,680	124	3,997	356	8.61%	187.76%
	Avg			3,829	188	4.05%	51.80%
A850 between A87 and B836	Max	1,422	214	1,739	446	22.29%	108.46%
	Avg			1,571	278	10.48%	29.92%
A850 between C-road Horneval and B838	Max	1,030	205	1,115	205	8.25%	0.00%
	Avg			1,045	205	1.46%	0.00%
A850 between A863 and C-road to A863 at Lonmore	Max	1,224	199	1,309	199	6.94%	0.00%
	Avg			1,239	199	1.23%	0.00%

Table 11.16: Predicted Increases in Traffic – Scenario 1B

Link		2025 Baseline		2025 Baseline + Construction		Increase %	
		Total	HGVs	Total	HGVs	Total	HGVs
A87 between Kyle of Lochalsh and	Max	5,017	214	5,102	214	1.69%	0.00%
	Avg			5,102	214	1.69%	0.00%

Link		2025 Baseline		2025 Baseline + Construction		Increase %	
		Total	HGVs	Total	HGVs	Total	HGVs
Kyleakin Roundabout							
A87 between Kyleakin Roundabout and A851	Max	4,185	205	4,270	205	2.03%	0.00%
	Avg			4,270	205	2.03%	0.00%
A87 between A851 and B8083	Max	6,936	199	7,021	199	1.23%	0.00%
	Avg			7,021	199	1.23%	0.00%
A87 between B8083 and A863	Max	3,550	202	3,635	202	2.39%	0.00%
	Avg			3,635	202	2.39%	0.00%
A87 between A863 and B883	Max	3,128	197	3,337	321	6.68%	62.85%
	Avg			3,235	219	3.42%	11.15%
A87 between B883 and A855	Max	4,247	140	4,456	264	4.92%	88.46%
	Avg			4,354	162	2.52%	15.69%
A87 between A855 and A850	Max	3,680	124	3,889	248	5.68%	100.35%
	Avg			3,787	146	2.91%	17.80%
A850 between A87 and B836	Max	1,422	214	1,631	338	14.70%	57.97%
	Avg			1,529	236	7.52%	10.29%
A850 between C-road Horneval and B838	Max	1,030	205	1,045	205	1.46%	0.00%
	Avg			1,045	205	1.46%	0.00%
A850 between A863 and C-road to A863 at Lonmore	Max	1,224	199	1,239	199	1.23%	0.00%
	Avg			1,239	199	1.23%	0.00%

Scenario 1A: Traffic Increase Summary

- 11.8.3 The results above show that the maximum daily increase in total traffic volumes along the A850 between the A87 and B836 (22.29%) is in exceedance of the IEMA thresholds (i.e., an increase of 10% on THC roads). However, on average, daily total traffic flows increase by 10.48% on the A850 between the A87 and B836.
- 11.8.4 During the peak period of construction, the daily increase in HGV traffic along parts of the A87 and A850 are also in exceedance of the IEMA thresholds (i.e. an increase of 10% on THC roads and 30% on trunk roads). On the A850 between the A87 and B836 the maximum daily HGV traffic flow increase is 108.46%. On the A87 between the A863 and B883, the maximum daily HGV traffic flow increase is 117.60%. On the A87 between the B883 and A855, the maximum daily HGV traffic flow increase is 165.50%. On the A87 between the A855 and A850, the maximum daily HGV traffic flow increase is 187.76%.
- 11.8.5 On average, daily HGV traffic flows increase by 29.92% on the A850 between the A87 and B836, 32.44% on the A87 between A863 and B883, 45.66% on the A87 between the B883 and A855 and 51.80% on the A87 between the A855 and A850.

- 11.8.6 In summary, under Scenario 1A, total traffic levels are within the IEMA thresholds of a 10% increase to traffic volumes, except along the A850 between the A87 and B836. However, along parts of the A87 and A850 between the Sligachan and northern site access the maximum and average daily increases in HGV trip generation are **Significant**, in terms of the EIA regulations. However, this is due to the fact that HGV traffic along these routes currently makes up a small proportion of the recorded traffic flows for these sections of road, as shown in **Table 11.15**. For comparison, the absolute change is 26 HGVs per hour (maximum), or 1 HGV every 4 minutes in each direction, along the A87 between the A855 and A850.

Scenario 1B: Traffic Increase Summary

- 11.8.7 The results above show that the maximum daily increase in total traffic volumes along the A850 between the A87 and B836 (14.70%) is in exceedance of the IEMA thresholds (i.e., an increase of 10% on THC roads). However, on average, daily total traffic flows only increase by 7.52% on the A850 between the A87 and B836.
- 11.8.8 During the peak period of construction, the daily increase in HGV traffic along parts of the A87 and A850 are also in exceedance of the IEMA thresholds (i.e. an increase of 10% on THC roads and 30% on trunk roads). On the A850 between the A87 and B836 the maximum daily HGV traffic flow increase is 57.97%. On the A87 between the A863 and B883, the maximum daily HGV traffic flow increase is 62.85%. On the A87 between the B883 and A855, the maximum daily HGV traffic flow increase is 88.46%. On the A87 between the A855 and A850, the maximum daily HGV traffic flow increase is 100.35%.
- 11.8.9 On average, daily HGV traffic flows increase by 10.29% on the A850 between the A87 and B836, 11.15% on the A87 between A863 and B883, 15.69% on the A87 between the B883 and A855 and 17.80% on the A87 between the A855 and A850.
- 11.8.10 In summary, under Scenario 1B, total traffic levels are within the IEMA thresholds of a 10% increase to traffic volumes, except along the A850 between the A87 and B836. However, along parts of the A87 and A850 between the Sligachan and northern site access the maximum (and average for the A850 between A87 and B836) daily increases in HGV trip generation are **Significant**, in terms of the EIA regulations. However, this is due to the fact that HGV traffic along these routes currently makes up a small proportion of the recorded traffic flows for these sections of road, as shown in **Table 11.16**. For comparison, the absolute change is 14 HGVs per hour (maximum), or 1 HGV every 8 minutes in each direction, along the A87 between the A855 and A850.

Table 11.17: Predicted Increases in Traffic – Scenario 2A

Link		2025 Baseline		2025 Baseline + Construction		Increase %	
		Total	HGVs	Total	HGVs	Total	HGVs
A87 between Kyle of Lochalsh and Kyleakin Roundabout	Max	5,017	214	5,102	214	1.69%	0.00%
	Avg			5,102	214	1.69%	0.00%
A87 between Kyleakin Roundabout and A851	Max	4,185	205	4,270	205	2.03%	0.00%
	Avg			4,270	205	2.03%	0.00%

Link		2025 Baseline		2025 Baseline + Construction		Increase %	
		Total	HGVs	Total	HGVs	Total	HGVs
A87 between A851 and B8083	Max	6,936	199	7,021	199	1.23%	0.00%
	Avg			7,021	199	1.23%	0.00%
A87 between B8083 and A863	Max	3,550	202	3,635	202	2.39%	0.00%
	Avg			3,635	202	2.39%	0.00%
A863 between B8009 and A87	Max	1,343	45	1,660	277	23.60%	511.20%
	Avg			1,492	109	11.09%	141.02%
A863 between B885 and B8009	Max	660	70	977	302	48.01%	330.31%
	Avg			809	134	22.57%	91.12%
A863 between C-road to Horneval and B885	Max	890	15	1,207	247	35.60%	1533.60%
	Avg			1,039	79	16.73%	423.06%
A863 between B884 and C-road to A850 at Horneval	Max	1,144	30	1,229	30	7.43%	0.00%
	Avg			1,229	30	7.43%	0.00%
A863 between A850 and B884	Max	1,302	32	1,387	32	6.53%	0.00%
	Avg			1,387	32	6.53%	0.00%

Table 11.18: Predicted Increases in Traffic – Scenario 2B

Link		2025 Baseline		2025 Baseline + Construction		Increase %	
		Total	HGVs	Total	HGVs	Total	HGVs
A87 between Kyle of Lochalsh and Kyleakin Roundabout	Max	5,017	214	5,102	214	1.69%	0.00%
	Avg			5,102	214	1.69%	0.00%
A87 between Kyleakin Roundabout and A851	Max	4,185	205	4,270	205	2.03%	0.00%
	Avg			4,270	205	2.03%	0.00%
A87 between A851 and B8083	Max	6,936	199	7,021	199	1.23%	0.00%
	Avg			7,021	199	1.23%	0.00%
A87 between B8083 and A863	Max	3,550	202	3,635	202	2.39%	0.00%
	Avg			3,635	202	2.39%	0.00%
A863 between B8009 and A87	Max	1,343	45	1,552	169	15.56%	273.23%
	Avg			1,452	69	8.12%	52.88%
A863 between B885 and B8009	Max	660	70	869	194	31.66%	176.55%
	Avg			769	94	16.51%	34.17%
A863 between C-road to Horneval and B885	Max	890	15	1,099	139	23.47%	819.69%
	Avg			999	39	12.24%	158.65%

Link		2025 Baseline		2025 Baseline + Construction		Increase %	
		Total	HGVs	Total	HGVs	Total	HGVs
A863 between B884 and C-road to A850 at Horneval	Max	1,144	30	1,229	30	7.43%	0.00%
	Avg			1,229	30	7.43%	0.00%
A863 between A850 and B884	Max	1,302	32	1,387	32	6.53%	0.00%
	Avg			1,387	32	6.53%	0.00%

Scenario 2A: Traffic Increase Summary

- 11.8.11 The results above show that the maximum daily increases in total traffic volumes along the A863 between the B8009 and the A87 (23.06%), the A863 between the B885 and the B8009 (48.01%) and the A863 between the C-road to Horneval and the B885 (35.60%) are in exceedance of the IEMA thresholds (i.e., an increase of 10% on THC roads). On average, daily total traffic flows increase by 11.09% on the A863 between the B8009 and the A87, 22.57% on the A863 between the B885 and the B8009 and 16.73% on the A863 between the C-road to Horneval and the B885.
- 11.8.12 During the peak period of construction, the daily increase in HGV traffic along parts of the A863 are also in exceedance of the IEMA thresholds (i.e. an increase of 10% on THC roads). On the A863 between the B8009 and the A87, the maximum daily HGV traffic flow increase is 511.20%. On the A863 between the B885 and the B8009, the maximum daily HGV traffic flow increase is 330.31%. On the A863 between the C-road to Horneval and the B885, the maximum daily HGV traffic flow increase is 1533.60%.
- 11.8.13 On average, daily HGV traffic flows increase by 141.02% on the A863 between the B8009 and the A87, 91.12% on the A863 between the B885 and the B8009 and 423.06% on the A863 between the C-road to Horneval and the B885.
- 11.8.14 In summary, under Scenario 2A, total traffic levels exceed the THC IEMA threshold of a 10% increase to traffic volumes along the A863. Along parts of the A863 between Sligachan and the southern site access the maximum and average daily increases in HGV trip generation are **Significant**, in terms of the EIA regulations. However, this is due to the fact that HGV traffic along these routes currently makes up a small proportion of the recorded traffic flows for these sections of road, as shown in **Table 11.17**. For comparison, the absolute change is 26 HGVs per hour (maximum), or 1 HGV every 4 minutes in each direction, along the A863 between the C-road to Horneval and the B885.

Scenario 2B: Traffic Increase Summary

- 11.8.15 The results above show that the daily increase in total traffic volumes along parts of the A863 are in exceedance of the IEMA thresholds (i.e., an increase of 10% on THC roads).
- 11.8.16 On the A863 between the B8009 and the A87, the maximum daily total traffic flow increase is 15.56%. On the A863 between the B885 and the B8009, the maximum daily total traffic flow increase is 31.66%. On the A863 between the C-road to Horneval and the B885, the maximum daily total traffic flow increase is 23.47%.
- 11.8.17 On average, the daily total traffic flow increase along the A863 between the B8009 and the A87 is 8.12%, which is below the IEMA threshold. On average, daily total traffic flows

increase by 16.51% on the A863 between the B885 and the B8009 and 12.24% on the A863 between the C-road to Horneval and the B885.

- 11.8.18 During the peak period of construction, the daily increase in HGV traffic along parts of the A863 are also in exceedance of the IEMA thresholds (10% on THC roads). On the A863 between the B8009 and the A87, the maximum daily HGV traffic flow increase is 273.23%. On the A863 between the B885 and the B8009, the maximum daily HGV traffic flow increase is 176.55%. On the A863 between the C-road to Horneval and the B885, the maximum daily HGV traffic flow increase is 819.69%.
- 11.8.19 On average, daily HGV traffic flows increase by 52.88% on the A863 between the B8009 and the A87, 34.17% on the A863 between the B885 and the B8009 and 158.65% on the A863 between the C-road to Horneval and the B885.
- 11.8.20 In summary, under Scenario 2B, total traffic levels are within the IEMA thresholds of a 10% increase to traffic volumes, except along the A863 to the east of the southern access. Along the A863 between Sligachan and the southern site access, the maximum and average daily increases in HGV trip generation are **Significant**, in terms of the EIA regulations. However, as mentioned previously, this is due to the fact that HGV traffic along these routes currently makes up a small proportion of the recorded traffic flows for these sections of road, as shown in **Table 11.18**. For comparison, the absolute change is 14 HGVs per hour (maximum), or 1 HGV every 8 minutes in each direction, along the A863 between the C-road to Horneval and the B885.

Alternative Construction Traffic Routing (Scenario 2)

- 11.8.21 Due to the low baseline levels of HGV flows along the A863 to the south of the southern access, the Proposed Development would lead to a **Significant** increase in HGV traffic movements if it is assumed that all vehicles approached the access and egressed the site in this direction.
- 11.8.22 In order to reduce the impact of construction traffic on the A863, loaded HGVs could approach the site from the south, with empty HGVs leaving the site via the northern access. Therefore, no two-way HGV journeys will be made via the A863, reducing the number of vehicles using this section of road at one time, and making more use of the A87 trunk road.

11.9 Potential Effects

Effect on Driver Severance and Delay

- 11.9.1 The IEMA guidance states that there are a number of factors which determine driver severance and delay: these include delay caused by additional turning vehicles and additional cars parked at the site, delays at junctions due to increased traffic, as well as delays at side roads due to reduced gaps in the oncoming traffic.
- 11.9.2 The principal road network in the study area consists of high-quality A87 (trunk road), A863 and A850 suitable for carrying HGVs. The use of well-established quarried material suppliers (where required) to the south-east of the Proposed Development location will assist in reducing excess mileage used to transport materials to the site. Accordingly, these receptors are of medium sensitivity. Magnitude of impact by the construction phase

HGV traffic is typically **'Moderate'**, resulting in a significance of effect of **'Moderate'** impact respectively, therefore **'Significant'** for each Scenario.

- 11.9.3 The main potential impact of driver severance and delay would relate to the transportation of abnormal loads, which is set out in **Paragraph 11.5.6**.

Effect on Road Safety

- 11.9.4 **Table 11.3** and **Table 11.4** define road safety as a high sensitivity receptor with a magnitude of impact based on the volume of accidents along the routes used to the site. An increase, or decrease, in accidents may result from changes in traffic flows and the composition of traffic on the local highway network.
- 11.9.5 The accidents recorded within the study area are set out in **Paragraphs 11.6.11 to 11.6.13**. A total of 68 accidents were recorded across the study area during the five-year period. Of these, 54 resulted in slight injury, 13 resulted in serious injury and 1 resulted in fatal injury.
- 11.9.6 There would be a large increase in HGVs against baseline HGV flows: however, these would be spread evenly throughout the working hours of 07:00 to 19:00 Monday to Friday and 08:00 to 17:00 on Saturdays.
- 11.9.7 Deliveries of abnormal loads will be delivered to site under police escort. Other large components would be moved in accordance with an agreed Construction Traffic Management Plan (CTMP).
- 11.9.8 The movement of abnormal loads has the potential to create a general hazard on the highway. All turbine components would be transported from the Port of Kyle of Lochalsh, and along the A87 and A850 or A863 to the site. Some of the components, such as blades, may be temporarily stored at the Broadford airstrip after being delivered to Kyle of Lochalsh. The access from the Port of Kyle of Lochalsh is highly constrained and a blade lifting trailer would be required to exit the port. The blade lifting trailer and a Superwing carrier will be used along the route to the site.
- 11.9.9 The abnormal loads must be delivered to the site under controlled conditions and under suitable escort. The manner in which abnormal loads are transported along the public highway/trunk road network would be subject to the approval of TS, THC and Police Scotland in advance and would be planned to ensure road safety is not compromised.
- 11.9.10 In summary, construction of the Proposed Development would create a **'Significant'** increase to HGV traffic levels within the Study Area, but these levels would remain well within the design capacity of the local road network. The number of accidents recorded for the study area are low over the five-year study period. Therefore, the significance of effect is assessed to be **'Slight'** and **'Not Significant'** for each Scenario.

Effect on Community Severance and Delay

- 11.9.11 The IEMA guidance identifies severance as 'the perceived division that can occur within a community when it becomes separated by a major traffic artery'. As an example, a road that passes through a community such as a town or village, where amenities may be located on one side of the road and residential properties are located on the other side, causes severance to the movements between those places. The degree of severance

depends on the traffic levels on the road and the presence of adequate crossing opportunities.

- 11.9.12 There are local amenities directly fronting the A87 in Portree, as well as the A863 in Ose and Sligachan, where traffic will be travelling at low speeds. Additionally, there are informal and formal crossing facilities at these locations. In accordance with significance criteria in **Table 11.3** community severance has been classified as a medium sensitivity receptor.
- 11.9.13 For Scenario 1A and 1B, the magnitude of change of the Proposed Development on Community Severance within Portree would be '**Major**' (<60% increase in HGV traffic). Therefore, the significance of effect is assessed '**Major**' and therefore '**Significant**', for both Scenarios 1A and 1B along the A87 in Portree.
- 11.9.14 For Scenario 2A and 2B, the magnitude of change of the Proposed Development on Community Severance within Ose and Sligachan would be '**Major**' (<60% increase in HGV traffic). Therefore, the significance of effect is assessed '**Major**' and therefore '**Significant**', for both Scenarios 2A and 2B along the A863 in Sligachan and Ose.

Effects on Noise

- 11.9.15 The effects of noise can be high in relation to sensitive receptors such as those residential properties which are present within the study area. A noise assessment has been undertaken for the Proposed Development and is presented in **Chapter 11: Noise** of the EIAR.
- 11.9.16 As discussed in **Table 11.4**, the IEMA Guidelines state that an increase in noise due to an increase in total traffic of less than 25% is deemed a '**Negligible**' noise impact to receptors, with anything greater than 25% requiring a quantitative assessment.
- 11.9.17 The nearest residential property to the northern access point is Upperglen, which is located approximately 300 m to the west. At this location, although noise from construction vehicles accessing the Site would be audible, it is anticipated that noise from vehicles accessing the Site would be significantly below the construction noise limit (see **Chapter 11: Noise** of the EIAR). The maximum daily traffic increase predicted for Scenario 1 is on the A850 between A87 and B836 in both Scenario 1A and Scenario 1B. This is an increase of 22.29% vehicle movements per day for Scenario 1A and 14.70% for Scenario 1B.
- 11.9.18 The southern access passes close to the residential property One Caroy, such that vehicles accessing the Site would pass relatively close to this property. Other residential properties are also located in the vicinity of the A863 between Sligachan and the southern site access. The largest maximum daily total traffic increase predicted for the Proposed Development is on the A863 between the B885 and the B8009 in both Scenario 2A and Scenario 2B. This is an increase of 48.01% vehicle movements per day for Scenario 2A and 31.66% for Scenario 2B. However, this will only be for the short period of peak construction, and the average daily total traffic increase predicted on the A863 between the B885 and the B8009 is 22.57% for Scenario 2A and 16.51% for Scenario 2B.
- 11.9.19 In accordance with the findings of the noise assessment, relevant noise limits are anticipated to be met due to the large separation distances between construction activities and residential receptors. Moreover, construction effects are short term effects, only occurring during the construction phase of the development. Noise during

construction works would be controlled by generally restricting works to standard working hours, unless specifically agreed otherwise.

- 11.9.20 Hence, the traffic noise significance of effects is assessed to be ‘**Slight**’ and ‘**Not Significant**’ for each Scenario. This corresponds with the findings of the noise assessment which describes the full environmental effects of noise in **Section 12.6: Predicted Impacts of Chapter 12: Noise** of the EIAR.

Effects on Vulnerable Users

- 11.9.21 Vulnerable road users are considered to be a high sensitivity receptor according to the assessment criteria detailed in **Table 11.3**.
- 11.9.22 The impact of traffic on vulnerable road users would be most noticeable within areas along the proposed access routes where the presence of vulnerable road users, such as pedestrians and cyclists, is highest.
- 11.9.23 For Scenario 1, the largest maximum daily increase in total traffic would be along the A850 between A87 and B836 in both Scenario 1A and Scenario 1B. This is an increase of 22.29% vehicle movements per day for Scenario 1A and 14.70% for Scenario 1B.
- 11.9.24 However, the majority of trip generation from the Proposed Development would arise from 20 tonne HGVs. Consequently, there could be a potential worsening of conditions for vulnerable users during the construction period along sections of the A87 and A850 where cycleways and footpaths are present and percentage increases of HGVs are highest.
- 11.9.25 The largest increase in HGV traffic is on the A87 between the A855 and A850, with a predicted maximum daily increase of 187.76% in Scenario 1A and 100.35% for Scenario 1B. The expected average daily increases in HGV traffic along this section of the A87 are 51.80% for Scenario 1A and 17.80% for Scenario 1B. Similarly, the second highest predicted maximum daily increase in HGV traffic is on the A87 between B883 and A855. These sections of the A87 are located either side of the town of Portree.
- 11.9.26 Portree is a residential area where traffic will be travelling at low speeds along the A87. Additionally, there are pedestrian footpaths and informal and formal crossing facilities at these locations. There are no dedicated cycleways along the A87 or A850. More detail on the local highway network can be found in **Technical Appendix 11.2: CTMP**.
- 11.9.27 This magnitude of impact is considered to be ‘**Minor**’ and the effect on vulnerable road users, for both Scenario 1A and 1B, is assessed to be ‘**Moderate**’ during the construction period and ‘**Significant**’ in terms of the EIA regulations.
- 11.9.28 For Scenario 2, the largest maximum daily total traffic increase predicted for the Proposed Development is on the A863 between the B885 and the B8009 in both Scenario 2A and Scenario 2B. This is an increase of 48.01% vehicle movements per day for Scenario 2A and 31.66% for Scenario 2B. The average daily total traffic increase predicted on the A863 between the B885 and the B8009 is 22.57% for Scenario 2A and 16.51% for Scenario 2B.
- 11.9.29 The largest increase in HGV traffic is on the A863 between the C-road to Horneval and the B885, with a predicted maximum daily increase of 1533.60% in Scenario 2A and 819.69% for Scenario 2B. The expected average daily increases in HGV traffic along this section of the A863 are 423.06% for Scenario 2A and 158.65% for Scenario 2B.

- 11.9.30 There are no pedestrian footpaths or cycleways located along this section of the A863 and the southern site access.
- 11.9.31 This magnitude of impact is considered to be '**Minor**' and the effect on vulnerable road users, for both Scenario 2A and 2B, is assessed to be '**Moderate**' during the construction period and '**Significant**' in terms of the EIA regulations.

Effects Due to Dust and Dirt

- 11.9.32 The movement of construction traffic to and from the site would have the potential to bring dust and dirt and other detritus onto the highway. Sensitive receptors within the study area include residential properties, B&Bs, local shops and other facilities, which may experience dust and dirt and have been classified as medium sensitivity receptors.
- 11.9.33 For Scenario 1, HGVs are likely to create the greatest impact in terms of dust and dirt with an anticipated **Significant** increase of HGV traffic on the A87 and A850 between Sligachan and the northern access in both Scenario 1A and 1B. For example, the largest increase in HGV traffic is on the A87 between the A855 and A850, with a predicted maximum daily increase of 187.76% in Scenario 1A and 100.35% for Scenario 1B. The expected average daily increases in HGV traffic along this section of the A87 are 51.80% for Scenario 1A and 17.80% for Scenario 1B.
- 11.9.34 For both Scenario 1A and 1B, given that the magnitude of impact of dust and dirt has been classified as '**Major**' (>60% increase) and would affect low sensitivity receptors, the potential effect would be '**Major**' and, therefore, '**Significant**'.
- 11.9.35 For Scenario 2, HGVs are likely to create the greatest impact in terms of dust and dirt with an anticipated '**Significant**' increase of HGV traffics along the A863 between Sligachan and the southern access in both Scenario 2A and 2B. For example, the largest increase in HGV traffic is on the A863 between the C-road to Horneval and the B885, with a predicted maximum daily increase of 1533.60% in Scenario 2A and 819.69% for Scenario 2B. The expected average daily increases in HGV traffic along this section of the A863 are 423.06% for Scenario 2A and 158.65% for Scenario 2B.
- 11.9.36 For both Scenario 2A and 2B, given that the magnitude of impact of dust and dirt has been classified as '**Major**' (>60% increase) and would affect low sensitivity receptors, the potential effect would be '**Major**' and, therefore, '**Significant**'.

Impact Caused by Movement of Abnormal Loads

- 11.9.37 The route from the Port of Kyle of Lochalsh to the Site is considered suitable for such movements, subject to the potential need for localised temporary works at junctions to facilitate movements. Any modifications to junction layouts would be confirmed through trial run and further surveys, and any modifications or works required to accommodate abnormal loads would be discussed with the Roads Authority and the necessary consents and permits would be obtained in advance of any works or delivery periods.
- 11.9.38 Transportation of the turbine equipment would lead to the following effects:
- The rolling closures of roads and footways causing temporary driver and pedestrian delay;
 - The perceived effect to pedestrians and vulnerable road users caused by the movement of large turbine components in proximity to property and infrastructure.

- 11.9.39 The severity of these impacts is considered as follows:
- Delays due to lane/road closures would be inevitable, although abnormal loads would be timed to avoid the peak hours and therefore abnormal loads would have a temporary minor adverse effect; and
 - The perceived effect to residents is subjective and it is likely that the transport of abnormal loads close to properties could lead to local objection, stress and anxiety.
- 11.9.40 Abnormal and oversized loads using the road network is defined as a high sensitivity receptor.
- 11.9.41 Due to the importance of the A87, A863 and A850 to local residents and taking account of potential impacts on driver delays and the community, the route during the daytime can be considered a high sensitivity receptor, resulting in a **'Moderate'** level of effect during the day which is **'Significant'** for each Scenario.
- 11.9.42 Therefore, consideration could be given to abnormal load deliveries being undertaken overnight to reduce the potential for disruption and delay, subject to approval. However, this would depend on the type of transport vehicle used and only by agreement with the relevant authorities. As the route could be considered low sensitivity at night, and the magnitude of impact of transporting the abnormal loads during the night would be **'Minor'**, the level of effect during the night would be **'Slight'** and therefore, **'Not Significant'** for each Scenario.

Cumulative Effects

- 11.9.43 **Table 6.5 in Chapter 6: Landscape and Visual Impact Assessment** of this EIAR provides further information on the potential cumulative developments within the Study Area.
- 11.9.44 The cumulative assessment of traffic, transport and access effects only considers wind farms that are consented but not yet under construction and submitted but pending decision or at appeal as only these schemes may potentially be under construction concurrently with the Proposed Development and therefore provides the potential for significant cumulative construction effects. The timescale for delivery of proposals currently in Scoping to successfully securing planning consent is considered to be of a duration by which it is unlikely that cumulative construction would occur. There is no potential for significant cumulative effects to occur from those wind farms which are operational due to the minimal vehicle trips attributed to the operational phase of a development.
- 11.9.45 There is a consented wind farm at **Glen Ullinish**, 4 km to the southeast of Ben Aketil. A Section 42 application to vary the original planning consent was submitted to THC in March 2019 – this application reduced the number of turbines from 14 to 11 and increased the maximum tip heights from 119m to 149.9m. This variation application (20/01129/S42) was granted in December 2021. Plans for **Glen Ullinish 2** would replace the existing wind farm consent, if they were successful. The consented Glen Ullinish Wind Farm proposes accessing land to the south of the site from the A863, via the A87, with turbine component deliveries expected from the Port of Kyle of Lochalsh. Considering the stage of progress of the Glen Ullinish 2 through design and planning, it has been excluded from the cumulative assessment. The original S42 application has been included in the cumulative assessment.

- 11.9.46 Adjacent to Ben Aketil are consented turbines at **Ben Sca**. Planning permission was granted by THC in November 2020 for 7 turbines (29.4 MW) (20/00013/FUL), with a two turbine (8.4 MW) extension consented in April 2022 (21/05767/FUL). Access to the site for turbine deliveries would be via the A87 and A850. The main site entrance from the A850 will utilise the existing access and track for the Ben Aketil Wind Farm, with a spur taken to create the new tracks required to serve the proposed turbines. It is anticipated that the wind farm construction period will last 12 months. No information is publicly available in respect to the assessment of the proposals and therefore it has been excluded from the cumulative assessment.
- 11.9.47 **Beinn Mheadhonach** is located 11 km southeast of Ben Aketil. Planning permission was granted by THC in August 2019 for a 4-turbine wind farm (18/03214/FUL). Turbine components would be transported on the A87 and A863 to reach the existing site entrance. It is estimated that construction would take 32 weeks. There is another proposal for the redesign of Beinn Mheadhonach which is still in scoping but is anticipated to be submitted at the same time as the Proposed Development and therefore has been included in the cumulative assessment. This proposal would replace the original consent for four turbines at Beinn Mheadhonach and involve the erection and operation of a five turbine wind farm (22/02995/SCOP). Due to lack of publicly available data, details of the estimated construction vehicle trip generation have been extracted from the EIAR chapter of the original planning application (ref:18/03214/FUL) for 4 turbines with no extrapolation to generate a corresponding construction trip generation for 5 turbines.
- 11.9.48 **Balmeanach** is located within 1 km of the Proposed Development. Although still in scoping, it is anticipated to be submitted at the same time as the Proposed Development. The proposed wind farm consists of up to 10 wind turbines with a blade tip height of 149.9m (22/03875/SCOP). It is proposed that access to the site would be via the existing Ben Aketil Wind Farm access track from the A850, and then via the proposed Ben Sca Wind Farm site access track. It is anticipated that wind turbine components would be delivered to the site via the A87 and A850, delivered from the Port of Kyle of Lochalsh. Commencement of construction of this development would coincide with grid availability, with significant upgrades to the electricity grid between the Isle of Skye and Fort Augustus expected to be completed by 2025 to allow connection by 2026/2027. The duration of the construction works for the proposed development would be approximately 18 months. The planning application has only reached the scoping stage. Subsequently, no further information is publicly available in respect to the assessment of the proposals and therefore it has been excluded from the cumulative assessment.
- 11.9.49 There are other non-wind farm developments on the Isle of Skye which have been identified, as described below.
- 11.9.50 Scottish and Southern Electricity Networks (SSEN) Transmission has now applied to the Scottish Ministers for consent under Section 37 of the Electricity Act 1989 to install and keep installed approximately 160 km of new overhead line and underground cabling between the existing Ardmore substation located approximately 30 km northwest of Portree, to the existing Fort Augustus substation located approximately 2.5 km west/southwest of Fort Augustus (Skye Reinforcement Project 22/04580/S37). This includes 110 km of new double circuit 132 kV overhead line supported by steel lattice towers between Fort Augustus and Broadford, 27 km of new single circuit 132 kV overhead line supported by trident wood poles (H poles) between Broadford and Ardmore

substation, and approximately 24 km of double circuit 132 kV underground cable. Construction of the Skye Reinforcement Project is expected to commence in 2024, if consent is granted, and the total construction of the development is anticipated to take approximately three years to construct and a further seven months for dismantling works associated with the existing overhead lines, depending on weather conditions and ecological considerations. According to **Chapter 2: Proposed Development**, construction traffic is expected to utilise the A87, A850 and A863. Due to the overlapping construction traffic routes and expected periods of construction, this development has been included in the cumulative assessment.

