Scottish & Southern Electricity Networks

TRANSMISSION

Scottish and Southern Electricity Networks Transmission

Lairg II Wind Farm Connection

Environmental Appraisal

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LIST OF ABBREVIATIONS

AWI	Ancient Woodland Inventory
BCS	Butterfly Conservation Scotland
BGS	British Geological Survey
BNG	Biodiversity Net Gain
BoCC	Birds of Conservation Concern
BSI	British Standards Institute
BSBI	Botanical Society for Britain and Ireland
CAR	Controlled Activities (Scotland) Regulations 2011
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CIRIA	Construction Industry Research and Information Association
CSEC	Cable Sealing End Compound
CSL	Construction Site Licence
CTMP	Construction Traffic Management Plan
DC	Direct Current
DWPA	Drinking Water Protected Areas
EcIA	Ecological Impact Assessment
ECU	Energy Consents Unit
EA	Environmental Appraisal
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EnvCoW	Environmental Clerk of Works
EPS	European Protected Species
FWPM	Fresh Water Pearl Mussel
GDL	Gardens and Designed Landscapes
GEMP	General Environmental Management Plan
GIS	Geographical Information System
GWDTE	Groundwater Dependent Terrestrial Ecosystems
GWP	Global Warming Potential
HER	Historic Environment Record
HGV	Heavy Goods Vehicle

HEPS	Historic Environment Policy for Scotland
HER	Historic Environment Record
HES	Historic Environment Scotland
HRA	Habitats Regulation Assessment
HVDC	High Voltage Direct Current
IBA	Important Bird Area
INNS	Invasive Non-Native Plant Species
kV	Kilovolt
LBAP	Local Biodiversity Action Plan
LDP	Local Development Plan
LNCS	Local Nature Conservation Sites
LNR	Local Nature Reserve
LoD	Limit of Deviation
NLS	National Library of Scotland
NNR	National Nature Reserve
NPF4	National Planning Framework 4 (Scotland)
NSA	National Scenic Area
NVC	National Vegetation Classification
NWSS	Native Woodland Survey of Scotland
OHL	Overhead Line
OS	Ordnance Survey
PWS	Private Water Supply
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
SLA	Special Landscape Area
SM	Scheduled Monument
SNRHE	Scottish National Record of the Historic Environment
SPA	Special Protection Area
SPMP	Soil and Peat Management Plan
SPP	Species Protection Plans
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SWT	Scottish Wildlife Trust

UGC	Underground Cable
UKHab	UK Habitat Classification
WFD	Water Framework Directive

1. INTRODUCTION

1.1 Background

1.1.1 Scottish and Southern Electricity Networks Transmission (hereafter referred to as 'SSEN Transmission'), operating under licence held by Scottish Hydro Electric Transmission plc., owns and maintains the electricity transmission network across the north of Scotland and holds a license under Section 9 of the Electricity Act 1989 to 'develop and maintain an efficient, co-ordinated and economical electricity transmission system in its licensed area'. SSEN Transmission is a wholly owned subsidiary of the SSE PLC group of companies.

1.1.2 Lairg II Wind Farm is being developed by Energyfarm UK Lairg II LLP and was consented by the Scottish Government Energy Consents Unit (ECU) in October 2021. There is a need to connect the consented Lairg II Wind Farm to the transmission grid by October 2026 and SSEN Transmission is obliged to provide a connection as the wind farm lies within the area covered by its license.

1.1.3 As a result, SSEN Transmission is proposing to construct a new 132 kV underground cable (UGC) between the consented Lairg II Wind Farm substation and the existing Dalchork-Loch Buidhe 132 kV overhead line (OHL), as shown on Figure 1.1 Site Location Plan. A cable sealing end compound (CSEC) and a short section of new OHL (i.e., the 'downleads') will also be installed to connect the installed plant to an existing steel lattice transmission tower on the existing Dalchork-Loch Buidhe 132 kV OHL (Tower 31).

1.1.4 The Applicant will progress the following project elements, shown on Figure 1.2 Site Layout, through two separate consenting routes:

- Downleads comprising approximately 30 m in length and approximately 10 m in horizontal distance from the existing tower to three 132 kV cable sealing end and surge arrestor combined structures, hereafter known as 'the Downleads', under Section 37 of The Electricity Act 1989. The Downleads also includes ancillary works comprising a cable sealing end compound, permanent bellmouth access, and temporary construction compound. Deemed planning permission under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997, as amended, is being sought for these ancillary works as part of the Section 37 (s37) application.
- A temporary stone track approximately 541 m in length required to facilitate the installation of the UGC. The Highland Council have confirmed that temporary access track will require temporary planning permission under the Town and Country Planning (Scotland) Act 1997 (as amended).

1.1.5 The above two items are hereafter referred to collectively as the 'Proposed Development'.

1.1.6 Where reference is made to the 'Downleads' within the technical chapters of this report, this encompasses the downleads and the associated ancillary infrastructure, unless stated otherwise.

1.1.7 The proposed UGC required is considered by the Applicant to benefit from permitted development rights under Class 40 1(a) of The Town and Country Planning (General Permitted Development) (Scotland) Order 1992 (TCP GDPO). However, for the purpose of this Environmental Appraisal, where reference is made to the UGC within the technical chapters, this also includes the temporary access track and the temporary spoil areas (unless stated otherwise) given that these elements are fundamental to the construction of the UGC.

1.1.8 It should be noted that an underground communications fibre cable is also required in proximity to the Proposed Development for protection and control purposes. The communications cable will be routed between the consented Lairg 132kV Wind Farm Substation and a joint box on the existing Dalchork-Loch Buidhe 132 kV OHL (Tower 19). The communications cable will require planning permission under the Town and Country Planning (Scotland) Act 1997 (as amended) and will be subject to a separate streamlined Environmental Appraisal; as such, it has not been considered further within this Environmental Appraisal.

1.1.9 The Proposed Development is in line with SSEN Transmission's commitment and licence obligation to facilitate the connection of renewables generators to the grid through an economical, efficient and coordinated approach to transmission reinforcement.

1.1.10 The Proposed Development is necessary to fulfil the statutory and licence obligations on SSEN Transmission as the onshore transmission licence holder. These obligations relate to developing the electricity transmission network to provide adequate transmission capacity and to provide connections to customers who wish to connect to and use the transmission system to participate in the national wholesale electricity market.

1.1.11 SSEN Transmission also has obligations to offer non-discriminatory terms for connection to the electricity transmission system and, as such, has a legal duty to provide connections for new electricity generators wishing to connect to the transmission network in its licence area under the terms of its statutory and licence obligations.

1.1.12 The Proposed Development is also supported by the National Planning Framework 4 (NPF4)[1] as it recognises that the: "*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*".

1.1.13 The intent behind Policy 11 of NPF4 is 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."*

1.1.14 *"Development proposals for all forms of renewable, low-carbon and zero emissions technologies will be supported. These include: ii. enabling works, such as grid transmission and distribution infrastructure"*

1.2 Site Location

1.2.1 The Proposed Development is located approximately 2 km to the south-east of the village of Lairg, to the west of Lairg Wind Farm and to the north of the consented Lairg II Wind Farm (hereafter referred to as 'the Site'). The Site covers approximately 1.62 hectares (ha), and the location is shown on Figure 1.1 Site Location Plan.

1.3 Site Context

1.3.1 The Proposed Development routes generally in a west to east direction between the consented Lairg II Wind Farm substation and Tower 31 on the existing Dalchork-Loch Buidhe 132 kV OHL. It partially routes adjacent to the existing Lairg II Wind Farm access track, which connects to the A836 in the west.

1.3.2 The Site is located in a rural area and lies between 190 m to 240 m above Ordnance Datum (AOD) with the surrounding land sloping to the north and west towards Lairg and rising to the east. The wider area is predominantly rural moorland with isolated residential and commercial properties. Larger settlements in the wider area include Torroble, located approximately 1 km north-west of the Proposed Development and Lairg, located approximately 2 km north-west. Torroboll Burn runs outwith the Site in the north-west, beyond the existing Lairg II Wind Farm access track.

1.4 Environmental Context

1.4.1 The Site is not located with a designated site and the following designated and environmentally sensitive sites are located within 5 km of the Site:

- Areas of native woodland and ancient woodland, with the closest being an area of native woodland (predominantly native pinewood) approximately 500 m north of the Site;
- Strath Carnaig and Strath Fleet Moors Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Important Bird Area (IBA) approximately 915 m north-east of the Site;
- 12 Scheduled Monuments with the closest being the Achany Glen, settlement 900m to 1850m south of Lairg Station (SM2208) located approximately 2 km south-west of the Site;

[1] National Planning Framework 4 [2021]. Available at https://www.gov.scot/publications/national-planning-framework-4/pages/1/

- Loch Shin and Nearby Lochs IBA approximately 2.7 km north-west of the Site;
- 11 Listed Buildings with the closest being Category C Lairg, Free Church Manse (LB8022) Category C Listed Building approximately 3.3 km north-west of the Site; and
- Lairg and Strath Brora Lochs IBA approximately 4.3 km north-east of the Site.

1.4.2 Peat is present within the Site. An Outline Soil and Peat Management Plan (SPMP) has been prepared (Appendix 6.1 Outline Soil and Peat Management Plan), utilising data from peat probing surveys. The plan sets out methods to minimise impacts on peat from construction and appropriate high-level construction mitigation principles.

1.4.3 Figure 1.3 Environmental Sensitivities shows the Site in relation to key statutory and non-statutory environmental designated sites.

2. PROPOSED DEVELOPMENT

2.1 Design Components

Downleads & Cable Sealing End Compound

2.1.1 The CSEC will comprise three 132 kV cable sealing end and surge arrestor combined structures, as well as three 132 kV post insulator structures located on a stone platform which will measure approximately 50 m in length by 20 m in width. These structures and plant combined will measure approximately 5 m in height. A new permanent bellmouth will be constructed to provide access to the CSEC from the existing access track.

2.1.2 A short section of new OHL i.e., the Downleads, will be installed to connect the installed plant to the existing steel lattice transmission tower on the Dalchork-Loch Buidhe 132 kV (Tower 31).

2.1.3 The CSEC will be surrounded by a palisade fence approximately 2.5 m in height.

2.1.4 The layout of the Proposed Development is shown on Figure 1.2 Site Layout, and the layout / elevation drawings for the CSEC are contained within Appendix 2.1: Cable Sealing End Compound Drawings.

Underground Cable Connection

2.1.5 The Proposed UGC consists of a 132 kilovolt (kV) single circuit underground cable (UGC), comprising three cables in a trefoil formation. A cable trench will be established measuring approximately 0.5 – 1.0 m in width by 1 – 1.5 m in depth. Spanning approximately 570m in length, the Proposed UGC will serve as a connection between the consented Lairg 132kV Wind Farm Substation and Tower 31 on the existing Dalchork-Loch Buidhe 132 kV overhead transmission line (OHL).

Associated Works: Temporary Access Track

2.1.6 Vehicle access is required along the length of the UGC route to allow excavation and creation of a cable trench; the proposed temporary access can be seen on Figure 1.2 Site Layout. Preference will be given to lower impact access solutions including the use of low pressure tracked personnel vehicles and temporary track solutions in boggy / soft ground areas to reduce any damage to, and compaction of, the ground. These journeys would be kept to a minimum to minimise disruption to habitats along the route.

2.2 Limit of Deviation (LoD)

2.2.1 As part of the construction activities, there may be a requirement for additional adjustments (micro siting) as a result of ground conditions, to avoid any unexpected environmental sensitives or due to utilities.

2.2.2 Consideration was given to the following general principles in defining the LoD for the Proposed Development:

- using the optimum LoD whilst providing flexibility for micro siting during the detailed design phase to avoid poor ground conditions, such as deep peat, as far as reasonably practical;
- avoiding sensitive environmental features, such as ecology and cultural heritage;
- avoiding watercourses and steep slopes; and
- avoiding residential properties.

2.2.3 The LoDs are illustrated on Figure 1.2 Site Layout. The LoD parameters specified allows for the access track alignment to be relocated up to 15 m either side from the proposed alignment.

2.3 Temporary Infrastructure

Construction Compound

2.3.1 A temporary compound and laydown area will be required to facilitate the construction of the Proposed Development. The indicative location for the construction compound can be seen on Figure 1.2 Site Layout. The construction compound will form part of the 'ancillary development'. Deemed planning permission under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997, as amended, is being sought for these ancillary works as part of the Section 37 (s37) application.

Access

2.3.2 Vehicle access is required to the Proposed Development during construction to allow for the delivery of materials, any possible excavation works, creation of foundations and erection of the CSEC. Existing tracks would be used where possible and upgraded as required. It is currently anticipated that access will be via the A836 and the existing access track for Lairg Wind Farm. A new and permanent bellmouth will be constructed to access the CSEC.

2.3.3 Vehicle access is required along the length of the UGC route to allow excavation and creation of a cable trench; the proposed temporary access can be seen on Figure 1.2 Site Layout. Preference will be given to lower impact access solutions including the use of low pressure tracked personnel vehicles and temporary track solutions in boggy / soft ground areas to reduce any damage to, and compaction of, the ground. These journeys would be kept to a minimum to minimise disruption to habitats along the route.

2.3.4 Temporary access panel solutions may also be used to protect the ground; however, temporary stone tracks are likely to be necessary in some areas depending on existing access conditions, terrain and altitude. All temporary tracks would be removed upon completion of the Proposed Development with land being reinstated to its former condition.

2.3.5 The Proposed Development will be permanently accessed during operation via the A836 and the existing access track for Lairg Wind Farm.

2.4 Construction Methodology

Excavations

2.4.1 A working corridor of approximately 21 m would be required during the installation of the 132 kV UGC. The proposed cabling would likely comprise an electrical circuit in a single trench comprising three phases (cables) in a ducted trefoil (triangular) formation. The trench for the power cables would be approximately 0.5 – 1.0 m in width by 1 – 1.5 m in depth. In some instances, the trench could be made wider (through benching and battering) for stability and safety of the workforce. There would also be one fibre duct installed within the trench.

2.4.2 The trench bottom would be uniform with adequate clearance on each side of the ducts and be free from roots, organic debris, clods, rocks, stones, and other materials likely to cause damage to the cable duct.

2.4.3 Trench walls would be supported appropriately where necessary to ensure trench stability. Excavations would be kept free from water by use of mobile pumps, with water pumped to a suitable location as agreed on Site by the Environmental Clerk of Works (EnvCoW) and in accordance with SSEN Transmission's General Environmental Management Plans (GEMPs) (Appendix 2.2). Drainage design measures to ensure the discharge would not result in pollution to surface water will be set out in the Construction Environmental Management Plan (CEMP). The Principal Contractor will be responsible for producing the CEMP.

2.4.4 All excavated material would be carefully stored a minimum of 10 m away from and downslope of any adjacent watercourse with particular care taken to prevent any risk of runoff or windborne dry sediment being discharged into the watercourses.

2.4.5 Engineered backfill would be placed around the cable duct in appropriate layers to protect the cable from accidental damage, and to ensure the desired cable rating is achieved. A 75 mm minimum bedding layer of stabilised backfill would be laid in the trench to provide bedding for the ducts. Marker boards would then be placed on top of the engineered fill. Excavated material would then be placed on top of the marker board and compacted in place. The exception to the compaction would be peat, in which the management will be undertaken in line with the Outline Soil and Peat Management Plan (Appendix 6.1).

2.4.6 Reinstatement of the surface layers would be completed by returning the remaining excavated material to the trench in layers, in reverse order with the existing vegetation placed on the trench where possible.