- 11.9.51 A mixed-use development comprising 250 new homes in Portree, as well as a business unit, community shop, care village, landscaping and associated infrastructure received Planning in Principle in June 2022 (21/05962/PIP). According to the Transport Assessment, construction is expected to start in 2025. For residential developments, cumulative effects are most likely to occur during peak commuting times once the development is occupied. It is considered unlikely that the residential units will be occupied before construction of the Proposed Development is complete if the repowered and extension turbines are built together (Option 1). If construction is undertaken using the staggered programme (Option 2), the effects of construction traffic will be less than the worst-case scenario presented in this chapter as construction will take place over a longer time period. Therefore, this development has been excluded from the cumulative assessment as no cumulative impacts or effects are expected.
- 11.9.52 Details of the estimated construction vehicle trip generation and affected road links were extracted for each cumulative development from the relevant EIAR Chapter found on the THC Planning portal. Only developments which would impact on the same study network as the Proposed Development have been included in the cumulative assessment.
- 11.9.53 Combining these with the respective link flows from Scenario 1A and Scenario 2A, as the worst-case, provides the following cumulative assessment, summarised in **Table 11.19** below.

Table 11.19: Cumulative Construction Trip Assessment

Link	Baseline 2025		Skye Reinforcement Project		Glen Ullinish (S42)		Beinn Mheadhonach (S42)		Ben Aketil		Cumulative		% Change*	
	Total	HGV	Total	HGV	Total	HGV	Total	HGV	Total	HGVs	Total	HGV	Total	HGV
A87 between Kyle of Lochalsh and Kyleakin Roundabout	5,017	214	746	170	50	30	32	26	86	0	5,931	440	18%	105.7%
A87 between Kyleakin Roundabout and A851	4,185	205	746	170	50	30	32	26	86	0	5,099	431	22%	110.5%
A87 between A851 and B8083	6,936	199	746	170	50	30	32	26	86	0	7,850	425	13%	113.4%
A87 between B8083 and A863	3,550	202	724	158	50	30	32	26	86	0	4,442	416	25%	105.7%
A863 between B8009 and A87	1,343	45	190	52	50	30	32	26	318	232	1,933	385	44%	749.2%
A863 between B885 and B8009	660	70	190	52	50	30	32	26	318	232	1,250	410	89%	484.1%
A863 between C-road to Horneval and B885	890	15	4	2	50	30	32	26	318	232	1,294	305	45%	1917.0%
A863 between B884 and C-road to A850 at Horneval	1,144	30	4	0	50	30	32	26	86	0	1,316	86	15%	185.1%
A863 between A850 and B884	1,302	32	4	0	50	30	32	26	86	0	1,474	88	13%	172.8%
A87 between A863 and B883	3,128	197	108	16					318	232	3,554	445	14%	125.7%
A87 between B883 and A855	4,247	140	108	16					318	232	4,673	388	10%	176.9%
A87 between A855 and A850	3,680	124	108	16					318	232	4,106	372	12%	200.7%
A850 between A87 and B836	1,422	19	18	2					318	232	1,758	253	24%	1203.1%
A850 between C-road to Horneval and B838	1,030	14	10	2					86	0	1,126	16	9%	14.2%
A850 between A863 and C-road to A863 at Lonmore	1,224	27	10	2					86	0	1,320	29	8%	7.4%

**actual values may differ due to rounding*

- 11.9.54 **Table 11.19** summarises the cumulative worst-case (although a highly unlikely scenario) of the peak construction vehicle traffic associated with the Proposed Development and cumulative windfarms if their construction occurred simultaneously. The largest impact on baseline traffic flows is on the A863 between the B885 and the B8009, with an 89% increase in total traffic flows.
- 11.9.55 **Table 11.19** also shows the worst-case cumulative impact of the increase in HGVs against baseline HGV flows. The highest percentage increase of the listed locations is 1917.0% on the A863 between the C-road to Horneval and the B885. This represents a cumulative magnitude of impact of '**Major**' on these low sensitivity receptors resulting in a significance of effect of '**Moderate**'. This can be reduced to '**Slight**' as the baseline HGV traffic flows along this route are low and therefore '**Not Significant**'.
- 11.9.56 The assessment of the cumulative impact of abnormal loads has not been undertaken as the simultaneous movement of these loads to different sites would not be permitted and would be planned fully in an Abnormal Load Traffic Management Plan (ATMP) for each development and approved by Police Scotland.

11.10 Mitigation

Construction Phase Mitigation

- 11.10.1 A Construction Traffic Management Plan (CTMP) would be in place to actively mitigate the effects as discussed above and an outline CTMP has been prepared at this stage and submitted as part of the Planning Application to outline the mitigation measures recommended during the construction stage. This is provided as **Technical Appendix 11.2: CTMP**.
- 11.10.2 The following measures would be implemented through a CTMP during the construction phase. The CTMP would be agreed with THC prior to construction works commencing:
- where possible, further detailed design processes would minimise the volume of material to be imported to site to help reduce HGV numbers;
 - a site worker transport and travel arrangement plan, including transport modes to and from the worksite (including pick up and drop off times);
 - a Traffic Management Plan to control the operation of the access junctions;
 - all materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads;
 - specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
 - wheel cleaning facilities would be provided at access junction(s);
 - normal site working hours would be limited to between 07:00 and 19:00 (Monday to Friday) and 08:00 and 17:00 on Saturday, though component delivery and turbine erection may take place outside these hours;
 - provide construction updates on the project website and or a newsletter to be distributed to residents within an agreed distance of the site; and
 - all drivers would be required to attend a detailed induction prior to undertaking any works on the Proposed Development site.
- 11.10.3 Advance warning signs would be installed on the approaches to the affected road network. Information signage could be installed to help improve driver information and

allow other road users to consider alternative routes or times for their journey (where such options exist).

- 11.10.4 The location and numbers of signs would be agreed post consent and would form part of the wider traffic management proposals for the Proposed Development.
- 11.10.5 The applicant would also ensure information would be distributed through its communication team via the project website, local newsletters and social media.
- 11.10.6 Post-consent, the applicant would establish a Community Liaison Forum, in collaboration with THC and local Community Councils. Through meetings, (in person or virtual, as appropriate) the forum would allow the community to be kept up to date with project progress and allow communication on the provision of transport-related mitigation and publicise the timings of turbine component deliveries. The Community Liaison Forum would be maintained until construction is complete and the Proposed Development is operational.
- 11.10.7 The Applicant would enter into a Section 96 (wear and tear) Agreement or a suitable alternative for the local adopted roads/routes to be used by construction vehicles. A pre-construction works inspection of the roads would be carried out with both parties in attendance with their condition recorded. Following completion of construction of the proposed Development a further inspection would be carried by both parties with repairs being agreed to return the roads to their pre-construction condition to be carried out in a timely manner for approval by the THC. Notwithstanding, the Applicant would carry out regular monitoring of the carriageway condition during the construction of the proposed Development. Necessary repair works would be carried out in a timely manner to prevent further deterioration of the carriageway during the works. Priority would be given to any damage which would be dangerous to users of the road affected.

Abnormal Load Transport Management Plan

- 11.10.8 An Abnormal Load Transport Management Plan would be prepared to cater for all movements to and from the Proposed Development site. This would include:
 - procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking.
 - a diary of proposed delivery movements to liaise with the communities to avoid key dates such as popular local events etc.
 - a protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic.
 - proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police, forming the committee. Through meetings, (in person or virtual, as appropriate) this committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.
- 11.10.9 A police escort would be required to facilitate the delivery of the predicted loads. The police escort would be further supplemented by a civilian pilot car to assist with the escort duty. It is proposed that an advance escort would warn oncoming vehicles ahead of the

convoy, with one escort staying with the convoy at all times. The escorts and convoy would remain in radio contact at all times where possible.

11.10.10 The abnormal loads convoys would be no more than three AILs long, or as advised by the police, to permit safe transit along the delivery route and to allow limited overtaking opportunities for following traffic where it is safe to do so.

11.10.11 The times in which the convoys would travel would need to be agreed with Police Scotland who have sole discretion on when loads can be moved.

Operational Phase Mitigation

11.10.12 The site entrance would be well maintained and monitored during the operational life of the Proposed Development. Regular maintenance would be undertaken to keep the site access track drainage systems fully operational and the road surface in good condition and to ensure there are no adverse issues affecting the public road network.

11.11 Summary of effects

Scenario 1

11.11.1 **Table 11.20** provides a summary comparing the significance of the effects during the construction period before and after the proposed mitigation.

Table 11.20: Summary of Pre/Post Mitigation Access, Traffic and Transport Effects (Scenario 1A and Scenario 1B)

Potential Impact	Pre-mitigation		Proposed Mitigation	Post-Mitigation Residual Effects	
	Effect	Significance		Effect	Significance
Driver severance and delay	Moderate	Significant	Traffic Management plan (TMP) for the movement of abnormal loads.	Minor	Not Significant
Community severance and delay	Major	Significant	Trial Run for abnormal loads prior to commencement of construction.	Minor	Not Significant
Vulnerable Road Users	Moderate	Significant	Road condition survey (including assessment of existing structures as appropriate) prior to the commencement of construction and a similar assessment following completion of the works.	Minor	Not Significant
Noise	Slight	Not Significant	Provision of information to local residents and users of amenities, to involve the community in the safe operation of the	Minor	Not Significant
Road Safety	Slight	Not Significant		Minor	Not Significant
Abnormal loads	Moderate	Significant		Minor	Not Significant
Dust and dirt	Major	Significant		Minor	Not Significant

Potential Impact	Pre-mitigation		Proposed Mitigation	Post-Mitigation Residual Effects	
	Effect	Significance		Effect	Significance
			CTMP and to alleviate stress and anxiety. Good construction practices including wheel wash and careful loading.		

Scenario 2

11.11.2 **Table 11.21** provides a summary comparing the significance of the effects during the construction period before and after the proposed mitigation.

Table 11.21: Summary of Pre/Post Mitigation Access, Traffic and Transport Effects (Scenario 2A and Scenario 2B)

Potential Impact	Pre-mitigation		Proposed Mitigation	Post-Mitigation Residual Effects	
	Effect	Significance		Effect	Significance
Driver severance and delay	Moderate	Significant	Traffic Management plan (TMP) for the movement of abnormal loads.	Minor	Not Significant
Community severance and delay	Major	Significant	Trial Run for abnormal loads prior to commencement of construction.	Minor	Not Significant
Vulnerable Road Users	Moderate	Significant	Road condition survey (including assessment of existing structures as appropriate) prior to the commencement of construction and a similar assessment following completion of the works.	Minor	Not Significant
Noise	Slight	Not Significant	Provision of information to local residents and users of amenities, to involve the community in the safe operation of the CTMP and to alleviate stress and anxiety. Good construction practices including wheel wash and careful loading. Proposed alternative construction traffic routing, making use of	Minor	Not Significant
Road Safety	Slight	Not Significant		Minor	Not Significant
Abnormal loads	Moderate	Significant		Minor	Not Significant
Dust and dirt	Major	Significant		Minor	Not Significant

Potential Impact	Pre-mitigation		Proposed Mitigation	Post-Mitigation Residual Effects	
	Effect	Significance		Effect	Significance
			the A87 trunk road for longer.		

Residual Effects

- 11.11.3 Given the temporary nature of construction programmes and with the implementation of mitigation measures through a CTMP and ATMP, all effects for Scenario 1A and 1B, as well as Scenario 2A and 2B, can be effectively managed and are assessed to be '**Minor**' or '**Negligible**'. No residual effects remain after mitigation measures have been implemented.

11.12 References

Highland Council (2016). Adopted Onshore Wind Energy Supplementary Guidance;
 Institute of Environmental Management and Assessment (IEMA) (1993). Guidelines for the Environmental Assessment of Road Traffic;
 LA104, Environmental assessment and monitoring, Design Manual for Roads and Bridges (DMRB) (Standards for Highways, 2020);
 Scottish Government (2023). National Planning Framework 4
 Transport Scotland (2007). Abnormal Load Movements – A brief guide to Notification and Authorisation requirements; and
 Transport Scotland (2012). Transport Assessment Guidance.

12 NOISE

12.1 Introduction

- 12.1.1 This chapter describes and assesses the potential noise effects associated with the construction and operation of the Proposed Development on noise sensitive receptors. Noise sensitive receptors in this case are people at residential properties, and therefore, noise effects are evaluated at residential properties in the vicinity.
- 12.1.2 Construction noise impacts have been largely scoped out of detailed assessment as the relevant noise limits referred to in relevant guidance (BS 5228-1:2009+A1:2014. *Code of Practice for Noise and Vibration Control on Construction and Open Sites*) would be met at noise sensitive receptor locations in the vicinity of the Proposed Development. There may be temporary impacts associated with blasting at the borrow pits and construction traffic assessing the Site which have been considered in the assessment.
- 12.1.3 Operational noise impacts have been assessed in line with ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*, and the associated guidance provided by the Institute of Acoustics (IOA) document, *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*. Predicted operational noise levels have been compared with relevant noise limits for the Proposed Development acting in isolation and in combination with other consented wind farms in the vicinity.
- 12.1.4 The potential noise impact associated with the substations and battery energy storage facility has been reviewed and its impact assessed with reference to BS 4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sound.
- 12.1.5 This chapter is supported by:
- **Figures 12.1, 12.2 and 12.3 in Volume 2;**
 - **Technical Appendices 12.1, 12.2, 12.3, 12.4 and 12.5 in Volume 3.**

12.2 Statutory and Planning Context

- 12.2.1 The relevant legislation and guidance are set out at **Table 12.1** below.

Table 12.1: Legislation and guidance relevant to noise

Document	Summary
Planning Policy	
Planning Advice Note PAN1/2011, Planning and Noise	Refers to the 'web based planning advice' on renewables technologies for onshore wind turbines
Scottish Government 2014, Web Based Planning Advice, Onshore Wind Turbines	States that the recommendations of ETSU-R-97 should be followed, and notes that the Scottish Government recognises the Institute of Acoustics Good Practice Guide as representing industry good practice.

Document	Summary
The Scottish Government's Technical Advice Note, Assessment of Noise	States that, for planning purposes, construction noise should be assessed according to BS 5228:2009+A1:2014, Noise and Vibration Control on Construction and Open Sites.
Guidance	
ETSU-R-97, The Assessment and Rating of Noise from Wind Farms	Sets out a methodology for assessing operational noise from wind farms and prescribes noise limits that apply at residential properties.
Institute of Acoustics (IOA) document, A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (GPG)	The IOA GPG expands on the principles set out in ETSU-R-97 and makes clarifications. The good practice guide has been endorsed by Scottish Government as representing best practice that should be followed.
The Highland Council, Onshore Wind Energy Supplementary Guidance	The Highland Council have provided their own additional guidance on the assessment of noise from wind energy developments. It includes a discussion on noise limits, and proposes that in the Highlands the noise limit should generally be set at the lower daytime noise limit and a 5 dB reduction in the night time lower limiting value.
BS 5228-1:2009+A1:2014. Code of Practice for Noise and Vibration Control on Construction and Open Sites	This standard provides guidance on the assessment and mitigation of noise from construction activities, and sets out recommended limits that should apply at different times of day.
BS 4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sound	This standard is used to assess the noise impact on people from noise arising from industrial and commercial activities and is the relevant standard for assessing the effects arising from the operation of the substations and battery energy storage facility.

12.3 Consultation Undertaken

- 12.3.1 Consultation was undertaken via the Scoping Report, the Highland Council's (THC's) pre-application service, and then subsequently directly with the Environmental Health Officer at THC dealing with noise.
- 12.3.2 THC's response to the Scoping Report described their general agreement to the noise assessment methodology proposed (i.e., ETSU-R-97), but with the limits modified in line with their supplementary guidance. It also specified that the cumulative operational noise impact assessment should take into account the consented noise limits on other development as well as the predicted noise levels.
- 12.3.3 Subsequently, the precise assessment methodology was discussed with THC, so that an agreed approach to the assessment could be undertaken. It was acknowledged that this was an area where there was significant consented wind turbine development and that, therefore, the cumulative operational noise assessment could be quite complex. Also, that there would be benefit in trying to simplify the methodology as much as possible whilst ensuring that operational noise levels would be acceptable in terms of ETSU-R-97 and THC's guidance. It was agreed that a simplified set of noise limits could be applied

to the Proposed Development acting in isolation as well as the limits which would apply to cumulative operational noise.

- 12.3.4 The main concerns raised by THC, and where they have been dealt with are set out at **Table 12.2** below.

Table 12.2: Summary of consultation undertaken

Concern	How it has been addressed
Noise assessment methodology	It was agreed that the operational noise impact assessment should follow the guidance set out in ETSU-R-97 and the IOA GPG and take into account the Highland Council's recommended reduced noise limits.
<p>Cumulative noise impacts</p> <p>THC prefer cumulative noise impacts to be assessed in three ways:</p> <ol style="list-style-type: none"> 1. Based on predicted operational noise levels for other sites included in the cumulative assessment for the installed or likely turbine type. 2. Taking into account other sites operating at their consented limits. (i.e., other consented developments are allowed to operate up to their consented limits even if they are predicted to be below) 3. Based on predicted operational noise levels plus an additional uncertainty margin of plus 2 dB 	<p>The approach to the cumulative noise assessment was agreed with THC. The relevant noise limits that would apply to noise from the Proposed Development, and cumulative operational noise, were discussed and agreed. The operational noise impact has been assessed against these agreed limits.</p> <p>It was further agreed that the cumulative noise assessment would be carried out based on predicted operational noise levels and taking into account the neighbouring sites operating at their limits at the nearest residential receptor locations. Therefore the approach of including additional uncertainty to the predicted noise levels (option 3 in the left hand column) was not required.</p>
Wind direction effects	It was agreed that where predicted operational noise impacts are assessed against the agreed noise limits, the noise modelling should not take into account wind direction (i.e., where cumulative operational noise levels may be lower in practice if the receptor location cannot be downwind of all the nearby turbines simultaneously). The predicted operational noise levels presented in this chapter are therefore, considered to be conservative as there may be instances where receptor locations cannot be downwind of all turbines in the vicinity simultaneously.

12.4 Approach to the Assessment

- 12.4.1 This section describes the approach to the assessment of construction and operational noise impacts. As set out in the introduction, construction noise has been largely scoped out of the assessment, and therefore, this section predominantly deals with operational noise impacts.
- 12.4.2 Noise from construction has been assessed with reference to BS 5228, *Noise and Vibration Control on Construction and Open Sites* which provides example criteria for the assessment of the significance of construction noise effects and a method for the prediction of noise levels from construction activities. The relevant noise limits for construction activities continuing for more than one month are 45, 55 and 65 dB L_{Aeq}, for night-time (23:00-07:00), evening and weekends, and daytime (07:00-19:00) including Saturdays (07:00-13:00) respectively. These are the limits against which noise from construction activities are assessed. Noise from construction activities would be controlled and minimised through a construction and environmental management plan (CEMP) which would be prepared prior to commencement of construction activities. This would also cover short term construction noise impacts from activities such as track construction which may be required in the vicinity of residential receptors.
- 12.4.3 It is noted that blasting would be required at the borrow pits, and that such noise may be audible at residential properties. It is not possible to accurately predict likely noise levels as they are dependent on the depth and size of charge as well as the structure of the ground. Given the large separation distances (i.e. at least 2 km) between the borrow pits and the residential receptors, detailed predictions have not been undertaken and the potential impact is considered to be not significant.
- 12.4.4 The traffic and transport chapter assesses the impact of construction traffic accessing the Site, and presents the predicted increases in road traffic along the access route during the construction phase of the development. The predicted increases in road traffic have been used to calculate the predicted increase in noise levels during the construction phase. Construction traffic predictions have been undertaken in line with the *Calculation of Road Traffic Noise (CRTN)*, Department of Transport, Welsh Office 1988.
- 12.4.5 The southern access passes close to the residential property One Caroy, such that vehicles accessing the Site would pass relatively close to this property. It is anticipated that noise from construction vehicles accessing the Site would be below the construction noise limit of 65 dB L_{Aeq}, but it is recommended that HGVs do not access the Site outside of normal daytime construction hours.
- 12.4.6 The nearest residential property to the northern access point is Upperglen, which is located approximately 300 m to the west. At this location, although noise from construction vehicles accessing the Site would be audible, it is anticipated that noise from vehicles accessing the Site would be significantly below the construction noise limit of 65 dB L_{Aeq}.
- 12.4.7 The approach to assessing operational noise effects has been carried out in line with the recommendations of ETSU-R-97 and the IOA GPG as required by local and national policy as referred to in **Table 12.1** above.
- 12.4.8 ETSU-R-97 recommends that, although noise limits should be set relative to existing background and should reflect the variation of both turbine and background noise with

wind speed, this can imply very low noise limits in particularly quiet areas, in which case, *“it is not necessary to use a margin above background in such low-noise environments. This would be unduly restrictive on developments which are recognised as having wider global benefits. Such low limits are, in any event, not necessary in order to offer a reasonable degree of protection to the wind farm neighbour”*.

- 12.4.9 For daytime periods (07:00 to 23:00), the noise limit is 35-40 dB L_{A90} or 5 dB(A) above the 'quiet day-time hours' prevailing background noise, whichever is the greater. The actual value within the 35-40 dB(A) range depends on the number of dwellings in the vicinity; the impact of the limit on the number of kWh generated; and the duration of the level of exposure. 'Quiet daytime hours' are defined as evenings from 18:00 to 23:00 plus Saturday afternoons from 13:00 to 18:00 and Sundays from 07:00 to 18:00.
- 12.4.10 For night-time periods (23:00 to 07:00) the noise limit is 43 dB L_{A90} or 5 dB(A) above the prevailing night-time hours background noise, whichever is the greater. The 43 dB(A) lower limit is based on an internal sleep disturbance criterion of 35 dB(A) with an allowance of 10 dB(A) for attenuation through an open window and 2 dB(A) subtracted to account for the use of L_{A90} rather than L_{Aeq} .
- 12.4.11 Where predicted noise levels are low at the nearest residential properties a simplified noise limit can be applied, such that noise is restricted to the minimum ETSU-R-97 level of 35 dB L_{A90} for wind speeds up to 10 m/s at 10 m height. This removes the need for extensive background noise measurements for smaller or more remote schemes.
- 12.4.12 It is stated that the $L_{A90,10min}$ noise descriptor should be adopted for both background and wind farm noise levels and that, for the wind farm noise, this is likely to be between 1.5 and 2.5 dB less than the L_{Aeq} measured over the same period. The $L_{Aeq,t}$ is the equivalent continuous 'A' weighted sound pressure level occurring over the measurement period 't'. It is often used as a description of the average ambient noise level. Use of the L_{A90} descriptor for wind farm noise allows reliable measurements to be made without corruption from relatively loud, transitory noise events from other sources.
- 12.4.13 ETSU-R-97 also specifies that a penalty should be added to the predicted noise levels, where any tonal component is present. The level of this penalty is described and is related to the level by which any tonal components exceed the threshold of audibility.
- 12.4.14 With regard to multiple wind farms in a given area, ETSU-R-97 specifies that the absolute noise limits and margins above background should relate to the cumulative impact of all wind turbines in the area contributing to the noise received at the properties in question. Existing wind farms should, therefore, be included in cumulative predictions of noise level for proposed wind turbines and not considered as part of the prevailing background noise.
- 12.4.15 In this case, baseline noise measurements have not been undertaken, due to the remote location of the Proposed Development, and because operational noise impacts have been assessed against fixed limits which take into account ETSU-R-97 and existing planning consents. These fixed limits were agreed with THC as set out at **Table 12.2** above.
- 12.4.16 The potential effects associated with operational noise have been assessed by comparing predicted noise levels, through noise modelling, with the relevant limits agreed with THC.

Effects Scoped Out

12.4.17 The following potential effects have been scoped out of the assessment:

Operational Noise from Substation and Battery Storage

12.4.18 Operational noise from the substations and battery energy storage facility is assessed according to BS 4142 *Methods for rating and assessing industrial and commercial sound*²⁶, which assesses the significance of the noise impact by comparing rating noise levels arising from the operation of the development with existing background noise levels. In this case, both background noise levels at low wind speeds and noise arising from the operation of the substations and battery storage are low, and in which case, BS 4142 states the '*Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night*'.

12.4.19 In this case, based on a review of operational noise levels arising from similar installations, and given the separation distance between the substations and battery storage facility and the nearest noise sensitive receptor of at least 3 km, operational noise levels would not be audible at any noise sensitive receptor location. Therefore, the assessment of operational noise from the substations and battery storage facility has been scoped out of the assessment.

Tonal Noise

12.4.20 As discussed at paragraph 12.4.13, ETSU-R-97 specifies that, in line with other noise guidance, a penalty should be added to measured or predicted wind turbine noise levels if there is tonal noise above a certain level which is audible at residential properties. In this assessment, it has been assumed that there would be no tonal noise associated with the operation of the wind farm which would give rise to such a penalty as most modern turbines operate without significant tonal noise. A penalty is usually included with the planning conditions for wind farms requiring a tonal penalty to be added to measured noise levels, where required, before comparing them with the noise limits. Warranty agreements with turbine suppliers ensure that any such penalties will not occur in practice.

Low Frequency and Infrasound

12.4.21 Low frequency sound is typically defined as sound in the audible hearing frequency range of 20 Hz up to about 200 Hz. Infra-sound is noise occurring at frequencies below that at which sound is normally audible, i.e., at less than about 20 Hz, due to the significantly reduced sensitivity of the ear at such frequencies. In this frequency range, for sound to be perceptible, it has to be at very high amplitude, which is not the case for wind turbine noise.

12.4.22 Noise from wind turbines is not inherently low-frequency and it is typically broad-band in nature, and close to a wind turbine the dominant frequencies are usually in the 250 to 2000 Hz range. As the distance from a wind farm site increases, the noise level decreases as a result of the spreading out of the sound energy and also, due to air absorption which increases with increasing frequency. This means that, although the energy across the

²⁶ BSI (2019), BS 4142 Methods for rating and assessing industrial and commercial sound.

whole frequency range is reduced, higher frequencies are reduced more than lower frequencies with the effect which, as distance from the Site increases, the ratio of low to high frequencies also increases. This effect may be observed with road traffic noise or natural sources, such as the sea, where higher frequency components are diminished relative to lower frequency components at long distances. At such distances, however, the overall noise level is so low, such that any bias in the frequency spectrum is insignificant.

- 12.4.23 Work carried out in 2006 by Hayes McKenzie for the UK Department of Trade and Industry to investigate the extent of low frequency and infrasonic noise from three UK wind farms²⁷ concluded that *“the common cause of complaints associated with noise at all three wind farms is not associated with low frequency noise, but is the audible modulation of the aerodynamic noise, especially at night”*. It is, therefore, considered that low frequency noise can be scoped out of the assessment.
- 12.4.24 In November 2016 a study into low frequency and infrasound was published by the State Office for the Environment, Measurement and Nature Conservation of the Federal State of Baden-Wuerttemberg²⁸ that contained a comprehensive review of low frequency and infrasound from wind turbines, and evaluated such noise in relation to other sources. The results state that *“the infrasound level in the vicinity of wind turbines is – at distances between 120 m and 300 m – well below the threshold of what humans perceive”* and that *“at a distance of 700 m from the wind turbines, it was observed by means of measurements that when the turbine is switched on, the measured infrasound level did not increase or only increased to a limited extent. The infrasound was generated mainly by the wind and not by the turbines”*.
- 12.4.25 The report concludes that *“Infrasound is caused by a large number of different natural and technical sources. It is an everyday part of our environment that can be found everywhere. Wind turbines make no considerable contribution to it. The infrasound level generated by them lie clearly below the limits of human perception. There is no scientifically proven evidence of adverse effects in this level range”*. It is, therefore, considered that infrasound can be scoped out of the assessment

Amplitude Modulation

- 12.4.26 The variation in noise level associated with wind turbine operation, at the rate at which turbine blades pass any fixed point of their rotation (the blade passing frequency), is often referred to as blade swish or Amplitude/ Aerodynamic Modulation (AM). This effect is identified within ETSU-R-97 where it is envisaged that *“... modulation of blade noise may result in variation of the overall A-Weighted noise level by as much as 3 dB(A) (peak to trough) when measured close to a wind turbine...”* and that at distances further from the turbine where there are *“... more than two hard, reflective surfaces, then the increase in modulation depth may be as much as 6 dB(A) (peak to trough)”*. There have been instances where level of AM rates are higher than this, which results in the noise being

²⁷ Department of Trade and Industry (2006). ETSU W/45/00656/00/00, The Measurement of Low Frequency Noise at 3 UK Windfarms. ETSU/DTI.

²⁸ Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg (2016). Low-frequency noise incl. infrasound from wind turbines and other sources. LUBW

perceived as more intrusive (in the same way as tonal content makes the noise more intrusive).

- 12.4.27 The Department of Energy & Climate Change commissioned a Wind Turbine AM Review report²⁹ that was published in two phases: Phase 1 in September 2015 and Phase 2 in October 2016 (although the Phase 2 report is dated August 2016). Phase 1 of the report sets out the approach and methodology to the review and research, and the Phase 2 report includes a literature review, research into human response to AM, and recommends how excessive AM might be controlled through the use of a planning condition. The report includes recommendations on how AM should be addressed when quantified according to the recommendations of a separate Institute of Acoustics (IOA) working group document, *A Method for Rating Amplitude Modulation in Wind Turbine Noise* (August 2016)³⁰.
- 12.4.28 The AM Review reports recommend a two-tier approach whereby the first tier seeks a reduction in the depth and/or occurrence of AM with a rating level (according to the IOA Amplitude Modulation Working Group method) ≥ 3 dB. Whether remedial action is required depends on the prevalence of any complaints, and how often AM rating levels ≥ 3 dB occur. The second tier is that if AM is deemed to be a significant issue, and if nothing can be done to reduce the level of AM, then a penalty scheme is proposed whereby a penalty ranging from 3 dB (for a rating level of 3 dB) up to a maximum of 5 dB (for a rating level of 10 dB and above) could be added to the measured level before measured levels are compared with the relevant noise limits.
- 12.4.29 It should be noted that most wind farms operate without significant AM, and that it is not possible to predict the likely occurrence of AM. At the time of writing there has been no official response to those recommendations from the IOA Noise Working group or endorsement from any Scottish Government Minister or Department. The IOA GPG, states that *'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'*, although it is possible to control such noise with an appropriately worded planning condition if necessary.

Value of Receptors

- 12.4.30 Noise effects on people at residential locations have been assessed and all residents that are not involved with the Proposed Development are treated equally and considered to be of high value. Where the occupier of a property has a direct financial involvement with the Proposed Development, they are less likely to be annoyed by noise from the wind farm, and therefore, higher noise limits are allowed, and therefore, the receptor value has been described as medium value. Noise is not normally assessed at non-residential locations unless levels are so high as to be likely to cause direct health effects, which is not the case here, and therefore, the sensitivity of people at non-residential locations are classed as low receptor values, and are not assessed in this chapter. A summary of the receptor values and sensitivities are set out at **Table 10.3** below.

²⁹ Department of Energy and Climate Change (2016), Wind Turbine AM Review: Phase 1 & Phase 2 Reports. DECC.

³⁰ Institute of Acoustics (2016), *A Method for Rating Amplitude Modulation in Wind Turbine Noise* - Version 1. IOA.

Table 12.3: Receptor value and sensitivity

Value	Description
High	People at residential properties
Medium	People at residential properties that have a financial involvement with the Proposed Development.
Low	People at other (non-residential) locations

Magnitude of Impact (Change)

12.4.31 Operational noise impacts have been assessed against the relevant noise limits agreed with THC, and with reference to existing predicted operational noise levels and noise limits which apply to consented developments in the vicinity. The relevant noise limits are set out at **The magnitude** of impact (adverse or beneficial) has been assessed in the categories 'high', 'medium', 'low' and 'negligible' as described in **Table 10.4**, below.

12.4.32 Table 10.4 below.

Table 12.4: Operational Noise Limits

Limit	Applicable to:
28 dB L _{A90}	Operational noise from the Proposed Development acting in isolation. Where predicted operational noise levels are equal to or below this a detailed cumulative operational noise impact assessment is not required.
35 dB L _{A90}	Where predicted operational noise levels from the Proposed Development acting in isolation are below 35 dB L _{A90} then operational noise impacts are considered to be acceptable, depending on cumulative operational noise levels.
38 dB L _{A90}	Where predicted operational noise levels from the Proposed Development acting with other developments in the vicinity are below 38 dB L _{A90} then operational noise impacts are considered to be acceptable.
Comparative	Where maximum predicted operational noise levels associated with the Proposed Development are equal to, or lower than, the predicted operational noise levels of the existing Ben Aketil Wind Farm then this is an indication of the Proposed Development having a negligible impact.

Determination of Significance

12.4.33 The approach to determining the significance of operational effects has been as follows:

- identify the relevant receptors where predicted operational noise levels are above 28 dB L_{A90};
- quantify the predicted operational noise levels at each residential receptor location from both the Proposed Development acting in isolation, and cumulatively with other consented wind farms in the vicinity; and
- compare the predicted operational noise levels with the limits set out at **The magnitude** of impact (adverse or beneficial) has been assessed in the categories 'high', 'medium', 'low' and 'negligible' as described in **Table 10.4**, below.
- Table 10.4.