2.4.7 The cable may be required to cross other infrastructure or hazards such as roads and burns. In these cases, the trench may require modification such as concrete reinforcement or waterproof geotextile wraps.

2.4.8 In particularly challenging areas of peatland or rock it may be necessary to employ an alternative installation methodology such as bridges, micro tunnelling, pipe jacking or HDD. Each one of these alternatives would require a separate type of temporary works. This will be confirmed by the Principal Contractor during detailed design.

2.4.9 On the successful installation of the cable, all temporary works would be removed and the land reinstated.

Material Use

2.4.10 SSEN Transmission's overall aim for the construction process is to minimise the amount of import and export of material required to the practical minimum. Potential measures include reusing any materials arising from the construction into design; for example, a site specific Soil and Peat Management Plan (SPMP) will be utilised in restoring the Site. Appendix 6.1 Outline Soil and Peat Management Plan will be used by the appointed Principal Contractor as a basis for preparing the detailed site specific construction SPMP, as part of a CEMP prior to construction.

Water Use and Drainage

2.4.11 A CEMP will be implemented during the construction of the Proposed Development. Drainage design measures to ensure the discharge would not result in pollution to surface water will be set out in the CEMP. The Principal Contractor will be responsible for producing the CEMP.

2.4.12 The construction works will not require any new water abstractions from local sources. Construction foul water will be collected and removed from Site for off-site disposal at a licenced premises.

2.4.13 Silt management measures / silt traps will be employed to prevent sedimentation of watercourses.

Employment

2.4.14 SSEN Transmission considers it important to act as a responsible developer with regards to the communities which host the construction works. The delivery of a major programme of capital investment provides the opportunity to maximise support of local communities. Employment of construction staff would be the responsibility of the Principal Contractor, but SSEN Transmission encourages the Principal Contractor to make use of suitable labour and resources from areas local to the location of the works.

Access and Transport

2.4.15 The construction will give rise to regular numbers of staff transport movements, with small work crews travelling to the Proposed Development. It is anticipated that the Principal Contractor will identify a single safe area within the contractors compound for parking away from the public highway and away from the existing wind farm access, so as not to result in any obstruction.

2.4.16 Vehicle movements will be required to construct new or upgraded access roads; deliver the materials to Site; deliver and collect materials and construction plant from the main site compound and to the UGC construction location.

2.4.17 A Construction Traffic Management Plan (CTMP) will be developed by the Principal Contractor, which will be agreed with The Highland Council roads team in advance of construction.

2.5 Construction Programme and Working Hours

2.5.1 It is anticipated that construction of the Proposed Development would take place over a period of approximately 18 months, following the granting of consents, although a detailed programming of works would be the responsibility of the Principal Contractor in agreement with SSEN Transmission.

2.5.2 Construction of the Proposed Development is estimated to start in February 2025 with completion in August 2026. Construction working hours will typically be between 07:00 to 17:00 Monday to Friday and 08:00 to 13:00 on Saturday. The working hours will be confirmed by the Principal Contractor prior to commencement.

2.6 Mitigation Measures

2.6.1 Following the initial appraisal, mitigation measures have been recommended to prevent, reduce or remedy any potential environmental effects identified. Such measures will be implemented during detailed design, construction and/or operation of the Proposed Development. Each technical chapter details the measures recommended to mitigate any identified impacts, and a summary of the recommended mitigation measures is provided in Chapter 8 'Summary of Mitigation Measures'.

2.6.2 Following the implementation of mitigation measures, an assessment of the effects has been undertaken. The findings are presented in each technical chapter of the EA (Chapters 4 – 7).

Embedded Mitigation

Design Mitigation

2.6.3 Through discussions with Statutory Consultees, landowners and as a result of surveys undertaken on site, a number of embedded mitigation measures have already been included as part of the Proposed Development.

2.6.4 Embedded mitigation relates to measures that are made during the pre-application phase and that are an inherent part of the Proposed Development (i.e., do not require additional action, including assessment, to be taken). In addition to mitigation through design, embedded mitigation includes other actions that would occur with or without input from an environment assessment feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects.

Enhancements – Biodiversity Net Gain

2.6.5 SSEN Transmission is committed to protecting and enhancing the environment by minimising the potential impacts from construction and operational activities. As part of this approach, SSEN Transmission have a commitment to deliver Biodiversity Net Gain (of 10%) on all projects.

2.6.6 In line with this approach, SSEN Transmission has undertaking a Biodiversity Net Gain assessment for the Proposed Development. This has provided a quantification of the pre- and post-development biodiversity across the Site to determine the actions necessary to achieve a 10% Biodiversity Net Gain.

Construction Good Practice

2.6.7 Table 2-1 lists key construction good practice measures.

Table 2-1 Key Construction Good Practice Measures

Ref	Title	Description
GE1	Noise Management Plan	The Principal Contractor will be required to produce and implement a Noise Management Plan for the construction phase. The plan will be taken forward by the Principal Contractor for any post construction works of a similar nature that are associated with the Proposed Development e.g., maintenance. The plan will be agreed with SSEN Transmission prior to construction commencing. Compliance with the relevant EC Directives and UK Statutory Instruments that limit noise emissions of a variety of construction plant; and guidance set out in BS 5228-1:2009+A1:2014 which covers noise control on construction sites.
GE2	Site Water Management Plan	A Site Water Management Plan will be developed to manage potential risks to the water environment including silt mitigation and its locations, dewatering of excavations inclusive of pump locations, monitoring points, cut off drains, and SuDS (incl. compound). In addition, this plan will show how rivers downstream will be protected from sedimentation or pollution resulting from the project activities. The Site Water Management Plan will include a drawing of the Proposed Development, as well as any access tracks detailing all locations of water mitigation measures. All relevant activities will be undertaken in compliance with the Controlled Activities Regulations. The plan will be to a standard to support a construction site licence (CSL), which the Principal Contractor is required to apply for. SSEN Transmission's GEMPs for 'Oil Storage and Refuelling', 'Soil Management', and 'Working with Concrete' (Appendix 2.2) will be adhered to.
GE3	Construction Traffic Management Plan	A Construction Traffic Management Plan will be developed by the Principal Contractor, which will be agreed with The Highland Council roads team in advance of construction. The CTMP will contain measures which will ensure the following: • A driver induction will be undertaken to include a safety induction, speed control and the identification of specified access routes. • Adoption of car sharing where possible to reduce the number of vehicles arriving and departing from the site. • HGV's adhere to weight restrictions on roads in the area.
GE4	Soil Management	Soil management will follow the general guidance set out in SSEN Transmission's GEMP - 'Soil Management' (Appendix 2.2). Additionally, reinstatement shall be completed as soon as practicably possible in order to prevent environmental disturbance.
GE5	Dust	Dust will be managed through implementation of standard control measures such as management of stock piles to supress dust and road cleaning in accordance with SSEN Transmission's GEMP – 'Dust Management' (Appendix 2.2).
GE6	Waste	Waste Management will be in accordance with Section 34 (Scotland) of the Environmental Protection Act, SSEN Transmission's GEMP – 'Waste Management' (Appendix 2.2) and the waste hierarchy.
GE7	Emergency	An Environmental Emergency Response Plan will be developed by the Principal Contractor to deal with, among other things, accidental spills / leaks. Appropriate spill kits will be located on site and in key vehicles. Site staff will be trained in their use and provided with advice on action(s) to be taken and who should be informed in the event of a pollution incident. Emergency response teams and contractors, their locations and response times will be identified in the plan.
GE8	Welfare facilities	On-site welfare facilities will be adequately designed and maintained to ensure all sewage is disposed of appropriately. This may take the form of an on-site septic tank with soak away, tankering and off-site disposal depending on agreement with SEPA; or discharge to foul sewer.
GE9	Adverse weather	The proposed timing of works dictates that work will have to be undertaken during winter months, details will be provided of how the Site will be managed to address this. SSEN Transmission's GEMP – 'Bad weather' (Appendix 2.2) will be adhered to.

Ref	Title	Description
GE10	Local residents	Local residents will be kept informed by the Principal Contractor of any potentially disruptive activities and actions being taken to mitigate the impact of these activities.
GE11	Excavation Cover	No excavations will be left open overnight, unless a ramp with a 45 degree angle is included to allow animals to escape should they fall in. All excavations will be backfilled immediately where possible.
GE12	Validity of Baseline Conditions	Where construction has not commenced within 12 months and conditions for species may have changed, surveys will be repeated in order to provide the most accurate and up to date recommendations for the Site.

2.7 Construction Environmental Management Plan

2.7.1 A CEMP will be prepared and implemented by the Principal Contractor for the works following their appointment. This document will detail how the Principal Contractor will manage the Site in accordance with all commitments and mitigation detailed in the EA, statutory consents and authorisations, and industry best practise and guidance.

2.7.2 The CEMP would also reference SSEN Transmission's GEMPs (Appendix 2.2) and Species Protection Plans (SPPs) (Appendix 2.3). The implementation of the CEMP will be managed on-site by a suitably qualified and experienced EnvCoW, with support from other environmental professionals as required.

2.8 Maintenance Programme

2.8.1 SSEN Transmission will have ownership of, and responsibility for, maintenance activities for all elements of the Proposed Development. Appropriate maintenance works will be carried out routinely and as soon as practicable following any unexpected events on-site.

3. APPRAISAL SCOPE AND METHODOLOGY

3.1 Approach to EA

3.1.1 The EA has been produced to support a s37 application for the Downleads element (including associated ancillary infrastructure) of the Proposed Development. The ancillary infrastructure associated within the Downleads; comprising a CSEC, permanent bell mouth and temporary construction compound will seek planning permission under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997, as amended, as part of the Section 37 (s37) application. The EA allows appropriate environmental management and mitigation to be identified for the Proposed Development in its entirety i.e., including UGC, as presented in Table 2-1 and Chapter 8.

3.1.2 With respect to the Downleads / CSEC component of the Proposed Development, a formal request for an Environmental Impact Assessment (EIA) Screening Opinion under Regulation 8 of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, was issued to the Energy Consents Unit (ECU) Scotland on 28/03/2023 A response was received on 05/06/2023 confirming that the Downleads / CSEC does not constitute EIA development, and as such, the s37 does not need to be accompanied by an EIA.

3.1.3 The approach followed in the EA is to initially identify the topics which require a level of assessment to determine the potential for likely direct and indirect environmental risks. This is achieved through a scoping exercise taking into consideration potential sensitive receptors and the nature of the construction and operation of the Proposed Development. 'Scoped out' topics are not considered further in the appraisal.

3.1.4 For the 'scoped-in' topics, this EA provides a concise appraisal of the likely direct and indirect environmental risks that the Proposed Development may pose; and makes recommendations for additional mitigation measures as required. The EA has been undertaken based on appropriate methodologies and best practice guidelines. Further details on this are provided in the technical chapters where considered relevant.

3.1.5 Chapter 8 collates the additional mitigation measures recommended in each of the appraisal chapters; which will be taken forward for inclusion in the site-specific CEMP.

3.2 Scope of Appraisal

3.2.1 Best practice in environmental appraisal encourages consultation and engagement with stakeholders early in the process, with advice and input from key consultees being sought at the early design stages of a project, to inform decisions about the Proposed Development. A summary of the consultation undertaken is provided within the technical chapters (Chapters 4 – 7).

3.2.2 An initial review of baseline conditions and sensitive receptors has been undertaken; Figure 1.3 Environmental Sensitivities illustrates the identified environmental considerations located within 5 km of the Site.

3.2.3 For each topic, the potential for environmental effects on these receptors has been considered and is documented in Table 3-1, which also indicates whether the topic is 'scoped in' or 'scoped out' of further assessment as discussed above.

Table 3-1: Scoping Review

Topic	Description	Scoped in/ out of appraisal
Landscape and visual effects	Designations and Protected Landscapes: There are no national or local designations within or in proximity to the Proposed Development. Reay – Cassley Wild Land Area is the closest designation, lying approximately 7 km north-west of the Site. Therefore, designated and protected landscapes are not considered further in this document.	Out
	Landscape Character The Proposed Development lies within the Rounded Hills – Caithness & Sutherland Landscape Character Type (LCT) 135. The Farmed and Forested Slopes with Crofting LCT 145 lies to the northwest of the study area. Effects of the Proposed Development will be considered on both LCTs.	In
	Visual Amenity: A viewshed was produced using Google Earth to estimate the visual influence of the Proposed Development. Based on this viewshed, site photography, desk-based research and previous experience on similar projects, a Study Area of 2 km radius was estimated. Effects on visual receptors within that Study Area will be considered in this assessment.	In
Biodiversity	There is potential for impacts such as habitat degradation and disturbance / displacement of notable features of surrounding designated sites including: Strath Carnaig and Strath Fleet Moors Special Protection Area (SPA), River Oykel Special Area of Conservation (SAC), Strath Carnaig and Strath Fleet Moors Site of Special Scientific Interest (SSSI), Strath Fleet and Strath Carnaig Moor Important Bird Area (IBA) and woodlands listed in the Ancient Woodland Inventory (AWI) and Native Woodland Survey of Scotland (NWSS). There is potential for impacts such as habitat degradation / drying of habitats present within the Site including: blanket bog, upland heath, upland flushed, fens and swamps and rivers. Of these habitats, blanket bog (f1a5) and upland heathland are Annex I habitats. All of the habitats listed are Scottish Biodiversity List[2] (SBL) habitats and listed in the Highland Local Biodiversity Action Plan[3] (LBAP) . The Site and surrounding area have the potential to support a number of protected and notable species including: otter, water vole, fish, freshwater pearl mussel, badger, pine marten, birds, amphibians, reptiles and mountain hare.	In
Heritage	There is the potential for impacts on known non-designated heritage assets within the Proposed Development boundary. The surrounding landscape contains numerous prehistoric earthworks and post-medieval stone structures and features, suggesting the potential for the discovery of previously unknown sub-surface archaeological remains is high. An assessment of the impacts on the cultural heritage resource is recommended to quantify any impacts on known and	In

[2] The SBL is a list of flora, fauna and habitats considered of principal importance for the conservation of biodiversity, developed by members of the Scottish Biodiversity Forum; https://www.nature.scot/doc/scottish-biodiversity-list.