12.4.34 An effect is considered to be significant if the limits set out at **The magnitude** of impact (adverse or beneficial) has been assessed in the categories 'high', 'medium', 'low' and 'negligible' as described in **Table 10.4**, below.

12.4.35 Table 10.4 are exceeded.

12.4.36 The significance of the impact of noise arising from road traffic associated with the construction of the wind farm has been determined with reference to the predicted increase in noise levels relative to the baseline road traffic flows. The significance of the predicted increase is set out at **Table 12.5** below, and is based on a change in noise level of 1 dB being the minimum perceptible under laboratory conditions, a change of 3 dB being the minimum perceptible for similar sounds in the environment, and a 10 dB change being perceived as a doubling (or halving) of the sound level.

Table 12.5: Construction Noise Level Significance Criteria

Noise Increase (dB)	Effect Category	Significance
0 to 1	No Impact	Not significant
1 to 3	Negligible	Not significant
3 to 5	Minor	Not significant
5 to 10	Moderate	Significant
More than 10	Major	Significant

12.4.37 It is noted that construction traffic effects are relatively short-term as the increases would only occur during the construction phase, Therefore, if the change in noise level due to construction traffic is less than 5 dB, the overall effect is considered to be not significant.

Nature of Effect

12.4.38 In addition to determining the significance of the effect, the assessment process also includes a qualitative description regarding the nature of the effect. These terms add additional information about how the effect would affect receptors.

Table 12.6: Assessment descriptors

Term	Nature of effect descriptors
Adverse	An effect which has the potential to decrease receptor value or status relative to baseline conditions.
Beneficial	An effect which has the potential to increase receptor value or status relative to baseline conditions.
Short-term	Effects that persist only for a short time, e.g. during the construction (or decommissioning) phase only; includes reversible effects.
Medium-term	Effects that may persist until additional mitigation measures have been implemented and become effective.
Long-term	Effects that persist for a much longer time, e.g. for the duration of the operational phase (essentially until the development ceases or is removed/ reinstated); includes effects which are permanent (irreversible) or which may decline over longer timescales.

Temporary	A reversible effect where recovery is possible and for which effects would persist only for a short or medium-term.
Frequent	Refers to a recurring effect that occurs repeatedly; in some cases a lower level of impact may occur with sufficient frequency to reduce the ability of a receptor to recover effectively.

Limitations of the Assessment

- 12.4.39 A simplified approach to the assessment has been undertaken whereby noise levels arising from the construction and operation of the Proposed Development have been assessed against a set of fixed simplified noise limits. Therefore, no baseline noise measurements have been undertaken. As the ETSU-R-97 noise limits are set at the greater of the lower limiting values and plus 5 dB above background, it is likely that at higher wind speeds where background noise levels tend to be higher, the resultant ETSU-R-97 noise limits would be higher. The assessment against fixed noise limits is, therefore, considered to represent a conservative approach.

Design Basis and Assumptions

- 12.4.40 The predicted noise impact of the Proposed Development has been undertaken for a candidate wind turbine that fits the dimensions appropriate for the scheme. It may therefore, not be the turbine that would be installed at the Site, nevertheless, the noise limits that are set via the planning conditions for the Proposed Development if consented would be met in practice by whatever turbine is installed.
- 12.4.41 The wind turbine locations are relatively remote from noise sensitive receptors such that operational noise is mitigated by the distance.

12.5 Existing Environment

- 12.5.1 The baseline noise environment at residential receptor locations near the Site is generally characterised as a typical rural environment. Noise experienced generally consists of wind induced noise effects, such as wind in trees and foliage, animal activity such as birdsong, human activity such as vehicles on local roads, and running water (depending on the level of rainfall and proximity to watercourses). There are a number of operational wind farms in the vicinity, including the operational Ben Aketil Wind Farm, and therefore, operational wind turbine noise would be audible at some receptor locations depending on the wind speed and direction and relative masking (or lack thereof) from other local noise sources.
- 12.5.2 No baseline noise measurements were undertaken because it was anticipated that operational noise levels would meet the relevant noise limits which would apply irrespective of baseline noise levels.
- 12.5.3 It should be noted that the existing Ben Aketil Wind Farm has noise limits that were set via the planning conditions for the consented development. The relevant noise limits are reproduced below for locations that are not financially involved with the consented wind farm.
- During Night Hours, 38 dB $L_{A90, 10min}$, or the Night Hours $LA_{90, 10min}$ Background Noise Level plus 5 dB(A), whichever is the greater.

- During Quiet Waking Hours, 35 dB $L_{A90, 10min}$, or the Quiet Waking Hours $L_{A90, 10min}$ Background Noise Level plus 5 dB(A), whichever is the greater.

12.5.4 At the financially involved property, Glen Vic Askill the following limits were applied;

- During Night Hours, 45 dB $L_{A90, 10min}$, or the Night Hours $L_{A90, 10min}$ Background Noise Level plus 5 dB(A), whichever is the greater.
- During Quiet Waking Hours, 45 dB $L_{A90, 10min}$, or the Quiet Waking Hours $L_{A90, 10min}$ Background Noise Level plus 5 dB(A), whichever is the greater.

12.5.5 Although Glen Vic Askill was specified as financially involved with the Ben Aketil Wind Farm in the original planning consent, it is not necessary to apply the financially involved noise limits at this location for the Proposed Development due to the large separation distances, and low predicted noise impacts.

12.5.6 In addition to the originally consented wind farm, there is consent for a life extension of the project where operational noise levels were controlled through limits which were set relative to the predicted operational noise levels presented in the assessment of the noise effects of the life extension. These limits are reproduced at **Table 12.7** below.

Table 12.7: Noise limits for the consented Ben Aketil life extension dB L_{A90}

Location	Easting	Northing	Standardised 10 m height wind speed								
			4	5	6	7	8	9	10	11	12
Upperglen	131978	851178	18	21	26	29	31	32	32	32	32
Coishletter Woodland	133696	851068	15	18	23	25	27	29	29	29	29
Blackhill	134519	850404	15	17	23	25	27	28	28	28	28
Glen Vic Askill	135979	844311	10	13	18	21	23	24	24	24	24
9 Balmeanach	133132	843734	13	16	21	24	26	27	27	27	27
Allt Ruairidh	132485	843549	14	17	22	24	26	28	28	28	28
2 Balmeanach	131318	843153	13	15	21	23	25	26	26	26	26
North of 1 Balmeanach	130944	843272	13	15	21	21	25	26	26	26	26
1 Caroy Struan	129987	845192	13	16	21	24	26	27	27	27	27
12 Feorlig	129987	845118	20	23	28	31	33	34	34	34	34
Upper Feorlig	129940	845118	20	23	28	31	34	34	34	34	34
11 Upper Feorlig	129895	844969	20	23	28	31	34	34	34	34	34
1 Roskhill	128254	845221	13	15	21	23	25	26	26	26	26
Roskhill Cottage	127638	845505	12	15	20	22	24	26	26	26	26
Horneval	127534	848009	14	16	22	24	26	27	27	27	27

12.5.7 The noise limits presented at **Table 12.7** above are generally low and are very low at low wind speeds (where wind turbine operational noise levels are low). In the context of the agreed limits, it is considered appropriate that, for the purposes of this assessment, a lower limiting value of 28 dB L_{A90} is applied to the values. This is on the same basis as the simplified noise limits agreed whereby, if the predicted operational noise levels from

the Proposed Development are 10 dB below the cumulative noise limits, then its contribution can be considered to be negligible.

12.6 Predicted Effects

Construction

- 12.6.1 Detailed construction predictions for on-site activities have been scoped out of the assessment due to the large separation distances between construction activities and residential property. There would be a commitment, via the CEMP, to ensure that noise from construction activities with a duration of longer than 1 month would meet the relevant noise limits of 65, 55, and 45 dB L_{Aeq} during the day, evening, and night time respectively.

Construction Traffic

- 12.6.2 The predicted increase in road traffic noise from construction vehicles accessing the Proposed Development during the construction phase of the development has been calculated based on the predicted traffic flows presented in the Traffic and Transport chapter. The assessed scenarios are described at **Paragraph 11.7.2 of Chapter 11: Traffic and Transport**.
- 12.6.3 The Traffic and Transport chapter presents two access scenarios and for each access scenarios presents a worst-case and best-case scenario. In addition predicted increases are presented both for the peak month of construction and for the average increases over the construction period. In this case, predicted noise increases have been calculated for the maximum trip generation (i.e. the construction traffic generated during the peak month of construction) to ensure a worst-case assessment.
- 12.6.4 The 4 scenarios assessed here for the peak month of construction are:
- Scenario 1A – Northern access route worst-case scenario
 - Scenario 1B – Northern access route best-case scenario
 - Scenario 2A – Southern access route worst-case scenario
 - Scenario 2B – Southern access route best-case scenario
- 12.6.5 The predicted increases in noise level are presented at Table 12.8 to Table 12.11 below.

Table 12.8: Peak Construction Traffic Predicted Increases; Scenario 1A

Location	Existing Baseline Traffic Flow		Baseline + Construction Traffic Flow		Predicted Relative Change in Traffic Noise Level	Effect Category
	Total Traffic Flow	Total HGV	Total Traffic Flow	Total HGV		
A87 between Kyle of Lochalsh and Kyleakin Roundabout	5017	214 (4%)	5102	214 (4%)	0.1 dB(A)	No Impact
A87 between Kyleakin Roundabout and A851	4185	205 (5%)	4270	205 (5%)	0.1 dB(A)	No Impact

Location	Existing Baseline Traffic Flow		Baseline + Construction Traffic Flow		Predicted Relative Change in Traffic Noise Level	Effect Category
	Total Traffic Flow	Total HGV	Total Traffic Flow	Total HGV		
A87 between A851 and B8083	6936	199 (3%)	7021	199 (3%)	0.0 dB(A)	No Impact
A87 between B8083 and A863	3550	202 (6%)	3635	202 (6%)	0.1 dB(A)	No Impact
A87 between A863 and B883	3128	197 (6%)	3677	429 (12%)	1.5 dB(A)	Negligible
A87 between B883 and A855	4247	140 (3%)	4796	372 (8%)	1.3 dB(A)	Negligible
A87 between A855 and A850	3680	124 (3%)	4229	356 (8%)	1.5 dB(A)	Negligible
A850 between A87 and B836	1422	214 (15%)	1971	446 (23%)	2.3 dB(A)	Negligible
A850 between C-road Horneval and B838	1030	205 (20%)	1115	205 (18%)	0.2 dB(A)	No Impact
A850 between A863 and C-road to A863 at Lonmore	1224	199 (16%)	1309	199 (15%)	0.2 dB(A)	No Impact

Table 12.9: Peak Construction Traffic Predicted Increases; Scenario 1B

Location	Existing Baseline Traffic Flow		Baseline + Construction Traffic Flow		Predicted Relative Change in Traffic Noise Level	Effect Category
	Total Traffic Flow	Total HGV	Total Traffic Flow	Total HGV		
A87 between Kyle of Lochalsh and Kyleakin Roundabout	5017	214 (4%)	5102	214 (4%)	0.1 dB(A)	No Impact
A87 between Kyleakin Roundabout and A851	4185	205 (5%)	4270	205 (5%)	0.1 dB(A)	No Impact
A87 between A851 and B8083	6936	199 (3%)	7021	199 (3%)	0.0 dB(A)	No Impact
A87 between B8083 and A863	3550	202 (6%)	3635	202 (6%)	0.1 dB(A)	No Impact
A87 between A863 and B883	3128	197 (6%)	3461	321 (9%)	0.9 dB(A)	No Impact
A87 between B883 and A855	4247	140 (3%)	4580	264 (6%)	0.8 dB(A)	No Impact
A87 between A855 and A850	3680	124 (3%)	4013	248 (6%)	0.9 dB(A)	No Impact

Location	Existing Baseline Traffic Flow		Baseline + Construction Traffic Flow		Predicted Relative Change in Traffic Noise Level	Effect Category
	Total Traffic Flow	Total HGV	Total Traffic Flow	Total HGV		
A850 between A87 and B836	1422	214 (15%)	1755	338 (19%)	1.4 dB(A)	Negligible
A850 between C-road Horneval and B838	1030	205 (20%)	1045	205 (20%)	0.0 dB(A)	No Impact
A850 between A863 and C-road to A863 at Lonmore	1224	199 (16%)	1239	199 (16%)	0.0 dB(A)	No Impact

Table 12.10: Peak Construction Traffic Predicted Increases; Scenario 2A

Location	Existing Baseline Traffic Flow		Baseline + Construction Traffic Flow		Predicted Relative Change in Traffic Noise Level	Effect Category
	Total Traffic Flow	Total HGV	Total Traffic Flow	Total HGV		
A87 between Kyle of Lochalsh and Kyleakin Roundabout	5017	214 (4%)	5102	214 (4%)	0.1 dB(A)	No Impact
A87 between Kyleakin Roundabout and A851	4185	205 (5%)	4270	205 (5%)	0.1 dB(A)	No Impact
A87 between A851 and B8083	6936	199 (3%)	7021	199 (3%)	0.0 dB(A)	No Impact
A87 between B8083 and A863	3550	202 (6%)	3635	202 (6%)	0.1 dB(A)	No Impact
A863 between B8009 and A87	1343	45 (3%)	1556	109 (7%)	1.3 dB(A)	Negligible
A863 between B885 and B8009	660	70 (11%)	873	134 (15%)	1.8 dB(A)	Negligible
A863 between C-road to Horneval and B885	890	15 (2%)	1103	79 (7%)	1.9 dB(A)	Negligible
A863 between B884 and C-road to A850 at Horneval	1144	30 (3%)	1229	30 (2%)	0.3 dB(A)	No Impact
A863 between A850 and B884	1302	32 (2%)	1387	32 (2%)	0.2 dB(A)	No Impact

Table 12.11: Peak Construction Traffic Predicted Increases; Scenario 2B

Location	Existing Baseline Traffic Flow		Baseline + Construction Traffic Flow		Predicted Relative Change in Traffic Noise Level	Effect Category
	Total Traffic Flow	Total HGV	Total Traffic Flow	Total HGV		
A87 between Kyle of Lochalsh and Kyleakin Roundabout	5017	214 (4%)	5102	214 (4%)	0.1 dB(A)	No Impact
A87 between Kyleakin Roundabout and A851	4185	205 (5%)	4270	205 (5%)	0.1 dB(A)	No Impact
A87 between A851 and B8083	6936	199 (3%)	7021	199 (3%)	0.0 dB(A)	No Impact
A87 between B8083 and A863	3550	202 (6%)	3635	202 (6%)	0.1 dB(A)	No Impact
A863 between B8009 and A87	1343	45 (3%)	1476	69 (5%)	0.6 dB(A)	No Impact
A863 between B885 and B8009	660	70 (11%)	793	94 (12%)	1.0 dB(A)	No Impact
A863 between C-road to Horneval and B885	890	15 (2%)	1023	39 (4%)	1.0 dB(A)	Negligible
A863 between B884 and C-road to A850 at Horneval	1144	30 (3%)	1229	30 (2%)	0.3 dB(A)	No Impact
A863 between A850 and B884	1302	32 (2%)	1387	32 (2%)	0.2 dB(A)	No Impact

- 12.6.6 The results of the construction traffic predictions show overall that no significant effects are predicted as the maximum predicted effect is a negligible increase of less than 3 dB.
- 12.6.7 It should be noted that the assessment considers the worst-case scenario of the peak month of construction and that the predicted increases for all other months of construction would be lower.

Operational Noise

- 12.6.8 Operational noise predictions have been carried out for the two development scenarios, as the extension to the wind farm may be carried out before the existing turbines are removed and the Site is repowered. The two scenarios are:
- Scenario 1: Both the repowering and extension are undertaken at the same time; and
 - Scenario 2: Where the extension would be constructed first, followed by the repowering of the existing wind farm a few years after the construction of the extension, but with the construction of both the extension and the repowering being completed within a period of five years (i.e., existing turbines remain while the extension turbines are built and the extension turbines become operational before the existing turbines are decommissioned).

- 12.6.9 In order to quantify likely operational noise levels, predictions have been undertaken in line with the methodology set out in the IOA GPG.
- 12.6.10 The operational noise predictions methodology is set out in full in **Technical Appendix 12.1**, but the main assumptions are described below.
- Received height of 4 m;
 - Ground effect ground coefficient $G=0.5$;
 - Atmospheric attenuation corresponding to a temperature of 10°C and a relative humidity of 70%;
 - Topographical barriers and concave ground profile corrections have been applied according to the IOA GPG;
 - A margin of plus 2 dB has been added to manufacturer's sound power level data.
- 12.6.11 The source sound power levels associated with the existing Ben Aketil Wind Farm and the Proposed Development are shown at **Table 12.12** below. The existing wind farm consists of Enercon E70 turbines with a hub height of 64 m, and a candidate turbine which fits the dimensions of the Proposed Development, the Siemens-Gamesa SG 6.6-155 6.6 MW machine, has been assumed for the extension and repowering.

Table 12.12: Wind turbine sound power levels dB L_{WA}

Turbine Type	Standardised 10 m height wind speed (m/s)									
	3	4	5	6	7	8	9	10	11	12
Enercon E70	85.2	90.4	95.6	100.8	103.4	105.1	106.5	106.5	106.5	106.5
SG 6.6-155	95.0	99.9	104.7	107.0	107.0	107.0	107.0	107.0	107.0	107.0

- 12.6.12 The octave band noise levels assumed for each turbine type are shown at **Table 12.13** below.

Table 12.13: Wind turbine octave band levels, dBA

Turbine Type	Octave band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Enercon E70	90.4	99.0	101.5	100.1	98.6	95.3	88.4	80.8
SG 6.6-155	86.6	94.0	98.6	100.9	100.7	101.0	94.4	79.4

- 12.6.13 Operational noise prediction results are presented for a selection of the nearest residential receptor locations to the Proposed Development. Results are presented for the existing Ben Aketil Wind Farm, and for two scenarios considered. The selection of residential properties was chosen to ensure that the nearest residential receptors in each direction from the Proposed Development are covered by the assessment. If the relevant limits are met at the nearest receptors, then they would be met at all receptors in the vicinity.
- 12.6.14 Only the results corresponding to when the turbines are operating at their highest sound power level, and assuming that the receptor location is downwind of all turbines, are presented. Under wind conditions other than downwind, and at lower wind speeds when the sound power levels are lower, operational noise level would be lower. The results for a selection of the nearest residential receptors are shown at **Table 12.14** below. It should

be noted that results are not presented for all residential property locations, but it has been ensured that the nearest receptors have been included such that operational noise levels at other locations are expected to be similar or lower than the levels presented here. The full results, as they vary with wind speed, are included in **Technical Appendix 12.2**, and the predicted impact is shown on noise contour plots at **Figure 12.1, 12.2 and 12.3** for the existing, Scenario 1 and Scenario 2 developments respectively.

Table 12.14: Operational noise prediction results dB L_{A90}

Receptor Location	Easting	Northing	Phase of development		
			Existing	Scenario 1	Scenario 2
Glen Vic Askill	135980	844311	23	19	24
Allt Ruairidh	132487	843535	27	23	28
2 Balmeanach	131319	843147	26	23	27
Tigh Na Mara 2 – 3 Caroy	130589	843464	27	24	28
Balmeanach House	132108	843379	25	22	26
Ruadh	131587	843112	25	23	26
An Cleireach 8 Balmeanach	132941	843609	26	23	27
Spindrift	131897	843257	25	22	26
9 Balmeanach	133133	843723	26	22	27
Blackhill	134523	850406	27	23	27
Burnside 12 Upper Feorlig	129982	845180	33	29	34
11 Upper Feorlig	129895	844970	33	28	33
9 Upper Feorlig	129877	844677	32	28	33
1 Roskill	128246	845214	25	24	27
Horneval	127340	848013	26	24	27
Upperglen	131983	851177	31	26	31
Fairfield Cottage	127368	846155	25	24	27
The Bungalow 4 Balmeanach	132095	843335	25	22	26
12 Upper Feorlig	129938	845119	33	28	34
Coishletter Lodge	133696	851068	27	24	28
North of 1 Balmeanach	130947	843279	26	23	27
1 Caroy Struan	130345	843908	26	24	27
Roskill Cottage	127644	845504	24	24	26

12.6.15 The results of the operational noise predictions indicate that predicted operational noise levels for the existing development and each of the scenarios of the Proposed Development are below 35 dB L_{A90}.

- 12.6.16 Predicted operational noise levels are therefore below the simplified noise limit agreed with THC, which applies to it acting in isolation and, in addition, are below the day and night time noise limits which were applied to the originally consented Ben Aketil Wind Farm.
- 12.6.17 The operational noise impact of the repowering and extension scheme results in lower predicted noise levels at residential receptor locations than is currently generated by the existing Ben Aketil Wind Farm.
- 12.6.18 In addition, it should be noted that the maximum increase in operational noise levels caused by Scenario 2 (the existing turbines remain, and the extension turbines become operational) is 2 dB which can be considered to be a negligible increase.
- 12.6.19 The results of the operational noise impact assessment for the Proposed Development acting in isolation is, therefore, considered to be not significant and the relevant noise limits are predicted to be met.

12.7 Mitigation

Operational Mitigation

- 12.7.1 No specific operational mitigation is required as the relevant noise limits are met. It should be noted that noise-reduced modes of operation are generally available for wind turbines of the scale proposed here that allow noise levels to be reduced by restricting the rotational speed of the machines. This mitigation could be employed in the unlikely event of any noise issues arising which would require mitigation to be implemented to enable the relevant limits to be met.
- 12.7.2 Noise from the operation of the wind farm is usually controlled through the implementation of planning conditions on noise which contain permissible limits. In this way if any operational noise issues arise then measurements can be undertaken to ascertain whether the Site is operating within the appropriate noise limits.

Construction Mitigation

- 12.7.3 No specific mitigation is required to control construction noise as the relevant noise limits are anticipated to be met due to the large separation distances between construction activities and residential receptors. Noise during construction works would be controlled by generally restricting works to standard working hours and exclude Sundays, unless specifically agreed otherwise.
- 12.7.4 BS 5228³¹ states that the 'attitude of the contractor' is important in minimising the likelihood of complaints and therefore, consultation with the local authority would be required along with providing information to residents on intended activity.
- 12.7.5 The construction and decommissioning works on-site would be carried out in accordance with:
 - relevant EU Directives and UK Statutory Instruments which limit noise emissions from a variety of construction plant;

³¹ BSI (2009), BS 5228 Code of practice for noise and vibration control on construction and open sites.

- the guidance set out in PAN1/2011³² and BS5228: 2009; and
- Section 61 of the Control of Pollution Act 1974³³ and Section 80 of the Environmental Protection Act³⁴.

12.7.6 The way in which noise effects would be minimised would be set out in the construction and environmental management plan (CEMP) which would be prepared prior to commencement of construction activities.

12.7.7 As noted at paragraph 12.4.3, noise from blasting at the borrow pits may be audible at nearby receptors. The most appropriate mechanism to manage noise effects is for a pre-blasting noise management programme to be prepared which would identify the most sensitive receptors that could be potentially affected by blasting noise. However, given the large distance between the borrow pits and neighbouring residences, this may not be considered necessary and would be addressed in the CEMP.

12.8 Summary of Effects

12.8.1 Construction effects are short term effects which would only occur during the construction phase of the development and, although noise from construction vehicles accessing the Site may be audible at residential properties in the vicinity, the relevant construction noise limits would be met, and the predicted increases in road traffic noise are considered to be not significant.

12.8.2 Operational effects are long term impacts, but the level of noise at receptor locations is dependent on the wind speed and directions, with audibility being dependent on the level of masking sounds at the receptor location. Although the operational noise impacts are considered long term impacts, the Proposed Development could be considered beneficial in relation to the existing wind farm as the predicted noise levels are lower than from the existing turbines.

12.8.3 No significant residual effects are predicted for the construction and operation of the Proposed Development acting in isolation as the relevant noise limits are predicted to be met.

12.9 Cumulative Effects

12.9.1 It is possible that cumulative construction effects may occur if there are simultaneous construction operations occurring in the vicinity of the development. On-site construction activities are likely to have a negligible impact at noise sensitive receptors due to distance between construction activities and residential receptors, and therefore, no significant cumulative construction effects with on-site construction are anticipated. There may be increased road traffic from construction vehicles if there are other projects in the vicinity that also generate construction road traffic. It is not possible to predicted potential cumulative construction noise impacts, however, any construction road traffic increases would be temporary and therefore, any short term associated noise impacts are not considered to be significant.

³² Scottish Government (2011), Planning Advice Note:: Planning and Noise.

³³ UK Government (1974), Control of Pollution Act.

³⁴ UK Government (1990), Environmental Protection Act (EPA).

- 12.9.2 A cumulative operational noise impact assessment is required where predicted operational noise levels from the Proposed Development are above 28 dB L_{A90} . This is because where predicted noise levels are 10 dB below the relevant cumulative noise limit (i.e., 38 dB L_{A90} in this case) the contribution can be considered to be *negligible*.
- 12.9.3 It can be seen at **Table 12.14** that there is one residential property for Scenario 1 where predicted noise levels are above 28 dB L_{A90} , and five residential properties for Scenario 2. Cumulative effects with other wind farms in the vicinity have been evaluated for these properties.
- 12.9.4 The following consented wind farms have been included in the cumulative predictions:
- Ben Sca (Enercon E115 with 77.5 m or 92.4 m hub heights);
 - Edinbane (Enercon E70 with a 64 m hub height); and
 - Glen Ullinish (Nordex N133 with a 78 m hub height).
- 12.9.5 It should be noted that there is a proposal for Glen Ullinish 2 Wind Farm at the scoping stage for a redevelopment of the consented Glen Ullinish Wind Farm for a larger development which would replace the consented development. The cumulative assessment carried out here only takes into account the consented Glen Ullinish Wind Farm. It is likely that the submitted Glen Ullinish 2 Wind Farm layout would differ from the scoping layout and therefore, it is not appropriate to use scoping layout in this assessment. Nevertheless, it is anticipated that the Glen Ullinish 2 development would need to meet the limits set for the consented Glen Ullinish Wind Farm which have been taken into account in the cumulative noise impact assessment presented here, and conversely any cumulative assessment carried out for Glen Ullinish 2 Wind Farm would need to take into account the consented Ben Aketil Wind Farm. It is, therefore, considered that at this stage it is only appropriate to assess the consented Glen Ullinish Wind Farm.
- 12.9.6 There is a proposed wind farm development called Balmeanach Wind Farm, for which a planning application has not yet been submitted. It is located approximately between the Proposed Development and the existing Edinbane Wind Farm. As a planning application has not been submitted for this development, it is not possible to include it in the cumulative noise assessment; it would be the responsibility of the Balmeanach Wind Farm environmental impact assessment to take into account any wind farm planning applications that are submitted before it, such as the Proposed Development.
- 12.9.7 The assumed sound power levels and octave band data for the wind turbines associated with each development included in the cumulative assessment is presented at **Table 12.15** below. For Edinbane the same sound power level data as used for the existing Ben Aketil Wind Farm has been used (as presented at **Table 12.12** above), as the same turbine model is installed at both wind farms. The grid coordinates assumed for each site are included in **Technical Appendix 12.3**.

Table 12.15: Cumulative schemes wind turbine sound power levels dB L_{WA}

Turbine Type	Standardised 10 m height wind speed (m/s)									
	3	4	5	6	7	8	9	10	11	12
Enercon E115 (77.5 m hub)	86.5	94.0	99.1	103.2	105.1	106.0	106.7	106.8	106.8	106.8
Enercon E115 (92.4 m hub)	87.0	94.7	99.7	103.7	105.4	106.1	106.8	106.8	106.8	106.8
Nordex N133	90.6	96.0	101.5	105.7	107.9	108.0	108.0	108.0	108.0	108.0

12.9.8 The octave band levels assumed for each turbine type are shown at **Table 12.16** below.

Table 12.16: Cumulative schemes wind turbine octave band levels, dBA

Turbine Type	Octave band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Enercon E115 (Ben Sca)	88.4	94.1	97.3	99.8	101.0	101.2	96.0	80.3
Nordex N133 (Glen Ullinish)	89.8	96.8	100.6	101.5	101.9	100.7	96.4	87.2

12.9.9 The predicted cumulative noise levels are presented below for the residential properties identified at **Table 12.14** where predicted noise levels from the Proposed Development in isolation are above 28 dB L_{A90}. The results are presented assuming that all properties are downwind of all turbines in the vicinity and they are all operating at their maximum sound power levels (which include plus 2 dB to account for uncertainty). The full results are presented in **Technical Appendix 12.4**, which shows the relative contribution from each wind farm and variation of predicted noise level with wind speed.

Table 12.17: Cumulative noise prediction results dB L_{A90}

Receptor Location	Phase of development		
	Existing	Scenario 1	Scenario 2
Burnside 12 Upper Feorlig	34	31	35
11 Upper Feorlig	34	31	34
9 Upper Feorlig	33	31	34
Upperglen	35	34	35
12 Upper Feorlig	34	31	35

12.9.10 The results of the cumulative operational noise predictions indicate that operational noise levels are below the agreed 38 dB L_{A90} noise limit applicable to cumulative noise from all consented wind turbine developments.

12.9.11 As agreed with THC, an additional cumulative operational noise impact assessment has been undertaken which assumes that each consented development is operating at its consented noise limit at the nearest noise sensitive receptor location. The full results are shown in **Technical Appendix 12.5** with the summary provided at **Table 12.18** below.

Table 12.18: Cumulative noise prediction results for alternative assessment, dB L_{A90}

Receptor Location	Phase of development		
	Existing	Scenario 1	Scenario 2
Burnside 12 Upper Feorlig	34	32	35
11 Upper Feorlig	34	31	35
9 Upper Feorlig	34	31	34
Upperglen	36	35	36
12 Upper Feorlig	34	32	35

12.9.12 The results of the cumulative noise impact assessment, for both methods, and for both scenarios considered indicate that the agreed cumulative noise limit of 38 dB L_{A90} are met at all receptor locations and therefore, cumulative operational noise impacts are considered to be not significant.

12.10 References

British Standards Institute (BSI) (2009 + 2014), BS 5228 + A1, Code of Practice for Noise and Vibration Control on Construction and Open Sites.

Calculation of Road Traffic Noise (CRTN), Department of Transport, Welsh Office 1988
Department of Energy and Climate Change (2011), Report on DECC Research Contract 01.08.09.01/492A (Analysis), Analysis of How Noise Impacts are Considered in the Determination of Wind Farm Planning Applications.

Department of Energy and Climate Change (2016), Wind Turbine AM Review: Phase 1 & Phase 2 Reports. DECC.

Department of Trade and Industry (1996), ETSU-R-97, The Assessment and Rating of Noise from Wind Farms. ETSU/DTI

Department of Trade and Industry (1997), ETSU W/13/00392/REP, Low Frequency Noise and Vibrations Measurement at a Modern Wind Farm. ETSU/DTI.

Department of Trade and Industry (2000), ETSU W/13/00385/REP, A Critical Appraisal of Wind Farm Noise Propagation. ETSU/DTI

Department of Trade and Industry (2006), ETSU W/45/00656/00/00, The Measurement of Low Frequency Noise at 3 UK Windfarms. ETSU/DTI.

Institute of Acoustics (IOA) (2015), Discussion Document on "Methods for Rating Amplitude Modulation in Wind Turbine Noise". IOA

Institute of Acoustics (IOA) (2016), A Method for Rating Amplitude Modulation in Wind Turbine Noise - Version 1.

Institute of Acoustics (IOA) (2012), Discussion Document on "A Good Practice Guide to the Application of ETSU-R-97 for Wind Turbine Noise Assessment". IOA

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

International Organization for Standardization (ISO) (1992), ISO 9613-1, Acoustics - Attenuation of sound during propagation outdoors, Part 1: Method of calculation of the attenuation of sound by atmospheric absorption.

International Organization for Standardization (ISO) (1996), ISO 9613-2, Acoustics - Attenuation of Sound During Propagation Outdoors, Part 2: General Method of Calculation.

Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg (2016), Low-frequency noise incl. infrasound from wind turbines and other sources. LUBW

Renewable UK (RUK) (2013), Template Planning Condition on Amplitude Modulation: Noise Guidance Notes.

Renewable UK (RUK) (2013), The Development of a Penalty Scheme for Amplitude Modulated Wind Turbine Noise: Description and Justification.

RenewableUK (RUK) (2013), Wind Turbine Amplitude Modulation: Research to Improve Understanding as to its Cause and Effect.

Scottish Government (2011), PAN1/2011. Planning and Noise.

Scottish Government (2014), Onshore Wind Turbines.

Styles, P., Stimpson, I., Toon, S., England, R. and Wright, M. . (2005), Microseismic and Infrasound Monitoring of Low Frequency Noise and Vibrations from Wind Farms. Keele University.

13 SOCIO-ECONOMICS, LAND USE, RECREATION AND TOURISM

13.1 Introduction

13.1.1 This chapter assesses the socio-economic, land use, recreation and tourism effects potentially arising from the Proposed Development, during construction, operation and decommissioning.

13.1.2 This chapter is supported by **Figure 13.1: Socio-Economic Features** in **Volume 2**.

13.2 Statutory and planning context

13.2.1 There is no specific legislation relevant to socio-economics, land use, recreation or tourism.

Planning context

13.2.2 Scotland's renewable energy and climate change targets, energy policies and planning policies are all material considerations when determining a S36 Application. Generally, the current policy context is supportive of renewable energy, and repowering in particular, that achieves a balance between environmental considerations and contributing to the Net-Zero journey, including a just transition. The suitability of the Proposed Development, including consideration of socio-economic, land use, recreation and tourism factors, in relation to local and national policies, has been considered in a standalone Planning Statement submitted with the S36 Application. This Section identifies the planning policy documents which have been used to inform the methodology and assessment of significance of effect.

13.2.3 National Planning Framework 4 was approved on 11th January 2023, this supersedes NPF3 (2014) and Scottish Planning Policy (2014) (SPP). The Energy policy within NPF4 states that '*Development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities.*'

13.2.4 In addition, project design and mitigation should consider 'public access, including impact on long distance walking and cycling routes and scenic routes'.

13.2.5 Previously, SPP included a presumption in favour of development that is economically, environmentally and socially sustainable. This means that decisions and policies should be guided by certain principles including, among others, giving due weight to net economic benefit (Paragraph 29). Paragraph 169 of SPP also sets out a number of criteria to consider in relation to energy infrastructure, including:

- net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities;
- public access, including impact on long distance walking and cycling routes and scenic routes identified in the NPF; and
- impacts on tourism and recreation.

- 13.2.6 NPF3 required development to have regard to the importance of Scotland's landscapes on quality of life, national identity and the visitor economy.
- 13.2.7 The following local and national policy documents have been considered in the assessment of effects and have been referenced where applicable in the sections below:
- National:
 - Onshore Wind Policy Statement 2022 (OWPS);
 - Tourism Scotland 2020;
 - Scotland Outlook 2030;
 - Scotland's National Strategy for Economic Transformation;
 - Scotland's Economic Action Plan 2019-20; and
 - Scottish Energy Strategy.
 - Local:
 - The Highland Council (2019). The West Highland and Islands Local Development Plan (WestPlan); and
 - Highlands and Islands Enterprise (2019), 2019-2022 Strategy.
- 13.2.8 The Highland-wide Local Development Plan (LDP) was adopted by the Highland Council in 2012 and relevant 'policy criteria' are taken forward in the LDP's Policy 67 Renewable Energy Developments and supporting supplementary guidance Onshore Wind Energy Supplementary Guidance (2017). In addition to the requirements outlined in the NPF documents described above, the guidance states that wind energy proposals within the Highlands should:
- research into the potential effects of wind farms on tourism and recreation;
 - illustrate the potential for socio-economic benefits to be derived from development proposals. A key aspect of this will be engaging with local communities to better understand local needs and issues;
 - identify the potential for effects on industries for which Highland's landscape is important - for example tourism and recreation; and
 - highlight the potential for secondary effects for tourism and recreation, such as a change in land use that causes adverse effects, for example, a change from forestry to a wind farm, or where there are potential benefits like improved public access in the area. It is important to consider the impact of proposed wind energy development not only on existing land uses, but also those permitted or which are included as specific proposals in the LDP.

13.3 Consultation undertaken

- 13.3.1 Consultation with stakeholders has been conducted by the request for a formal Scoping Opinion. The Scoping Opinion and additional responses relevant to socio-economic, land use, recreation and tourism issues, is summarised by **Table 13.1**. The table also shows where Scoping responses have been addressed in this chapter.

Table 13.1: Scoping responses regarding socio-economic, land use, recreation and tourism considerations

Consultee	Scoping consultation response	Section of chapter
The Highland	THC considers that socio-economics should have its own chapter in the EIA; should include	Direct impacts on the Northern Site Access

Consultee	Scoping consultation response	Section of chapter
Council (THC)	<p>relevant economic information connected with the project, including the potential number of jobs, and economic activity associated with the procurement, construction, operation and decommissioning of the development.</p> <p>THC would expect to see how each known access route that was likely to be affected by the project and how this would be dealt with during construction and operation. Considering:</p> <ul style="list-style-type: none"> from the North, the existing access road joining the A850 near Edinbane is much used by walkers, runners and cyclists and is recorded on our database as a Wider Network Access path; and from the South the link into Upper Feorlig is also well used and forms part of a popular cycling loop alongside the Edinbane Windfarm linking into Glen Vic Askill. <p>Given the scale of the Proposed Development and cumulative effects of other wind farms, the Access Team want to see access cycle paths improvements linking into other projects for the wider community.</p> <p>THC agrees viewpoint selection with additional suggested viewpoint from the Uig to Lochmaddy Ferry route. Requested THC visuals within an A3 binder.</p> <p>Impact of recreational routes should be considered – including impact on North Coast 500 and Uig to Lochmaddy Ferry.</p>	<p>have been considered in Section 13.6; however, given the screening effect of the forestry, indirect visual impacts on recreational users using the existing Northern Site Access have not been considered. Direct impacts on access on the link into Upper Feorlig have been considered in Section 13.6, as well as indirect visual impacts on the cycling loop as a whole have been considered.</p> <p>Access improvements relating to other projects would be linked to the community benefit fund.</p> <p>The Uig to Lochmaddy Ferry has been considered as recreational receptor and is considered in paragraph 13.5.30 and paragraph 6.7.85, in Chapter 6: Landscape and Visual Assessment.</p>
NatureScot	<p>The forest north of the site is well used for informal recreation by local people. In addition, walkers visit the trig point on the summit of Ben Aketil and mountain bikers use both the forest road and the crofters track to the south of the site. Impacts on these users should be considered for all phases of the project and mitigation proposed to minimise disruption during the construction phase.</p>	<p>Direct impacts on access within the forestry to the north have been considered in Chapter 16: Other Issues; however, given the screening effect of the forestry, indirect visual impacts on recreational users of the forest have not been considered.</p> <p>Direct impacts on access and indirect visual impacts along the forest road and crofters track to the</p>

Consultee	Scoping consultation response	Section of chapter
		<p>south have been considered in Section 13.6 of this assessment.</p> <p>Indirect visual impacts on the summit of Ben Aketil have also been considered in Chapter 6: Landscape and Visual Impact Assessment.</p>

13.4 Scope and methodology

13.4.1 The assessment has been informed by established best practice, using Government and industry reports, as well as professional experience and knowledge. In particular, predicted impacts refer to guidance provided within 'A Handbook on Environmental Impact Assessment', published by NatureScot in 2018 (version 5)³⁵. The chapter also draws on technical assessments relevant to the Proposed Development within this EIAR.

Guidance

13.4.2 The following documents have been considered in the assessment:

- BiGGAR Economics (2017), Wind Farms and Tourism Trends in Scotland;
- BiGGAR Economics (2021), Wind Farms and Tourism Trends in Scotland: Evidence from 44 Wind Farms;
- BVG Associates (2017), Economic benefits from onshore wind farms;
- ClimateXChange (2012), The Impact of Wind Farms on Scottish Tourism;
- Department for Business, Energy & Industrial Strategy (2019), BEIS Public Attitudes Tracker;
- Glasgow Caledonian University/Moffat Centre (2008), Economic impacts of wind farms on Scottish tourism;
- Highlands and Islands Enterprise (2019), 2019-2022 Strategy;
- Highlands and Islands Area Profiles 2020 Lochaber, Skye And Wester Ross (2020);
- Institute of Environmental Management and Assessment (IEMA) (2011), The State of Environmental Impact Assessment in the UK;
- NatureScot (2018), Environmental Impact Assessment Handbook V5;
- RenewableUK (2015), Onshore Wind: Economic Impacts in 2014;
- RenewableUK (2021), The Onshore Wind Energy Prospectus;
- Scottish Government (2016), Draft Advice on Net Economic Benefit and Planning;
- Scottish Government (2020), Towards a Robust, Resilient Wellbeing Economy for Scotland: Report of the Advisory Group on Economic Recovery;

³⁵ NatureScot (2018), A Handbook on Environmental Impact Assessment.

- Scottish Renewables, Scottish National Heritage, SEPA, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science and Association of Environmental Clerks of Works (2019), Good Practice During Windfarm Construction;
- Visit Scotland (2020), Key Facts: Tourism in Scotland 2019; and
- Zero Waste Scotland (2021), The future of onshore wind decommissioning in Scotland.

Study area

- 13.4.3 The socio-economic, land use, recreation and tourism effects have been assessed across local, regional and national scales to identify which areas are most significantly impacted by the Proposed Development. Although the Proposed Development would be located within the electoral ward of Eilean a' Cheò (i.e., the isle of Skye), in order to make a robust assessment, the local study area is Eilean a' Cheò, as the smallest area for which reliable employment and economic data is available. The Highlands is the regional study area and the national study area comprises Scotland as a whole.
- 13.4.4 The assessment of tourism impacts focuses on local effects, therefore, a 15 km study area from the Proposed Development has been adopted.
- 13.4.5 Direct recreational effects have only been assessed for receptors within the Site, while recreational impacts occurring outside the Site are deemed indirect and are considered within a 5 km study area from the Proposed Development.
- 13.4.6 The study area for land use covers all the land taken by the Proposed Development, either temporarily during construction, or permanently during operation.

Baseline determination

- 13.4.7 Baseline conditions have been determined by desk-based surveying that use publicly available statistics and information, which are referenced fully in **Section 13.11**. In addition, relevant information has been gathered from other technical chapters within this EIAR; notably, data has been gathered from landscape and visual impact surveys, as well as assessments undertaken for other wind farm developments deemed similar in location and scope.
- 13.4.8 ZTV mapping has been used to identify tourism and recreational receptors potentially subject to indirect visual impacts within the respective study areas. ZTV mapping indicates areas of potential visibility and for the purposes of this assessment is based on a surface model including trees and buildings as visual barriers in order to provide a more realistic indication of potential visibility. There is some commercial forestry within the study area and some areas may be felled during the operational phase of the Proposed Development. Over time, this would result in localised variation in potential visibility although it is unlikely that long-term land use of forested areas would change. Where areas of forestry are felled, they would be restocked and new trees would grow. As such, while there would be temporary localised variations, the overall pattern of potential visibility is unlikely to fundamentally change.

Scope of the assessment

Effects scoped into the assessment

- 13.4.9 The assessment considers the potential net employment and economic effects (direct, indirect and induced), tourism, recreation, and land use effects during construction and operation of the Proposed Development.
- 13.4.10 Initiatives such as community benefit funding and community ownership do not form part of the formal appraisal process within the planning system. However, these shall also be considered within the assessment to present a fuller picture of the economic and social impacts that the Proposed Development could have.
- 13.4.11 Furthermore, the assessment evaluates cumulative effects in the context of the existing Ben Aketil Wind Farm and other local developments (within 15 km from the Site).

Effects scoped out of the assessment

Decommissioning effects

- 13.4.12 As decommissioning is likely to constitute a reversal of the activities undertaken during the construction phase, it is considered that the likely effects on land use, recreation and tourism would be the same.
- 13.4.13 In relation to employment and economic effects, while there have been recent studies, including Zero Waste Scotland's (2021) 'The future of onshore wind decommissioning in Scotland', there is still an absence of data regarding the likely decommissioning expenditure involved.

Wider economic impacts

- 13.4.14 Wider economic benefits have not been considered in the assessment, as they are more speculative and reliant upon local businesses responding to the opportunities available.
- 13.4.15 Furthermore, regarding the potential benefits to the supply chain, the Proposed Development provides opportunities for the involvement of suppliers from the Highlands and Islands, and wider Scotland. The range of activities that suppliers can be involved in include; research and development, design, project management, civil engineering, component fabrication and/or manufacture, installation and maintenance. There is expertise in all of these areas in the wider region, although a full wind energy supply chain covering all aspects of wind turbine component manufacture has not yet been developed within the region or indeed within Scotland as a whole. In Scotland, there are currently several wind turbine manufacturing plants in Fife, and in the Highlands.
- 13.4.16 A key contextual consideration has been, with an increasing number of wind farm schemes either operational, under development or having gained consent in Scotland, the commercial viability, and job prospects amongst Scottish supply chain firms has improved. Cluster benefits in the industry increase where firms are supported by the spending of other firms within the renewables sector. The net effect is to increase business and employment opportunities within Scotland's renewable energy sector, boosting the performance of regional and national economies.
- 13.4.17 In addition, during the construction process, there would be opportunities for those employed to develop skills that would be of benefit to the local economy and local

businesses in the longer term. Further, employment generated through the Proposed Development would contribute to diversifying the local economy and help support the retention in the area of the working age population.

Effect on community services

- 13.4.18 It is not expected that construction workers from outside Eilean a' Cheò would have a significant effect on the demand for housing, health or educational services. Once constructed, only a small workforce would be involved in the operation and maintenance of the Proposed Development. Therefore, effects on demand for such community services during construction have been scoped out.

Events

- 13.4.19 Neither the turbine area, nor the area within the Site, are used to host any events, and so direct impacts on events has been scoped out of this assessment. No events were identified on the Visit Scotland and Scotland information websites within the 15 km tourism study area; therefore, no indirect effects on events are predicted.

Approach to the assessment of effects

Economic and employment effects

- 13.4.20 To evaluate the economic impact from project expenditure during construction and operation, an input-output model has been used to calculate the direct, indirect and induced impacts of localised economic activity on the overall economy. The model generates the Gross Value Added (GVA) to the economy and the years of employment supported within the economy as economic indicators of impact. Additionality factors, including leakages and displacement, have been considered to provide net GVA and years of employment. The sum of direct, indirect and induced impacts equals the total GVA and employment supported. This is consistent with Scottish Government advice on net economic benefit³⁶.
- 13.4.21 Direct, indirect and induced effects are defined as follows:
- **direct:** the employment, and other economic outputs, directly attributable to the delivery of the Proposed Development. Direct employment includes any new jobs created to manage and supervise the construction and operational phases of the Proposed Development that are filled by employees of the Applicant, or the appointed contractor (or subcontracted employees);
 - **indirect:** the employment and other outputs created in other companies and organisations that provide services to the Proposed Development (i.e., procurement and other supply chain effects); and
 - **induced:** additional jobs and other economic outputs created in the wider economy as a result of the spending of employee incomes on locally produced goods and services (i.e., personal vehicle maintenance, food and drink etc.) and other derived multiplier effects occurring from direct and indirect effects of the Proposed Development.
- 13.4.22 The job years and GVA values calculated in **Table 13.17** represent the gross employment and economic impacts; nevertheless, to understand the potential net impacts, a number

³⁶ Scottish Government (2016), Net Economic Benefit and Planning.

of ‘additionality’ concepts, including leakages and displacement, must be considered. Leakage is the proportion of project outcomes that benefit individuals or organisations located beyond the relevant area of impact. Displacement is an estimate of the economic activity, as a result of the Proposed Development, that would be diverted from other businesses in the Highlands.

Land use effects

- 13.4.23 Impacts relating to effects on land use are largely assessed using simple area analysis to gauge the magnitude of any resource loss as a consequence of the Proposed Development.

Recreation effects

- 13.4.24 Recreation effects have been assessed qualitatively with reference to evidence from research and comparable wind farms and using professional experience and judgment. There is the potential for indirect effects on recreational amenity during the operational phase. The distinction between a visual effect and a recreational amenity effect should be noted. Recreational effects are described as effects that influence the recreational value (e.g. use or enjoyment of an asset such as a walking route). On the other hand, visual effects associated with the Proposed Development can occur at recreation receptor locations, when people are looking towards the Proposed Development and from locations where clear views of the turbines are available. Although visual effects can influence recreational amenity, they only contribute to part of the recreational experience. Therefore, the magnitude of impact of any visual effect reported in the other assessments in **Chapter 6: Landscape and Visual Assessment** and **Chapter 10: Cultural Heritage and Archaeology** has been modified using professional judgment to reflect the level of importance the visual experience plays in the overall recreational amenity of that attraction. As explained in **Chapter 6: Landscape and Visual Assessment**, with regard to the cumulative impacts, the impacts with the future baseline (existing and consented developments were include in the main assessment) and are, therefore, considered in our main assessment of indirect impacts on recreational amenity.

Tourism effects

- 13.4.25 Tourism effects have been assessed qualitatively, with reference to evidence from research and comparable wind farms and using professional experience and judgment.
- 13.4.26 The assessment of tourism effects has included potential impacts on the tourism economy. Businesses reliant on tourism, such as restaurants or accommodation providers, are considered part of the tourism economy and have not been assessed separately. To understand the potential impact on the tourism economy, a literature review has been undertaken.
- 13.4.27 Additionally, this assessment considers whether specific effects on individual tourism assets resulting from the Proposed Development could enable changes in the behaviour of tourists that might lead to effects on the tourism economy. As explained in **Chapter 6: Landscape and Visual Assessment**, with regard to the cumulative impacts, the impacts with the future baseline (existing and consented developments were include in the main assessment) and are therefore considered in our main assessment of indirect impacts on tourism amenity.

Effects evaluation methodology

- 13.4.28 The significance of the socio-economic, land use, recreation and tourism effects resulting from the construction and/or operation of the Proposed Development have been assessed by combining the magnitude of impact with the sensitivity of receptor.

Sensitivity of receptor

- 13.4.29 Although no published standards define receptor sensitivity relating to socio-economic, land use, recreation and tourism assessments; as a general standard, the sensitivity of each receptor, or receptor group, is based on its importance or scale, and ability of the baseline to absorb or be influenced by the identified effects. For example, a receptor (such as a public footpath or a supply chain business) is considered less sensitive when there are alternatives with capacity within the study area. In assigning receptor sensitivity, consideration has been given to the following:
- the importance of the receptor e.g. local, regional and national;
 - the availability of comparable alternatives;
 - the ease at which the resource could be replaced;
 - the capacity of the resource to accommodate the identified impacts over a period of time; and
 - the level of usage and nature of users (e.g. sensitive groups such as people with disabilities).
- 13.4.30 Based upon professional judgement and experience on other large-scale projects, four levels of sensitivity are used and defined in **Table 13.2**: high; medium; low; and, negligible.
- 13.4.31 In the case of socio-economic, land use, recreation and tourism, the sensitivity of a receptor is often subjective. Different receptors have differing sensitivities, dependent on factors such as the economic profile of the local area, the perception of the type of development and public attitudes towards the potential benefits of a development. Therefore, this assessment is based on a worst-case assumption that there is a negative perception of the Proposed Development.

Table 13.2: Socio-economic, land use, recreation and tourism sensitivity criteria

Sensitivity	Description
High	<p>The receptor:</p> <ul style="list-style-type: none"> • has little or no capacity to absorb change without fundamentally altering its present character; or • is of high socio-economic, land use, recreational, or tourism value; or • is of national or international importance; or • is accorded priority in national policy; or • has no alternatives with available capacity within its study area; or • is a destination in its own right (as regards tourism and visitor attractions).

Sensitivity	Description
Medium	<p>The receptor:</p> <ul style="list-style-type: none"> • has moderate capacity to absorb change without fundamentally altering its present character; or • has a moderate socio-economic, land use, recreational or tourism value; or • is of regional importance; or • is accorded priority in local policy; or • has some alternatives with available capacity within its study area; or • is a destination for people already visiting the area (as regards tourism and visitor attractions); or • forms a cluster of low sensitivity receptors.
Low	<p>The receptor:</p> <ul style="list-style-type: none"> • is tolerant of change without detriment to its character; or • is of low socio-economic, land use, recreational or tourism value; or • is of local importance; or • is accorded low priority in policy; or • has a choice of alternatives with available capacity within its study area; or • is an incidental destination for people already visiting the area (as regards tourism and visitor attractions).
Negligible	<p>The receptor is resistant to change and is of low socio-economic, land use, recreational or tourism value; or there is a wide choice of alternatives with available capacity within its study area.</p>

Magnitude of impact

13.4.32 There are no published standards defining thresholds of impact magnitude for socio-economic, land use, recreation or tourism impacts; however, to clearly identify significant effects, specific and targeted criteria for defining the magnitude of impacts have been developed, based on experience of other similar projects. Therefore, the following four levels of impact magnitude have been adopted using professional judgement: high; medium; low and negligible. These impacts can be beneficial or adverse. Criteria for each of these levels of impact magnitude for each receptor group are set out in **Table 13.3**.

Table 13.3: Magnitude of impact criteria

Receptor Group	High	Medium	Low	Negligible
Economy	An impact that would dominate over baseline economic conditions by >10%.	An impact that would be expected to result in a moderate change to baseline economic	An impact that would be expected to result in a perceptible difference from baseline economic	An impact that would not be expected to result in a measurable variation from baseline

Receptor Group	High	Medium	Low	Negligible
		conditions by >5%.	conditions by >0.5%.	economic conditions.
Employment	An impact that would dominate over baseline labour market conditions and/or would affect a large proportion (>10%) of the existing resident workforce.	An impact that would be expected to result in a moderate change to baseline labour market conditions and/or would affect a moderate proportion (>5%) of the existing resident workforce.	An impact that would be expected to result in a perceptible difference from baseline labour market conditions and/or would affect a small proportion (>0.5%) of the existing resident workforce.	An impact that would not be expected to result in a measurable variation from baseline labour market conditions.
Tourism and recreational economy	An impact that would dominate over baseline tourism and visitor economy conditions.	An impact that would be expected to result in a moderate change to baseline tourism and visitor economy conditions.	An impact that would be expected to result in a perceptible difference to baseline tourism and visitor economy conditions.	An impact that would not be expected to result in a measurable variation from baseline tourism and visitor economy conditions.
Tourism and recreational receptors	An impact that would be expected to cause a major restriction of access to or availability of tourism and visitor assets in the study area or would result in a major change to existing patterns of use.	An impact that would be expected to have a moderate restriction of access to or availability of tourism and visitor assets in the study area or would result in a moderate change to existing patterns of use.	An impact that would be expected to have a small restriction of access to or availability of tourism and visitor assets in the study area or would result in a small change to existing patterns of use.	An impact that would be unlikely to result in a noticeable difference to tourism and visitor assets in the study area.
Land use	An impact that would lead to a major restriction on the operation of a receptor, e.g. forestry business, or complete closure of a receptor.	An impact that would lead to a moderate to major restriction on the operation of the receptor.	An impact that would lead to a minor restriction on the operation of the receptor.	An impact that would lead to a negligible restriction on the use of the receptor.

Receptor Group	High	Medium	Low	Negligible
Cumulative	An impact that would lead to a major change to baseline conditions through interactions with other projects.	An impact that would lead to a moderate change to baseline conditions through interactions with other projects.	An impact that would lead to a minor change to baseline conditions through interactions with other projects.	An impact that would lead to a negligible change to baseline conditions through interactions with other projects.

Significance of Effects

- 13.4.33 The significance of effects matrix presented in **Table 13.4** illustrates how magnitude of impact and sensitivity of receptor are combined to determine the significance of effects (classified as major, moderate, minor or negligible), derived from professional judgement.

Table 13.4: Significance of effect matrix

Sensitivity of Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

- 13.4.34 Effects may be positive (beneficial) or negative (adverse) and this is specified where applicable. When an effect is classified as major, it is considered to represent a 'significant effect'. When an effect is classified as moderate, this can also be considered to represent a 'significant effect'. However, this should be subject to professional judgement and interpretation, particularly where the sensitivity or impact magnitude levels are not clear, borders between categories, or is an intermittent impact. In addition, significant effects need not be unacceptable, nor irreversible.

Additional mitigation

- 13.4.35 The assessment accounts for any embedded mitigation included in the design of the Proposed Development and good practice measures in regards to traffic management, control of noise and dust, signage and provisions for maintaining access for walkers. Any additional mitigation measures that are required to avoid, prevent, reduce or, if possible, offset any identified significant adverse are set out and considered prior to assessing residual effects.

Assessment difficulties and uncertainties

- 13.4.36 Data has been collated from published sources and comparable experience of similar developments; however, given that repowering projects are limited so far there is not a full understanding of the economic impacts; therefore, there is insufficient data relating to likely expenditure, contract types and contract spend across different study areas. In

order to estimate the construction phase socio-economic impacts calculations relating to gross and net economic and employment benefits have been based on just the expenditure associated with the installation of the new turbines. This is a conservative approach as there would be additional expenditure associated with the removal of existing turbines.

- 13.4.37 The Highlands and Islands Enterprise Statistics for Lochaber, Skye and Wester Ross³⁷ has been used as the most recent and accurate comparison of the economic baselines across the different study areas. While the statistics were published in November 2019, considering the negative impact the Covid-19 Pandemic had on the economy and employment post March-2020, it could be considered that pre-pandemic figures are more representative of a typical economic baseline.
- 13.4.38 The Applicant has endeavoured to ensure that key tourism and recreation facilities in the area are identified; nevertheless, it is possible that a number of small attractions may not have been identified through the data collection process. To mitigate this, the desk-based assessment of tourism receptors has utilised several data sources, as well as evaluating receptors which have been identified through public consultation and Scoping.

13.5 Existing environment

Local economic and employment baseline

Population

- 13.5.1 In 2021, the total population for Eilean a' Cheò was 10,697, the total population for the Highlands was 238,060, and the total population for Scotland was 5,479,900 (National Records of Scotland, 2022). The total population for each area has been disaggregated into different age groups, with ages 16-64 considered those of working age.

Table 13.5: Population estimates 2021*

Age Groups	Eilean a' Cheò		Highlands		Scotland	
Aged 0-15	1,461	13.7%	38,130	16%	911,522	16.6%
Aged 16-64	6,411	59.9%	144,706	60.8%	3,494,517	63.8%
Aged 65+	2,825	26.4%	55,224	23.2%	1,073,861	19.6%
Total Population	10,697	100%	238,060	100%	5,479,900	100%

*Totals may not add up, due to rounding.

Source: National Records of Scotland (2022) Mid-2021 Population Estimates Scotland.

- 13.5.2 The population of THC area is expected to decrease by 1.0% to 233,250 over the period of 2018-2043, compared to growth in Scotland of 2.5% to 5,574,819 (National Records of Scotland, 2020). The Highland population is also expected to have a higher proportion of the population aged over 65 (29.8%) compared to Scotland (24.9%). The share of the

³⁷ Highlands and Islands Enterprise (2019), Lochaber, Skye and Wester Ross Key Statistics, Available at: <https://www.hie.co.uk/media/6368/lochaber-plus-skye-plus-and-plus-wester-plus-ross-plus-key-plus-statistics-plus-2019-1.pdf> (accessed January).

population of working age is expected to decrease to 56.0% in Highland, compared to 60.3% in Scotland.

Table 13.6: Highland and Scotland population projections: 2018 - 2043*

Age Groups	Highlands		Scotland	
	% of 2043 population	% change in population	% of 2043 population	% change in population
Aged 0-15	14.3%	-15.4%	14.8%	-10.5%
Aged 16-64	56%	-5.4%	60.3%	-0.2%
Aged 65+	64.2%	+22.1%	24.9%	+23.2%
Total Population	233,250	100%	5,574,819	100%

**Totals may not add up, due to rounding.*

- 13.5.3 Source: National Records of Scotland (2020), Sub-National Population Projections (2018-2043).
- 13.5.4 Data on population projections is not available at the level of the Eilean a' Cheò ward. However, projections commissioned by THC suggest that different areas of the Highlands will see different population changes over time. The population in Skye and Lochalsh is expected to increase by 11.8% (**Table 13.7**).

Table 13.7: Skye and Lochalsh population projections: 2016 – 2041*

Age Groups	Skye and Lochalsh			
	2016		2041	
Aged 0-15	1,994	15.2%	2,046	13.9%
Aged 16-64	8,029	61.1%	7,393	50.4%
Aged 65+	3,113	23.7%	5,091	34.7%
Total Population	13,136	100%	14,667	100%

**Totals may not add up, due to rounding.*

- 13.5.5 Source: NHS Highland (2019), Skye and Lochalsh: Population and Demography.

Economic activity

- 13.5.6 **Table 13.8** illustrates the proportion of the population who are economically active, rates for employment and unemployment, and gross weekly earnings. Data on economic activity is not available at the level of the Eilean a' Cheò ward; however, the economic activity for the Lochaber, Skye and Wester Ross reported in the table gives an indication of local economic activity.

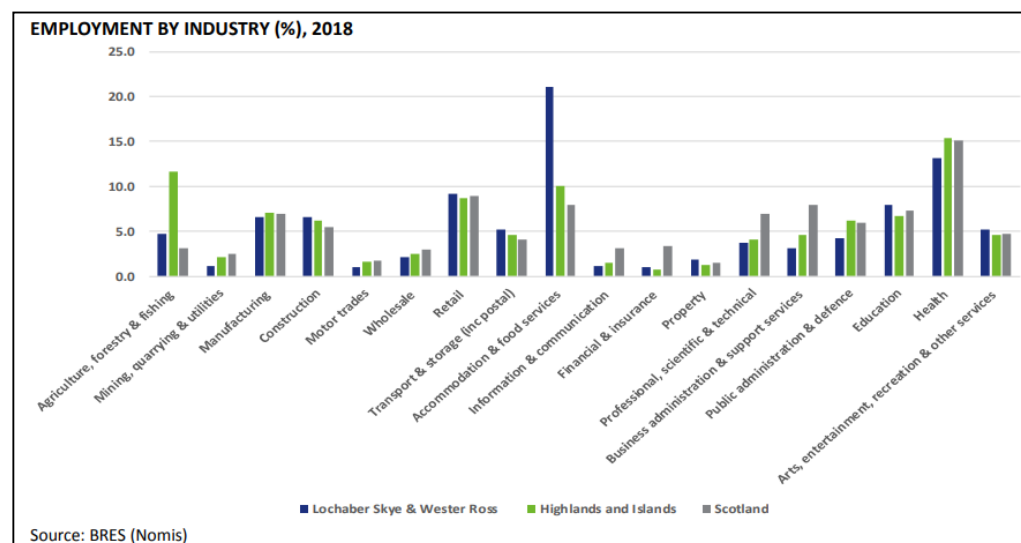
Table 13.8: Economic activity and unemployment (2019)

	Lochaber, Skye & Wester Ross	Highland	Scotland
Economic Activity Rate (Aged 16-64)	83.2%	80.9%	77.9%
Unemployment Rate (Aged 16-64)	1.6%	2.3%	3.2%

Source: HIE's Lochaber, Skye and Wester Ross Key Statistics (2019)

- 13.5.7 As indicated by the Highlands and Islands Enterprise's Lochaber, Skye and Wester Ross Key Statistics³⁸, compared with the Highlands and Islands and Scotland, Skye had a higher share of employment in construction; retail; transport and storage; accommodation and food services; education and arts, entertainment, recreation and other services in 2018. Employment in the Accommodation and food services sector in Lochaber, Skye and Wester Ross (21.1%) was more than double that of the Highlands and Islands (10.0%) and Scotland (7.9%), highlighting the importance of the tourism sector in the area.

Table 13.9: Employment by sector for 2018



Supply chain

- 13.5.8 Recent baseline data relating to the local supply chain is unavailable; however, HIE (2019) noted that Lochaber, Skye and Wester Ross had a higher share of employment by occupation in professional; administrative and secretarial and skilled trade occupations compared to the Highlands and Islands and Scotland. For the Highlands and Scotland, current employment by occupational group is illustrated by **Table 13.10**, which gives an indication of the wider supply chain. Of particular relevance to the development,

³⁸ HIE (2019), Lochaber, Skye and Wester Ross Area Profile 2020. Available at: <https://www.hie.co.uk/media/10592/lochaber-skye-and-wester-ross-area-profile-2020.pdf> (accessed January 2023).

construction and operation of the Proposed Development are: professional occupations (19.7%), which is lower than the Scottish average (25.3%); associate professional and technical (14.0%), which is higher than the Scottish average (14.8%); skilled trades occupations (11.1%), which is lower than the Scottish average (8.7%); and process plant and machine operatives (7.4%), which is also higher than the Scottish average (6.0%).