[3] Highland Environment Forum (2021). Highland Nature: Biodiversity Action Plan 2021 – 2026. Available at: https://www.highlandenvironmentforum.info/wp-content/uploads/2022/01/Highland-Nature-Biodiversity-Action-Plan-2021-2026-_compressed-.pdf

Topic	Description	Scoped in/ out of appraisal
	potential heritage assets, and to provide details on recommendations to avoid or reduce those impacts.	
Hydrology	Operational impacts have been scoped out of this assessment as it is not anticipated that direct and indirect environmental risks will arise from the operation of the Proposed Development, with good design layout and the implementation of mitigation measures and GEMPs protecting against longer-term effects. There are no fisheries crossed or in the vicinity of the Proposed Development. The impact of pollution on fisheries has therefore been scoped out of the assessment. The impact of mobilisation of contaminated soil/bedrock has been scoped out; contaminated soils are not likely to be present around the Proposed Development due to its historical and present land use. There are no public and private water supplies (PWS) within the Study Area and therefore any potential changes to public supplies and PWS have been scoped out. There are no designated sites relevant to hydrology, hydrogeology, geology, and peat within the Study Area and therefore any effects on designated sites have been scoped out.	Out
	• Hydrology – changes to drainage regime and associated alteration to surface water runoff rates and volumes, erosion/sedimentation, and water quality characteristics throughout the Proposed Development and the wider catchment. • Hydrogeology – changes to groundwater infiltration and groundwater levels, water quality and wetland characteristics. • Geomorphology and geology – geomorphological characteristics of the land around the Proposed Development and changes to geological structures. • Soils and peat – changes to soil and peat characteristics related to erosion, compaction, and soil quality, and changes to peat stability within and immediately adjacent to the Proposed Development.	In
Peat	Changes to soil and peat characteristics related to erosion, compaction, and soil quality, and changes to peat stability within and immediately adjacent to the Proposed Development.	In
Population and human health	Potential effects on population and human health may relate to effects on TV and radio reception, noise and vibration, or EMF. Due to the nature of the Proposed Development adverse impacts on population and human health are not predicted and therefore not considered further in this EA.	Out
Land use	Land within the Site is Class 5.3, classified by The Macaulay System of Land Capability for Agriculture. Class 5.3 is capable of use as improved grassland. Any effects on land use would be localised, with the minimal loss of Class 5.3 agricultural land in the UGC location or temporary access tracks. As impacts to agricultural land would be localised and minimal, it is proposed to scope out land use from further assessment. As no loss of forestry area is anticipated as a result of the Proposed Development and no areas of forestry are located within the Site itself, forestry is not considered further in the EA.	Out

Topic	Description	Scoped in/ out of appraisal
Traffic and transport	The location of the Proposed Development i.e., in an area that is sparsely populated with no sensitive receptors in the immediate vicinity of the UGC, is such that it is considered that the construction of the Proposed Development will have no significant Traffic and Transport effects on any sensitive receptors that would require to be mitigated against. Furthermore, any Traffic and Transport effects will be generated primarily during the construction phase (i.e., temporary), with any operational traffic expected to be limited to service vehicles carrying out routine maintenance. Therefore, a full Traffic and Transport chapter has been scoped out of further assessment, subject to the provision of a Construction Traffic Management Plan (CTMP) which will be the responsibility of the Principal Contractor to produce. The CTMP will be finalised post-submission as part of a full CEMP.	Out
Recreation and tourism	The Proposed Development would utilise the A836 and the existing wind farm access track for construction and maintenance. However, the construction of the Proposed Development would not form any restriction to the usage of the route. The Proposed Development would not cross any Core Paths, with the closest over 1km away, within the village of Lairg. Where there may be interactions with recreational users, an outdoor access plan would be prepared as part of the CEMP, and signage would be erected at suitable locations to warn of construction traffic. There are several accommodation businesses in the wider area, inclusive of bed and breakfasts, hotels and lodges, with the closest being Lairg Glamping Pods situated approximately 1.3 km north-east of the Proposed Development. It is considered unlikely that any local businesses would be adversely affected by the Proposed Development. Based on the above, Recreation and Tourism is scoped out of further assessment.	Out
Major accidents and disasters	Given the nature of the Proposed Development, the potential for effects related to the vulnerability to accidents and disasters are likely to be limited to those associated with unplanned power outages, due to extreme weather or structural damage. Crisis management and continuity plans are in place across the SSE Group. These are tested regularly and are designed for the management of, and recovery from, significant energy infrastructure failure events. Where there are material changes in infrastructure (or the management of it) additional plans are developed. The vulnerability of the Proposed Development to accidents and disasters is therefore not considered further in the EA.	Out
Material assets and waste	The Proposed Development has limited potential to impact material assets and waste. Due to the nature of the Proposed Development, waste generating activities are not likely to occur during the operation of the UGC. Any waste arising from construction activities will be strictly controlled in accordance with the project CEMP. Therefore, material assets and waste has not been assessed further in the EA.	Out
Air quality and climate	The Proposed Development has limited potential to impact local air quality. There is a potential to give rise to some localised and temporary construction related releases associated with dust and construction plant and traffic exhaust emissions. However, the nature of the construction activities is that these would be localised, short term and intermittent.	Out

Topic	Description	Scoped in/ out of appraisal
	The potential for such nuisance effects on residential or recreational amenity during construction would be strictly controlled in accordance with the project CEMP. In regard to climate change, in the context of the EA process climate change is considered both in relation to the contribution of the Proposed Development to increasing or decreasing gaseous emissions with Global Warming Potential (GWP) and in relation to climate change adaptation and resilience. Emissions associated with the Proposed Development would be limited to temporary and short term emissions of exhaust gases from vehicles and construction plant, and the potential for the release of carbon dioxide as a result of dewatering and exposing peat and peat soils during construction. Neither source is considered likely to be significant in terms of GWP. The Proposed Development would enable a connection of a renewable source of energy to the National Grid, helping to reduce reliance on fossil fuels which produce harmful emissions. Consequently, Air Quality and Climate Change are not considered further in this EA.	
Noise and vibration	Construction noise and vibration effects would be short term and intermittent, with impacts from the construction of the UGC installation taking approximately one to two weeks to complete per 500 m. As such, it is considered that construction noise and vibration can be managed through the CEMP which will include mitigation measures to minimise impacts in line with Best Practicable Means as outlined in British Standard 5228:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites, Part 1: Noise and Part 2: Vibration. Therefore, noise has not been considered further within this EA.	Out

3.3 Cumulative Effects

3.3.1 There are two aspects to Cumulative Effects, defined as follows:

- In-combination effects: The combined effect of the Proposed Development together with other reasonably foreseeable developments (taking into consideration effects at the site preparation and earthworks, construction and operational phases); and
- Effects Interactions: The combined or synergistic effects caused by the combination of a number of effects on a particular receptor (taking into consideration effects at the site preparation and earthworks, construction and operational phases), which may collectively cause a more significant effect than individually. A theoretical example is the culmination of disturbance from dust, noise, vibration, artificial light, human presence and visual intrusion on sensitive fauna (e.g., certain bat species) adjacent to a construction site.

3.3.2 The potential for cumulative effects will be considered in relation to approved EIA development within the study area relevant to each particular issue. The basis for this is that only these developments have the potential to result in cumulative effects in combination with those arising from the Proposed Development. The final list of development to be considered in the cumulative effects assessment has been frozen one month prior to publication to allow sufficient time to compile the EA.

3.3.3 A review of The Highland Council planning portal and the ECU search portal has been undertaken to identify any relevant developments for consideration within the cumulative assessment; the details of which are provided in Table 3-2.

Table 3-2: Cumulative Developments

LOCATION	PLANNING REFERENCE & DESCRIPTION
Within the site	ECU00001763 – Lairg to Loch Buidhe 132 kV Overhead Line
To the south and east of the Site	19/01096/FUL – Lairg 2 Wind Farm
To the south and east of the Site	21/00849/FUL – Lairg 2 Wind Farm Re-Design
To the south and east of the Site	22/01058/S42 – Lairg 2 Wind Farm Deviation from planning condition
To the east of the Site	21/00580/FUL – Erection of temporary 80 m high meteorological mast

3.3.4 The individual technical chapters present the findings of the assessment of in-combination cumulative effects (which includes effects of the Proposed Development with other schemes). Where effect interactions have been identified on common receptors, the cumulative effect of this has been assessed within the respective chapters cumulative assessment.

4. ECOLOGY AND NATURE CONSERVATION

4.1 Introduction

4.1.1 This chapter assesses the likelihood of environmental effects on ecology and nature conservation resulting from the Proposed Development.

4.2 Information Sources

4.2.1 The report draws on several technical reports and figures which are listed below:

- Appendix 4.1: Baseline Ecology Data Report - Confidential
- Appendix 4.2: UKHab Survey Report [Underground Cable]
- Appendix 4.3: Protected Species Survey Report [Underground Cable]
- Figure 4.1: Designated Sites up to 10 km
- Figure 4.2: Designated sites up to 2 km
- Figure 4.3: UKHab Survey Results
- Figure 4.4: Protected Species Survey Results
- Figure 4.5: Confidential Ornithology Figure

4.2.2 Appendices 4.1 – 4.3 were produced at an earlier stage of the project development, during the optioneering phase, in line with SSEN Transmission's Routeing Guidance (hereafter referred to as 'SSEN Transmission's Routeing Guidance')[4]. The appendices supported the Alignment Selection stage of the guidance which sought to develop a preferred alignment for the Proposed UGC and its associated temporary access track.

4.3 Confidentiality

4.3.1 Figure 4.5 Confidential Ornithology accompanying this report shows the nest sites/territory locations of sensitive Schedule 1[5] species to add context to the appraisal. This figure is not for public viewing and should only be distributed to those individuals for whom it is essential to progress or assess the Proposed Development.

4.3.2 Appendix 4.1: Baseline Ecology Data Report is also a confidential document due to the protection level of certain species identified. Due to the risk of protected species persecution, this document should not be released into the public realm.

4.4 Methodology

4.4.1 This section describes the methodology used to gather baseline information, identify impacts resulting from the Proposed Development, and assesses their likely effects on features of ecology and nature conservation interest associated with the Proposed Development and surrounding area. Details of the methodologies used to gather and evaluate baseline information in relation to designated sites, habitats and protected species are provided in Appendices 4.1 – 4.3.

4.4.2 Scientific plant and animal names are provided in the appendices (not in this appraisal, unless first mentioned) following standard nomenclature. Scientific nomenclature for higher plant species (e.g., vascular, flowering plants) follows that provided in the latest edition of New Flora of the British Isles[6]. Nomenclature for lower species follows that provided in Mosses and Liverworts of Britain and Ireland[7].

[4] Scottish & Southern Electricity Networks, 2020. PR-NET-ENV-501: Procedures for Routeing Overhead Lines and Underground Cables of 132 kV and above
[5] Schedule 1 species are afforded an extra level of protection under the Wildlife and Countryside Act 1981 (as amended)
[6] Stace C. A. (2019). New Flora of the British Isles. Fourth Edition. C&M Floristics, Suffolk.
[7] Atherton, I., Bosanquet, S., Lawley, M. eds. (2010). Mosses and Liverworts of the British Isles: a field guide. British Bryological Society.

4.4.3 Issues relating to groundwater dependent terrestrial ecosystems (GWDTE) and peat are addressed within Chapter 6: Hydrology, Hydrogeology, Geology and Soils.

Consultation to Date

4.4.4 Consultation was undertaken with relevant stakeholders during the alignment stage of the project. The responses relevant to ecology and nature conservation to date from the consultation process are provided below in Table 4-1 Consultation Responses.

Table 4-1 Consultation Responses

Consultee	Date	Response
NatureScot	11 April 2022	The Renewable Energy Casework Advisor at NatureScot was consulted on 11 April 2022 regarding the approach to ornithological assessment. It was deemed acceptable to use the existing ornithology survey data gathered in connection with the Lairg II wind farm and the Dalchork to Loch Buidhe overhead line (OHL).

Baseline Information

4.4.5 The methodologies used to identify and evaluate baseline conditions are presented in Table 4-2.

Table 4-2 Baseline Data Collation

Baseline Data	Date
Desk Study	A desk study was completed to review existing ecological baseline information available in the public domain with regards to designated and priority areas of biological interest and species and habitats of conservation importance in addition to record searches from conservation organisations. Freely downloadable datasets and records from conservation organisations were searched to identfy: • statutory designated sites of European or international conservation importance within 10 km of the Proposed Development (incl. SPA, SAC and Ramsar); • statutory designated sites of national and/or local importance within 2 km of the Proposed Development (incl. SSSI, National Nature Reserves [NNR] and Local Nature Reserves [LNR]); • woodlands listed on the AWI and/or the NWSS database, Scottish Wildlife Trust (SWT) Reserves, IBA and Scottish Wildcat Priority Areas within 2 km of the Proposed Development; • records of protected or otherwise notable species were identified within 2 km of the Proposed Development (where suitable for commercial purposes). The search area was extended to 10 km for records of bats; and • record requests were also submitted to Butterfly Conservation Scotland (BCS) and Botanical Society for Britain and Ireland (BSBI).

Baseline Data	Date
	Where measurements are presented in the findings, these provide the approximate distance of the designated area / species record from the closest point of the Proposed Development.
Habitats	A detailed habitat survey was undertaken between the 30th May and 2nd June 2022 and then updated between the 25th and 26th October 2022 following a design change. At the time of survey, various alignment options were being considered and as such the survey area covered the alignment options, plus the 100 m LoD and then a further 250 m buffer from the LoD. In relation to the Proposed Development, the habitat data fully covers the Proposed Development and 250 m buffer (hereafter the Habitat Survey Area). Habitats were described and mapped following the Professional Version 1.1 of UK Habitat (UKHab) Classification using the following documents: • UKHab Classification User Manual (hereafter 'UKHab User Manual')[8]; • UKHab Classification Field Key[9]; and • The UKHab Classification Habitat Descriptions Version 1.1[10]. Following baseline data collection, habitats were assessed for their affiliation with Annex I habitats of the Habitats Directive, SBL habitats or LBAP priority habitats.
Protected Species	A protected species survey was carried out between the 30th May and 2nd June 2022 and then updated between the 25th and 26th October 2022 following a design change. At the time of survey various alignment options were being considered and as such the survey area covered the alignment options plus a 100 m LoD and a further survey buffer detailed for each species below. In relation to the Proposed Development, the protected species data fully covers the Proposed Development and up to 250 m buffer, depending on the species as detailed below. Otter - An otter survey was undertaken of the LoD and further 200 m survey buffer (Otter Survey Area). The survey comprised a search for signs of otter following standard industry survey guidance[11] and guidance from NatureScot[12]. Signs of otter include resting sites, prints, spraints, anal jelly, feeding sings, paths and slides. Water vole – A water vole survey was undertaken of the LoD and further 100 m survey buffer (Water Vole Survey Area). The survey comprised a search for signs of water vole following standard industry survey guidance[13] [14] and guidance from NatureScot[15]. Signs of water vole include droppings, latrines, feeding stations, burrows, lawns, nests, footprints and runways. Fish and freshwater pearl mussel (FWPM) - Watercourses within the LoD and further 250 m survey buffer were assessed for their overall suitability to support fish[16] and

[8] Butcher, B., Carey, P., Edmonds, R., Norton, L., and Treweek, J. (2020). The UK Habitat Classification User Manual Version 1.1 at http://www.ukhab.org/
[9] Butcher, B., Carey, P., Edmonds, R., Norton, L., and Treweek, J. (2020). The UK Habitat Classification – Field Key V1.1 at http://www.ukhab.org/
[10] Butcher, B., Carey, P., Edmonds, R., Norton, L., and Treweek, J. (2020). The UK Habitat Classification – Habitat Definitions V1.1 at http://www.ukhab.org/
[11] Chanin P (2003). Monitoring the Otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature, Peterborough
[12] NatureScot (2020). Standing advice for planning consultants: Otters. Available: https://www.nature.scot/doc/standing-advice-planning-consultations-otters
[13] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Matthews and Paul Chanin. The Mammal Society, London.
[14] Strachan, R., Moorhouse, T. & Gelling, M. (2011) Water Vole Conservation Handbook (3rd Edition), Wildlife Conservation Research Unit, University of Oxford.
[15] NatureScot (2020). Standing advice for planning consultants: Water vole https://www.nature.scot/doc/standing-advice-planning-consultations-water-voles
[16] Hendry, K., & Cragg-Hine, D. (1997). Restoration of Riverine Salmon Habitats: A Guidance Manual. R&D Technical Report W44. Environment Agency, Bristol

Baseline Data	Date
	FWPM[17] (Fish and FWPM Survey Area). Details of the channel, substrate composition and bank characteristics were recorded where suitable was habitat encountered. Badger - A badger survey was undertaken of the LoD and further 100 m survey buffer (Badger Survey Area). The survey comprised a search for signs of badger following standard industry survey guidance[18] and guidance from NatureScot[19]. Signs of badger include setts, dung pits and latrines, prints, mammal paths, hairs, snuffle holes, feeding remains and scratching posts. Red squirrel – A red squirrel survey was undertaken of the LoD and further 50 m survey buffer (Red Squirrel Survey Area). The survey comprised a search for signs of red squirrel following standard industry survey guidance[20] [21] and guidance from NatureScot[22]. Signs of red squirrel include visual sightings, prints, foraging signs and dreys. Pine marten - A pine marten survey was undertaken of the LoD and further 250 m survey buffer (Pine Marten Survey Area). The survey comprised a search for signs of pine marten following standard industry survey guidance[23] and guidance from NatureScot[24]. Signs of pine marten include den sites, prints and scats. Bats - A Preliminary Roost Assessment (PRA) was undertaken from ground level of the trees and structures occurring within and up to 30 m of the LoD to identify potential roost features (PRFs) for bats (Bat Survey Area). Where PRFs were identified they were recorded and classified as 'low', 'moderate' or 'high' suitability following best practice guidance[25] [26]. During the protected species survey, any incidental records of protected or priority species were recorded as well as any habitat to support such species.