Table 13.10: Employment by occupational group (2021)

Sector	Highland (Numbers)	Highland (%)	Scotland (%)
Managers, Directors and Senior Officials	8,000	7.4	8.2
Professional Occupations	21,400	19.7	25.3
Associate Professional & Technical	15,200	14.0	14.8
Administrative & Secretarial	10,200	9.4	9.8
Skilled Trades Occupations	12,100	11.1	8.7
Caring, Leisure and Other Service Occupations	9,900	9.1	8.4
Sales And Customer Service Occupations	10,600	9.8	8.6
Process Plant & Machine Operatives	8,000	7.4	6.0
Elementary Occupations	13,100	12.1	10.0

13.5.9 **Table 13.11** also provides an indication of the wider supply chain within the regional and national study areas, showing the size of businesses within the Highlands. There is a marginally greater number of micro businesses (88.8%) in the Highlands than in Scotland (87.8%). There is a marginally lower number of small, medium and large business (9.8%, 1.2% and 0.2% respectively) than in Scotland (10.2%, 1.6% and 0.4% respectively).

Table 13.11: Business counts

Enterprises	Highland (Numbers)	Highland (%)	Scotland (Numbers)	Scotland (%)
Micro	9,590	88.8	152470	87.8
Small	1,060	9.8	17775	10.2
Medium	130	1.2	2730	1.6
Large	25	0.2	675	0.4

Future baseline

13.5.10 The Scottish Government's Onshore Wind Policy Statement (2022)³⁹ identifies that Scotland has a well-established energy supply chain, with onshore wind supporting over

³⁹ Scottish Government (2022), Onshore Wind Policy Statement.

1900 FTE Scottish jobs (Figures from 2019). The Policy Statement also emphasises the need to develop a skilled workforce (section 5.1), which means:

- 13.5.11 'ensuring that Scotland has the skills needed to drive economic transformation by embedding access to entrepreneurial learning in schools and colleges focusing on the transition to Net-Zero, the digital revolution, and lifelong training...The strategy will also help ensure new and current businesses are supported in investing in innovative ideas that could lead to new industries and quality jobs across the country.'
- 13.5.12 The Policy Statement indicates that national and local supply chain capacity would improve irrespective of the Proposed Development, which would increase the likelihood that labour and materials could be supplied for the Proposed Development within the study areas.

Study area sensitivities

- 13.5.13 It is considered that the local and regional study areas are of moderate socio-economic value so are considered to have **Medium** (Regional) sensitivity. The national study area is considered to have high socio-economic value so is considered to have **High** (National) sensitivity.

Community benefit

- 13.5.14 The existing community benefit arrangement between the Applicant and the local community has paid out £752,211.50 since 2007. This includes funding from both the existing turbines, operational in 2007, and the extension, operational in 2010. These funds have been used to support numerous local initiatives, including initiatives such as:
- an ambulance response vehicle;
 - a new floor in Dunvegan Community Hall sports hall;
 - a new heating system in Dunvegan Community Hall;
 - a community mini bus;
 - improvements to the war memorial;
 - Cullen FM radio transmitter repairs;
 - chrome books for Dunvegan Primary School; and
 - installation of a moorings pontoon, bridge, plinth and access path on Loch Dunvegan.
- 13.5.15 In terms of cumulative community benefit funding, an estimate has been calculated based on the values provided in planning application documents, or by multiplying the installed capacity by the industry standard amount per MW at time of consent for all the cumulative schemes. In total, it is estimated that the current community benefit fund, excluding the existing Ben Aketil Wind Farm and extension, would be £442,200.
- 13.5.16 The local communities are considered to be of local importance and, therefore, **Low** sensitivity.

Recreation and tourism

Tourism economy

- 13.5.17 Consultation of the data published by the VisitScotland Key Facts on Tourism in Scotland 2019 Report⁴⁰, indicated that the total spend of visitors from the UK to Scotland was £3.20 bn. In 2019, the number of trips made by overseas visitors increased by 8% from 2018, to 13.81 million trips. In 2019, the total spend of overseas visitors was £2.54 bn; however, the number of trips made by overseas visitors declined by 7% from the previous year to 3.46 million trips.
- 13.5.18 A year-long study into the impact of tourism on Eilean a' Cheò and within the wider supply chain was conducted by the Moffat Centre at Glasgow Caledonian University in 2019. The study found that in 2019, approximately 650,000 visitors travelled to Eilean a' Cheò and the Isle of Raasay, 72.7% of which came from overseas.
- 13.5.19 Tourism to Eilean a' Cheò and Raasay generated around £260 million of economic output and contributed £140m in GVA to the Scottish economy and provided employment for 2,849 full time jobs.

Attractions

- 13.5.20 Local tourism attractions have been identified using a 15 km tourism study area from the Proposed Development and the ZTV, as shown in **Figure 13.1**. 31 attractions (as stated on the VisitScotland and TripAdvisor websites) are likely to have visibility of at least one turbine. The attractions are summarised below in **Table 13.12**.

Table 13.12: Overview of attractions in the tourism study area with theoretical visibility of at least one turbine (VisitScotland and TripAdvisor)

Type of Attraction	Number of Attractions
Tour/Viewpoint	4
Historical Site	5
Sport and Leisure	8
Art Galleries	3
Visitor Centre/Gift Shop	4
Museum	7

- 13.5.21 Attractions relating to sport and leisure, art galleries, visitor centres/gift shops and museums have been discounted as the main features of these attractions, which provide the majority of their tourism amenity value, relate to indoor experiences or activities centred on the immediate environment; therefore, they could not be substantially visually impacted by the Proposed Development in a way that could cause a significant effect.
- 13.5.22 Attractions relating to tours/viewpoints and historical sites could be visually impacted by the Proposed Development. The findings of **Chapter 10: Archaeology and Cultural Heritage** indicates that there would be no significant effects (in EIA terms) on cultural

⁴⁰ Ibid.

significance of any of the historical sites so these have been discounted from further assessment.

13.5.23 The following five tour/viewpoint attractions (see **Figure 13.1**) were considered for further assessment within this chapter:

- Isle of Skye Wildlife Tours – the main feature relates to visiting various habitats and spotting wildlife;
- Skye Bus Tours – the main feature of the various options relate to visiting key tourist attractions on the island, such as the fairy pools, the fairy glen and Dunvegan Castle. With the exception of Dunvegan Castle (which would have no visibility of the Proposed Development), the key tourism attractions fall outwith the study area.;
- Hebridean Whisky Tour – the main feature relates to visiting whisky distilleries across multiple Hebridean islands to experience the culture, provenance and the landscape. The closest distillery is Talisker Distillery; however this is outside the tourism study area.; and
- SeaSkye Boat Tours – the main feature relate to enjoying the natural heritage and outdoor adventure.

13.5.24 **Chapter 6: Landscape and Visual Assessment** reports that there would be less than moderate effects along most transport routes; however, there would be a moderate magnitude of change along the A863 Sligachan to Dunvegan. Although there may be an impact on views experienced in transit during the tour, this comprises a limited part of the tour experience and it is not considered that there is any potential for significant effects on individual tourism attractions as a result of the Proposed Development. Therefore, individual tourism attractions have been scoped out of further assessment in this chapter.

13.5.25 **Chapter 6: Landscape and Visual Assessment** reports that, visually, there is potential for a substantial/moderate magnitude of change during construction on residents at the settlements of Upper Feorlig, Feorlig and Caroy. A study of VisitScotland and Google Maps data indicate that there is a cluster of accommodation providers within Caroy (see **Figure 13.1**), which have been included for further assessment within this chapter.

13.5.26 **Chapter 6: Landscape and Visual Assessment** reports that, visually, there is potential for between and large/medium and medium/small magnitude of change during operation on residents at the settlements of Upper Feorlig, Feorlig, Caroy, Harlosh, Roag, Dunvegan, and Colbost. A study of VisitScotland and Google Maps data indicate that there is a cluster of accommodation providers within Caroy, Harlosh, Roag, Dunvegan, and Colbost (see **Figure 13.1**), which have been included for further assessment within this chapter.

Summary

13.5.27 Although tourism is identified as a key priority at a national level, it is considered that given the limited number of tourism attractions and accommodation providers potentially affected by the Proposed Development that the study area is of low tourism value and therefore, of **Low** sensitivity.

Recreation

13.5.28 Within the boundary of the Site, there are no core paths. However, as mentioned in THC's Scoping Response, there is an informal wider access network path through the Site and

the crofters track which comprises the Southern Access, which are both used recreationally. The path uses the existing access track and then extends through the Site, towards the existing Ben Aketil turbines, exiting the Site to the North, towards Edinbane.

- 13.5.29 There is an informal cycle route, which loops from the south of the Site, from Upper Feorlig, alongside the Edinbane Wind Farm linking into Glen Vic Askill. The recreational value of the cycle route was referenced in the Scoping Response of THC's Access Team.
- 13.5.30 THC's access team also identified potential for recreational effects on the Uig to Lochmaddy ferry route, which is 17 km away from the Proposed Development. **Chapter 6: Landscape and Visual Assessment** identified that a minor visual effect would be experienced from this route, as only patchy visibility would be possible at distance. A minor visual effect is unlikely to result in a significant effect on recreational amenity; therefore, the route has been scoped out of further assessment.
- 13.5.31 There are a number of core paths within the 5 km study area, including routes in close proximity to the A850 north and west of the Site. The core paths within the study area are illustrated by **Figure 13.1** and are listed below in **Table 13.13**.

Table 13.13: Identified Core Paths within 5 km study area

Path Code	Path Name	Length (km)	Approximate Distance to the Proposed Development (km)
SL07.03	Edinbane Link Path	0.9	3.7
SL07.02	Edinbane to Greshornish Road End	1.9	3.0
SL07.01	Greshornish Forest Path	6.9	1.5
SL06.02	Healaval Forest	4.3	2.9
SL28.05	Vatten to Feorlig	1.0	0.8

- 13.5.32 As per the path data obtained from ScotWays on 5th January 2023, several other paths have been identified within the ZTV and 5 km recreational study area. These are identified in **Figure 13.1** and consist of Recorded Rights of Way and Other Routes, as listed below:
- other route HSL/HSL114/1 Loch Caroy to Glen Vic Askill;
 - recorded right of way HSL/HSL7/1; and
 - recorded right of way HSL/HSL8/1 Churches Walk.

- 13.5.33 The recreational routes identified are considered to be of local importance and, therefore, of **Low** sensitivity.

Cumulative development

- 13.5.34 There is the potential for cumulative effects to arise where the construction and operational phases overlap with the Proposed Development. Given that cumulative effects in relation to socio-economics, land use, tourism and recreation relate to traffic and transport impacts during construction, or visual and settings impacts during operation, in-combination with other nearby developments, the cumulative baseline for this assessment is based on other nearby developments identified in **Table 6.5** of **Chapter 6: Landscape and Visual Assessment**.

13.6 Predicted impacts

Socio-economic impacts

Construction phase impacts

- 13.6.1 There would be economic impacts resulting from expenditure on such items as site preparation, access roads, purchase and delivery of materials, plant, equipment and components. Informed by other examples of wind farms in Scotland, the peak onsite workforce is expected to be approximately 50 workers. Some workers would be sourced from the local and regional labour force, as well as from Scotland as a whole.
- 13.6.2 The remainder of this section quantifies the likely benefits to jobs in the Highlands, as well as broader benefits to employment in Scotland as a whole. The section also quantifies the predicted impacts to the economy; based on the proportion of construction expenditure that would take place as a result of the Proposed Development.

Capital expenditure

- 13.6.3 An analysis of the supply chain has not been conducted, but given the similar labour market profile for the local and national economy, it was considered that assumptions relating to project expenditure can be made based on the findings of national studies.
- 13.6.4 The Capital Expenditure (CAPEX) for the construction and development of the Proposed Development has been estimated using research undertaken by BiGGAR Economics, on behalf of RenewableUK (2015)⁴¹.
- 13.6.5 Applying this methodology, for the Proposed Development with up to nine turbines and a combined generating capacity of 59.4 MW, the construction and development costs are expected to reach £87,264,005⁴². The Proposed Development also comprises a battery storage component with a storage capacity of 20 MW, the construction and development costs per MW is estimated at £500,000⁴³. The construction and development costs are expected to reach £10,000,000.
- 13.6.6 CAPEX was divided into four primary categories of contract; development and planning, turbines, balance of plant (construction costs, excluding turbine supply) and grid connection. CAPEX for the battery component has not been divided into contract types, given the lack of reliable data in this regard.
- 13.6.7 A study by Renewables UK(2015), formerly the British Wind Energy Association a trade association for wind power and other renewable energies, evaluated that 10% of CAPEX was development and planning, whereas 64% was on the turbines; however, developments in the sector and the transition towards larger turbines has altered this composition. BVG Associates (2017)⁴⁴ estimated that turbine related contracts accounted for the majority of CAPEX, followed by balance of plant, development and planning and grid connection.

⁴¹ RenewableUK (2015), Onshore Wind: Economic Impacts in 2014.

⁴² Calculation based on (development + construction costs per MW) * capacity of wind turbine element of PD.

⁴³ RegenSW (2019), Energy Storage – Towards a Commercial Model – 2nd Edition.

⁴⁴ BVG Associates (2017), Economic benefits from onshore wind farms.

- 13.6.8 The values shown by **Table 13.14** exceed those used in the RenewableUK (2015) and the BVG Associates (2017) reports, to take into account a larger proportion of CAPEX expenditure on turbine related contracts (70%), followed by balance of plant (20.5%), development and planning (4.4%) and grid connection (5.1%).

Table 13.14: Estimated development and construction expenditure by type for the Proposed Development

Item	Description	Cost (£millions)	% of Expenditure
Development and Planning	The processes up to the point of financial close or placing firm orders to proceed with construction, and project management costs incurred by the Applicant. Includes project design, environmental studies, legal agreements, project funding and planning permissions.	3.8	4.4
Turbines	The activity by wind turbine manufacturers and their suppliers, covering nacelle component manufacture and assembly and blade and tower manufacture.	61.1	70.0
Balance of Plant	Includes civil and project management, roads, substation buildings, turbine foundations and hardstandings, landscaping/ forestry/ fencing, and mechanical and electrical installation.	17.9	20.5
Grid Connection	Includes engineering services, construction, electrical components, and industrial equipment and machinery.	4.5	5.1
Total		87.3	100%

- 13.6.9 The economic impact of the construction and development phase has been estimated for Eilean a' Cheò, the Highlands and Scotland as a whole. To do this, it was necessary to estimate the proportion of each type of contract that might be secured in each study area. The assumptions have been based on a review of spend within each study area during construction of the original Ben Aketil development and the extension and the weighted development and construction costs from the RenewableUK (2015)⁴⁵ research and analysis of the economic impacts of onshore wind. The percentage of spend by contract type within each study area is shown in **Table 13.15**. There is limited evidence on the impacts associated with battery installation, but a significant proportion of the contract value would be the battery itself, and the installation is likely to involve specialist skills.

⁴⁵ RenewableUK (2015), Onshore Wind: Economic Impacts in 2014.

Therefore, the share of the spend in the Highlands is assumed to be 2% of the total, and the share of the spend in Scotland is assumed as 18% of the total.

- 13.6.10 To estimate the expenditure for each contract in each study area, these percentages have been applied to the estimated size of each component contract. The estimated value of contract type is shown in **Table 13.15**.

Table 13.15: Estimated development and construction expenditure in Eilean a' Cheò, The Highlands and Scotland by contract type*

Item	Eilean a' Cheò		The Highlands		Scotland	
	Cost (£millions)	% of item total	Cost (£millions)	% of item total	Cost (£millions)	% of item total
Development	0.2	5	0.5	13	2.3	59
Turbines	0.6	1	6.1	10	12.2	20
Balance of Plant	1.4	8	2.1	12	6.4	36
Grid Connection	0.2	5	2.1	30	1.6	36
BESS	0.0	0	0.2	2	1.8	18
Total	2.5		10.3		24.3	

*Totals may not add up, due to rounding.

Gross employment and economic impacts

- 13.6.11 The contract values potentially awarded in each area represents an increase in turnover of businesses in these areas. Estimates of the expected direct construction phase employment and economic implications of the Proposed Development have been calculated. Estimates have been calculated by applying ratios of turnover per unit of GVA and GVA, per employee, from the Scottish Annual Business Statistics (SABS) 2019⁴⁶ (GVA and employment ratios are not available for the local area, therefore, regional values have been used for the local study area) to the predicted CAPEX. Although SABS 2020 is the most recent available data set, 2019 was considered to be more representative, due to the national lockdown during the 2020 Coronavirus pandemic.
- 13.6.12 Turnover per unit of GVA and GVA per employee ratios have been calculated, as shown in **Table 13.16**. The construction ratios have been weighted using the relevant economic sector data for each sub component (turbines, balance of plant and grid connection).

Table 13.16: GVA and turnover per employee

Item	The Highlands		Scotland	
	Turnover per Employee	GVA/Turnover	Turnover per Employee	GVA/Turnover
Development	76,828	0.65	123,173	0.54
Turbines	203,214	0.42	186,958	0.35

⁴⁶ Scottish Annual Business Statistics (2019), Available at <https://www.gov.scot/publications/scottish-annual-business-statistics-2019/documents/> (accessed December 2022).

Item	The Highlands		Scotland	
	Turnover per Employee	GVA/Turnover	Turnover per Employee	GVA/Turnover
Balance of Plant	160,400	0.38	174,277	0.35
Grid Connection	12,360	0.65	105,378	0.51
BESS	141,010	0.53	147,466	0.44

- 13.6.13 Applying the above ratios to the capital expenditure provides an estimate of the likely level of job years and GVA by study area (**Table 13.17**). The Eilean a' Cheò study area is part of the Highlands study area, which is part of the Scotland study area; therefore, jobs or GVA generated within smaller study areas would count towards jobs and GVA within the larger study areas. The regional and national multipliers outlined in **Table 13.16** above have only been applied to the difference in local and regional turnover and regional and national turnover.

Table 13.17: Estimated construction phase direct economic impact of the Proposed Development*

Item	Eilean a' Cheò		The Highlands		Scotland	
	Job Years	GVA (£million)	Job Years	GVA (£million)	Job Years	GVA (£million)
Development	2.4	0.1	6.5	0.3	20.8	1.3
Turbines	3.0	0.3	30.1	2.6	62.7	4.7
Balance of Plant	8.9	0.5	13.4	0.8	38.0	2.3
Grid Connection	1.8	0.1	10.8	0.8	13.3	1.0
BESS	0.0	0.0	1.4	0.1	13.6	0.9
Total	16.2	1.1	62.1	4.7	148.5	10.2

*Totals may not add up, due to rounding.

Net employment and economic impacts

- 13.6.14 To account for leakages, commuting data were reviewed to determine the proportion of workers likely to be involved in the construction of the Proposed Development based outside of the Highlands and Scotland. It is assumed that 4.3% of jobs benefit non-Caithness and Highlands residents and 1.1% would benefit non-Scottish residents. This assumption is based on Census 2011 commuting data for the Highlands, which was used instead of the more recent 2021 census data as this was recorded during the Covid-19 pandemic, which could have affected the results.
- 13.6.15 Regarding displacement, analysis assumed that displacement would be 5% for the local study area, with similar levels of displacement (5%) assumed at a regional level. At a national level, higher levels of displacements were assumed (15%).
- 13.6.16 The effects of leakage and displacement can act to reduce the value of the project within the economy; however, an estimate of the additional jobs and economic value created in the economy, through the (positive) indirect and induced effects of project expenditure in

the economy, should also be considered. Indirect and induced impacts on employment and GVA has been calculated using Type II (indirect and induced) GVA and employment multiplier values published in the Scottish Government 2019 Input-Output tables⁴⁷. To reflect the lower multiplier effects at local levels, GVA and employment multipliers in Eilean a' Cheò was set at 50% of the Scottish level and the Highlands was set at 65% of the Scottish level. The indirect and induced multipliers are shown in

13.6.17 Table 13.18.

Table 13.18: Indirect and induced multipliers in Eilean a' Cheò, The Highlands and Scotland by contract type

Item	Eilean a' Cheò		The Highlands		Scotland	
	Type II Employment Multiplier	Type II GVA Multiplier	Type II Employment Multiplier	Type II GVA Multiplier	Type II Employment Multiplier	Type II GVA Multiplier
Development	1.3	1.3	1.3	1.3	1.5	1.5
Turbines	1.3	1.3	1.4	1.4	1.6	1.6
Balance of Plant	1.4	1.5	1.5	1.6	1.8	1.9
Grid Connection	1.4	1.5	1.5	1.6	1.8	1.9
BESS	1.3	1.4	1.4	1.5	1.7	1.7

13.6.18 Applying the above assumptions to the gross employment and economic impacts provides an estimate of the likely level of net employment and economic impacts (**Table 13.19**). As stated above, as Eilean a' Cheò is part of the Highlands, which is part of Scotland; therefore, jobs or GVA generated within smaller study areas would count towards jobs and GVA within the larger study areas. The regional and national multipliers outlined in **Table 13.18** above have only been applied to the difference in local and regional, and regional and national turnover.

⁴⁷ Scottish Government (2018), Supply, Use and Input-Output Tables.

Table 13.19: Estimated net construction phase employment and economic impact of the Proposed Development*

Item	Indirect/Induced Jobs			Indirect/Induced GVA (£millions)		
	Eilean a' Cheò	The Highlands	Scotland	Eilean a' Cheò	The Highlands	Scotland
Development	2.8	7.6	25.7	0.1	0.4	1.6
Turbines	3.5	37.7	81.5	0.3	3.2	6.1
Balance of Plant	11.3	17.5	54.7	0.7	1.1	3.5
Grid Connection	2.3	14.7	18.5	0.2	1.2	1.4
BESS	0.0	1.9	15.5	0.0	0.1	1.0
Total	20.0	79.3	197.6	1.3	6.1	13.6

*Totals may not add, due to rounding.

- 13.6.19 Given the scale of the potential economic and employment impacts in comparison with the economy in each study area, it is not likely that any impact would be expected to result in a measurable variation from baseline economic conditions. Therefore, the net socio-economic impacts are considered to be **Negligible** (Beneficial).

Operation phase impacts

- 13.6.20 When the Proposed Development is operational, a team of personnel would be required to provide servicing, maintenance, repairs and other operational support. The operation and maintenance impact of the Proposed Development has been estimated as the impact that would persist throughout the lifespan of the Proposed Development. The long-term assessments of the operations and maintenance impacts have been assessed over the 35-year period. This would include the battery component, which is not expected to require substantial operation and maintenance expenditure.
- 13.6.21 Annual expenditure on operations (OPEX) and maintenance was estimated based on analysis undertaken in the 2015 RenewableUK report⁴⁸, which stated the weighted average cost was £59,867 per MW per annum. Therefore, it is estimated that annual operations and maintenance expenditure associated with the Proposed Development could be up to £3.59 million (excluding community benefit funding and nondomestic rates). Over the first 35 years of operational life of the Proposed Development with a generating capacity of 59.4 MW, this could amount to approximately £124 million. These figures are solely based on the wind generation element of the Proposed Development, excluding the battery storage element, because no current analysis of battery storage is available. Thus, actual OPEX would likely be higher and the OPEX estimates assessed below represent the conservative scenario.
- 13.6.22 To estimate the economic impact of the operation and maintenance expenditure in each study area, it was first necessary to estimate the proportion of operation and maintenance

⁴⁸ RenewableUK (2015), Onshore Wind: Economic Impacts in 2014.

contracts that could be secured in each of these areas, as shown in Table 13.20. These assumptions have been based on a review of spend within each study area during operation of the original Ben Aketil development and the extension and the contract proportions reported in the 2015 RenewableUK report. As shown in Table 13.20, there is no OPEX predicted within the local study area so potential socio-economic impacts have not been calculated at this level.

Table 13.20: Estimated annual operation and maintenance expenditure in Eilean a' Cheò, The Highlands and Scotland

Item	Eilean a' Cheò		The Highlands		Scotland	
	Cost (£millions)	% of item total	Cost (£millions)	% of item total	Cost (£millions)	% of item total
Operation and Maintenance	0.2	5	1.5	42	2.1	58

Gross employment and economic impacts

- 13.6.23 As with the construction phase, the contract values awarded in each of the study areas represent an increase in turnover in those areas. The economic impact of the increase in turnover on GVA and employment in the operational phase was estimated similarly to construction phase impacts.
- 13.6.24 Turnover per unit of GVA and GVA per employee ratios have been calculated and are illustrated below, in **Table 13.21**:

Table 13.21: Estimated GVA and turnover per employee (operations and maintenance)

Item	Turnover per Employee		GVA/Turnover Ratio	
	The Highlands	Scotland	The Highlands	Scotland
Operation and Maintenance	153,259	161,600	0.5	0.5

- 13.6.25 Applying the above assumptions to the Proposed Development provides an estimate of the likely level of employment in Eilean a' Cheò, The Highlands and Scotland as a whole. This is shown by below in **Table 13.22**: As stated above, the Eilean a' Cheò study area is part of the Highlands study area, which is part of the Scotland study area; therefore, jobs or GVA generated within smaller study areas would count towards jobs and GVA within the larger study areas. The regional and national multipliers outlined in **Table 13.21**: have only been applied to the difference in local and regional, and regional and national turnover.

Table 13.22: Estimated operations and maintenance direct economic impact of the Proposed Development

Area	Estimated Number of Jobs (Years)	Estimated GVA (£millions)
Eilean a' Cheò	1.2	0.1
The Highlands	9.7	0.7

Area	Estimated Number of Jobs (Years)	Estimated GVA (£millions)
Scotland	13.3	1.0

Net employment and economic impacts

13.6.26 As in the construction phase, net impacts on employment and GVA for operation and maintenance has been calculated using additionality factors. This includes leakages and displacement (both the same as in the construction phase) and GVA and Type II (indirect and induced) employment multiplier values for the relevant industry sectors published on the Scottish Government 2019 Input-Output tables⁴⁹ (as identified in **Table 13.23**). Similarly, to reflect the lower multiplier effects at local levels, GVA and employment multipliers in Eilean a' Cheò was set at 50% of the Scottish level and the Highlands was set at 65% of the Scottish level.

Table 13.23: Type II employment and GVA multipliers in the Eilean a' Cheò, Highlands and Scotland

Item	Type II Employment Multipliers			Type II GVA Multipliers		
	Eilean a' Cheò	The Highlands	Scotland	Eilean a' Cheò	The Highlands	Scotland
Operation and Maintenance	1.3	1.4	1.6	1.3	1.3	1.5

13.6.27 Applying the above assumptions to the gross employment and economic impacts provides an estimate of the likely level of net employment and economic impacts (**Table 13.24**). As Eilean a' Cheò is part of The Highlands, which is part of Scotland, jobs or GVA generated within smaller study areas would count towards jobs and GVA within the larger study areas. Therefore, the regional and national multipliers outlined in the **Table 13.23** have only been applied to the difference in local and regional, and regional and national impacts.

Table 13.24: Estimated annual operation and maintenance net economic impact of the Proposed Development

Area	Estimated Number of Jobs	Estimated GVA (£millions)
Eilean a' Cheò	1.4	0.1
The Highlands	12.3	0.8
Scotland	17.0	1.2

13.6.28 The 35-year operational period for the Proposed Development could generate GVA worth a cumulative total of £3.2 million in Eilean a' Cheò, £28.4 million in the Highlands and £41.2 million for Scotland.

13.6.29 Given the scale of the potential economic and employment impacts in comparison with the economy in each study area, it is not likely that any impact would be expected to result in a measurable variation from baseline economic conditions. Therefore, the net socio-economic impacts are considered to be **Negligible** (Beneficial).

⁴⁹ Scottish Government (2018), Supply, Use and Input-Output Tables: 1998-2018.

- 13.6.30 Furthermore, as a result of the community funding provided by the Applicant, the Proposed Development would generate a beneficial effect on the local economy. Aligned with standard industry practice⁵⁰, the Applicant would provide £5,000 or equivalent per MW (index linked) during the operation life of the Proposed Development. The total installed capacity of the Proposed Development, if consented would be up to 59.4 MW⁵¹. Therefore, it would total over £297,000 per year. Following the Good Practice Principles for Community Benefit and the existing community benefit arrangement in place for the existing Ben Aketil Wind Farm, the Applicant is committed to the community benefit staying in the local area.
- 13.6.31 Considering the change to baseline condition for both the existing Ben Aketil Wind Farm community benefit fund and the cumulative community benefit fund, the community benefit fund contribution from the Proposed Development would represent an impact that would dominate over baseline economic conditions by >10%. Therefore, the magnitude of impact would be **High**.

Land use impacts

Construction phase impacts

- 13.6.32 Ongoing activities within the Site may be temporarily affected during the construction phase of the Proposed Development. The Applicant would work with the landowner and land users (crofters) to ensure that they are able, wherever possible, to continue their activities safely during construction of the Proposed Development. There would be no felling within the commercial forestry in the Developable Area. The establishment of the northern borrow pit would require the forestry within the footprint of this area to be removed. Options to replace the trees lost as a result are under consideration and would be agreed with the land and forestry owners ahead of the commencement of felling. Options being considered include compensatory planting elsewhere or replanting of trees within the footprint of the northern borrow pit once restoration of the borrow pit has been completed. The utilisation of the northern borrow pit would, therefore, result in a temporary loss of a minor area of forestry.
- 13.6.33 As the construction of the Proposed Development is a repowering, it would only result in a minor change or restriction on the current land use and the impact would be temporary and subject to a planning condition covering the construction phase to minimise impacts. Therefore, the magnitude of impact is considered to be **Low** (Adverse).

Operational phase impacts

- 13.6.34 the Proposed Development would reuse infrastructure (e.g. tracks) from the Existing Development (approximately 4.63 Ha). However, there would be a requirement for new infrastructure, which would result in a loss of approximately 8.67 ha from existing livestock grazing land.
- 13.6.35 The construction of the Southern Access Track would improve access to the Site for the crofters who use the land within the Site for sheep grazing. Currently, access is obtained via a rough crofters' track; part of this track would be upgraded during the construction of

⁵⁰ Scottish Government (2019), Community Benefits From Onshore Renewable Energy Developments.

⁵¹ This figure does not include BESS.

the Southern Access Track (refer to **Chapter 2: Proposed Development** for a description of the design evolution and of the proposed Southern Access Track).

- 13.6.36 Given that existing land use could continue unabated, and that any minor loss in livestock grazing land footprint would be offset by improvements in accessibility, it is considered that the magnitude of impact would be **Negligible** (Neutral).

Recreational impacts

Construction phase impacts

- 13.6.37 The recreational routes provide connectivity, opportunity for exercise, cultural and social heritage, experience of nature and good views of the surrounds.
- 13.6.38 There could be temporary direct impacts affecting accessibility on the recreational routes within the Site and surrounding area listed in **paragraph 13.5.28**. There is also the potential for impacts on recreation within the surrounding area resulting from construction traffic, which could affect community severance, road safety and vulnerable road users, including walkers and cyclists. An assessment of effects on road users and other sensitive receptors has been undertaken in **Chapter 11: Traffic and Transport**, which has been considered in this assessment.
- 13.6.39 In accordance with the Construction (Design and Management) Regulations 2015, notices would be placed in prominent locations around the Site to outline areas of restricted access. Measures for ensuring public safety during construction would be secured by the Construction Environmental Management Plan (CEMP), and periods of exclusion would be kept to the minimum necessary for safe working. The CEMP would set out measures to ensure that recreational users are informed of the construction work and directed into safe areas where there would be no conflict with plant and machinery.
- 13.6.40 There is the potential for indirect impacts on recreational receptors caused by visual disturbance during the period of construction, which could affect amenity and enjoyment of nearby walks.
- 13.6.41 **Chapter 6: Landscape and Visual Assessment, Section 6.7** identified that the Proposed Development would result in a substantial/moderate magnitude of change (this is based on the worst-case scenario, i.e., Scenario 2) on the recreational routes within the Site and surrounding area. While construction activity could result in a substantial/moderate magnitude of change in views looking towards the Proposed Development along the local path network, there would still be other unaffected views, such as those over Loch Bracadale. In addition, views might only be affected along certain parts of the route and/or in only one direction of travel. However, views only comprise part of the recreational amenity provided by the local path network.
- 13.6.42 Given the potential impacts on the main features of the recreational routes, it is considered there is the potential for an impact that would be expected to have a small restriction of access to or availability of tourism and visitor assets in the study area or would result in a small change to existing patterns of use. Therefore, the magnitude of impact would be **Low**.