4.4.6 The conservation importance of statutory/non-statutory designated sites, habitats and species was evaluated with reference to conservation legislation, local/national planning policy and population trends. Protected and priority species were identified, and their conservation status determined, based on their presence on at least one of the following legislative/planning frameworks or conservation lists:

- Nature Conservation (Scotland) Act 2004 (as amended);
- Wildlife and Natural Environment Act 2011 (as amended);

[17] NatureScot (2020). Standing advice for planning consultants: Freshwater Pearl Mussels. Available: https://www.nature.scot/doc/standing-advice-planning-consultations-freshwater-pearl-mussels

[18] Scottish Badgers (2018). Surveying for Badgers: Good Practice Guidelines, Version 1. Scottish Badgers, Forfar, Angus.

[19] NatureScot (2020). Standing advice for planning consultants: Badgers. Available: https://www.nature.scot/doc/standing-advice-planning-consultations-badgers

[20] Gurnell, J., Lurz, P., McDonald, R. and Pepper, H. (2009). Practical Techniques for Surveying and Monitoring Squirrels. Practice Note. Forestry Commission, Edinburgh.

[21] Cresswell WJ, Birks J, Dean M, Pacheco M, Trewhella WJ, Wells D and Wray S (2012). UKBAP Mammals: Interim Guidelines for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southhampton.

[22] NatureScot (2020). Standing Advice for Planning Consultations, Protected Species: Red Squirrel. Available at: https://www.nature.scot/doc/standing-advice-planning-consultations-red-squirrels

[23] O'Mahony, D., O'Reilly, C. and Turner, P. (2005). National Pine Marten Survey of Ireland 2005. Available online at: https://pinemarten.ie/wp-content/uploads/2018/11/2005-National-Pine-Marten-Survey-Ireland.pdf

[24] NatureScot (2020). Standing Advice for Planning Consultations, Protected Species: Pine Marten. Available at: https://www.nature.scot/doc/standing-advice-planning-consultations-pine-martens

[25] Collins J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). The Bat Conservation Trust, London.

[26] NatureScot (2020). Standing advice for planning consultations – Bats. Available online: https://www.nature.scot/doc/standing-advice-planning-consultations-bats

- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (the Habitats Regulations)[27];
- National Planning Framework 4 (NPF4);
- Listed on the Wildlife and Countryside Act 1981 (Scotland) Regulations 2001 (as amended);
- Listed on the SBL[2];
- Listed as a priority species/habitat on the LBAP[3]; and
- Red or amber listed within Birds of Conservation Concern (BoCC) 5 (Eaton *et al*, 2021)[28].

Appraisal

4.4.7 The appraisal methodology was formulated with cognisance of guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM)[29] in relation to ecological impact assessment. The appraisal methodology described is considered proportionate with the anticipated impacts of the Proposed Development, baseline habitats present and the planning framework (i.e., Environmental Impact Assessment (EIA) is not required).

4.4.8 The appraisal methodology is as follows:

- Identification of the potential impacts from the Proposed Development on designated sites and protected /priority habitats and species (hereafter collectively 'Ecological Features'). In some instances, Ecological Features were appraised in groups due to similarity in ecology, potential impacts from the Proposed Development, and subsequent effects;
- The effect of the identified impacts from the Proposed Development on Ecological Features is then assessed with cognisance of embedded mitigation. Specific mitigation is also recommended at this stage, if appropriate; and
- A conclusion is then determined based on any 'residual' effects remaining on Ecological Features following the implementation of embedded and additional mitigation measures. This conclusion is determined based on a combination of a quantitative and qualitative assessment that relies on professional experience and judgement. Factors considered to inform the conclusions include the effectiveness of mitigation proposed, nature of the impacts described (e.g., duration, frequency and magnitude) and the susceptibility of Ecological Features to these potential impacts. The appraisal will then conclude either:
  - No effects of the Proposed Development on Ecological Feature(s);
  - Negative residual effects of the Proposed Development on Ecological Features that are not significant;
  - Negative residual effects of the Proposed Development on Ecological Features that are significant; and
  - Positive residual effects of the Proposed Development on Ecological Features.

4.4.9 This appraisal is undertaken with consideration of the design details (including embedded mitigation) and construction methodology of the Proposed Development (Chapter 2) and baseline biodiversity conditions of the Site and surrounding area (Section 4.4).

[27] Within Scotland, the primary legislation in relation to Habitats Regulations remains the 1994 statutory instrument. The legislation has been updated post-Brexit: https://www.gov.scot/publications/eu-exit-habitats-regulations-scotland-2/.

[28] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. Online at: https://britishbirds.co.uk/content/status-our-bird-populations, accessed March 2023.

[29] CIEEM (2018). Guidelines for Ecological Impact Assessment in the U.K and Ireland. Version 1.

4.4.10 Operational effects on ecology are unlikely to generate changes to the current baseline. There is no habitat loss or activities associated with the operational phase of the Proposed Development that are likely to affect habitats or protected species. As such operational effects on ecology have been scoped out of this appraisal.

Limitations

4.4.11 Any limitations to the ecological assessment in relation to the Proposed Development are detailed in Appendix 4.1 – 4.3. None of the limitations identified effect the overall appraisal for the reasons discussed within the relevant appendices.

4.5 Baseline Environment

4.5.1 This section provides a summary of the baseline biodiversity conditions of the Proposed Development and surrounding area. Details of habitat and protected species baseline conditions are provided in Appendix 4.1, Appendix 4.2 and Appendix 4.3.

Designated Sites

4.5.2 Designated Sites for Nature Conservation identified up to 10 km from the Proposed Development are summarised below in Table 4-3 and shown in Figure 4.1 and Figure 4.2.

Table 4-3 Designated sites up to 10 km from the Proposed Development.

Site Name and Designation	Qualifying features	Distance & Direction from Site (at its closest point)
Strath Carnaig and Strath Fleet Moors SPA	Breeding hen harrier.	1 km NE
Strath Carnaig and Strath Fleet Moors SSSI	Breeding hen harrier.	1 km NE
Strath Fleet and Strath Carnaig Moor IBA	Breeding hen harrier.	1 km NE
Loch Shin and nearby lochs IBA	Resident: greylag goose and merlin. Breeding: Scottish crossbill and Arctic loon.	2 km NW
Lairg and Strath Brora Lochs SPA	Black-throated diver.	4.3 km N
Caithness and Sutherland Peatlands SPA	Regularly supporting populations of European importance of: red-throated diver, black-throated diver, hen harrier, golden eagle, merlin, golden plover, wood sandpiper, short-eared owl and dunlin. Regularly supporting populations of migratory species importance of: common scoter, greenshank and wigeon.	5.6 km NW

Site Name and Designation	Qualifying features	Distance & Direction from Site (at its closest point)
Caithness and Sutherland Peatlands Ramsar	This site is internationally important due to the presence of the following Habitats Directive Annex I features: oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* (H3130), natural dystrophic lakes and ponds (H3160), northern Atlantic wet heaths with *Erica tetralix* (H4010), blanket bogs (H7130), transition mires and quaking bogs (H7140), and depressions on peat substrates of the *Rhynchosporion* (H7150). Nationally important species occurring on the site for otter, plant species and invertebrates: (*Oreodytes alpinus and Aeshna caerulea*). Birds species occurring at levels of national importance and/or regularly supported during the breeding season.	5.6 km NW
Caithness and Sutherland Peatlands SAC	Qualifying Interests: blanket bogs, depressions on peat substrates of the *Rhynchosporion*, otter, natural dystrophic lakes and ponds, northern Atlantic wet heaths with *Erica tetralix*, oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto Nanojuncetea*, *Saxifraga hirculus*, and transition mires and quaking bogs.	5.6 km NW
River Oykel SAC	Qualifying Interests: FWPM and Atlantic salmon.	6.7 km SW

4.5.3 Ten areas of ancient woodland are present within 2 km of the Proposed Development. The closest area of ancient woodland is located 1.2 km north-west of the Proposed Development. Three areas of woodland recorded in the NWSS were identified within 1 km of the Proposed Development, all of which are native pinewoods. The closest woodland is located 460 m north of the Proposed Development.

Site Overview

4.5.4 Land associated with the Proposed Development primarily comprises wet heathland, dry heathland, blanket bog, degraded blanket bog, upland flushes fens and swamps, watercourses and hardstanding. Land management activities include grazing and drainage.

Habitats

4.5.5 The following sections discuss protected, or priority habitats identified within, and adjacent to the Proposed Development. These habitats are defined as those listed in the Habitats Directive, SBL and/or Highland LBAP. Full details of the ecological baseline are presented in Appendix 4.2.

Priority Habitats

4.5.6 Seven priority habitats were recorded across the Habitat Survey Area. Of these, three are listed in Annex I of the Habitats Directive (f1a5 Blanket bog, h1b5 Dry heaths; upland and h1b6 Wet heathland with cross-leaved heath; upland) as well as the SBL and LBAP. The remaining four habitats: f1a Blanket bog; f1a6 Degraded blanket bog; f2c Upland flushes, fens and swamps; and r2 - Rivers and lakes, are all listed in the SBL and LBAP. A description of these habitats is provided in Table 4-4 with the location of habitats provided in Figure 4.3.

Table 4-4: Priority Habitats Within the Habitat Survey Area

Primary Habitat Codes	Description	Total Area (ha) / Length (km)	Prioirty Habitat
f1a Blanket bog	This blanket bog was recorded within the Habitat Survey Area and could not be taken beyond level 4 of the UKHab categories due to the abundance of ericoid species and therefore did not meet the criteria for f1a5 Blanket bog. The habitat was often dominated by heather with abundant species including deergrass, *Sphagnum sp.*, purple moor-grass, *Polytrichum commune* and wavy-hair grass. Cross-leaved heath, heath milkwort, tormentil and star sedge were frequent whilst hare's-tail cottongrass, common cottongrass and common sedge were occasional. Additionally, soft rush and marsh violet were recorded as occasional in wetter areas such as along watercourses.	18.43 ha	SBL Habitat: Blanket bog LBAP Habitat: Peatland and wetland
f1a5 Blanket bog (H7130)	Blanket bog was recorded throughout the Habitat Survey Area and was often dominated by *Sphagnum* and purple moor-grass whilst abundant species included cross-leaved heath, deergrass and sweet vernal grass. Frequent to occasional species included marsh lousewort, heath milkwort, soft rush, *Polytrichum commune*, hare's-tail cottongrass, tormentil, heather, common cottongrass, common sedge, deer fern, heath rush, marsh violet, wavy-hair grass, marsh thistle and cinquefoil species.	16.36 ha	Annex I habitat: 7130 Blanket bogs SBL Habitat: Blanket bog LBAP Habitat: Peatland and wetland

Primary Habitat Codes	Description	Total Area (ha) / Length (km)	Prioirty Habitat
f1a6 Degraded blanket bog	Degraded blanket bog was recorded to the south of the existing road. It was classed as degraded due to the presence of drainage channels from the surrounding works, causing the habitat to be dryer and have less *Sphagnum* cover than the non-degraded blanket bog. The habitat was dominated by heather and purple moor-grass whilst abundant species included cross-leaved heath, deergrass and *Sphagnum* species. Occasional species include hare's-tail cottongrass, bog asphodel and bog bilberry.	21.12 ha	SBL Habitat: Blanket bog LBAP Habitat: Peatland and wetland
f2c Upland flushes, fens and swamps	Flushes were recorded throughout the Habitat Survey Area as area-based and linear-based habitats depending on size. Flushes were often dominated by bog pond weed and abundant to occasional species included sweet vernal grass, Sphagnum species, *Polytrichum commune*, heather, common cottongrass, soft rush, purple moor-grass, tormentil, marsh violet, deer fern, cross-leaved heath, common sedge, marsh thistle, common butterwort and hare's-tail cottongrass.	2.56 ha and 0.56 km	SBL Habitat: Upland flushes, fens and swamps LBAP Habitat: Peatland and wetland
h1b5 Dry heaths; upland (H4030)	Dry heath was recorded throughout the Habitat Survey Area, primarily on hillsides where the habitat was naturally drier than the surrounding wetland habitat. Some areas were also subject to burning. The habitat was dominated by heather and abundant species included feather-moss and reindeer lichen. Rare species included tormentil, purple moor-grass, heath milkwort, deergrass, wavy-hair grass and bog asphodel. Hare's tail and *Sphagnum* was also recorded in wet hollows.	9.12 ha	Annex I Habitat: 4030 European dry heaths SBL Habitat: Upland heathland LBAP Habitat: Upland and moorland

Primary Habitat Codes	Description	Total Area (ha) / Length (km)	Prioirty Habitat
h1b6 Wet heathland with cross-leaved heath; upland (H4010)	Wet heath was recorded throughout the Habitat Survey Area and was often dominated by heather, purple moor-grass and deergrass. Abundant to frequent species include cross-leaved heath, common cottongrass, *Sphagnum* species, heath rush and mat-grass.	10.65 ha	Annex I habitat: 4010 Northern Atlantic wet heaths with *Erica tetralix* SBL Habitat: Upland heathland LBAP Habitat: Upland and moorland
r2 - Rivers and lakes	Torroboll Burn originates at Loch Dailidh n' Airbh c. 1.18 km east of the Habitat Survey Area. The burn enters from the east and bisects the Habitat Survey Area, travelling north-west towards the River Shin.	0.93 km	SBL Habitat: Rivers LBAP Habitat: Freshwater: rivers, burns and lochs

Invasive Non-Native Plant Species (INNS)

4.5.7 No invasive non-native species were recorded within the Habitat Survey Area.

Protected and Priority Species

4.5.8 Full details of the protected species results which form the ecological baseline are presented in Appendix 4.1 and Appendix 4.3. Results of the protected species survey are shown in Figure 4.4.

Otter

4.5.9 Otters are fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) and included within the SBL as a species which Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. Otter are not included as priority species in the LBAP.

4.5.10 As part of the desk study, a review of planning application supporting documents identified otter in the wider area and signs of use along Torroboll Burn. The protected species survey identified evidence of otter along the Torroboll Burn. A non-breeding resting site and several spraints were identified under the bridge c.110 m to the south-east of the Proposed Development. Additionally, habitat with suitability to be used as a resting site was recorded under an overhanging bank of the Torroboll Burn, located c.112 m from the Proposed Development, however, no evidence to confirm use by otter was recorded. Overall, the general habitat surrounding the Torroboll Burn within the Otter Survey Area was optimal habitat for otter, including suitable banksides and overhanging heathland vegetation suitable for resting sites.

Water vole

4.5.11 Water voles receive partial protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is included within the SBL. Water vole are also listed as a priority species in the LBAP.

4.5.12 As part of the desk study, a review of planning application supporting documents identified water vole in the wider area and along the Torroboll Burn. The protected species survey identified several burrows, paths and nibbled vegetation of suitable size and character for water vole to the south-east of the Survey Area, located c. 110 m from the Proposed Development. However, no positive evidence, such as droppings or footprints, to

confirm presence of water vole was recorded. Overall, the habitat within the Water Vole Survey Area was optimal for water vole. The banks were suitable for burrowing, the flow was slow-moderate throughout and there was suitable vegetation for foraging.

Fish and freshwater pearl mussel

4.5.13 Several species of fish are fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) and further species as well as FWPM receive full and partial protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Thirteen species of fish and FWPM are included within the SBL and four species of fish are also listed as a priority species in the LBAP. FWPM are not listed as a priority species in the LBAP but are included within the commitments outlined in the freshwater habitat action plan.

4.5.14 The desk study found that salmon, trout, eel and three-spined stickleback are present in the wider area and within the Torroboll Burn. No records of FWPM were recorded. The protected species survey deemed the habitat to be suitable to support fish, with a single fish (species unknown) being recorded. The Site also had suitability to support FWPM and given the distance and connectivity to the River Oykel SAC (6.7 km) which is designated for FWPM as well as the desk study records showing use of the watercourse by salmonids, the presence of the species cannot be ruled out.

Badger

4.5.15 Badgers and their setts are protected under the Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2011. No evidence of badger was identified during the desk study or protected species survey. The Badger Survey Area predominantly comprised blanket bog and wet heath habitats which could be used by badger with no natural or manmade barriers preventing access to the Proposed Development from the wider area.

Red Squirrel and Pine Marten

4.5.16 Red squirrels and their dreys (resting places) receive full protection under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended). Pine marten receives full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Both pine marten and red squirrel are included within the SBL. Additionally, both species are listed as priority species in the LBAP.

4.5.17 The desk study found that red squirrel and pine marten are present in the wider area. The protected species survey found no evidence of either species within the Survey Areas. No trees or woodland to support these species was recorded within the Survey Areas, and as such, the Site was considered to have negligible suitability to support dreys or dens for these species. However, the Site could still be used for foraging and commuting by pine marten.

Bats

4.5.18 All bat species found in Scotland are fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). Nine bat species (Brandt's bat, Daubenton's bat, whiskered bat, Natterer's bat, noctule bat, Nathusius' pipistrelle, common pipistrelle, soprano pipistrelle and brown long-eared bat) are included within the SBL. Additionally, six bat species (Daubenton's bat, Natterer's bat, Nathusius' pipistrelle, common pipistrelle, soprano pipistrelle and brown long-eared bat) are listed as priority species in the LBAP.

4.5.19 The desk study found records of the following bat species: brown long-eared bat, Daubenton’s bat, common pipistrelle and soprano pipistrelle. The protected species survey found no features suitable for roosting bats within 30 m of the Proposed Development due to an absence of trees, structures, or other suitable natural features. Linear features, including Torroboll Burn, within the Survey Area could provide suitable foraging and commuting habitat for bats.

Birds

4.5.20 The habitats within the Site support ground nesting birds with skylark and curlew recorded as incidental sightings during the protected species survey. Both species are red listed within BoCC[30] and are listed within SBL[31].

4.5.21 No further bird surveys have been undertaken for the Proposed Development, due to the extensive data available from surveys to inform other developments that have overlapping study areas with the Proposed Development. A Habitats Regulation Assessment (HRA) Screening was undertaken for a separate proposal related to the Proposed Development[32]. This involved a proposed OHL or UGC to connect the consented Lairg II Wind Farm to the electricity transmission network. The site and study area assessed within the HRA fully overlap with the Proposed Development and included similar proposed works activities that would result in the same potential for Likely Significant Effects (LSE) on qualifying species of the three SPAs detailed above (Section 4.4). Relevant potential effects identified include loss/degradation of functionally linked habitat and disturbance and displacement of qualifying features. The HRA screening concluded that the proposed OHL/UGC would not result in an adverse effect on the integrity of any of the relevant European sites, alone or in-combination with other identified projects.

4.5.22 Data available to inform the appraisal ornithological studies for the Dalchork to Loch Buidhe OHL which are ongoing. Results are shown in Figure 4.5 alongside buffers to highlight the distance from the Proposed Development. A review of data from this development and surveys to inform Lairg II Wind Farm has been undertaken and identified the following species of elevated conservation importance of relevance to this appraisal:

- Red-throated diver – One territorial pair (no confirmation of breeding) on a small loch approximately 1 km from the Site in 2021 but not present in 2022. SBL, Schedule 1.
- Black-throated diver – No records within the Site, with the nearest flight activity approximately 1.5 km away and the nearest breeding site approximately 4.5 km away in 2021 and 2022. SBL, BoCC amber list, Schedule 1.
- Hen harrier – The nearest breeding site was approximately 3 km away in 2021 and 2.7 km away in 2022. Historically, this species has nested at several locations in the wider area surrounding the Site, the closest nest site to the Site was approximately 2.4 km away in 2013. No flight activity within the Site in 2021. SBL, BoCC red list, Schedule 1.
- Red kite – Occasional flights across the Site in 2016-2018 with no evidence of breeding. In 2021 and 2022 the nearest breeding site was approximately 2.4 km away with no flight activity across the Site. SBL, Schedule 1.
- White-tailed eagle – Occasional flights to the south of the Site. No evidence of breeding. SBL, BoCC amber list, Schedule 1.
- Golden eagle – Two flights across the Site, in 2016-2018. No flight activity within the Site in 2021. No evidence of breeding. SBL, Schedule 1.
- Peregrine – Occasional flights across the Site. No evidence of breeding. SBL, Schedule 1.
- Merlin – Occasional flights across the Site. The nearest breeding site in 2021 and 2022 was approximately 2.4 and 2.6 km away respectively. SBL, BoCC red list, Schedule 1.

[30] BTO (2021). Birds of Conservation Concern 5. Available at: https://www.bto.org/sites/default/files/publications/bocc-5-a5-4pp-single-pages.pdf

[31] NatureScot (2020). Scottish Biodiversity List. Available at: https://www.nature.scot/doc/scottish-biodiversity-list

[32] WSP (2022). Lairg II Wind Farm Grid Connection: Habitats Regulations Appraisal Screening.

Amphibians and Reptiles

4.5.23 Reptiles are fully protected under the Wildlife and Countryside Act 1981 (as amended). Amphibians are given limited protection under the Wildlife and Countryside Act 1981 (as amended), with the exception of great crested newts and natterjack toads which are fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). Four reptiles and three amphibians are included within the SBL. No reptile or amphibian species are listed as priority species in the LBAP.

4.5.24 The desk study recorded common lizard within 1 km of the Site. The protected species survey found that the heathland and degraded bog as well as stone tracks and rock outcrops form suitable habitat for basking reptiles. Additionally, the wetland habitats present within the Survey Area could support amphibians and an incidental record of common frog was recorded during the survey. No ponds are present within the Survey Area to support breeding newts and great crested newts are not known in the area (Appendix 4.1).

Other Species

4.5.25 The protected species survey identified suitable habitat for brown hare and mountain hare. However, the Site is unlikely to support hedgehog due to its upland nature.

4.5.26 Both the BCS and BSBI were contacted as part of the desk study (Appendix 4.1), and as such records of notable invertebrate species were identified within the wider area. No results were obtained from the immediate surroundings, however, it is likely a lack of records is primarily due to the remoteness of the Site.

4.6 Mitigation

4.6.1 Embedded mitigation relevant to this appraisal includes reliable tried and tested measures documented within:

- Application of SSEN Transmissions General Environment Management Plans (GEMPs), particularly oil storage and refuelling, soil management, working in sensitive habitats and working in or near water; and
- Adherence to the relevant general binding rules specified in the Water Environment (Controlled Activities) (Scotland) Regulations 2011, as amended (CAR) and any project-specific registrations or licences required prior to any construction works commencing.

4.6.2 Design and generic embedded mitigation of relevance to protected and priority species comprising the following:

- The proposed CEMP;
- SSEN Transmission's Species Protection Plan (SPP) for otter, badger, water vole, bats, red squirrel, birds and pine martens. These SPPs detail a mitigation hierarchy to avoid or minimise impacts on protected or priority species. Impact avoidance and mitigation measures detailed typically include:
  - Pre-construction surveys and monitoring undertaken by an Environmental Clerk of Works (EnvCoW);
  - Sensitive working methods and avoidance of sensitive areas (such as resting sites) or supervision of works in close proximity to such sites; and
  - Application for the relevant Protected Species Development Licence from NatureScot if impacts on certain protected species cannot be avoided. Works will then proceed under the conditions of the licence issued.
- Pre-construction environmental inductions will be given to all construction staff, including information on sensitive habitats, species and legislation.

4.7 Appraisal

4.7.1 This appraisal is undertaken with consideration of the design details (including embedded mitigation) and construction methodology of the Proposed Development (see Chapter 2: Proposed Development) and baseline biodiversity conditions of the Site and surrounding area.

Impacts and Ecological Features Scoped Out

4.7.2 Impacts from the Proposed Development on the following designated sites have been scoped out due to their distance from the Site, nature of qualifying/notified features and/or lack of functional connectivity:

- Loch Shin and nearby lochs IBA. The site is located 2 km from the Proposed Development and is designated for greylag goose, merlin, Scottish crossbill and black-throated diver. Given the distance from the Site and the small scale of the Proposed Development, the IBA and its qualifying interests would unlikely be directly or indirectly affected by the Proposed Development.
- Lairg and Strath Brora Lochs SPA. The SPA is located 4.3 km from the Proposed Development and designated for black-throated diver. Given the distance from the Proposed Development, the designated site would unlikely be directly or indirectly affected by the Proposed Development. The footprint of the Proposed Development does not occupy suitable functionally linked habitat (lochs) for the sole qualifying species black-throated diver, and the nearest waterbody is 1 km south-west, out with the Zone of Influence (ZoI)[33] from the Proposed Development for potential disturbance impacts[34]. Further to this, the Proposed Development footprint is outwith the predicted distance of 1 km or less for alternative nest sites for black-throated diver from the designated site based on guidance (SNH, 2016)[35].
- Caithness and Sutherland Peatlands SAC/SPA/Ramsar. The designated sites are located 5.6 km from the Site. Given the distance and the small scale of the Proposed Development, the designated sites and their qualifying species would unlikely be directly or indirectly affected by the Proposed Development. The Proposed Development footprint is outwith the predicted distance for alternative nest sites for all qualifying species based on guidance (SNH, 2016)[35].
- Red Squirrel. No habitat suitable to support the species is present within the Survey Area.
- Bats. No potential roosting features were identified within the Survey Area. Works will be during the daytime and as such foraging and commuting bats are unlikely be affected by the Proposed Development.
- Fish and FWPM. Due to embedded mitigation measures (including pollution prevention measures) fish and FWPM are not anticipated to be impacted by construction activities. This includes adhering to the CEMP, implementing the GEMPs and enforcement by an EnvCoW. There will be no direct effects on the watercourse, the Proposed Development is c.90 m at its closest point.
- Bird strike. The Proposed Development does incorporate above ground infrastructure comprising three 132 kV cable sealing end and surge arrestor combined structures, as well as three 132 kV post insulator structures located on a stone platform which will measure approximately 50 m in length by 20 m in width. These structures will measure approximately 5 m in height. Downleads are required to connect the existing OHL at Tower 31 to the UGC. Considering the relatively low height and localised nature of the above ground infrastructure, no collision risk to birds is predicted. Therefore, this impact is scoped out for ornithology.

Table 4-5 provides an appraisal of the potential effects on Ecological Features resulting from construction impacts of the Proposed Development. Reference has been made to which element of the Proposed

[33] The zone of influence relates to the range in which black throated diver could experience potential disturbance effects.

[34] Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022). Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283. https://www.nature.scot/doc/naturescot-research-report-1283-disturbance-distances-review-updated-literature-review-disturbance#Black-throated+diver,+Gavia+arctica Accessed 06/04/2023.

[35] SNH (2016). Assessing Connectivity with Special Protection Areas (SPAs).

Development the potential effect relates to i.e., the Downleads or the Proposed UGC and temporary access track.

Table 4-5: Appraisal on Important Ecological Features.

Ecological Feature	Potential Effect	Development Activity	Details of Ecological Effect and Embedded Mitigation Measures	Appraisal
Strath Carnaig and Strath Fleet Moors SPA Strath Carnaig and Strath Fleet Moors SSSI Strath Fleet and Strath Carnaig Moor IBA	Habitat Degradation	Loss of habitat suitable for designated feature (hen harrier). Pollution during site clearance and construction.	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> There is potential for direct damage to habitat used by the designated features – hen harrier. However, the footprint of the Proposed Development is very localised in comparision to the extensive foraging habitat available for hen harrier within the designated site and in the wider area outwith the designated site. Overall, the Proposed Development will effect a small linear corridor of habitat, 1.63 ha. Pollution effects are unlikely to be signficant given the relatively small scale of the Proposed Development and associated works. Further to this, the Proposed Development and nearby watercourses are located downstream of the designated site meaning water pollution events resulting in habitat degredation are unilkely. Embedded mitigation measures i.e. CEMP, GEMPs (Appendix 2.2) and enforcement by an EnvCoW, will effectively mitigate the potential for pollution casued during construction.	No effect
Strath Carnaig and Strath Fleet Moors SPA Strath Carnaig and Strath Fleet Moors SSSI Strath Fleet and Strath Carnaig Moor IBA	Disturbance and displacement	Disturbance and displacement to the qualifying feature (hen harrier) from aural and visual stimuli during the constrcution phase e.g. vehicle movements, use of machinery and works personnel.	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> Disturbance to qualifying populations of hen harrier affecting breeding success. Hen harrier nests in the wider area surrounding the Proposed Development but construction bird monitoring data from 2021 and 2022 in support of the Dalchorck to Loch Buidhe 132 kV Overhead Line development shows that the nearest nest site was approximately 3 km away in 2021 and 2.7 km away in 2022. Furthermore, the historic distribution of hen harrier shows nest sites in the wider area around the Proposed Development between 2002 and 2017 in a condensed area with the closest nest site to the Site being approximately 2.4 km away. These distances are beyond the ZoI predicted for impacts from disturbance[34]. In addition, consideration is given to potential disturbance and displacement for hen harrier from foraging sites. Habitat within the footprint of the Proposed Development could be used by this species for foraging, the Proposed Development occupies a realtively small footprint (1.63 ha) and very extensive suitable foraging habitat is available within the designated site and elsewhere in the wider area. Furthermore, data shows a lack of flight activity from the	No effect