Operational phase impacts

- 13.6.43 The recreational routes provide connectivity, opportunity for exercise, cultural and social heritage, experience of nature and good views of the surrounds.
- 13.6.44 The existing routes through the Site would continue to be accessible for recreational users and the Proposed Development would include upgrades and extensions to the existing internal access track network and the formation of a new Southern Access Track, which would have a positive impact on accessibility within the Site. For example, the existing Edinbane Wind Farm Cycle Loop Route has emerged following the construction of multiple windfarm developments, including the Existing Development.
- 13.6.45 **Chapter 6: Landscape and Visual Assessment** reports that, visually, there would be a substantial magnitude of change on recreational routes across the Site, including those that connect with the Ben Aketil summit. However, it is acknowledged that the baseline views already comprise wind farm development so changes to the nature of the views would be limited.
- 13.6.46 Consideration has also been given to recreational routes in the wider study area. As shown, on **Figure 13.1** the majority of the recreational routes are located to the south of the Proposed Development, with the remaining recreational routes having less visibility, both in terms of number of number of turbines and coverage of the route.
- 13.6.47 The ZTV indicates that Other Route HSL/HSL114/1 would have no visibility of the proposed turbines. Both Recorded Rights of Way identified in **paragraph 13.5.31** have partial visibility of the turbines. HSL/HSL8/1 to the east of the Site would have visibility of up to six turbines for a small part of the route, with majority of the route having no visibility. HSL/HSL7/1 to the north of the Site would be partially exposed to visibility of up to nine turbines; however, a large section of the route would have no visibility, as it is screened by the extensive forestry to the north-west of the Site.
- 13.6.48 The majority of the Core Paths listed in **Table 13.13** have no theoretical visibility of the proposed turbines. However, the ZTV illustrates that the Vatten to Feorlig Path (SL28.05) and the Edinbane Link Path (SL07.03) would have visibility of up to nine turbines.
- 13.6.49 The Edinbane Wind Farm Cycle Loop would have visibility of all turbines where it crosses the Site and to south, but visibility would be reduced to between one and six turbines variably along the eastern leg, where it passes through Edinbane Windfarm, and no visibility from the north.
- 13.6.50 **Chapter 6: Landscape and Visual Assessment** notes that in most views the Proposed Development would replace views of the existing turbines (i.e., turbines are presently key visual elements); however, due to their increased height they would be more visible. At worst this would result, visually, in a moderate magnitude of change. It is noted that the key views from most recreational routes tend to be focused south towards Loch Bracadale, west towards Macleod's Tables, and east towards the Cuillin Hills.
- 13.6.51 In addition, views might only be affected along certain parts of the route and/or in only one direction of travel. However, views only comprise part of the recreational amenity provided by the local path network. Studies considering the potential impacts on the wider recreational experience have found that, in respect of other wind farm projects, where users have been asked if the presence of turbines would discourage them from using a route, the majority would not be deterred. For example, an independent survey of tourists

and day-trippers in the area around the proposed Clashindarroch Wind Farm in Aberdeenshire (Gilmorton Rural Development, 2009) found that 84% of respondents did not feel that the proposed wind farm would have an impact on their willingness to revisit the area. The survey also evaluated there was no difference in the attitude of walkers and other visitors in relation to their willingness to revisit. Furthermore, the magnitude of impact for cyclists and horse riders may be less than for walkers, as the speed of travel is likely to be faster and individual views are experienced for a shorter period of time. Even for users who find the presence of a wind farm detracts from their experience, this may simply manifest itself in users choosing not to linger in those sections of the route which have clear views of the wind farm.

- 13.6.52 Given the potential impacts on the main features of the recreational routes, it is considered there is the potential for an impact that would result in a small change to existing patterns of use. Therefore, the magnitude of impact would be **Low**.

Tourism impacts

Construction phase impacts

- 13.6.53 Throughout the construction period, the Proposed Development would benefit the local economy through expenditure on the purchasing of: temporary accommodation, food, drink, fuel and other services of personal welfare needed to sustain a construction workforce. This expenditure would be experienced predominantly by businesses within the local tourism sector, or those sectors partially dependent on tourism (e.g. retail).
- 13.6.54 There is the potential for tourism impacts on a cluster of accommodation providers in Caroy caused by visual disturbance during the period of construction. The providers advertise predominantly on the basis of their location in relation to its seclusion and nearby amenities/attractions, quality of their interiors, and views of their surroundings, with the view west towards Loch Bracadale being key. While there may be a moderate magnitude of change to views north from some of the accommodation providers, the key views and other features advertised would be unaffected. Any temporary losses that may occur in the event that tourists are deterred from visiting the local area could be offset by demand for accommodation by construction workers.
- 13.6.55 Overall, the magnitude of construction phase impacts on tourism is assessed as **Negligible**.

Operational phase impacts

Public attitude to renewable energy development

- 13.6.56 The potential for impact on tourism is closely linked to the public perception of those visiting an area; thus, this section provides an overview of studies undertaken to assess public perception of wind farm development across the UK.
- 13.6.57 In 2011, as part of their policy update, VisitScotland investigated the attitudes of UK consumer towards wind farms⁵². The survey was largely attitudinal based and according

⁵² Visit Scotland (2011). Available at: http://www.visitscotland.org/research_and_statistics/tourism_topics/wind_farms.aspx (accessed December 2022).

to the results, wind farms do not have any significant impacts on the levels of tourism with evidence. For example, 52% of the study respondents disagreed that wind farms spoil the look of the UK/Scottish countryside.

- 13.6.58 Based on this research, VisitScotland published a Position Statement in 2014⁵³, which stated: “VisitScotland understands and supports the drive for renewable energy and recognises the economic potential of Scotland’s vast resource, including the opportunities for wind farm development... There is a mutually supportive relationship between renewable energy developments and sustainable tourism.”
- 13.6.59 A Department of Energy and Climate Change (DECC) survey⁵⁴ on public attitudes showed that in March 2014, 89% of the British public said they supported the use of renewable energy for electricity, heat and fuel in the UK. Furthermore, the BEIS Public Attitudes Tracker: Energy Infrastructure and Energy Sources (2022), published by the Department for Business, showed that 79% of people support the development of onshore wind, in comparison to 74% at the start of 2017.
- 13.6.60 Visit Scotland (2020)⁵⁵ research indicates that visitors aspire to be more responsible, both in terms of their personal and environmental impact. VisitScotland’s Trends (2020) Paper identified that travellers are now seeking to consciously off-set the carbon impact of their travel. The use of sustainable energy by local businesses may, therefore, appeal to this type of traveller and promote Scotland as an environmentally friendly and climate conscious country to visit.
- 13.6.61 Furthermore, the Scottish Government is aware that some communities in Scotland are concerned that the deployment of onshore wind can have a negative effect on tourism. Current evidence suggests that whilst there may be discrete impacts in some cases, this is not the general rule. For example, the Scottish Government’s Onshore Wind Policy Statement Refresh (2021)⁵⁶ considers the potential effect of onshore wind farms on local and national tourism as a significant opportunity to cultivate a ‘people and place’ approach, by providing economic opportunities in areas that may otherwise be overlooked. The Policy Statement references details many examples of where renewable energy schemes have boosted tourism and recreation across Scotland. For example, Whitelee Wind Farm on the outskirts of Glasgow has provides additional outdoor recreational activities on over 130 km of tracks.
- 13.6.62 In the case of the Proposed Development, the Applicant has sought to raise awareness of the Proposed Development within the local community, and actively encouraged engagement from members of the public. The Pre-Application Consultation (PAC) Report supports the Section 36 Application and details the engagement with, and responses to, the public consultation.

⁵³ Visit Scotland (2014). Available at: <https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/policies/visitscotland-position-statement---wind-farms---oct-2014.pdf> (accessed December 2022).

⁵⁴ Department for Business, Energy & Industrial Strategy (2022), BEIS Public Attitudes Tracker.

⁵⁵ Visit Scotland (2020), Key Facts on Tourism in Scotland. Available at: <https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/key-facts-on-tourism-in-scotland-2019.pdf> (accessed December 2022).

⁵⁶ Scottish Government (2021). Onshore Wind Policy Statement.

Economy

- 13.6.63 The most comprehensive study of the potential effects of wind farms on tourism was undertaken by the Moffat Centre at Glasgow Caledonian University in 2008⁵⁷. The study found that, even though there may be minor effects on tourism providers and a small number of visitors may not visit Scotland in the future, the overall impact on tourism expenditure and employment would be very limited. Although the study was conducted over 10 years ago, a Scottish Government Report (2012)⁵⁸ has confirmed the findings. In subsequent years, wind farms have become increasingly prevalent in Scotland, however, no evidence has emerged to suggest there are any negative effects on the tourism economy.
- 13.6.64 In 2017, BiGGAR Economics⁵⁹ undertook a study into the effects of constructed wind farms on tourism at the national, regional and local level.
- 13.6.65 The report considered tourism employment from 2009 to 2015, a six-year period over which Scotland, and almost all local authority areas, increased the number of wind farms, despite significant growth in employment in sustainable tourism. The analysis found no correlation between tourism employment and the number of turbines at the national, or local authority level. Overall, research completed to date suggests that the tourism sector is not adversely impacted by renewable energy development.
- 13.6.66 Additionally, the research considered the impact on tourism employment at a smaller level, in data zones up to 15 km from wind farm developments. The wind farms considered had been constructed between 2009 and 2015. The study compared tourism employment in 2009, when the wind farms did not exist, and 2015, when they have been constructed, to measure the effect of wind farms on local tourism employment. This excluded construction impacts, such as wind farm related employees staying in local accommodation.
- 13.6.67 At the local authority level, no link was determined between the development of a wind farm and tourism related employment. In 21 of the 28 areas considered, employment in this sector grew. In 22 of the areas, employment in tourism either grew faster, or decreased less, than the rate for the relevant local authority area as a whole.
- 13.6.68 Overall, the study concluded that published national statistics on employment in sustainable tourism demonstrate there is no relationship between the development of onshore wind farms and tourism employment in the areas immediately surrounding wind farm development, at the local authority level, nor at the level of the Scottish economy as a whole.
- 13.6.69 Furthermore, over the period of 2010-2019, GVA in the Highlands has increased by 87%, compared to 42% expansion of the sector, in the same time period, at a Scottish level. Notably, over this time period, there has been a significant increase in the number of wind farm developments, with onshore wind capacity in the Highlands increasing by 1609% from 2009-19⁶⁰.

⁵⁷ Glasgow Caledonian University/Moffat Centre (2008), Economic impacts of wind farms on Scottish tourism: report.

⁵⁸ ClimateXChange (2012), The Impact of Wind Farms on Scottish Tourism.

⁵⁹ BiGGAR Economics (2017). Wind Farms and Tourism Trends in Scotland.

⁶⁰ BiGGAR Economics (2021), Wind Farms and Tourism Trends in Scotland.

- 13.6.70 The research findings agree with the conclusions made by the Scottish Parliament's Economy, Energy and Tourism Committee in 2012, when they found no robust, empirical evidence of a negative link between wind farm development and tourism.
- 13.6.71 In conclusion, there is no research evidence that shows that negative effects on the tourism economy in Scotland as a result of wind farms are likely. Within this context, the following section nevertheless considers whether there might be any specific impacts on individual tourism assets.

Assets

- 13.6.72 There is the potential for tourism impacts on a cluster of accommodation providers in Caroy, Harlosh, Roag, Dunvegan, and Colbos caused by visual disturbance from the operational turbines. The providers advertise predominantly on the basis of their location in relation to its seclusion and nearby amenities/attractions, quality of their interiors, and views of their surroundings, with the view west towards Loch Bracadale being key. While there may be a at worst a medium magnitude of change to views north from some of the accommodation providers, the key views and other features advertised would be unaffected.

Summary

- 13.6.73 The prevailing public attitude towards windfarms and economic analysis of the relationship between windfarms and tourism indicates that it is likely that any impact would not be expected to result in a measurable variation from baseline tourism and visitor economy conditions. While potential impacts on accommodation providers could result in an impact that would result in a small change to existing patterns of use. Therefore, the overall magnitude of impact on tourism is assessed as **Low/Negligible**.

13.7 Assessment of Effects

- 13.7.1 Based on the discussion of predicted impacts in **Section 13.6**, this section comments on the sensitivity of each receptor, the predicted magnitude of impact and subsequent significance of effect.

Economic and employment effects

Construction phase effects

- 13.7.2 During the construction phase of the Proposed Development, it is expected the net economic and employment impacts would be **Negligible** (Beneficial) on a receptor of **Medium** (regional) sensitivity in the local and regional study areas, the baseline GVA is not expected to noticeably increase, and thus, the overall level of effect is **Negligible** (Beneficial). This is **Not Significant**.
- 13.7.3 For Scotland as a whole, a **Negligible** (Beneficial) impact is predicted on a receptor of **High** (national) sensitivity, as the baseline GVA is not expected to be noticeably increased, leading to a level of effect of **Minor** (Beneficial). This is **Not Significant**.

Operational phase effects

- 13.7.4 In terms of the magnitude of net economic and employment effects, it is expected that during the operational phase, in Eilean a' Cheò and the Highlands, a **Negligible** (Beneficial) impact would arise on a receptor of **Medium** (Regional) sensitivity, leading to a level of effect of **Negligible** (Beneficial). This is **Not Significant**.
- 13.7.5 In Scotland as a whole, the predicted magnitude of impact is **Negligible** (Beneficial) on a receptor of **High** (national) sensitivity, leading to a level of effect of **Minor** (Beneficial). This is **Not Significant**.
- 13.7.6 In terms of community funding, a **High** (positive) impact is predicted for the Proposed Development community benefit fund, which is a **Low** (local) sensitivity receptor, which would result in a **Moderate** effect, which is considered **Significant**.

Land use effects

Construction phase effects

- 13.7.7 The magnitude of the impact on the land use during the construction phase is considered **Low** (Adverse). The sensitivity of the Site is considered to be **Low** (Regional) as it is of minor land use value. This leads to a level of effect of **Minor** (Adverse). This is **Not Significant**.

Operational phase effects

- 13.7.8 The magnitude of impact is considered to be **Negligible** (Neutral). The sensitivity of the receptor would remain **Medium** (Regional). Therefore, the level of effect arising from the Proposed Development would be **Negligible** (Adverse). This is **Not Significant**.

Recreational effects

Construction phase effects

- 13.7.9 There would be a **Low (adverse) impact on recreation**, which is considered to be of **Low** (Local) sensitivity. This leads to a level of effect of **Negligible** (Adverse). This is **Not Significant**.

Operational phase effects

- 13.7.10 There would be a **Low** (Adverse) impact on recreation, which is considered to be of **Low** (Local) sensitivity. This leads to a level of effect of **Negligible** (Adverse). This is **Not Significant**.

Tourism effects

Construction phase effects

- 13.7.11 The Proposed Development would result in a short term, **Negligible** (Neutral) impact on receptors of **Low** (local) sensitivity, resulting in a **Negligible** (Neutral) effect. This is **Not Significant**.

Operation phase effects

- 13.7.12 The operational impacts on tourism have been considered to be **Low/Negligible** (Adverse) on a **Low** (National) sensitivity receptor, leading to a level of effect of **Negligible** (Adverse). This is **Not Significant**.

Cumulative effects

Construction phase effects

- 13.7.13 In this case, operational and consented wind farm developments are considered part of the baseline and included within the main assessment.
- 13.7.14 The cumulative assessment should, therefore, consider impacts related to other proposals in the study area. There were no other proposals with a submitted planning application, but two of the proposals at Scoping were expecting to submit planning applications at the same time as the Proposed Development therefore these two proposals have been considered in the cumulative assessment.
- 13.7.15 A cumulative effect is considered to occur where the magnitude of the combined effect of two, or more, developments is greater than that of the developments considered separately. The assessment of cumulative effects should focus on whether there are any likely significant cumulative impacts which are reasonably foreseeable rather than an assessment of every potential cumulative effect.
- 13.7.16 Therefore, cumulative operational effects should only be considered in cases where an effect of minor or greater significance has been predicted as a result of the Proposed Development. The purpose of this threshold is to ensure the assessment remains proportionate and focused on those cases where there is potential for an effect to arise that is significant in EIA terms.
- 13.7.17 There may be cumulative beneficial effects on socio-economics during construction and operation if the Proposed Development supports the development of the supply chain, which other wind farm developments in the area may benefit from. This would increase the socio-economic impact. However, the impact is likely to be negligible, and the significance of effect would remain the same after consideration of the cumulative schemes at Scoping.
- 13.7.18 In terms of direct impacts on recreation or land use, any effects would be contained within the Site, and none would be further impacted by any other developments outside this area.
- 13.7.19 There were no minor effects on recreation or tourism. Furthermore, **Chapter 6: Landscape and Visual Impact Assessment** asserts that, in relation to visual impacts, the magnitude of change for the Proposed Development would remain the same after consideration of the cumulative schemes at Scoping. Therefore, cumulative effects on tourism and recreation amenity have been discounted.
- 13.7.20 Including the cumulative schemes at Scoping would increase the cumulative community benefit fund to £682,250 per year (again excluding the community benefit from the Existing Development). There would still be a **High** (positive) impact is predicted for the Proposed Development community benefit fund, which is a **Low** (local) sensitivity receptor, which would result in a **Moderate** effect, which is considered **Significant**.

13.8 Additional mitigation

- 13.8.1 There are no additional mitigation measures proposed in terms of socio-economics, land use, recreation and tourism effects as the effects have been predicted to be **Minor/Negligible** and would be **Not Significant**.

13.9 Residual Effects

- 13.9.1 As no additional mitigation is proposed, the residual effects are the same as those reported in **Sections 13.7 and 13.8**.

13.10 Summary of effects

- 13.10.1 Based on the installed capacity, the assessment of the Proposed Development's socio-economic impact found that:

- the development expenditure during the construction phase is estimated to be approximately £97.2 million, approximately £2.5 million of which would be spent in the local Eilean a' Cheò economy, with £10.3 million spent in the Highland economy and approximately £24.3 million in Scotland as a whole;
- for Scenario 1, an 18-month construction phase, the Proposed Development is expected to directly and indirectly support approximately 30 jobs in Eilean a' Cheò, 119 jobs in The Highlands and 296 jobs nationally;
- for Scenario 2, two 12-month construction periods with a 5 year period between phase 1 and phase 2; the Proposed Development is expected to support, directly and indirectly, 40 jobs in Eilean a' Cheò, 159 jobs in The Highlands and 395 jobs in Scotland as a whole;
- the local Eilean a' Cheò economy would be boosted by a total of £2.0 million (net Gross Value Added – GVA) over the Scenario 1 construction phase, with the Highland economy boosted by £9.1 million and Scotland as a whole £20.5 million net GVA;
- for the scenario 2 construction phase, the local economy would be boosted by £2.7 million net GVA, the Highland economy by £12.1 million and the Scottish economy as a whole by £27.3 million;
- the development expenditure during the operational phase is estimated to be approximately £3.6 million per annum. It is estimated that £0.2 million would be spent each year in the local economy, with £1.5 million per year in The Highlands and £2.1 million in Scotland as a whole;
- during the operational phase, the Proposed Development is expected to directly and indirectly support 48 jobs in Eilean a' Cheò, 429 jobs in the Highlands and 596 jobs in Scotland;
- the local economy would be expected to be boosted by a total of £3.2 million of net GVA during the operation phase. The Highland economy would benefit by £28.4 million net GVA and the Scottish economy would benefit by £41.2 million net GVA; and
- based on a total installed capacity of around 59.4 MW, the total community funding would be around £297,000 per year, which would equate to £10.4 million for a 35-year lifetime.

- 13.10.2 There would be **Negligible** or **Minor Not Significant** effects on land use, recreation and tourism.

13.11 References

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14 AVIATION

14.1 Introduction

- 14.1.1 This chapter considers the potential effects of the Proposed Development on existing and planned military and civil aviation activities, including those resulting from impacts to radar. Other potential effects result from the physical presence of the turbines as obstacles, and effects on navigational aids ('Nav aids') and radio communication stations.
- 14.1.2 The chapter includes a description of the assessment methodology that has been adopted, the consultations conducted, relevant policy and legislation, the overall baseline conditions and measures that will be taken to mitigate any significant effects. The chapter concludes with a summary of the impacts and mitigation requirements.
- 14.1.3 Radio waves are used in a variety of Nav aids, radio communication systems and radar; any large structure has the potential to interfere with their propagation and reception. Radars are designed to detect movement, hence a turbine's rotating blades can be interpreted as aircraft, with the potential to then affect air traffic management.
- 14.1.4 Wind turbines can also have an impact on flying simply due to their physical presence. In this respect they are no different to any other tall obstacles such as pylons or television masts, with recognised criteria for safeguarding the airspace around airfields. Away from airfields, such obstacles are a normal part of the aviation scenery and measures are in place to enable aircraft to safely navigate around them.
- 14.1.5 The potential effects are highly dependent on the location of the wind farm and on the positions of the individual turbines. In some cases, there are no significant consequences, and no mitigation is required, whilst in other cases the turbine specification or layout must be designed to accommodate local infrastructure. Mitigation is often available and appropriate to manage impacts.
- 14.1.6 This chapter is supported by the following appendix:
- **Technical Appendix 14.1 in Volume 3.**

14.2 Statutory and planning context

- 14.2.1 The relevant sections of key legislation, policy and guidance documents are described in the table below, which together place a responsibility on the decision maker and the applicant to assess potential impacts on aviation.

Table 144.1: Legislation and guidance relevant to Aviation

Document	Summary
Legislation	
CAA CAP 393 (February 2021), The Air Navigation Order (ANO) and Regulations	Specifies the statutory requirements for the lighting of onshore wind turbines over 150 m tall

Document	Summary
Planning Policy	
Scottish Planning Policy (SPP), (2014)	The SPP states, under paragraph 169 on Development Management, that consideration should be given to the "impacts on aviation and defence interests and seismological recording"
National Planning Framework 4 Revised Draft (November 2022): Energy Policy	The revised draft NPF4 states in Policy 11 e) iv. that project design and mitigation will demonstrate how the impacts on aviation and defence interests including seismological recording will be addressed.
Scottish Onshore Wind Policy Statement 2022	<p>Under Chapter 6, Onshore Wind and Aviation Considerations, it is noted wind turbines have the potential to impact aviation operations, including, but not limited to, impact on aviation radar.</p> <p>The document recognises recent progress stating that bespoke solutions which alleviated specific, individual objections have been deployed successfully over the last decade or more, releasing significant volumes of renewable generation. However, the pace of deployment necessitated by the climate emergency means we must find a way to alleviate these impacts in an effective, efficient and timely manner. It is also important that solutions are cognisant of the cost of deploying renewable energy, particularly given the need to focus on both security of supply and low-cost generation, given the current international and economic situation.</p> <p>Beyond the above statement of need, the document sets out the structure and aims of Industry and Government groups set up to address the issues of radar impacts and aviation lighting; specifically the Onshore Wind Aviation Radar Delivery 2030 group and the Aviation Lighting Working Group.</p> <p>The Aviation Lighting Working Group has developed draft guidance focussed on delivering consistent methods, practices and recommendations to aid in assessing aviation obstacle lighting impacts. The draft guidance is out to consultation with relevant stakeholders, with a final version expected to be published by the end of Q2 2023.</p> <p>In section 7.2, Background to Eskdalemuir, an overview is provided describing the role of the Eskdalemuir Seismic Array, the impacts of wind turbines to it and the work conducted to date. That work aims to find a way forward in both Safeguarding the array and maximising renewable energy deployment within the array safeguarding zone.</p> <p>It concludes by stating that the intention of the Scottish Government is to finalise their approach to maximising renewable deployment within the 50km consultation zone as soon as possible following of the publication of the policy statement.</p>
Planning Circular 2/03: Safeguarding of Aerodromes, Technical Sites and Military Explosives	<p>This Circular summarises the Scottish Ministers' understanding of the general effect of the relevant primary or secondary legislation.</p> <p>It contains four annexes. Annexes 1 and 2 describe the formal process by which decision makers should take into</p>

Document	Summary
Storage Areas (revised March 2016)	<p>account safeguarding, including in relation to wind energy developments. Annex 3 lists officially safeguarded civil aerodromes and Annex 4 lists planning authority areas containing civil en-route technical sites for which separate official safeguarding maps have been issued (as of 27 January 2003).</p> <p>The Circular also refers planning authorities, statutory consultees, developers and others to CAA CAP 764 (CAA Policy and Guidance on Wind Turbines), which is discussed further under Guidance below, and The Meteorological Office (Met Office) guidelines.</p>
CAA Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level (June 2017)	<p>This policy statement highlights and clarifies the requirements set out in CAP 393, the Air Navigation Order, for the lighting of onshore turbines. Key sections are described further under the assessment methodology below.</p>
Guidance	
CAP 764: CAA Policy and Guidance on Wind Turbines (Feb 2016)	<p>CAA guidance within CAP 764, sets out recommended consultation and assessment criteria for the impacts of wind turbines on all aspects of civil aviation.</p> <p>The CAA involvement in the Wind Farm Pre-Planning Consultation Process ceased on 25 December 2010. CAP 764 now states that “<i>developers are required to undertake their own pre- planning assessment of potential civil aviation related issues.</i>”</p> <p>Within CAP 764 the CAA provides a chapter describing the “wind turbine development planning process”, within which the main civil aviation stakeholders and their interests are listed and described in brief. Table 1 within the guidance document provides an overview of considerations and the following paragraphs detail what developers will need to consider, conducting associated consultations as appropriate.</p> <p>The CAA observes in section 2.36 that impact on communications, navigation and surveillance infrastructure alone is not sufficient to support an objection; rather those impacts need to have a negative impact on the provision of an air traffic service.</p> <p>The CAA notes in section 5.25 of CAP 764 that “<i>it is incumbent upon the developer to liaise with the appropriate aviation stakeholder to discuss – and hopefully resolve or mitigate – aviation related concerns without requiring further CAA input. However, if these discussions break down or an impasse is reached, the CAA can be asked to provide objective comment</i>”.</p> <p>Section 5.26 of CAP 764 states that “<i>the CAA will not provide comment on MoD objections or arguments unless such comments have been requested by the MoD.</i>”</p>

14.3 Consultation undertaken

14.3.1 **Table 14.2** below provides details of consultations undertaken with relevant regulatory bodies, together with action undertaken by the Applicant in response to consultation feedback.

Table 14.2: Consultees and responses

Consultee	Response	Action
Scoping responses		
Highlands and Islands Airports Ltd (HIAL); Scoping response email to ECU dated 16 th August 2022, their Ref: 2022/281/BEB	With reference to the above, our assessment shows that, at the given position and height, this development would not infringe the safeguarding criteria for Benbecula Airport. Therefore, Highlands and Islands Airports Limited has no objections to the proposal	No action required.
Ministry of Defence (MOD); Scoping response letter from DIO to ECU dated 8 th September 2022, their ref DIO10055997	Subject to an aviation lighting condition and an aviation charting condition, the MOD has no objection to the proposed development. As a minimum the MOD would require that the development be fitted with MOD accredited aviation safety lighting in accordance with the Air Navigation Order 2016	The MOD lighting requirements have been included in the lighting design submitted to aviation stakeholders (Technical Appendix 14.1). Accurate positional information will be provided to enable charting.
National Air Traffic Services (NATS); Scoping response email to ECU dated 23 rd August 2022; their ref SG08568	NATS (En Route) plc objects to the proposal. Prestwick Centre ATC [Air Traffic Control] objects as a result of impacts to the Tiree En-route radar.	Mitigation has been agreed with NATS, subject to contract. Contracting for mitigation is now required to enable NATS to remove their objection, conditional upon implementing the agreed radar mitigation scheme prior to construction.
Aviation Obstruction Lighting		
Highlands and Islands Airports Ltd (HIAL); Response by email dated 12 th January 2023	I can confirm that we approve Ben Aketil's Aviation Obstruction Lighting plan.	No action required.
Ministry of Defence	No additional response	The scoping response will be applied to the lighting design.
Scottish Ambulance; Response by email	The proposal to use a visible spectrum cardinal lighting scheme, with all of the turbines falling within this	No action required.

Consultee	Response	Action
dated 10 th January 2023	area, as well as the most elevated turbine being lit, would be acceptable from a Babcock air ambulance perspective.	
Scottish Police; Response by email dated 12 th January 2023	I have no concerns and don't envisage any impact to Babcock police operations.	No action required.
MOD; letter from DIO dated 2nd March 2023 (included in Appendix 14.1)	The MOD acknowledge engagement held with the developer's aviation consultant and can confirm that the lighting proposal submitted for review has been deemed acceptable. It is noted that this lighting brief submitted for review only provides details of lighting for the completed development and does not cover construction equipment and temporal structures.	No action required.
The UK Civil Aviation Authority (CAA)	.Response outstanding at the time of submission.	An Aviation Lighting Design and Consultation Study Report was submitted to the CAA for consideration and approval on January 31 st 2023.

14.4 Approach to the assessment

- 14.4.1 The objective is for the Proposed Development to have no significant residual impacts on aviation infrastructure. This is addressed through consultation with all relevant stakeholders within the consenting process. The task of the applicant is to independently assess the potential effects and, where significant effects may occur, to enter a dialogue with the affected stakeholders prior to submission as far as is possible. Whilst the aim of this pre-submission dialogue is to elicit the approval of all stakeholders, typically solutions are identified but do not reach full maturity in terms of the assessment by the stakeholders and the contracting of mitigation where required. The stakeholders consider dialogue a higher priority and more meaningful once design iterations are completed and a live application exists.
- 14.4.2 An initial scoping assessment identified those stakeholders potentially affected by the Proposed Development. The assessment process involves considering all military and civil aerodromes in the wider area out to approximately 60 km; all radar installations out to the limit of their range; all navigational aids; air-ground-air communications stations and low flying activities. A key sensitivity is the visibility of the Proposed Development to those radars potentially affected. Because of this, studies have been conducted prior to submission to assess the visibility of the Proposed Development to all relevant radars in the area.

- 14.4.3 As the Proposed Development includes structures over 150 m high, there is a statutory requirement for aviation lighting on the Proposed Development. The precise details of the lighting will be agreed with the Civil Aviation Authority (CAA) prior to construction. However, a scheme of lighting will be submitted alongside the EIAR. The requirements for the lighting of En-route obstacles (i.e. those away from the vicinity of a licensed aerodrome) are set out in Article 222 of the UK Air Navigation Order (ANO) 2016 as modified by the June 2017 CAA Policy Statement: 'Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level'. Article 222 requires medium intensity (2000 candela) steady red aviation warning lights to be mounted as close as possible to the top of all structures at or above 150 m above ground level (AGL) and illuminated at night. In terms of requirement for lighting wind turbine generators, the CAA interprets this as the fitting of lights on the top of the supporting structure (the nacelle) rather than the blade tips. Additionally, the 2017 Policy Statement requires at least three (to provide 360-degree coverage) low-intensity lights (32 candela) be provided at an intermediate level of half the nacelle height. The lights should be turned on only when illuminance reaching a vertical surface falls below 500 LUX (dusk like conditions). If the horizontal meteorological visibility in all directions from every wind turbine generator in the Proposed Development is more than 5 km, the intensity of the nacelle mounted lights may be reduced to not less than 10% of the minimum peak intensity specified for a light of this type.
- 14.4.4 If four or more wind turbine generators are located together in the same group, with the permission of the CAA, only those on the periphery of the group need be fitted with a light and intermediate lights may not be required. Where acceptable to airspace users, and very much subject to the specific location, the CAA has increasingly supported the use of visible spectrum lighting of the cardinal turbines only; these being the 'corner' turbines that mark the geographical extent of the development and in addition removing the requirement for any lights on the towers. In addition to this, infra-red lights would be used on all peripheral turbines. This reduces the visual impacts of the lighting scheme (see **Section 6.7** for more detail on visual impacts resulting from the proposed lighting scheme).

14.5 Existing environment

- 14.5.1 The site lies under uncontrolled airspace, remote from all military and civil aerodromes, in an area already characterised by wind turbines. The site is over 50 km east of the nearest licensed aerodrome at Benbecula Airport, operated by HIAL and it is approximately 43 km from the aerodrome on Skye.
- 14.5.2 All turbines are fully terrain screened from the MOD Air Defence radar at Benbecula, reflected in the MOD scoping response, which did not raise radar impacts as a concern.
- 14.5.3 All turbines will be visible to the NATS En-route radar at Tiree, 110 km to the south. At the scoping stage, NATS determined the predicted impacts to be unacceptable to them. There is therefore a requirement for mitigation. Mitigation has been agreed with NATS, details of which are provided in the 'Mitigation' section below..
- 14.5.4 Obstacle lighting will be required because the turbines are over 150 m tall. The adjacent wind farm at Ben Sca does not have aviation obstacle lighting. It is noted in the scoping response from The Highland Council, that "Turbine lighting at this location would be of

concern and require careful assessment of likely effects and consideration should therefore be given to limiting light pollution associated with the development”.