Ecological Feature	Potential Effect	Development Activity	Details of Ecological Effect and Embedded Mitigation Measures	Appraisal
			species across the Proposed Development, suggesting the Proposed Development is not an important foraging resource. Furthermore, any displacement effects would be temporary with construction of the Proposed Development predicted to last 18 months. In the unlikely event that the established hen harrier breeding distribution changes to the extent that a nest site location is present within a ZoI for disturbance from the Proposed Development, mitigation will be implemented through a bird SPP (Appendix 2.3) to ensure no adverse residual effects.	
River Oykel SAC	Habitat Degradation	Pollution during site clearance and construction	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> The SAC is hydrologically connected to the Proposed Development via the Torroboll Burn, which flows into the River Shin upstream of the River Oykel SAC. Embedded mitigation measures i.e. CEMP, GEMPs (Appendix 2.2) and enforcement by an EnvCoW, will effectively mitigate the potential for pollution casued during construction.	No effect
Woodlands listed in the AWI and NWSS	Habitat Degradation	Pollution during site clearance and construction	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> Sections of woodland identified within the search parameters are hydrologically linked to the Proposed Development. The closest areas listed on the AWI (categories 1a ancient (of semi-natural origin), 2a ancient (of semi-natural origin), 1b long-established (of plantation origin)) are located c. 1.2 km north-west of the Proposed Developent, and as such there would be no habitat loss. The woodland is however hydrologically linked by Torroboll Burn. Embedded mitigation measures i.e. CEMP, GEMPs (Appendix 2.2) and enforcement by an EnvCoW, will effectively mitigate the potential for pollution casued during construction.	No effect
Blanket bog (f1a Blanket bog, f1a5 Blanket bog and f1a6 Degraded blanket bog)	Habitat Degradation/ Drying	Physical damage and site clearance. Pollution during Site clearance and construction	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> The UK Biodiversity Action Plan (UK BAP) aims to restore blanket bog to halt the loss of biodiversity, with approximately 20-50% of Scotland's blanket bogs anticipated to be in damaged condition. Therefore, f1a blanket bog and f1a6 degraded blanket bog has also been included within this category as it is important habitat capable of restoration. Construction activities would result in the permanent loss (0.14 ha) and temporary loss/degradation of blanket bog (0.39 ha) to facilitate the installation of the downleads, including the associated ancillary infrastructure (CSEC, the permanent bellmouth and the	Adverse residual effects that are not significant

Ecological Feature	Potential Effect	Development Activity	Details of Ecological Effect and Embedded Mitigation Measures	Appraisal
			temporary construction compound); the temporary access track associated with the Proposed UGC is also factored into this. Of this, 0.32 ha is considered irreplaceable habitat (blanket bog in moderate or good condition). Given the loss of irreplaceable habitat it is not possible to remove residual effects entirely, however, mititgation measures to reduce degradation effects are included below. A full breakdown of the anticipated habitat losses per element of the Proposed Development (i.e., by the consenting regime they fall under) is set out within the Project BNG Report. Any excavations required for the Proposed UGC cable trench will be kept free from water by use of mobile pumps, with water pumped to a suitable location as agreed on site by the EnvCoW and in accordance with SSEN Transmission's GEMPs (Appendix 2.2). Drainage design measures to ensure the discharge will not result in pollution to surface water will be set out in the CEMP. Embedded mitigation to reduce the scale of impact on this bog habitat will include sensitively and effectively managing peat and soils and is outlined in the GEMP (Appendix 2.2) and the Outline Soil and Peat Management Plan (Appendix 6.1). Good practice methods include careful removal of vegetated turves, short timescales between lifting and replacement of turves (with a four week reinstatement objective) and ensuring stored turves are kept in good condition (including watering when weather conditions could lead to desiccation). Revegetation of bare soil with native vegetation and excavated material will be re-used as close to excavation location as practicable and as soon as possible. All excavated material from the Proposed UGC trench will be carefully stored a minimum of 10 m from any watercourses and 50 m from any watercourse identified on Ordnance Survey 50,000 scale mapping, with soil mounds and restoration depths no higher than 2 m and with stable banking. Care will be taken to prevent any risk of runoff or windborne dry sediment being discharged into watercourses. Whilst bog habitat within the Survey Area is irreplaceable, much of this habitat under the Proposed Development footprint is either degarded or blanket bog but not Annex I which has the potential for restoration, with areas of active bog in good condition limited to the east of the Proposed Development in an area largely subject to temporary loss. On the successful installation of the cables all temporary works will be removed and the land reinstated. The habitat is likely to recover where there is temporary damage.	

Ecological Feature	Potential Effect	Development Activity	Details of Ecological Effect and Embedded Mitigation Measures	Appraisal
f2c Upland flushes, fens and swamps	Habitat Degradation	Pollution during site clearance and construction.	Downleads (including ancillary infrastructure) and Proposed UGC Upland flushes fens and swamp are a SBL priority habitat and listed as a prioirty habitat in the LBAP. The habitat was recorded within the Habitat Survey Area but does not fall within the Proposed Development footprint and therefore would not be directly effected. Potential for GWDTEs to be effected will be assessed in Chapter 6: Hydrology, Hydrogeology, Geology and Soils. Embedded mitigation measures i.e. CEMP, GEMPs (Appendix 2.2) and enforcement by an EnvCoW, will effectively mitigate the potential for pollution casued during construction.	No effect
Upland heathland (h1b5 Dry heaths; upland (H4030) and h1b6 Wet heathland with cross-leaved heath; upland (H4010)).	Habitat degradation/ drying	Physical damage and site clearance.	Downleads (including ancillary infrastructure) and Proposed UGC Construction activities would result in the temporary loss/degradation of upland heath (0.42 ha) to facilitate the installation of the Proposed UGC including access required and temporary construction compound (ancillory infrastrucutre to the Downleads). A full breakdown of the anticipated habitat losses per element of the Proposed Development (i.e., by the consenting regime they fall under) is set out within the Project BNG Report. Mitigation measures will follow those outlined above for effects on bog habitat. Reinstatement of the surface layers will be completed by returning the remaining excavated material to the trench in layers, in reverse order with the existing vegetation placed on the trench where possible. On the successful installation of the Proposed UGC, all temporary works will be removed and the land reinstated. This habitat is likely to recover where there is temporary damage.	Adverse residual effects that are not significant
r2 - Rivers and lakes	Habitat degradation	Pollution during site clearance and construction.	Downleads (including ancillary infrastructure) and Proposed UGC Torrobol Burn was recorded within the Survey Area but does not fall within the Proposed Developments footprint. Embedded mitigation measures i.e. CEMP, GEMPs (Appendix 2.2) and enforcement by an EnvCoW, will effectively mitigate the potential for pollution casued during construction.	No effect

Ecological Feature	Potential Effect	Development Activity	Details of Ecological Effect and Embedded Mitigation Measures	Appraisal
Otter	Reduced population of nationally protected species caused by disturbance, displacement, killing and injury of individuals	Site clearance and construction	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> Construction activities may injure, kill or disturb /displace individuals (if present), due to the proximity to Torroboll Burn (c. 90 m), which would constitute an offence under legislation afforded to this species. Otters utilise freshwater, marine and terrestrial habitats and any disturbance/displacement would be temporary, licenced accordingly (where resting sites are found to be present during pre-construction surveys) and be unlikely to significantly affect the local population. Construction activities would be undertaken during daytime periods only, avoiding periods when otters are thought to be most active. Works within a potential disturbance zone of any identified resting sites will be licensed and supervised by the EnvCoW following all mitigation measures outlined in the SSEN otter SPP. The responsibility of obtaining licences will be that of the contractor. Pollution prevention measures, outlined in the GEMP (Appendix 2.2) and CEMP will also minimise the potential for the release of sediment into watercourses.	Temporary adverse residual effects that are not significant
Water vole	Reduced population of nationally protected species caused by disturbance, displacement, killing and injury of individuals	Site clearance and construction	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> No confirmed evidence of water vole has been recorded nearby the Proposed Development, however, given the suitable habitat present, a precautionary assessment has been included. Effects on water vole as a result of the Proposed Development are unlikely given the distance to the burn (c. 90 m). Water vole burrows are typically located in close proximity to the bank, although it is acknowledged that they may use surrounding habitats and as such this risk has been considered. Construction activities may injure, kill or disturb /displace individuals (if present), due to the proximity to Torroboll Burn (c. 90 m), which would constitute an offence under legislation afforded to this species. Any disturbance/displacement would be unlikely to significantly affect the local population. Construction activities will be supervised by the EnvCoW and follow all mitigation measures outlined in the SSEN water vole SPP (Appendix 2.3). Pollution prevention measures, outlined in the GEMP (Appendix 2.2) and CEMP will also minimise the potential for the release of sediment into watercourses.	Temporary adverse residual effects that are not significant

Ecological Feature	Potential Effect	Development Activity	Details of Ecological Effect and Embedded Mitigation Measures	Appraisal
Badger	Reduced population of protected species caused by disturbance, displacement, killing and injury of individuals	Site clearance and construction	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> No evidence of badgers has been recorded nearby the Proposed Development, however, given the suitable habitat present, a precuationary assessment has been included. Construction activities may injure, kill or disturb /displace individuals (if present), which would constitute an offence under legislation afforded to this species. Any disturbance/displacement would be temporary, licenced accordingly (should setts be found to be present during pre-construction surveys) and be unlikely to significantly affect the local population. Construction activities would be undertaken during daytime periods only, avoiding periods when badgers are most active. Works will follow all mitigation measures outlined in the SSEN badger SPP (Appendix 2.3), as well as those detailed in the CEMP, enforced by the EnvCoW.	Temporary adverse residual effects that are not significant
Pine Marten	Reduced population of protected species caused by disturbance, displacement, killing and injury of individuals	Site clearance and construction	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> No evidence of pine marten has been recorded nearby the Proposed Development, however, given the suitable habitat present, a precuationary assessment has been included. Construction activities may injure, kill or disturb /displace individuals (if present), which would constitute an offence under legislation afforded to this species. Any disturbance/displacement would be temporary and be unlikely to significantly affect the local population. Construction activities will be supervised by the EnvCoW and follow all mitigation measures outlined in the SSEN pine marten SPP (Appendix 2.3).	Temporary adverse residual effects that are not significant
Birds - Schedule 1 species	Reduced population of birds of conservation concern caused by disturbance, displacement, destruction of nest sites, killing	Site clearance and construction	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> Several bird species with elevated protection under Schedule 1 of the Wildlife and Countryside were recorded nesting/ holding territory in the wider area surrounding the Proposed Development during construction monitoring in 2021 and 2022 in support of the Dalchorck to Loch Buidhe 132 kV Overhead Line development: hen harrier, merlin, red kite and red-throated diver. For all species, nest sites/territories were out with a ZoI for disturbance from the Proposed Development based on guidance[34]. In the unlikely event that breeding distribution changes to the extent that a nest site location is present within a ZoI for disturbance from the Proposed Development, mitigation will be implemented through a bird SPP (Appendix 2.3) to ensure no adverse residual effects.	No effect

Ecological Feature	Potential Effect	Development Activity	Details of Ecological Effect and Embedded Mitigation Measures	Appraisal
	and injury of individuals			
Birds - additional species	Reduced population of birds of conservation concern caused by disturbance, displacement, destruction of nest sites, killing and injury of individuals	Site clearance and construction	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> Construction activities may injure, kill or disturb /displace individuals (if present), which would constitute an offence under legislation afforded to birds. Appropriate mitigation including timing of construction to avoid breeding bird season (March to August, inclusive) where possible, aderhance to SSEN Bird SPP (Appendix 2.3), and supervision of works by an EnvCoW, will mean that there is unlikely to be a significant effect on birds. The EnvCoW will provide on-site guidance, in particular regards to nesting birds and will undertake regular searches for bird nests within the works area. If an active bird nest is identified or suspected, the EnvCoW will establish an exclusion zone around the nest (physically demarcated) in which no works will occur until the nest has naturally become inactive (e.g. chicks fledged) as determined by the EnvCoW. The extent of the exclusion zone will be dependent on the species.	Temporary adverse effect at Site level
Amphibians and Reptiles	Reduced population of SBL species through loss of habitat and killing/injury of individuals.	Site clearance and construction	Amphibians and reptiles could use habitats on Site, as well as those in the surrounding landscape. Both species are considered unlikely to be affected by construction activities due to embedded mitigation measures such as site walkovers ahead of site work, presence of the EnvCoW and implementation of a CEMP. As such neither species group is predicted to be adversely affected.	No effect

Ecological Feature	Potential Effect	Development Activity	Details of Ecological Effect and Embedded Mitigation Measures	Appraisal
Brown hare and Mountain hare	Reduced population of an SBL species through loss of habitat and killing/injury of individuals.	Site clearance and construction	<u>Downleads (including ancillary infrastructure) and Proposed UGC</u> Brown hare and mountain hare could use habitats on Site, as well as those in the surrounding landscape. Both species are considered unlikely to be impacted by construction activities due to embedded mitigation measures such as site walkovers ahead of site work, presence of the EnvCoW and implementation of a CEMP. As such neither species is predicted to be adversely affected.	No effect

4.8 Biodiversity Net Gain

4.8.1 The Proposed Development in its entirety (i.e., including Downleads (including ancillary infrastructure) and Proposed UGC) would result in the permanent loss of approximately 0.16 ha and temporary loss of 0.89 ha of habitat. A full breakdown of the anticipated habitat losses per element of the Proposed Development (i.e. by the consenting regime they fall under) is set out within the Project BNG Report.

4.8.2 A Biodiversity Net Gain (BNG) assessment for the Proposed Development has been undertaken to determine the actions necessary to achieve a BNG.

4.9 Recommendations and Mitigation

4.9.1 Based on the information provided in this appraisal a number of additional mitigation measures have been identified to ensure the Proposed Development does not result in any significant effects on Ecological Features (Table 4-6).

Table 4-6: Appraisal on Important Ecological Features.

Reference	Title	Description
E1	Artificial Lighting	Artificial lighting will not directly illuminate watercourses, natural linear features and adjacent habitat within the Site and surrounding area in line with guidance[36], so as to avoid discouraging otters and bats and other foraging wildlife from using the Site.
E2	Pre-Construction Nesting Bird Checks	Pre-construction survey to identify nesting birds (within 48 hours prior to construction works due to occur within the nesting bird season (recognised as March to August, inclusive). To be undertaken by a Suitably Qualified Ecologist (SQE).

4.9.2 Overall, the impacts of the Proposed Development can be mitigated to ensure there are no significant effects on the surrounding habitats and species. Works will be overseen by an EnvCoW to ensure any updates to the ecological baseline are accounted for and fully mitigated.

[36] Institution of Lighting Professionals (ILP) (2018). Bats and artificial lighting in the UK. Bats and the Built Environment series, Guidance Note 08/18

5. CULTURAL HERITAGE

5.1 Introduction

5.1.1 This chapter presents the assessment of the potential effects on the Cultural Heritage topic resulting from the Proposed Development. This chapter (and its associated Figures and Appendices) is not intended to be read as a standalone assessment and reference should be made to the introductory chapters of the EA.

5.1.2 Cultural heritage comprises a diverse range of elements that are referred to throughout the chapter as heritage assets. Heritage assets are features created or that have undergone modification from human agency. This includes a wide range of visible and buried archaeological sites and monuments, as well as other historic features or places. Heritage assets comprise World Heritage Sites, Scheduled Monuments, Listed Buildings, Gardens and Designed Landscapes (GDL), Battlefields, Conservation Areas, Marine Protected Areas, other underwater sites, buried archaeological remains, other historic buildings, and earthworks.

5.1.3 Additional information which supports this chapter is presented in the following figures and technical appendices:

- Appendix 5.1 – Cultural Heritage Gazetteer
- Figure 5.1 – Cultural Heritage Assets

5.2 Information Sources

5.2.1 The assessment has been informed by a review of all available archaeological records, historical documentary evidence, cartographic evidence and photographic material. This has involved a consultation of the following sources:

- GIS data on World Heritage Sites, Scheduled Monuments and Listed Buildings obtained from Historic Environment Scotland (HES);
- GIS data on non-designated heritage assets obtained from the Scottish National Record of the Historic Environment (SNRHE) which is maintained by HES;
- information from The Highland Council Historic Environment Record (HER);
- readily accessible primary and secondary historical sources were consulted for information relating to the area's historical past, including past land use;
- Pre-Ordnance Survey maps of the Proposed Development held by the National Library of Scotland (NLS). The relevant maps range in date from the seventeenth to the nineteenth centuries;
- first and subsequent editions of the Ordnance Survey Maps of the area of interest, held by the NLS;
- LIDAR datasets of the general area through the Scottish Remote Sensing Portal maintained by the Scottish Government; and
- the solid and drift geology maps for the Proposed Development, recorded by the British Geological Survey (BGS) / Geological Survey of Great Britain maps.

5.2.2 Information on World Heritage Sites, Scheduled Monuments, and Listed Buildings were downloaded from HES on 4th April 2023, and the SNRHE and The Highland Council online portal HER were checked on 4th April 2023. Any additions or alterations to these records made after that date have not been included in this assessment.

5.3 Limitations and Assumptions

5.3.1 The data gathering exercise on which this assessment has been based was extensive but not exhaustive, thus there remains the possibility that there may be heritage assets of archaeological or historical significance that have not been identified. It has been assumed that the information obtained from the data sources listed in Section 6.2 is accurate and up to date at the time of assessment.

5.3.2 The assessment is based on the Proposed Development as presented at the time of compiling this report. Any comments received on this document from HES or The Highland Council Historic Environment Team (HCHET) may inform on any future assessment or investigations that may need undertaking.

5.4 Methodology

Study Area

5.4.1 To assess the effect of the Proposed Development on Cultural Heritage an Inner Study Area of 500 m extending out from the LoD was applied to identify all known and potential heritage assets. An Outer Study Area of 1 km was applied to identify all designated heritage assets whose settings may be impacted by the Proposed Development.

5.4.2 A study of the surrounding landscape was necessary to establish the local archaeological and historical context, to provide a broader understanding of the historical development of the Proposed Development and the potential for unidentified archaeological remains within those areas.

Site Visit

5.4.3 The Proposed Development area was visited during 26-27 September 2022 by a qualified archaeologist and executed in accordance with CIfA Standards and Guidance for Archaeological Field Evaluation[37]. The walkover survey of the Proposed Development was carried out with the following aims:

- To assess the baseline condition of the known heritage assets identified through the desk-based assessment;
- To identify any further features of cultural heritage interest not detected through the desk-based assessment that could be affected by construction of the Proposed Development; and
- To identify areas with the potential to contain currently unrecorded buried archaeological remains.

5.4.4 All areas of land within the Inner Study Area were surveyed in full and all heritage assets that were identified through the desk-based assessment were visited.

Terminology

5.4.5 The technical terminology applied to the assessment process is based on that contained within NPF4. For the purpose of this appraisal, historic environment assets and places are referred to as heritage assets, which includes designated and non-designated heritage assets.

Legislation, planning policy and guidance

5.4.6 The following national legislation forms the background against which the assessment has been made:

- The Historic Environment Scotland Act 2014[38]; and
- The Ancient Monuments and Archaeological Areas Act 1979[39];

5.4.7 The following national planning policies have been considered as part of this assessment:

- National Planning Framework for Scotland 4 (NPF4)[40];
- Historic Environment Policy for Scotland (HEPS)[41]; and
- Planning Advice Note (PAN) 2/2011: Planning and Archaeology[42].

[37] Chartered Institute for Archaeologists (2021). Standards and Guidance for Archaeological Field Evaluation.
[38] Scottish Government (2014). The Historic Environment Scotland Act 2014.
[39] UK Government (1979). The Ancient Monuments and Archaeological Areas Act 1979.
[40] Scottish Government (2023). Scotland's Fourth National Planning Framework
[41] HES (2019). Historic Environment Policy for Scotland.
[42] Scottish Government (2011). Planning Advice Note (PAN) 2/2011: Planning and Archaeology.

5.4.8 The following local planning policy has been considered as part of the assessment:

- Highland Wide Local Development Plan[43].
- Caithness and Sutherland Local Development Plan 2018[44]

5.4.9 The following guidance has been applied to the assessment process:

- Designation Policy and Selection Guidance[45];
- Managing Change in the Historic Environment Setting[46]; and
- Standards for Archaeological Work[47].

5.4.10 All elements of the assessment have been undertaken in accordance with the following Chartered Institute for Archaeologists (CIfA) guidance:

- Standards and Guidance for Historic Environment Desk Based Assessment[48]; and
- Standards and Guidance for commissioning work on, or providing consultancy advice on, archaeology and the historic environment[49].

Determining Magnitude of Change and Sensitivity of Receptors

5.4.11 Cultural significance lies in the value of a heritage asset to this and future generations because of its heritage interest; this may be artistic, archaeological, architectural, historic, traditional, aesthetic, scientific or social. Known and potential heritage assets within the study areas have been identified from the sources listed within Section 5.2.1.

5.4.12 The determination of the cultural significance or value of heritage assets is based on statutory designation and/or professional judgement against the characteristics and criteria expressed in HES Designation Policy and Selection Guidance[50] and the HEPS[51].

5.4.13 A degree of professional judgement is necessary, guided by acknowledged standards, designations and priorities when evaluating the importance or significance (and hence the 'value') of heritage assets. It is also important to understand that buried archaeological remains may not be well understood at the time of initial assessment, and therefore can be of uncertain value. The determination of setting has been undertaken in accordance with guidance provided within the Managing Change Guidance[52]. A three-stage process was undertaken to assess the impact of the Proposed Development options on the setting of heritage assets:

- Stage 1: Designated and non-designated heritage assets that might be affected by the Proposed Development were identified. The potential for impacts on the designated heritage assets in the wider landscape due to the potential inter-visibility with the Proposed Development were also determined through the desk-based review and a site walkover survey.
- Stage 2: The setting of all baseline heritage assets was defined by establishing how the surroundings contribute to the ways in which the asset is understood, appreciated, and experienced.
- Stage 3: The way in which the Proposed Development would impact upon setting was then assessed for all baseline heritage assets.

[43] Highland Council (2012). Highland Wide Local Development Plan.
[44] Highland Council (2018). Caithness and Sutherland Local Development Plan
[45] HES (2019). Designation Policy and Selection Guidance.
[46] HES (2022). Managing Change in the Historic Environment Setting – Historic Environment Scotland's guidance note series.
[47] Highland Council (2012). Standards for Archaeological Work.
[48] CIfA (2022). Standards and Guidance for Historic Environment Desk Based Assessment.
[49] CIfA (2022). Standards and Guidance for commissioning work on, or providing consultancy advice on, archaeology and the historic environment.
[50] HES (2019). Designation Policy and Selection Guidance.
[51] HES (2019). Historic Environment Policy for Scotland.
[52] HES (2022). Managing Change in the Historic Environment Setting – Historic Environment Scotland's guidance note series.

5.4.14 Table 5-1 identifies factors which are appropriate to consider during the assessment of heritage assets, with the adoption of five ratings for value: very high, high, medium, low, and negligible.

Table 5-1 Criteria for assessing the value of heritage assets

Value	Example
Very High	World Heritage Sites (including nominated sites) Assets of acknowledged international importance
High	Scheduled Monuments (including proposed sites) Listed Buildings (Category A and B) Registered Battlefields Marine Protected Areas Gardens and Designed Landscapes Conservation areas containing nationally important buildings Non-designated heritage assets of scheduled quality and importance Assets of national importance.
Medium	Listed Buildings (Category C) Conservation areas containing buildings that contribute significantly to its historic character Heritage assets of regional importance
Low	Heritage assets of local importance Heritage assets compromised by poor preservation and/or poor survival of contextual association Buildings of modest quality in their fabric or historical association
Negligible	Heritage assets with very little or no surviving archaeological interest Artefact find spots (where the artefacts are no longer *in situ* and where their provenance is uncertain) Poorly preserved examples of particular types of minor historic landscape features (e.g., quarries and gravel pits, dilapidated sheepfolds, etc)

5.4.15 The criteria for assessing the magnitude of impact from the Proposed Development on heritage assets is shown in Table 5-2.

Table 5-2 Criteria for assessing the magnitude of impact on heritage assets.

	Adverse	Beneficial
Major	Changes to most or all key archaeological materials or key historic building elements such that the resource is totally altered; and Comprehensive changes to setting such as extreme visual effects, gross change of noise or change to sound quality, or fundamental changes to use or access.	Preservation of a heritage asset *in situ* where it would otherwise be completely or almost lost; and Changes that appreciably enhance the cultural significance of a heritage asset and how it is understood, appreciated and experienced.
Moderate	Changes to many key archaeological materials or key historic building elements, such that the resource is clearly modified; and Considerable changes to setting that affect the character of the asset such as visual change to many key aspects or views, noticeable differences in noise or sound quality, or considerable changes to use or access.	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; and Changes that improve the way in which the heritage asset is understood, appreciated and experienced.
Minor	Changes to key archaeological materials or key historic building elements, such that the asset is slightly altered; and Slight changes to setting such as slight visual changes to few key aspects or views, limited	Changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed; and

	Adverse	Beneficial
	changes to noise levels or sound quality, or slight changes to use or access.	Changes that result in a slight improvement in the way a heritage asset is understood, appreciated and experienced.
Negligible	Very minor changes to archaeological materials, historic buildings elements, or setting; and Very minor changes to setting such as virtually unchanged visual effects, very slight changes in noise levels or sound quality, or very slight changes to use or access.	Very minor changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed; and Very minor changes that result in a slight improvement in the way a heritage asset is understood, appreciated and experienced.
No Change	Changes to fabric or setting that leave significance unchanged.	

5.4.16 The overall impact on an attribute is a function of the importance of the attribute and the scale of change is shown in Table 5-3 below. For the purpose of this assessment, impacts of Moderate or greater are considered potentially material to the planning process and described as significant. Effects found to be 'minor' or less are considered not potentially material and are therefore described as not significant. The word significant is used here in its ordinary meaning of "worthy of consideration".

Table 5-3 Overall impact

		Magnitude of Impact				
Value		Major	Moderate	Minor	Negligible	No Change
	Very high	Very Large	Large or Very Large	Moderate or Large	Slight	Neutral
	High	Large or Very Large	Moderate or Large	Moderate or Slight	Slight	Neutral
	Medium	Moderate or Large	Moderate	Slight	Neutral or Slight	Neutral
	Low	Slight or Moderate	Slight	Neutral or Slight	Neutral or Slight	Neutral
	Negligible	Slight	Neutral or Slight	Neutral or Slight	Neutral	Neutral

5.5 Baseline Environment

Introduction

5.5.1 The location of the heritage assets which lie within the study areas surrounding the Proposed Development are tabled in Appendix 5.1 – Cultural Heritage Gazetteer and indicated in Figure 5.1 – Cultural Heritage Assets.

Site Geology

5.5.2 The bedrock geology of the Proposed Development area is the Altnaharra Psammite Formation composed of Psammite and micaceous psammite. The metamorphic bedrock formed between 1000 and 541 million years ago between the Tonian and Ediacaran periods. The superficial geology of the Proposed Development area is peat and the surrounding area is alluvium, till and morainic deposits, composed of diamicton, sand and gravel; these sedimentary superficial deposits were formed between 2.5 million and 11.8 thousand years ago during the Quaternary period.[53]

[53] British Geological Survey (Available at: https://www.bgs.ac.uk/)

Previous Archaeological Investigations

5.5.3 There have been a number of previous archaeological investigations conducted around the Proposed Development, documenting archaeological finds in the form of walkover surveys and watching briefs. The investigations are as follows:

- HER ID EHG650 – Lairg Water Mains Renewal – An archaeological assessment commissioned in February 2002 was undertaken in advance of the proposed water mains renewals around Lairg. The assessment comprised of a desk-based study and a walkover survey. Several archaeological sites were recorded along the water mains including hut circles, field systems of Bronze or Iron Age date and remains of crofting settlements of the nineteenth century.[54]
- HER ID EHG1198 - Rapid Survey for Anemometer Mast - A rapid archaeological survey was carried out in 2004 at the site of a proposed wind-speed measuring mast. The proposed mast site and access track were walked and examined for archaeological evidence. There were extensive, though fragmentary, signs of peat cutting but otherwise no significant features or finds were noted.[55]
- Highland Archaeology Services ID HAS 060704A – In November 2006 an assessment of the impacts on archaeology and cultural heritage of a proposed wind-farm development at Lairg was carried out. Following a desk-based assessment, the proposed turbine sites and access track were examined for archaeological evidence. Two previously unrecorded features were located: a cairn (HA03), and an extensive group of field clearance cairns (HA04). All these, as well as a settlement site of round houses and cairns, previously partly recorded, may date to the Bronze and Iron Ages (c. 4,200 to 1,500 years ago).[56]
- Highland Archaeology Services ID HAS110206 - A rapid walk-over survey was carried out to inform proposed changes to the siting of a control building at Lairg Wind farm site. No heritage assets were noted.[57]
- HER ID EHG5035 - Lairg Wind Farm Watching Brief - A watching brief was carried out during site stripping and construction work at Lairg Wind Farm in September 2012 to identify and record any archaeological features affected by the work. Despite careful routing of the access road, a group of field clearance cairns could not be entirely avoided. The cairns affected were removed under close archaeological supervision. The cairns were shallow and made up of mixed stones and peat, with no buried soil levels, burials or other associated features (HA05).[58]
- HER ID EHG5690 – Desk Based Assessment and walkover survey - Proposed Lairg II Wind Farm development - A desk-based assessment and walkover survey were undertaken by AOC Archaeology Group in 2018 to inform an Environmental Impact Assessment in advance of the proposed development of a second wind farm at Lairg (referred to as Lairg II). Previously recorded and unrecorded archaeological remains were observed, and notes taken about their location, extent condition and significance. This information informed the assessment of potential direct impacts. The walkover survey recorded the remains of a head dyke as well as four buildings and four clearance cairns that lie outside the study areas and one enclosure (Canmore ID 5509) (HA06) located within the Outer Study Area. As such the magnitude of impact on unknown heritage assets has the potential to be High. Any resulting level of effect would be dependent upon the importance of the assets encountered.[59]

[54] Hooper, J (2002). Highland water mains renewal, Lairg regional supply, Earth Tech Engineering Limited, on behalf of the North of Scotland Water Authority (NoSWA)
[55] Highland Archaeology Services Ltd. (2004). Rapid Survey for Anemometer Mast, Lairg Sutherland, Report No. HAS0493
[56] Highland Archaeology Services Ltd. (2006). Lairg Wind Farm Environmental Statement
[57] Highland Archaeology Services Ltd. (2011). Lairg Wind Farm Walkover Survey
[58] Highland Archaeology Services Ltd. (2012). Lairg Wind Farm Watching Brief
[59] AOC Archaeology Group (2019). Lairg II Wind Farm Environmental Impact Assessment Report (EIAR) (Cultural Heritage)

Baseline Overview

5.5.4 There are no World Heritage Sites, Scheduled Monuments, Listed Buildings, Gardens and Designed Landscapes, Registered Battlefields, and Conservation Areas within the study areas surrounding the Proposed Development.

5.5.5 There are 11 non-designated heritage assets identified in the outer Study Area. Of these, five were identified during the UGC walkover survey in 2022. The remaining six are assets recorded in The Highland Council HER.