- 14.5.5 It should be noted that there are low intensity steady red aviation obstacle lights on the least elevated turbine, T11, on the operational Ben Aketil wind farm. The two lights are on during the night time only.
- 14.5.6 The MOD has stipulated, within its scoping response of September 2022, a requirement for aviation lighting; “As a minimum the MOD would require that the development be fitted with MOD accredited aviation safety lighting in accordance with the Air Navigation Order 2016.” The ANO does allow for a reduced lighting scheme, subject to the approval of aviation stakeholders and the CAA.

14.6 Predicted effects

- 14.6.1 There are no significant aviation impacts during construction or decommissioning, beyond the usual lighting of the cranes and notification of their use, as tall structures. The primary consideration in terms of impacts and any requirement for mitigation, arises from the operational phase of the development. The remainder of this chapter addresses only the operational phase.
- 14.6.2 Scoping responses have identified two effects requiring management. These are the predicted impacts to the NATS Tiree En-route radar and the requirement for aviation obstacle lighting. The mitigation of these effects are discussed in the section below.
- 14.6.3 There are no other impacts anticipated as a result of the Proposed Development.

14.7 Mitigation

NATS

- 14.7.1 A mitigation solution has been agreed with NATS. This will remove the impacts to their Tiree En-route radar.
- 14.7.2 The agreed solution is plot suppression, more commonly described as blanking. This will prevent the proposed turbines generating clutter on the NATS radar displays. It is a solution applied very widely across the UK.
- 14.7.3 At the time of submission, contracting for the agreed mitigation was yet to be completed. Once contracts have been finalised, NATS will be in a position to remove their objection, subject to the implementation of the radar mitigation scheme prior to construction.

Aviation Obstacle Lighting

- 14.7.4 Night time lighting is required under the legislation of the Air Navigation Order (ANO) and as a requirement of the MOD to mitigate night time low flying collision risk.
- 14.7.5 However, because of the nature of the area, light pollution from aviation obstacle lighting is of concern to local communities and other stakeholders. In balancing the two requirements it is considered appropriate to implement a reduced lighting scheme, with not all turbines being lit. This can be acceptable to CAA where the night time use of the airspace is only very rarely low flying VFR (Visual Flight Rules) traffic.

- 14.7.6 A cardinal lighting scheme was proposed for consultation in December 2022. Stakeholder feedback has confirmed that this is acceptable, with the final approval of the CAA outstanding at the time of submission. In this case, four turbines are proposed to have nacelle mounted medium-intensity steady red (2000 candela) obstacle lights, operating from dusk until dawn. This will include the most elevated turbine, i.e. the turbine with the most elevated turbine tip, which in the case of the Proposed Development is T5. In addition, it is proposed that T1, T6 and T9 will be lit in order to define the geographical footprint of the Proposed Development.

Lighting Specification

- 14.7.7 The specification of the lighting is provided below:
- medium intensity steady red (2000 candela) lights on the nacelles of turbines T1, T5, T6, and T9 (four in total); and
 - a second 2000 candela light on the nacelles of the above turbines to act as alternates in the event of a failure of the main light; and
- 14.7.8 The lights on these turbines to be capable of being dimmed to 10% of peak intensity when the visibility as measured at the Proposed Development exceeds 5 km. The switching on and off of lights would be controlled by a timer 30 minutes before sunset until 30 minutes after sunrise, and not by photocells, or similar, that respond to particular light levels, thereby not incurring effects in the daytime.
- 14.7.9 The intensity of the light emitted from an aviation obstruction light is designed to vary with the observed angle. It aims to be at its brightest when observed from a similar level or just above, but less bright as the observer falls significantly below or above the light. Hence the intensity is greatly reduced when observed from below the turbines, reducing the visual impact. Different manufacturers produce lights with slightly varying characteristics, though broadly similar in complying with international standards.

14.8 Summary of effects

- 14.8.1 The effects on low flying and the NATS radar would be mitigated as described above. There would be no residual impacts and no cumulative impacts.

14.9 References

Civil Aviation Authority (Feb 2016), 'CAP 764: CAA Policy and Guidelines on Wind Turbines'.

Civil Aviation Authority (Jun 2017), 'Policy Statement - Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level'.

Civil Aviation Authority (Feb 2021), 'CAP 393: The Air Navigation Order 2016 (ANO) and Regulations'.

Scottish Government (2022), 'National Planning Framework 4- Revised Draft'.

Scottish Government (revised March 2016), 'Planning Circular 2/03: Safeguarding of Aerodromes, Technical Sites and Military Explosives Storage Areas'.

Scottish Government (2014), 'Scottish Planning Policy'.

Scottish Government (Dec 2017), 'Onshore wind: policy statement'.

15 CLIMATE CHANGE MITIGATION

15.1 Introduction

- 15.1.1 Wind turbines provide an important mechanism for the reduction of carbon dioxide (CO₂), and other greenhouse gas (GHG) emissions into the atmosphere by reducing the consumption of fossil fuel generated mains electricity. However, during their manufacture, construction and decommissioning, wind farms can themselves result in the emissions of GHGs, particularly in such instances as where natural carbon stores, such as peat, are present and potentially impacted by the development.
- 15.1.2 For this reason, this chapter provides an approximation of:
- the GHG emissions associated with the manufacture, construction and decommissioning of the Proposed Development;
 - the contribution which the Proposed Development would make towards the reduction of emissions, which would otherwise be produced by fossil fuel power generation.
- 15.1.3 Taken together, these two elements indicate the whole life “carbon balance” of the Proposed Development, together with an understanding of the “emissions payback” period. Once emissions resulting from the manufacture, construction and decommissioning of the Proposed Development have been “paid back” (offset) by the wind farm, all subsequent wind-generated electricity would displace a similar amount of conventionally generated electricity, thereby contributing to an overall GHG reduction.
- 15.1.4 Although often colloquially termed “carbon balance”, the assessment includes all GHGs, not just carbon dioxide. The results are presented in tonnes of carbon dioxide equivalent (tCO₂e), where equivalence means having the same warming effect as CO₂ over 100 years.
- 15.1.5 This chapter is supported by:
- **Technical Appendix 15.1 in Volume 3.**

15.2 Scope and Methodology

- 15.2.1 Whilst the Proposed Development is expected to deliver GHG savings over its lifetime, it also has the potential to cause GHG emissions through the following pathways:
- disturbance of peatland;
 - felling of forestry; and
 - embodied carbon in turbines and other infrastructure.
- 15.2.2 The GHG assessment of the Proposed Development has been undertaken using the latest version (V1.7.0) of the Scottish Government’s Carbon Calculator Tool, which is the standard way of assessing GHG emissions and savings from onshore windfarm developments. A detailed explanation of the Scottish Government’s Carbon Calculator Tool methodology is found within **Technical Appendix 15.1**. In brief, the calculator uses project-specific data from the construction of the Proposed Development (**Chapter 2: Proposed Development**) and the receiving environment (**Chapters 6-14 and 16**),

particularly with regards to peat disturbance. This allows GHG emissions and avoidance to be quantified across the project lifecycle stages (construction, operation, and decommissioning/site restoration).

- 15.2.3 Calculations are provided for minimum, maximum and expected scenarios, whereby the minimum scenario assumes the lowest energy output and the lowest carbon losses from the Proposed Development, and the maximum assumes highest energy output and highest carbon losses. The expected scenario is based upon 9 turbines with an anticipated installed capacity of 6.6 MW and capacity factor of 42%.
- 15.2.4 The Scottish Government's Carbon Calculator Tool includes embodied emissions from turbines and their foundations, but not for Battery Energy Storage System (BESS). As such, a supplementary life cycle analysis of BESS has been conducted and integrated within the calculator outputs, with the method outlined below.
- 15.2.5 Overall, Life Cycle Analysis studies on BESS have found that the manufacturing stage has the greatest impact in terms of embodied carbon. Lithium-ion batteries are the most common choice of battery technology, with several examples of Lithium-ion BESS supporting wind and solar farms in the UK. A study undertaken by Romare and Dahllöf (2017)⁶¹ indicates that the cradle to grave emissions of a lithium-ion battery is in the region of 150-200 kg CO₂e/kwh. Although this assessment was undertaken for batteries for light-duty vehicles, evidence suggests that there is a near-linear scale of GHG emissions when battery size increases. A conservative estimate of 200 kg CO₂e/kwh has therefore been applied to the BESS. A 20 MW BESS is proposed as part of this Development, and for the purposes of this assessment it is assumed the BESS has a one-hour duration (meaning the energy storage capacity would be 20 MWh).
- 15.2.6 The GHG emissions and savings are combined to establish the overall (net) GHG effect of the Proposed Development, as well as its carbon payback period.

15.3 Significance

- 15.3.1 Given the international urgency of climate change, the sensitivity of the receptor (i.e. global climate) to fluctuations in GHG emissions is considered 'Very High'. Thus, the level of the significance of effects is determined by the magnitude, and timing, of GHG emissions and the likelihood of avoiding severe climate change.
- 15.3.2 Aligned with IEMA's Guidance to Assessing GHG Significance (2022)⁶², any project that causes GHG to be avoided, or removed from the atmosphere, has a beneficial effect that is always significant. In such a scenario, the project substantially exceeds the national net zero requirements and is thus aligned with the goal of the Paris Agreement to limit temperature rise to well below 2°C, aiming for 1.5°C.

Table 15.12: IEMA's Guidance to Assessing GHG Significance (2022) Framework for assessment of significant effects

⁶¹ Romare, M., and L. Dahllöf (2017) The Life Cycle Energy Consumption and Greenhouse Gas Emissions from Lithium-Ion Batteries, A Study with Focus on Current Technology and Batteries for light-duty vehicles. IVL Swedish Environmental Research Institute Ltd. C 243

⁶² IEMA (2022) Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance

Significance	Level	Criteria
Significant	Major adverse	Project adopts a business-as-usual approach, not compatible with the national Net Zero trajectory, or aligned with the goals of the Paris Agreement (i.e., a science-based 1.5°C trajectory). GHG impacts are not mitigated or reduced in line with local or national policy for projects of this type.
	Moderate adverse	Project's GHG impacts are partially mitigated, and may partially meet up-to-date policy; however emissions are still not compatible with the national Net Zero trajectory, or aligned with the goals of the Paris Agreement.
Not significant	Minor adverse	Project may have residual emissions, but the project is compatible with the goals of the Paris Agreement, complying with up-to-date policy and good practice.
	Negligible	Project has minimal residual emissions and goes substantially beyond the goals of the Paris Agreement, complying with up-to-date policy and best practice.
Significant	Beneficial	Project causes GHG emissions to be avoided or removed from the atmosphere, substantially exceeding the goals of the Paris Agreement with a positive climate impact.

15.4 Consultation undertaken

- 15.4.1** Responses relating to climate change mitigation were received as part of the scoping consultation from May 2022. These are summarised below and have been addressed in the EIAR as required.

Table 15.23: Consultation responses and necessary action taken

Consultee and Date	Summary of Key Issues	Action taken
The Highland Council, 20 th September 2022	Requested for carbon balance calculations to be carried out and summarised with a focus on the carbon payback period for the windfarm.	This section comprises an assessment of GHG balance associated with the Proposed Development, with carbon payback period included.

15.5 Statutory and Planning Context

- 15.5.1** Planning and energy policy and legislation, including national and local policy objectives and legal requirements in relation to climate change, are summarised in **Chapter 5: Planning Policy Context**. Both national and local policy recognise that planning should consider the contributions a proposed development makes towards achieving the climate change targets. Guidance and legislation relating specifically to carbon and GHG emissions are listed below.

Scottish Planning Policy (2014)⁶³

- 15.5.2 The Scottish Planning Policy (SPP, 2014) states that “where peat and other carbon rich soils are present, applicants should assess the likely effects of development on carbon dioxide (CO₂) emissions. Where peatland is drained or otherwise disturbed, there is liable to be a release of CO₂ into the atmosphere. Developments should aim to minimise this release.”

Good Practice During Wind Farm Construction, NatureScot et al. (2019)⁶⁴

- 15.5.3 The SNH, now NatureScot, ‘Good Practice During Wind Farm Construction’ guidance recognises that one of the key aims of wind farm development is to reduce carbon emissions. However, wind farm developments, through the materials used, during the construction processes employed and the potential emissions from disturbed soils and habitats, do result in carbon emissions.
- 15.5.4 The guidance recognises that, in some circumstances, the carbon payback of wind farm developments could be significantly affected by the construction methods used and the degree of restoration of the site. The guidance, therefore, seeks to ensure that good practice is adopted to reduce the carbon emissions associated with wind farm development.

15.6 Existing environment

- 15.6.1 Baseline environmental conditions relating to potential climate change impacts from the Proposed Development include existing carbon stored in the site (such as peat and forestry) that could be impacted by the Proposed Development and result in CO₂ and other GHG emissions. Given the baseline characteristics, it is likely that the application Site presently sequesters carbon.

Peat

- 15.6.2 The National Soil map of Scotland⁶⁵ has been consulted to assist the high-level understanding of the carbon-rich soils within the Site. The area is predominantly made up of peaty gleys, with dystrophic blanket peat. There are two other significant areas; one which is mainly made up of brown soils extending directly north of Loch Caroy, and one which is mainly made up of peat along the eastern side of Aketil Burn.
- 15.6.3 Peat depth and peat condition surveys were undertaken in June, August and November 2022 for areas of proposed infrastructure. The peat depth surveys and reconnaissance survey confirm that peat cover across the site is very extensive, with the majority of the site having peat that is between 0.5 – 1.5 m deep. For further information on the peatland habitat within the site, consult **Chapter 9: Hydrology, Geology, Hydrogeology, and Peat.**

⁶³ Scottish Planning Policy (SPP: 20214) Scottish Planning Policy. Available at: <https://www.gov.scot/publications/scottish-planning-policy/pages/3/>

⁶⁴ NatureScot et al. (2019) Good Practice during Wind Farm Construction, Fourth Edition; A joint publication by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland, and Historic Environment Scotland. Available at <https://www.nature.scot/doc/guidance-good-practice-during-wind-farm-construction>

⁶⁵ https://map.environment.gov.scot/Soil_maps/?layer=1&layer=1

Forestry

- 15.6.4 There is no significant forestry areas within the Application Site, although small areas of tree cover can be found along watercourses.

Design Considerations

- 15.6.5 Peat disturbance has been considered during the design process, which has sought to avoid areas of deep peat. The felling requirement has also been minimised by design. The site design process is described in **Chapter 2: Proposed Development** whilst specific details relating to peat depth (**Chapter 9: Hydrology, Geology, Hydrogeology, and Peat**) are included in elsewhere in the EIAR.

15.7 Predicted impacts

- 15.7.1 The results of the carbon balance assessment carried out for the Proposed Development are presented below for each project stage. The project-specific input and output data is contained within **Technical Appendix 15.1**, alongside the detailed methodology of the calculator.

Construction and Decommissioning

- 15.7.2 **Table 15.3** presents the results of the GHG balance assessment for the manufacture, construction, and decommissioning stages of the Proposed Development. The lack of significant forestry on site results in negligible predicted GHG emissions from forestry felling. Total projected emissions are 60,849 tCO₂e.

Table 15.34: Predicted GHG emissions from wind farm manufacture, construction and decommissioning

Source of GHG Emissions/Savings	GHG Emissions (tCO ₂ e)	% of Total Emissions
Losses due to turbine manufacture, construction and decommissioning	53,511	88
Losses due to embodied emissions of BESS*	4,000	7
Losses due to back-up power generation	0	0
Losses due to reduced carbon fixing potential	407	< 1
Losses from soil organic matter	2,848	5
Losses due to Dissolved Oxygen Content and Portable Oxygen Content	83	< 1
Losses due to forestry felling	0	0
Total	60,849	100

**The losses due to the embodied emissions of BESS are not an output of the carbon calculator, and have been integrated into the calculations based upon an assumed 20MW capacity BESS*

- 15.7.3 Any post-decommissioning site restoration and enhancement work, such as blocking drainage ditches to promote re-wetting, would be aligned with the Outline Habitat

Management Plan (see **Technical Appendix 7.6**). Such activities can incur GHG savings by promoting growth of peat or other natural carbon stores. Other management options may occur during the Habitat Management Planning stage.

- 15.7.4 **Table 15.4** shows the total CO₂ gains due to site improvement during post-decommissioning (tCO₂e).

Table 15.45: Total CO₂ Gains Due to Improvement of the Site (tCO₂e)

Improvement	GHG Emissions (tCO ₂ e)	% of total
Change in emissions due to improvement of degraded bogs	0	0
Change in emissions due to improvement of felled forestry	0	0
Change in emissions due to restoration of peat from borrow pits	0	0
Change in emissions due to removal of drainage from foundations and hardstanding	-11	100
Total change in emissions due to improvements	-11	100

- 15.7.5 Taking into account the predicted GHG emissions from wind turbine manufacture, construction and decommissioning alongside those savings from the improvement of the site, the total net GHG emissions from the Proposed Development are expected to be 60,838 (**Table 15.6**).

Table 15.6: Total net GHG emissions from the Proposed Development

	GHG savings (tCO ₂ e)	GHG emissions (tCO ₂ e)
Predicted GHG emissions from wind turbine manufacture, construction and decommissioning	-	60,849
Total CO ₂ gains/savings due to improvement of the Site	11	-
Total net GHG emissions from wind farm manufacture, construction, decommissioning and improvement of site	60,838	

Operation

- 15.7.6 The operational stage of the Proposed Development has the greatest potential for GHG savings. At this stage, GHG emissions from construction activities would have ceased and operation of the turbines would generate zero-carbon electricity for the remainder of their lifespan.
- 15.7.7 **Table 15.7** presents projected annual emissions savings as measured against the fossil fuel-mix and grid-mix of electricity.

Table 15.7: Annual Emissions Savings Against Fossil Fuel and Grid Electricity Generation Mix

GHG savings*	GHG savings (tCO ₂ e)		
	Expected value	Minimum value	Maximum value
Grid mix electricity generation			
GHG savings per year	42,262	34,232	51,137
Lifetime GHG savings*	1,479,240	1,198,120	1,789,795
Fossil fuel mix electricity generation			
GHG savings per year	94,411	76,473	114,238
Lifetime GHG savings*	3,304,385	2,676,555	3,998,330

*Operational GHG savings based over a lifetime of 35 years

Emissions Payback Period

- 15.7.8 The emissions payback time can be calculated by dividing the total expected emissions caused by the Proposed Development (60,838 tCO₂e: **Table 15.6**) by expected annual savings from operation (42,262 or 94,411 tCO₂e: **Table 15.7**). This gives a predicted emissions payback of 0.6 years against a fossil fuel mix electricity generation.

Table 15.8: Carbon Payback Period of the Proposed Development

	Carbon payback time (years)
Grid mix electricity generation	1.4
Fossil fuel mix electricity generation	0.6

15.8 Assessment of Effects

Net GHG Effect

- 15.8.1 Given the Proposed Development's projected operational life of 35 years, its total GHG savings are expected to be 3,243,547 tCO₂e, inclusive of construction, operation and decommissioning (with 42% capacity factor), against a fossil fuel mix electricity generation.

15.9 Cumulative Effects

- 15.9.1 The Scottish government has set ambitious targets to reduce national GHG emissions, with renewable energy being a fundamental part of this plan. In 2021 renewable electricity comprised 39.6% of total generated electricity, with onshore wind comprising 24% of UK renewable energy generation⁶⁶.

⁶⁶

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1094629/DUK_ES_2022.pdf

- 15.9.2 The Proposed Development would contribute approximately 59.4 MW of installed capacity. The cumulative effect of this Development with any other wind-based energy generation projects in Skye and the UK as a whole would be highly likely to result in total emissions savings by offsetting fossil fuel contributions to grid electricity. The GHG savings would thus outweigh total losses and the cumulative effects from these existing and potential wind farm developments would be Significantly Beneficial, contributing towards climate change mitigation.

15.10 Mitigation

- 15.10.1 It has been assumed that all activities during construction, operation and decommissioning would be conducted in accordance with good practice guidance.
- 15.10.2 Relevant guidance includes:
- Good Practice During Wind Farm Construction, NatureScot et al. (2019); and
 - Life Extension and Decommissioning of Onshore Windfarms, SEPA (2016).
- 15.10.3 Further, it is assumed that mitigation outlined in **Chapter 17: Schedule of Mitigation** would be implemented to reduce environmental impacts, including GHG emissions, and improve effectiveness of restoration works.
- 15.10.4 As no adverse effects are predicted, no additional mitigation measures are proposed.

15.11 Summary of Effects

- 15.11.1 GHG emissions would arise from the manufacture, construction and decommissioning activities, including the loss of peat and forestry, from the construction of turbines and associated infrastructure.
- 15.11.2 These emissions are projected to be offset 0.6 years (~7 months) after the Proposed Development becomes operational against a fossil fuel mix of electricity, or 1.4 years (~17 months) against a grid-mix of electricity. The Proposed Development is predicted to deliver total emissions savings of 3,243,547 tCO₂e over its 35-year operational lifetime, against a fossil fuel mix electricity generation.
- 15.11.3 The overall impact is considered to represent a **Significant and Positive effect**, and contribute to long-term climate change mitigation. Consequently, the Proposed Development contributes towards Scotland's emissions reduction targets as set out in the Climate Change (Emissions Reductions Targets) (Scotland) Act 2019, together with its renewable energy obligations as set out in the Scottish Climate Change Plan.

15.12 References

IEMA (2022) Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance.

NatureScot et al. (2019) Good Practice during Wind Farm Construction, Fourth Edition; A joint publication by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland, and Historic Environment Scotland. Available at <https://www.nature.scot/doc/guidance-good-practice-during-wind-farm-construction>

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16 OTHER ISSUES

16.1 Introduction

- 16.1.1 Within this chapter, the environmental factors of Telecommunications, and Shadow Flicker are addressed.

16.2 Telecommunications

Introduction

- 16.2.1 This Section of the chapter describes the existing environment and assesses the potential impacts with respect to wireless transmission infrastructure e.g., telecommunications, telemetry, microwave, broadcast, etc. For ease of reference, in this chapter all wireless transmission infrastructure is referred to as Telecommunications.
- 16.2.2 During operation, a windfarm has the potential to cause an impact on telecommunications infrastructure by introducing new physical structures (turbines) into an area that can block and/or reflect radio signals.

Consultation

- 16.2.3 Consultation was undertaken at EIA scoping stage with the relevant telecommunication link operators to inform the telecommunication links within the vicinity of the Proposed Development and to advise their position with respect to the Proposed Development. A summary of the consultation is provided in **Table 16.1**.

Table 16.1: Link operator responses

Link Operator	Consultation Summary	Comment / Action Taken
Arqiva	Arqiva would object to the proposed EIA scoping layout because of the detrimental impact on broadcasting link between Skriaig and Scoval; T06 of the scoping layout was located between the two transmitter sites and would stop broadcast depending on rotation speed and turbine angle; breaks in transmission would lead to five other sites experiencing transmission breaks; and there must be at least 100 m of separation between the direct path and the turbine tip – T06 is within this corridor.	T06 of the scoping layout has been removed from the design altogether to eliminate the potential impacts on the broadcasting link.

Link Operator	Consultation Summary	Comment / Action Taken
British Telecom (BT)	BT would object to the proposed EIA scoping layout as T07 of the scoping layout caused interference with BT's current and presently planned radio network.	T07 of the scoping layout was moved out of the specified 100 m clearance buffer (and is now labelled T06 on the final layout). No impacts are expected on the BT radio network as a result.
Joint Radio Company (JRC)	JRC would object as all turbines comprising the EUA scoping layout, except Turbines 1, 5 and 8, affect the 460MHz Telemetry and Telecontrol links; T06 and T07 also affect the 1GHz Microwave Point to Point link operated by Scottish Hydro (SSE). JRC is willing to work with the Applicant on clearing as many turbines as possible (even those in the coordination zone) – when satisfactory coordination is achieved, and zone of protection is implemented, it will withdraw its objection.	Changes were made to the design following the EIA scoping layout to avoid impacts on telecommunication and other wireless transmission infrastructure. Further information is provided in Chapter 2 of this EIAR.
Mobile Broadband Network Limited (MBNL)	MBNL would object to the Proposed Development as T06 of the scoping layout did not satisfy the 100 m clearance zone from an MBNL broadcasting link.	T06 of the scoping layout has been removed from the design altogether to eliminate the potential impacts on the broadcasting link.
Virgin Media	Virgin Media does not currently have any microwave links in the vicinity that could be affected by the Proposed Development.	No action required.
Vodafone	Vodafone would object to the application on the basis of the EIA scoping layout, because of the potential impact two2 links as a result of T06.	T06 of the scoping layout was removed altogether. This is no longer expected to be a concern.

Baseline

- 16.2.4 Telecommunications link infrastructure was identified through consultation with the relevant telecommunications stakeholders. The search radius was, therefore, informed by the safeguarding criteria applied by each stakeholder. Only telecommunication links that crossed the Site were considered.

- 16.2.5 Telecommunications links in relation to the Site are illustrated on **Figure 16.1**. The JRC does not provide specific link details and were therefore not included in the figure. However, JRC undertook their own assessment and confirmed that the Proposed Development would have impacts on telecommunication links that enable the remote operation of Ben Aketil Wind Farm.
- 16.2.6 Additional telecommunications links information that became available through consultation is included in **Table 16.2**.

Table 16.2: Telecommunications links that cross the Site

Operator	Link ID / Reference	Frequency	Clearance Buffer	A End	B End
BT	6500965	6 GHz	100 m	E 118040 N: 851640	E:144640 N: 841480
Vodafone	0950641/1	13 GHz	100 m	E: 145153 N: 840761	E: 118148 N: 851442
	0950964/1	15 GHz	100 m	E: 145153 N: 840761	E: 118148 N: 851442

- 16.2.7 To mitigate potential effects on JRC's UHF link and continue to allow the existing Ben Aketil Wind Farm to be operated remotely, the Applicant replaced the UHF link with a satellite uplink. JRC confirmed on 28 March 2023 that, based on the information provided (i.e. the proposed nine-turbine layout described in **Chapter 2**) and on known interference scenarios, no potential problems are foreseen.

Assessment of effects

- 16.2.8 As illustrated on **Figure 16.1**, through the design iteration process, all wind turbines comprising the final layout of the Proposed Development have been sited outwith the identified links and their safeguarding exclusion zones. Therefore, no impacts are predicted on any telecommunication assets displayed on **Figure 16.1** from the Proposed Development.

Mitigation

- 16.2.9 Via the design mitigation for the Proposed Development, no effects are predicted on telecommunication links displayed on **Figure 16.1**. Therefore, the plotted telecommunication links would require no further mitigation.

Summary

- 16.2.10 As identified in the assessment of effects, no impacts on any plotted telecommunications links are predicted, and mitigation is already in place for mitigating potential effects on JRC's UHF link. Therefore, no further mitigation is required.

16.3 Shadow Flicker

Introduction

- 16.3.1 This section of the chapter considers the potential effects of shadow flicker on receptors arising from the Proposed Development.
- 16.3.2 Shadow flicker may occur under certain combinations of geographical position and time of day when the sun passes behind the rotors of a wind turbine and casts a shadow over neighbouring properties. Rotating wind turbine blades can cause brightness levels to vary periodically at locations where they obstruct the sun's rays. As the blades rotate, the shadow flicks on and off, an effect known as shadow flicker. The effect is most likely to be an issue inside buildings, where the flicker appears through a window opening. This can result in a nuisance when the shadow is cast over the windows of residential properties. shadow flicker can be a cause of annoyance at residences near wind turbines if it occurs for a significant period during the year.

Scope and Methodology

- 16.3.3 The magnitude of the shadow flicker effect varies both spatially and temporally and depends on several environmental conditions coinciding at any particular point in time, including, the position and height of the sun, wind speed and direction, cloudiness, and proximity of the turbine to a sensitive receptor. To undertake a shadow flicker assessment, information on the Proposed Development, the location of potential residential receptors and other parameters are included in a computer model in order to predict and quantify the impact shadow flicker may have on receptors within the vicinity of the Proposed Development.
- 16.3.4 It is common practice to use a multiplier of the equivalent of 10 rotor diameters as a maximum separation distance between a turbine and an affected residence⁶⁷, within which shadow flicker effects can occur. However, in line with The Highland Council (THC) guidelines on shadow flicker assessments⁶⁸, a multiplier of the equivalent of 11 rotor diameters from each proposed wind turbine has been established as the shadow flicker study area. The shadow flicker study area that was taken into consideration in the assessment is illustrated on **Figure 16.2**.

Baseline, Impacts and Effects

- 16.3.5 Whilst examining the established study area in relation to potential shadow flicker receptors within the vicinity of the Site, it has been identified that no residential dwellings fall within the shadow flicker study area. This is confirmed by **Figure 16.2** which illustrates the shadow flicker study area in relation to residential dwellings within the vicinity of the Proposed Development. Therefore, no shadow flicker impact or effect on any residential receptors is predicted.

⁶⁷Update of UK Shadow Flicker Evidence Base. Available at:: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48052/1416-update-uk-shadow-flicker-evidence-base.pdf.

⁶⁸ Onshore Wind Energy Supplementary Guidance, Available at:: <https://www.highland.gov.uk/onshorewind>.

Summary

- 16.3.6 Since no shadow flicker effects are expected to occur as a result of the Proposed Development, no detailed shadow flicker assessment is required.

16.4 References

The Highland Council (2016), Onshore Wind Energy Supplementary Guidance, available at:

https://www.highland.gov.uk/downloads/file/18793/onshore_wind_energy_supplementary_guidance_november_2016

(Accessed: January 2023).

Department of Energy and Climate Change (2011), Update of UK Shadow Flicker Evidence Base, Available at: via:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48052/1416-update-uk-shadow-flicker-evidence-base.pdf

(Accessed: January 2023).

17 SCHEDULE OF MITIGATION

17.1 Introduction

- 17.1.1 The assessment of the Proposed Development has identified a number of impacts that would arise as a result of progression of the Proposed Development. Mitigation measures have accordingly been identified and developed to counter adverse impacts and reduce the significance of residual effects on the receiving environment.
- 17.1.2 Environmental mitigation measures identified during the EIA process are reported in **Chapters 6 to 16** of this EIA Report. Subject to the granting of planning consent, these measures will form a mandatory schedule of commitments under the terms of any contract(s) for the construction and future maintenance of the Proposed Development.
- 17.1.3 Environmental commitments are scheduled in **Table 17.1**.

17.1: Summary of Environmental Commitments

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
2.1	Micrositing	The proposed turbine locations and ancillary infrastructure would be subject to a maximum micrositing tolerance of 50 m in any direction. In those places where environmental features may be potentially affected by the micrositing, tolerance would be constrained to less than 50 m, and such changes would be managed in consultation with an appropriately qualified and experienced environmental manager during the construction phase. Any relocation of the turbines and/or ancillary infrastructure from the Proposed Development layout outwith the micrositing tolerance would be agreed with the Highland Council and would be in accordance with the mitigation set out in the EIA Report.	Construction	Contractor	Chapter 2: Proposed Development
2.2	Environmental Management	<p>The Principal Contractor would ensure construction activities and procedures set out in the project's Construction Environmental Management Plan (CEMP) are carried out in accordance with the mitigation measures outlines in this EIA Report and any planning conditions listed on the planning consent.</p> <p>A suitably qualified environmental manager would review the developed CEMP in line with the construction activities on a regular basis, and update the CEMP whenever required. Any CEMP revisions must be effectively communicated with the council's Environment and Health Officer in a timely manner.</p>	Construction	Contractor	Chapter 2: Proposed Development

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>The CEMP would be based on the adoption of good practice, supported by robust project management and on-site works supervision of an environmental manager.</p> <p>Good practice includes the adoption of Pollution Prevention Guidelines (PPGs) and replacement Guidance for Pollution Prevention (GPPs). The services of other specialist advisors would be retained as appropriate, such as an Environmental Advisor, to be called on as required to advise on specific environmental issues.</p>			
2.3	Temporary Construction Compounds and Work Areas	Lighting would be kept to a minimum and would be limited to working areas only and would comply with health and safety requirements. Lighting would be down lit and linked to timers and movement sensors so that light pollution is kept to a minimum.	Construction	Contractor	Chapter 2: Proposed Development
		The compounds would be used as storage areas for the various components, fuels and materials required for construction.	Construction	Contractor	Chapter 2: Proposed Development
		Four comparatively small construction compounds would be located on existing hard standing areas at the base of four of the existing turbines.			
		Once the existing turbines have been decommissioned, some of the material within the hardstandings of the existing turbines would be reused in the production of new hardstandings for the proposed repowering turbine working areas.			
		Construction compounds and laydown areas would be reinstated. Reinstatement would involve removing			

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		the stone and underlying geotextile before carefully ripping the exposed substrate and replacing the excavated soil/peat.			
2.4	Design of Site Compounds	Temporary and permanent compounds, and substations, would be constructed in keeping with the local built environment. The final designs for the buildings and compound would incorporate sustainable design features and would be agreed with THC.	Construction	Contractor	Chapter 2: Proposed Development
2.5	Battery Energy Storage Facility	The battery technology type for the Proposed Development would meet all the relevant safety and environmental standards. The number, dimensions, housing type, finish, arrangement, security fencing and landscaping of energy storage elements would be subject to THC consultation and approval prior to construction.	Construction	Contractor	Chapter 2: Proposed Development
2.6	Health and Safety during Construction and Operation	<p>Site security and access during the construction period would be governed under Health and Safety at Work Act 1974 and associated legislation. During construction, some restrictions on use of the paths running through the Proposed Development may be required for public safety.</p> <p>Informal recreational access within the Site during the operational phase would be permitted. Appropriate warning signs would be installed concerning restricted areas such as the substation compound, transformers, switchgear and metering systems. All onsite electrical cables would be buried underground with relevant signage. Public access</p>	Construction, Operation	Contractor	Chapter 2: Proposed Development

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		would be improved through a more extensive accessible network of tracks.			
2.7	Construction hours	The main construction hours for the development would be between 07:00 and 19:00 from Monday to Friday, and 08:00 and 17:00 on Saturdays and Sundays, unless otherwise agreed with THC. Construction hours generally also apply to the delivery of materials to the proposed development; however, abnormal loads may be delivered out of these hours when the road network is at its quietest to reduce traffic disturbance.	Construction	Contractor	Chapter 2: Proposed Development
2.8	Felling	If Borrow Pit 2 is required, the plantation trees in this area would need to be felled. Should this option be required, the applicant would consult with key stakeholders and consultees and agree to suitable mitigation such as compensatory planting, or possibly replanting of plantation tree species within the reinstated borrow pit, post-construction.	Agreement pre-Construction. Compensatory mitigation post-construction	Applicant	Chapter 2: Proposed Development
2.9	Maintenance and Operation of Wind Turbines	Routine servicing of the turbines would typically be undertaken twice a year, with a full annual service and a minor service every six months. In the first year, there is also likely to be an initial three-month service post-commissioning. Individual turbines would be switched off as servicing was ongoing. Maintenance and servicing would include activities such as changing of gearbox oils and individual turbine components.	Operation	Contractor, Applicant or Asset Operator	Chapter 2: Proposed Development

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
Landscape and Visual Assessment					
6.1	Aviation Lighting	<p>The following mitigation strategies would be applied during the operation of the Proposed Development:</p> <ul style="list-style-type: none"> • automatic (controlled by sensors installed on the turbines) dimming of the lights to a nominal intensity of 200 candela during periods of meteorological visibility in excess of 5 km; • directional intensity mitigation which has the potential to reduce the intensity of the lights for nearby receptors located at elevations below the turbine nacelles; and • the switching on and off of lights would be controlled by a timer 30 minutes before sunset until 30 minutes after sunrise, and not by photocells or similar that respond to particular light levels, thereby not incurring effects in the daytime. 	Operation	Applicant or Asset Operator	Chapter 6: Landscape and Visual Assessment
6.2	Construction Effects	<p>Construction of the Proposed Development would follow an agreed construction method statement that would include arrangements for implementation of various aspects of the works to mitigate local adverse impacts during construction. These would be designed in agreement with THC and other statutory agencies. Specific mitigation measures during construction would include:</p> <ul style="list-style-type: none"> • protection of valued landscape features that are to be retained within the Site; • placing of turbines on gentler gradients, where possible, to minimise the groundworks necessary to accommodate the turbines, hard standings and access requirements; 	Construction	Contractor, Applicant or Asset Operator	Chapter 6: Landscape and Visual Assessment

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<ul style="list-style-type: none"> location of new borrow pits where rock resource is likely and either within areas of forestry to screen views and/or making use of existing ones. restoration of borrow pits post-construction, with an overall aim of creating a naturalistic and sympathetically designed landscape profile. Reinstatement would be carried out as soon as possible after phases of work are complete; maintaining the Site and temporary construction compound in a tidy and contained condition; removing all temporary construction materials from the Site once work is completed; and controlling construction lighting so that it does not impinge into sensitive views (e.g. from residential dwellings). 			
	Ecology				
7.1	Annex I Habitats (Wet Heath / Blanket and wet modified bog)	<p>Annex I habitats have been avoided as much as practicable via design. Additional protection of habitats would be achieved through good practice measures, such as pollution control measures and sensitive habitat restoration. Pollution control measures would be implemented and monitored via the CEMP.</p> <p>HMP embedded in the Proposed Development would include peat/bog restoration which would enhance bog habitats on-site.</p>	Pre-Construction, construction, operation	Contractor, Applicant or Asset Operator	Chapter 7: Ecology
7.2	Protected Terrestrial Mammals	Embedded mitigation includes good practice construction measures in relation to protected species; Pre-construction surveys for protected terrestrial mammals including otter and pine marten, would therefore be undertaken, prior to the commencement of construction works.	Pre-construction, construction	Contractor	Chapter 7: Ecology

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		The appointment of a suitably qualified or experienced environmental manager or ecologist would also ensure the protection of protected species during construction of the Proposed Development.			
7.3	Bats	Mitigation options such as 'feathering' of the turbine blades while idling where possible/ appropriate would further reduce impact magnitude and significance	Operation	Applicant or Asset Operator	Chapter 7: Ecology
Ornithology					
8.1	Birds	No significant adverse effects upon any important ornithological feature would occur as a result of the operation of the proposed Development. As such, no additional mitigation measures are required. Enhancement measures, provided as part of the HMP (e.g., delivery of notable habitat restoration and connectivity improvements for bird species) would however remain in place throughout the operational phase, subject to periodic review in accordance with any emerging best practice management advice.	Operation	Applicant or Asset Operator	Chapter 8: Ornithology
8.2	Monitoring	<p>Monitoring would be used to measure the effectiveness of embedded mitigation.</p> <ul style="list-style-type: none"> An alternative ornithological monitoring strategy would be prepared for golden eagle, white-tailed eagle and hen harrier to include population monitoring and carcass searches. The alternative strategy would, where agreed with relevant stakeholders, replace current post-construction monitoring for the operational Ben Aketil Wind Farm and be implemented for the operational lifetime of the Proposed Development. In the event that an alternative monitoring strategy cannot be agreed, monitoring would include for the continuation of post- 	Operation	Applicant	Chapter 8: Ornithology

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		construction monitoring prescriptions under the requirements of Condition 17 and 15 of the operational Ben Aketil and Ben Aketil (two turbine) Extension Wind Farms respectively.			
Hydrology, Geology, Hydrogeology and Peat					
9.1	Soils and Peat	<p>Soil stripping would be undertaken with care and would be restricted to as small a working area as practicable. Topsoil removed and laid in a storage bund, up to 2 m in height, on unstripped ground adjacent to the working area. Attempt to retain the turf layer vegetation-side-up where possible, although ground conditions may make this challenging. Subsoils and superficial geological deposits would be removed subsequently and laid in storage bunds, also up to 2 m in height, clearly separated from the topsoil bund. Care would be taken to maintain separate bunds for separate soil types in order to preserve the soil quality.</p> <p>For work within areas of peat, acrotelmic peat (the uppermost 0.5 m) would be removed as for the topsoil. It would be attempted to retain the acrotelm vegetation side-up where possible, although ground conditions may make this challenging. The underlying catotelmic peat would be stored in bunds up to 1 m in height. Catotelmic peat is sensitive to handling, and loses its internal structure easily, so would be transported as short a distance as possible to its storage location.</p> <p>Limited smoothing or 'blading' of stockpiled soils and catotelmic peat would be undertaken to help shed rainwater and prevent ponding of water on the</p>	Pre-construction, construction, operation	Contractor, Applicant or Asset Operator	Chapter 9: Hydrology, Geology, Hydrogeology and Peat

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>stockpile. Bunds on notably sloping ground would have sediment control measures installed near the base, on the downslope side, to collect and retain any sediment mobilised by rainfall. Stockpiles would be located on flat or nearly flat ground where possible.</p> <p>Excavated soil and peat would be used in restoration and rehabilitation at the end of the construction period, in order to promote fast re-establishment of vegetation cover on worked areas and areas of bare soil or peat that are not required for the operational phase of the Proposed Development. Soils and peat would be stored for as short a time as practicable, in order to minimise degradation through erosion and desiccation.</p> <p>Should prolonged periods of dry weather occur, a damping spray would be employed to maintain surface moisture on the soil and peat bunds. This would help to maintain vegetation growth in the turves and to retain the soil structure.</p> <p>Construction work would make use of current best practice guidance relating to developments in peatland areas. A risk management system, such as a geotechnical risk register, would be compiled and maintained at all stages of the project and developed as part of the post-consent detailed design works, and would be updated as new information becomes available.</p> <p>Micrositing would be used to avoid possible problem areas identified during ground investigation or other detailed design works. This would be assisted by</p>			

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>additional verification of peat depths, to full depth, in any highlighted areas where construction work is required. Track drainage would be installed in accordance with published good practice documentation and would be minimised in terms of length and depth in order to minimise concentration of flows.</p> <p>Construction activities would be restricted during periods of wet weather, particularly for any work occurring within 20 m of a watercourse or within areas of identified deeper peat. Careful track design would ensure that the volume and storage timescale for excavated materials would be minimised as far as practicable during construction works.</p> <p>Vegetation cover would be re-established as quickly as possible on track and infrastructure verges and cut slopes, by re-laying of excavated peat acrotelm, to improve slope stability and provide erosion protection. Additional methods, including hydroseeding and/or use of a biodegradable geotextile, would be considered, if necessary, in specific areas.</p> <p>During construction, members of project staff would undertake advance inspections and carry out regular monitoring for signs of peat landslide indicators. A geotechnical specialist would be on call to provide advice if required by conditions within the Site.</p> <p>Construction staff would be made aware of peat slide indicators and emergency procedures. Emergency procedures would include measures to be taken in the event that an incipient peat slide is detected.</p>			

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
9.2	Surface Watercourses and Groundwater	<p>Silt fencing or appropriate alternative sediment control protection would be installed on the downhill side of excavations to prevent inadvertent discharge of silty water into or towards any watercourse within the Site.</p> <p>All engineering works adjacent to watercourses, including access tracks and watercourse crossing structures, would have appropriate sediment control measures established prior to any groundworks.</p> <p>Vegetation would be retained along watercourse banks to act as additional protection to the watercourses.</p> <p>A water quality monitoring programme would be established. Details would be agreed with SEPA but are anticipated to include at least the following:</p> <ul style="list-style-type: none"> • visual checks for entrained sediment; and • <i>in situ</i> measurements of pH, temperature, specific conductivity. <p><i>In situ</i> measurement of turbidity and dissolved oxygen may be recommended for locations with particular sensitivity, if relevant.</p> <p>Pre-construction monitoring would be undertaken on a monthly basis for a minimum period of three months prior to any work taking place within the Proposed Development.</p> <p>During construction, the monitoring would be undertaken by the appointed environmental manager or suitably experienced alternative individual. Any change from baseline conditions of pH and/or</p>	Pre-construction, construction	Contractor	Chapter 9: Hydrology, Geology, Hydrogeology and Peat

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>specific conductivity would potentially indicate an incident and additional investigation would be required in order to identify the origin of the change. Control locations (WQC1, WQC2, WQC3 and WQC4 – see Table 9.12 in Volume 1 of the EIA Report) are intended to help differentiate between incidents arising within the Site and incidents that are unrelated to the Site.</p> <p>The recommended frequency of monitoring for the different locations are shown in Table 9.12 of Volume 1, and the locations in Figure 9.6 in Volume 2a.</p> <p>Groundwater monitoring boreholes would be established within the two proposed borrow pit areas prior to any construction work beginning, to a depth at least 1 m below the deepest expected excavation. Groundwater level monitoring would be undertaken to determine whether groundwater is present within the borrow pit areas and, if it is, at what level the seasonally highest groundwater table stands. Any groundwater within a borrow pit area would be managed in line with best practice, with discharge via a settlement pond to allow any entrained sediment to be removed prior to discharge. Any required discharge licence would be obtained prior to excavation commencing.</p> <p>All works through and adjacent to wetland areas would be supervised by the environmental manager.</p>			
9.3	Drainage Infrastructure	Trackside drainage would be no longer or deeper than necessary to provide the required track drainage.	Pre-construction, construction	Contractor	Chapter 9: Hydrology, Geology,

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>Cross-drains under tracks would be installed at an appropriate frequency to mimic natural drainage patterns and to minimise concentration of flows.</p> <p>All drainage infrastructure would be designed with a capacity suitable for a rainfall intensity of a 1-in-200-year storm event plus allowance for climate change.</p> <p>Where track sections cross wetland or bog areas, cross-drainage would be provided within the track construction to ensure continuity of flow. This may take the form of a drainage layer within the track, suitably closely spaced drainage pipes, or both as appropriate. These would be determined on a case-by-case basis to suit each individual area.</p> <p>All required licences for watercourse crossings and construction works would be in place prior to works within the Proposed Development beginning.</p> <p>All long-term and temporary drainage infrastructure would be established on a running-basis ahead of excavation works. This includes temporary bunding and cut-off drains around turbine bases, hardstanding areas and borrow pits. Trackside drainage would be installed in line with track construction progress.</p> <p>Temporary water control measures would be implemented as necessary adjacent to larger areas of excavation. These would include borrow pit sites and may also include turbine base excavations and hardstanding areas. These measures would take the form of temporary settlement ponds, filter drains or proprietary treatment measures such as Siltbusters.</p>			Hydrogeology and Peat

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>Detail would be provided within the Pollution Prevention Plan(s) required for the Construction Runoff Permit and suitability would be determined following appropriate on-site soil tests.</p> <p>All earthmoving activity would be restricted during periods of wet weather, particularly for work occurring within 20 m of a watercourse, to minimise mobilisation of sediment in heavy rainfall. The 'stop' conditions provided in Table 9.14 in Volume 1 are recommended to guide all earthmoving activity at all stages of the Proposed Development</p> <p>Long-term drainage infrastructure would have a monitoring and maintenance programme established, to include regular visual inspection of drainage infrastructure to check for blockages, debris or damage that may impede flow. Remediation would be undertaken immediately. Routine maintenance would be scheduled where possible for dry weather.</p>			
9.4	Excavations	<p>Any water collecting within excavations would be pumped out prior to further work within the excavation. The water is likely to require treatment to remove suspended solids prior to discharge to ground.</p> <p>Cable trenches would be laid in disturbed trackside material. In areas where cable routes cross up or down steep slopes, clay bunds or alternative impermeable barrier would be placed for every 0.5 m change in elevation along the length of the trench to minimise in-trench groundwater flow.</p> <p>Vegetation cover would be re-established as quickly as possible on all areas of stripped ground, once</p>	Construction	Contractor	Chapter 9: Hydrology, Geology, Hydrogeology and Peat

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>activity involving these areas is complete. This would include track verges, screening bunds, cut slopes and much of the Site during decommissioning and restoration works. Where possible this would be achieved using excavated peat acrotelm. Additional measures including hydroseeding and/or use of a biodegradable geotextile would be considered if insufficient peat turf is available and for areas of particular sensitivity that require immediate protection.</p> <p>Rock testing would be undertaken on appropriate samples from the borrow pit areas to determine its suitability for unbound track and hardstanding construction. This would include testing to determine likely degradation patterns during the lifespan of the development. Should the tests identify problems with parts of the rock within the borrow pit footprints, care would be taken to ensure that unsuitable material is not used for construction but would be retained for use in borrow pit restoration.</p> <p>Any unused or remaining unsuitable aggregate material, plus any spare rock material arising from hardstanding or track reinstatement, may be used to reinstate the borrow pits to a suitable profile, and capped with soil or turf to promote re-establishment of natural vegetation cover.</p> <p>Only tracked or low ground pressure vehicles would be permitted access to unstripped ground.</p>			
9.5	Development Traffic	<p>Tracks and hardstanding areas would be monitored on a regular basis, particularly following periods of heavy or prolonged rainfall or after snow clearance. Any sections of track or hardstanding showing signs</p>	Pre-construction, construction	Contractor	Chapter 9: Hydrology, Geology,

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>of excessive wear would be repaired as necessary with suitable rock from the borrow pits or external sources.</p> <p>The bridge structures at watercourse crossings would have appropriate splash control measures as part of their design, to prevent silty water splashing into the watercourses from vehicle movements. The splash controls would be monitored regularly to ensure they remain effective and have not become damaged in any way.</p> <p>Routine monitoring checks of project infrastructure, including track and hardstanding surfaces and all drainage infrastructure, would be undertaken on a quarterly basis throughout operation of the Proposed Development. Monitoring would involve visiting all aspects of the infrastructure and undertaking a visual inspection to identify the following:</p> <ul style="list-style-type: none"> • areas where track surfaces or hardstanding areas were showing evidence of erosion or surface damage; • any areas where surface water was ponding or collecting on tracks or hardstanding areas; • any areas where drainage infrastructure was damaged, blocked or inadequate. <p>Any areas of track or hardstanding surface showing signs of damage, erosion or excessive wear would be repaired as necessary. Drainage features would be repaired, reinstated or replaced as necessary to ensure continued efficient operation.</p>			Hydrogeology and Peat

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>Site-specific mitigation, including track drainage segregation to avoid 'flushing' from excavation works, and micro-siting to avoid specific higher sensitivity areas, would be identified and established where appropriate.</p> <p>All traffic routes would be clearly demarcated, and vehicles would not be permitted access outwith these areas.</p>			
9.6	Pollution Prevention	<p>Oil and fuel storage and handling on site would be undertaken in compliance with SEPA's <i>Guidance on Pollution Prevention 2 – Above ground oil storage tanks</i> and with the <i>Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)</i>.</p> <p>Risk assessments would be undertaken and all Hazardous Substances and Non-Hazardous Pollutants that would be used and/or stored within the Site would be identified. Hazardous substances likely to be within the Site include oils, fuels, hydraulic fluids and anti-freeze. No non-hazardous pollutants have been identified as likely to be used within the Site. Herbicides would not be used.</p> <p>All deliveries of oils and fuels would be supervised by the Principal Contractor.</p> <p>All storage tanks would be located within impermeable, bunded containers where the bund is sufficient to contain 110% of the tank's capacity. For areas containing more than one tank, the bund would be sufficient to contain 110% of the largest tank's capacity or 25% of the total capacity, whichever is the greater.</p>	Pre-construction, construction	Contractor	Chapter 9: Hydrology, Geology, Hydrogeology and Peat

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>Any valve, filter, sight gauge, vent pipe or other ancillary equipment would be located within the containment area.</p> <p>Waste oil would not be stored within the Site but would be removed to dedicated storage or disposal facilities.</p> <p>Management procedures and physical measures would be put in place to deal with spillages, such as spill kits and booms.</p> <p>Maintenance procedures and checks would ensure the minimisation of leakage of fuels or oils from plant.</p> <p>Refuelling and servicing would be undertaken in a designated area or location with adequate precautions in place, such as a dedicated impermeable surface with lipped edges to contain any contaminants.</p> <p>Where vehicle maintenance is necessary in the field, owing to breakdown, additional precautions would be taken to contain contaminants, such as spill trays or absorbent mattresses.</p> <p>The access track would be designed and constructed to promote good visibility where possible and two-way access where visibility is restricted, to minimise risk of vehicle collisions.</p> <p>It is anticipated that construction-phase welfare facilities would use a suitably sized holding tank with waste water removed from the Proposed</p>			

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>Development by tanker for disposal at a licensed disposal facility. Operational-phase welfare facilities may use a similar procedure or would install a waste treatment package plant with associated discharge. All relevant water environment authorisations would be put in place should there be any requirement for these.</p> <p>The Site Spillage and Emergency Procedures would be prominently displayed at the Site office and staff would be trained in their application. The Procedures document would incorporate guidance from the relevant SEPA Guidance Notes.</p> <p>In the event of any spillage or discharge that has the potential to be harmful to or to pollute the water environment, all necessary measures would be taken to remedy the situation. These measures would include:</p> <ul style="list-style-type: none"> • identifying and stopping the source of the spillage; • containing the spillage to prevent it spreading or entering watercourses by means of suitable material and equipment; • absorbent materials, including materials capable of absorbing oils, would be available within the Site to mop up spillages. These would be in the form of oil booms and pads and, for smaller spillages, quantities of proprietary absorbent materials. • sandbags would also be readily available for use to prevent spread of spillages and create dams if appropriate. 			

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<ul style="list-style-type: none"> • where an oil/fuel spillage may have soaked into the ground, the contaminated ground would be excavated and removed from the Site by a licensed waste carrier to a suitable landfill facility. • the emergency contact telephone number of a specialist oil pollution control company would be displayed within the Site. • sub-contractors would be made aware of the guidelines for handling of oils and fuels and of the spillage procedures at the Site. <p>SEPA would be informed of any discharge or spillage that may be harmful or polluting to the water environment. Written details of the incident and its resolution would be forwarded to SEPA no later than 14 days after the incident.</p> <p>All works through and adjacent to wetland areas would be supervised by the environmental manager.</p>			
9.7	Peat Management Plan	<p>A Peat Management Plan (PMP) has been produced to address the requirement for excavation of peat and peaty soils during the construction process (see Technical Appendix 9.2 in Volume 3).</p> <p>The Outline Peat Management Plan in Technical Appendix 9.2 would be updated and refined as necessary with further site-specific detail once ground investigation results become available. Location-specific reinstatement and restoration would be directed by the environmental manager, taking account of specific local variation in topography and natural ground conditions.</p>	Construction	Contractor	Chapter 9: Hydrology, Geology, Hydrogeology and Peat

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		The Construction Peat Management Plan, to be prepared post-consent, would be a live document, with revisions added as necessary during the construction process.			
Archaeology and Cultural Heritage					
10.1	Cultural Heritage Assets Conservation	<p>A professionally qualified Archaeological Contractor would be appointed to act as an Archaeological Clerk of Works (ACoW) for the duration of the construction phase. The role of the ACoW would be to provide advice to the appointed Construction Contractor regarding micro-siting of development components, where there is a possibility of intersecting with identified heritage assets, and to undertake archaeological monitoring of topsoil stripping operation in areas designated and approved by the Council's Archaeological Advisors (THC:HET). The activities of the ACoW would be carried out according to the scope of work and terms specified under the Written Scheme(s) of Investigation (WSI) and approved by THC:HET.</p> <p>Furthermore, written guidelines would be issued for use by all construction contractors, outlining the need to avoid causing unnecessary damage to known heritage assets.</p> <p>To ensure preservation in-situ, assets within the site boundary (namely Glen Heysdal farmstead and River Caroy farmsteads and enclosure) would be marked out for avoidance for the duration of the construction phase. Any required micro-siting of the access track would be managed to avoid the visible remains and the demarcated areas.</p>	Construction	Contractor	Chapter 10: Archaeology and Cultural Heritage

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		A watching brief would be provided for the section of the proposed southern access track (between 130312, 844918 and 130352, 844317) which crosses an area containing remains of a historic field system.			
Traffic and Transport					
11.1	Construction Traffic Management Plan	<p>Mitigation measures to control potential impacts of construction traffic associated with the Proposed Development would be proposed as necessary and would include the implementation of a CTMP (an outline CTMP, included in Technical Appendix 11.2, has been prepared at this stage and submitted as part of the Planning Application). The following measures would be implemented through a CTMP during the construction phase:</p> <ul style="list-style-type: none"> • where possible, further detailed design processes would minimise the volume of material to be imported to site to help reduce HGV numbers; • a site worker transport and travel arrangement plan, including transport modes to and from the worksite (including pick up and drop off times); • a Traffic Management Plan to control the operation of the access junctions; • all materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads; • specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway; • wheel cleaning facilities would be provided at access junction(s); 	Construction	Contractor, Applicant or Asset Operator	Chapter 11: Traffic and Transport

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<ul style="list-style-type: none"> normal site working hours would be limited to between 07:00 and 19:00 (Monday to Friday) and 08:00 and 17:00 on Saturday, though component delivery and turbine erection may take place outside these hours; provide construction updates on the project website and or a newsletter to be distributed to residents within an agreed distance of the Site; and all drivers would be required to attend a detailed induction prior to undertaking any works on the Proposed Development site. 			
11.2	Road Conditions and Delivery of Abnormal Loads	<p>A road condition survey (including assessment of existing structures as appropriate) prior to the commencement of construction and a similar assessment following completion of the works would be completed.</p> <p>Any modifications to junction layouts would be confirmed through trial run and further surveys, and any modifications or works required to accommodate abnormal loads would be discussed with the Roads Authority and the necessary consents and permits would be obtained in advance of any works or delivery periods.</p> <p>An Abnormal Load Transport Management Plan would be prepared to cater for all movements to and from the Proposed Development site. This would include:</p> <ul style="list-style-type: none"> procedures for liaising with the emergency services to ensure that police, fire and ambulance 	Pre-construction, construction	Contractor, Applicant or Asset Operator	Chapter 11: Traffic and Transport

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking.</p> <ul style="list-style-type: none"> • a diary of proposed delivery movements to liaise with the communities to avoid key dates such as popular local events etc. • a protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic. • proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police, forming the committee. Through meetings, (in person or virtual, as appropriate) this committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising. <p>A police escort would be required to facilitate the delivery of the predicted loads. The police escort would be further supplemented by a civilian pilot car to assist with the escort duty. It is proposed that an advance escort would warn oncoming vehicles ahead of the convoy, with one escort staying with the convoy at all times. The escorts and convoy would remain in radio contact at all times where possible.</p> <p>The abnormal loads convoys would be no more than three AILs long, or as advised by the police, to permit safe transit along the delivery route and to allow</p>			

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>limited overtaking opportunities for following traffic where it is safe to do so.</p> <p>The times in which the convoys would travel would need to be agreed with Police Scotland who have sole discretion on when loads can be moved.</p>			
11.3	Community effects	<p>Signage: Advance warning signs would be installed on the approaches to the affected road network. Information signage could be installed to help improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist). The location and numbers of signs would be agreed post consent and would form part of the wider traffic management proposals for the Proposed Development.</p> <p>Information distribution: The applicant would also ensure information would be distributed through its communication team via the project website, local newsletters, and social media.</p> <p>Community Liaison Forum Post-consent, the applicant would establish a Community Liaison Forum, in collaboration with THC and local Community Councils. The forum would allow the community to be kept up to date with project progress and allow communication on the provision of transport-related mitigation and publicise the timings of turbine component deliveries. The Community Liaison Forum would be maintained until</p>	Pre-construction, construction, operation	Contractor, Applicant or Asset Operator	Chapter 11: Traffic and Transport

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>construction is complete and the Proposed Development is operational.</p> <p>Section 96 (wear and tear) Agreement</p> <p>The Applicant would enter into a Section 96 (wear and tear) Agreement or a suitable alternative for the local adopted roads/routes to be used by construction vehicles. A pre-construction works inspection of the roads would be carried out with both parties in attendance with their condition recorded. Following completion of construction of the proposed Development a further inspection would be carried by both parties with repairs being agreed to return the roads to their pre-construction condition to be carried out in a timely manner for approval by the THC. Notwithstanding, the Applicant would carry out regular monitoring of the carriageway condition during the construction of the proposed Development. Necessary repair works would be carried out in a timely manner to prevent further deterioration of the carriageway during the works. Priority would be given to any damage which would be dangerous to users of the road affected.</p>			
11.4	Operation phase mitigation	The Site entrance would be well maintained and monitored during the operational life of the Proposed Development. Regular maintenance would be undertaken to keep the Site access track drainage systems fully operational and the road surface in good condition and to ensure there are no adverse issues affecting the public road network.	Operation	Applicant or Asset Operator	Chapter 11: Traffic and Transport
	Noise				
12.1	Construction effects	No specific mitigation is required to control construction noise as the relevant noise limits are	Construction	Contractor	Chapter 12: Noise

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
		<p>anticipated to be met due to the large separation distances between construction activities and residential receptors. Noise during construction works would be controlled by generally restricting works to standard working hours and exclude Sundays, unless specifically agreed otherwise.</p> <p>BS 5228⁶⁹ states that the 'attitude of the contractor' is important in minimising the likelihood of complaints and therefore, consultation with the local authority would be required along with providing information to residents on intended activity.</p> <p>The construction and decommissioning works on-site would be carried out in accordance with:</p> <ul style="list-style-type: none"> • relevant EU Directives and UK Statutory Instruments which limit noise emissions from a variety of construction plant; • the guidance set out in PAN1/201170 and BS5228: 2009; and • Section 61 of the Control of Pollution Act 1974⁷¹ and Section 80 of the Environmental Protection Act⁷². <p>The way in which noise effects at the construction stage would be minimised would be set out in the CEMP which would be prepared prior to commencement of construction activities.</p>			

⁶⁹ BSI (2009), BS 5228 Code of practice for noise and vibration control on construction and open sites.

⁷⁰ Scottish Government (2011), Planning Advice Note: Planning and Noise.

⁷¹ UK Government (1974), Control of Pollution Act.

⁷² UK Government (1990), Environmental Protection Act (EPA).

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
12.2	Operation effects	<p>No specific operational mitigation is required as the relevant noise limits are met . Noise-reduced modes of operation are generally available for wind turbines of the scale proposed here that allow noise levels to be reduced by restricting the rotational speed of the machines. This mitigation could be employed in the unlikely event of any noise issues arising which would require mitigation to be implemented to enable the relevant limits to be met.</p> <p>Noise from the operation of the wind farm is usually controlled through the implementation of planning conditions on noise which contain permissible limits. In this way if any operational noise issues arise then measurements can be undertaken to ascertain whether the Proposed Development is operating within the appropriate noise limits.</p>	Operation	Applicant or Asset Operator	Chapter 12: Noise
Socioeconomics, Land Use, Recreation and Tourism					
13.1	Recreation	In accordance with the Construction (Design and Management) Regulations 2015, notices would be placed in prominent locations around the Site to outline areas of restricted access. Measures for ensuring public safety during construction would be secured by the Construction Environmental Management Plan (CEMP), and periods of exclusion would be kept to the minimum necessary for safe working. The CEMP would set out measures to ensure that recreational users are informed of the construction work and directed into safe areas where there would be no conflict with plant and machinery.	Construction	Contractor	Chapter 13: Socioeconomics, Land Use, Recreation and Tourism
Aviation					
14.1	NATS Radar	The applicant would enter into an agreement with NATS to implement the agreed mitigation solution, i.e. radar blanking.	Pre-construction	Applicant or Asset Operator	Chapter 14: Aviation

Ref	Matter / Effect requiring mitigation	Description of Mitigation Measure	Development Phase	Responsible party	EIA Report Chapter (Vol. 1)
14.2	Aviation Obstacle Lighting	A cardinal lighting scheme would be adopted, with four turbines to have nacelle mounted medium-intensity steady red (2000 candela) obstacle lights, operating from dusk until dawn. This would include the most elevated turbine, i.e. the turbine with the most elevated turbine tip, which in the case of the Proposed Development is T5. In addition, it is proposed that T1, T6 and T9 would be lit in order to define the geographical footprint of the Proposed Development.	Operation	Applicant or Asset Operator	Chapter 14: Aviation
Climate Change Mitigation					
15.1	Carbon emissions	Any post-decommissioning site restoration and enhancement work, such as blocking drainage ditches to promote re-wetting, would be aligned with the Outline Habitat Management Plan (see Technical Appendix 7.6).	Construction	Applicant	Chapter 15: Climate Change Mitigation
15.2		All activities during construction, operation and decommissioning would be conducted in accordance with good practice guidance: <ul style="list-style-type: none"> • Good Practice During Wind Farm Construction, NatureScot et al. (2019); and • Life Extension and Decommissioning of Onshore Windfarms, SEPA (2016). 	Construction	Applicant	Chapter 15: Climate Change Mitigation