Historic Background

5.5.6 The heritage assets within the study areas are described in the context of a timeline of archaeological periods from prehistoric through to modern. The location of the recorded heritage assets are shown on Figure 5.1 – Cultural Heritage Assets.

Prehistoric (12,000 BCE – 400 CE)

5.5.7 The landscape within the study areas contains rich and diverse archaeological remains dating from the prehistoric period, found principally within pastureland and in heather moorland areas and on the higher slopes overlooking Auchinduich.

5.5.8 The earliest prehistoric inhabitants of Scotland leave ephemeral traces of their lives within the archaeological record. The people of the Palaeolithic and Mesolithic periods were nomadic hunter gatherers and left little evidence for their existence, with most heritage assets encountered related to flint scatters. Later prehistoric inhabitants of the Neolithic, Bronze Age, and Iron Age leave more visible traces of their existence within the archaeological record, ranging from stone monuments and burial cairns to hill forts and settlements in the form of hut circle clusters. There are two heritage assets which can be dated to the later prehistoric period within the Inner Study Area. First is a settlement of five stone-walled huts (Canmore ID 5103) (HA01) located within an associated field system. The associated field clearance has been annotated 'Tumuli' on the 1873 OS map.

5.5.9 About 150 m north-east of the huts is a sub-circular peat-covered prehistoric burnt mound (Canmore ID 5091) (HA02), measuring approximately 12 m in diameter and 1 m in height. The mound of fire-cracked stone is assumed to be a location where heated stones were used to boil water for cooking purposes during the Bronze age. While the exact date of this mound is unknown, it is postulated that these demarcated human settlement in the prehistoric period as early as the Bronze Age.

5.5.10 Several heritage assets like round cairns (HA03, HA04, HA05) and a possible clearance cairn (HA07) lie in the Inner Study Area and may have a prehistoric date, potentially related to a larger settlement just outside the Inner Study Area to the north-west. The closest of the round cairns (Canmore ID 283726) (HA04) is located 93 m south of the Proposed Development, and the possible clearance cairn (HA07) that was identified during walkover survey is located 210 m south of the Proposed Development.

Plate 1 - Photo of the possible hut circle (HA07) visible as a shallow earthwork, looking north-east.

5.5.11 Closer to the Proposed Development is another possible cairn (HA10), a possible roundhouse structure (HA09), and a rubble feature (HA11) that may belong to the prehistoric period.

5.5.12 The Proposed Development lies within an extensive prehistoric landscape and prehistoric dwellings and agricultural activity have been identified within the study areas. Therefore, it is postulated that there is a High potential for prehistoric remains to survive within the Proposed Development boundary.

Medieval (CE 400 – 1560)

5.5.13 The study areas and the surrounding areas of Lairg show evidence of prehistoric settlements and agriculture, which may have continued into the medieval period. The Pictish tribes occupied most of the Sutherland, from the end of Roman authority around 400 CE and the rise of the kingdom of Alba in 900 CE, with their kingdoms stretching from the River Forth to Shetland.

5.5.14 After defeating the forces of Dál Riata, and invading Alt Clut and Northumbria, the Picts made the first known peace treaties with the English while dominating Dál Riata until 811. The Vikings arrived in the late 8th century and Scandinavian colonies were established. In the 9th century, the House of Alpin combined the lands of the Scots and Picts to form a single Kingdom of Alba which constituted the basis of the Kingdom of Scotland. From the twelfth century, the largely pastoral economy, saw the first burghs being created. After the Black Death in 1350, serfdom disappeared in the fourteenth century and there was a growth seen in social identity.

5.5.15 The site of the Battle of Gruids is located c.4km north-west of the Proposed Development in which Alexander Master of Sutherland defeated John MacKay of Strathnaver and is documented as taking place between 1519 and 1522.

5.5.16 It is possible that the medieval land use of the study areas remained agricultural. The post-medieval field systems, dwelling places and agricultural remains in the vicinity could have originated in the medieval period. However, the Proposed Development would probably have been located in a sparsely populated rural landscape throughout this period. Hence, it is assumed that there is a Low potential for medieval remains to survive within the Proposed Development boundary.

Post-Medieval (CE 1560 – 1900)

5.5.17 Though schematic, early historic maps provide a good insight to settlement locations. Pont's 1614 map annotates Loch Shin to the north-west of the study areas and River Shin situated to the west. Sparce rural settlement are shown at the southern end of Loch Shin, but no settlements are noted within the Proposed Development boundary.[60]

5.5.18 Roy's military map of the Highlands (1747-52)[61] shows the study areas as occupying uninhabited uplands. The area to the north of the Outer Study Area has been labelled as Mulnklerin and Tarbat (Torroble) showing scattered settlement. One such settlement could be in the Outer Study Area, south-west of the Proposed Development, although the location is indicative, the presence of the settlement suggests that agricultural and pastoral activity was present in the area.[61] This is evidenced by a possible sheiling hut (HA08) identified during the UGC 2022 walkover survey. A sheiling hut is representative of a small dwelling usually in an upland area, denoting a seasonal mountain pasture, and may be medieval or later in date.

5.5.19 There are only a few late 18th and early 19th century maps that cover the study areas but it seems that the area around the Proposed Development was sparsely populated, likely by rural farmsteads, during this period.

5.5.20 In the mid-18th century, Sutherland was affected by the Highland Clearances, making way for large sheep farms. The Sutherland Estate of the Countess of Sutherland amounted to approximately 1.5 million acres who realised the financial benefit of pasture lands and hundreds of people renting these lands were forcibly displaced. As per the Old Statistical Account (OSA) for Lairg the population of the parish is recorded to have risen between 1736 and 1794, from 750 to approximately 1350. Possibly, the increase in Lairg's population was a result of clearances undertaken further to the north.[62]

5.5.21 Burnett's 1853 map shows the study areas in an upland area and marks Ruigh Na Cup deserted township as comprising of a longhouse, a second building and kailyard (or small walled garden). The walkover survey by AOC in December 2018, recorded the remains an enclosure (Canmore ID 5509) (HA06).

5.5.22 The township (Canmore ID 5509) (HA06) was also labelled 915 m south-east of the Proposed Development comprising two unroofed buildings, three enclosures and a ring-dyke depicted on the 1st edition OS map.

5.5.23 Given the proximity to the Proposed Development, it is likely this area represents an area of Highland clearance which had formerly been utilised by crofting families and was later used for sheep farming. Hence, the potential for post-medieval pre-clearance settlement remains and agricultural remains to survive is High.

Modern (1900 CE – Present)

5.5.24 By the end of the 19th century, Lairg saw the arrival of railways. This brought the opportunity to reduce agricultural dependence on sheep and diversify. Historic map regression suggests that the Proposed Development has undergone little to no change since 1879. To the north of the study areas, the villages of Torroble and Rhianbreck seem to have been developed in the 20th century, to the south of the town of Lairg.

5.5.25 In 1919, the ownership of Lairg came to Sir William Edgar Horne who financed a wide range of development, including a diesel generator in 1924 that made Lairg one of the first villages in the Highlands to gain an

[60] AOC Archaeology (2019). Lairg II Wind Farm Environmental Impact Assessment Report – Volume I, Chapter 7: Archaeology & Cultural Heritage
[61] National Library of Scotland (2023). Roy's Military Map of 1742-52
[62] AOC Archaeology (2019). Lairg II Wind Farm Environmental Impact Assessment Report – Volume I, Chapter 7: Archaeology & Cultural Heritage

electricity supply. Later in the 1950s, the construction of the hydro-electric dam helped raise the level of Loch Shin by over 30 feet.

5.5.26 The NCAP aerial photographs from 1946 to 1988, show very little change in the study areas. The Lairg Wind Farm was constructed between 2010 and 2012 and became operational in September 2012.

5.5.27 There are no modern assets within the study areas and it is likely that land use was largely unchanged from the post-medieval period. There is a Low potential for modern remains to survive within the Proposed Development.

Future Baseline

5.5.28 The existing cultural heritage baseline is predicted to be relatively stable. No major changes are envisaged which would mean that the future baseline could be substantively different to the present-day baseline described above. Further cultural heritage assets are likely to be discovered, however the increase in heritage assets will not change the importance or sensitivity of these sites as receptors.

5.6 Appraisal

Construction (Downleads, including ancillary infrastructure; and the Proposed UGC)

5.6.1 Construction activities which require the breaking of ground, including the establishment of site compounds, topsoil stripping/bulk excavation and the excavation of footings, and temporary access tracks have the potential to result in direct physical impacts on any known or potential heritage assets within the Proposed Development boundary.

5.6.2 The following works are anticipated to involve ground breaking and/or disturbance and/or may cause direct impacts to known or potential heritage assets:

- during construction of parts of the Proposed Development;
- while creating and using temporary access routes;
- while creating and using construction compounds and temporary spoil heaps.

5.6.3 A total of eight heritage assets have been identified within Inner Study Area of which one (HA10) is partly located within temporary spoil areas associated with the Proposed UGC. It is assessed that there is potential for construction works to result in direct impacts on this heritage asset that would be Moderate adverse. As the heritage asset is of medium value as it is of potential prehistoric in date and relating to funerary activity, the resulting overall impact would be Moderate Adverse.

5.6.4 The historic background highlighted that there is a High potential for prehistoric or post-medieval sub-surface archaeological remains to survive within the Proposed Development boundary. Any heritage assets discovered would most likely be of low value given their local importance and poor preservation. Proposed construction works that directly impact any sub-surface archaeological remains would be Major adverse. Therefore, the resulting overall impact would be Moderate Adverse.

5.6.5 Mitigation to reduce or offset these impacts is provided in Section 5.7. After mitigation the overall impact on the heritage assets would be Slight Adverse after preservation by record or Neutral after demarcation and avoidance, and therefore not significant.

Operation (Downleads and associated ancillary infrastructure only)

5.6.6 There would be no physical impacts during operation of the Proposed Development, as the heritage assets would not be affected by the Proposed Development after the construction phase. The visual impacts of the Proposed Development would be nominal as similar above ground structures are already present adjacent to the site. The impact caused by the introduction of some above ground infrastructure associated with the

downleads and cable sealing end compound. i.e., three 132kV cable sealing end and surge arrestor combined structures, as well as three 132kV post insulator structures, would be Negligible, as these will not majorly alter the existing the character or setting of the heritage assets within the study areas. Therefore, the overall effect would be no higher than Neutral.

5.6.7 The Proposed UGC, by its nature, will not be visible following reinstatement and establishment of the landcover. Therefore, no permanent effects from the UGC are anticipated during the Operational Phase.

5.7 Recommendations and Mitigation

Embedded Mitigation

5.7.1 Section 2.6 of this EA sets out general embedded mitigation measures including construction good practice. The location of the development was subject to a route selection process which was undertaken in 2022. The chosen route has specifically considered the potential impacts on known heritage assets from desk-based information.

Additional Mitigation

5.7.2 The default position for the mitigation of potential direct impacts on heritage assets is the avoidance of the impacts through design changes to allow for preservation *in situ*. Where the assessment has identified the potential for direct impacts on heritage assets, demarcation and avoidance measures will be applied to mitigate these potential impacts.

5.7.3 Where heritage assets cannot be avoided, and where construction works are taking place in areas of high archaeological potential, archaeological works are recommended in advance of or during the construction period.

5.7.4 Details of the recommended mitigation and the heritage assets affected are provided in Table 5-4.

Table 5-4: Proposed Mitigation

Reference	Title	Description
CH1	Demarcation and avoidance	Heritage assets with visible remains within the construction areas of the Proposed Development and the limit of deviation will be demarcated prior to commencement of construction of the proposed temporary stone access track to ensure visibility of the asset location to all members of the construction crew, and avoidance during this phase. Demarcation would be achieved using high visibility marker posts set 5 m from the edge of the heritage assets, with the markers retained throughout the construction phase. Demarcation of the assets would be the responsibility of the Principal Contractor, with identification of the assets made on the ground by a qualified archaeologist using the baseline information provided in the Gazetteer (Appendix 5.1).

Reference	Title	Description
		The heritage assets that fall within the construction area and the limit of deviation, to be demarcated are: • Possible sheiling hut (HA08) • Possible cairn (HA10) • Rubble feature (HA11)
CH2	Archaeological monitoring	Given the high potential for encountering sub-surface archaeological remains, it is recommended that an archaeological watching brief be implemented for all ground-breaking works during construction. This will allow for a permanent record of any hitherto unknown archaeological remains that may exist within the Proposed Development.
CH3	Preservation by record	Where preservation *in situ* of the cairn (HA10) and any archaeological remains discovered during the watching brief, is not possible, preservation by record will be undertaken in advance of construction to mitigate the impact upon the heritage assets. This would take the form of an archaeological excavation of the archaeological remains.

5.7.6 Prior to any mitigation, a Written Scheme of Investigation would be drafted in consultation with HCHET. This document would detail the precise methodology of any archaeological work to be undertaken and any subsequent phases of assessment.

5.7.7 Any archaeological works required would be undertaken in line with the following guidance and principles set out by CIfA:

- Standards and guidance for archaeological excavation.[63]
- Standards and guidance for archaeological field evaluation.[64]
- Standards and guidance for archaeological watching brief.[65]
- Standards and guidance for the creation, compilation, transfer and deposition of archaeological archives.[66]

[63] Chartered Institute for Archaeologists (2014). Standards and guidance for archaeological excavation

[64] Chartered Institute for Archaeologists (2014). Standards and guidance for archaeological field evaluation

[65] Chartered Institute for Archaeologists (2014). Standards and guidance for an archaeological watching brief

[66] Chartered Institute for Archaeologists (2014). Standards and guidance for creation, compilation, transfer and deposition of archaeological archives

6. HYDROLOGY, HYDROGEOLOGY, GEOLOGY AND PEAT

6.1 Introduction

6.1.1 This chapter assesses the likelihood of environmental effects to hydrology, hydrogeology, geology and peat resulting from the Proposed Development. It should be read alongside Appendix 6.1: Outline Soil and Peat Management Plan.

6.1.2 This appraisal is carried out in accordance with the legislation, policy and guidance set out in Appendix 6.2: Legislation, Policy & Guidance.

6.2 Methodology

6.2.1 The general methodology used to appraise the effect of the Proposed Development on the hydrology, hydrogeology, geology and the surrounding area as follows:

- desktop study to obtain baseline and historical data;
- consultation with The Highland Council, Scottish Water and SEPA to identify water abstractions and Private Water Supplies (PWS) and public water supplies;
- identification of the potential effects of the Proposed Development; and
- identification of options for the mitigation of potential effects taking account of SSEN's General Environmental Management Plans (GEMPs).

6.2.2 UKHab surveys within 250m of the Proposed Development were undertaken in October 2022; data from these surveys has been used to identify any potential Groundwater Dependent Terrestrial Ecosystems (GWDTE).

Information Sources

6.2.3 The following sources of information have been reviewed during the desktop research to obtain baseline and historical data:

- SEPA's Surface Water and Groundwater Current Condition (2020)[67];
- NatureScot Sitelink[68];
- British Geological Survey (BGS) Maps for 1:50k Bedrock Geology and 1:50k Superficial Geology[69]
- James Hutton Institute National Soils Map[70];
- NatureScot Carbon and Peatland Map[71];
- BGS 1:625k Hydrogeological Map of Scotland[72]; and
- SEPA Flood Maps[73].

[67] SEPA (2020) River Basin Management Plan (RBMP) 2021-2017 Maps - Current Condition Waterbody WFD Classifications [online]. Available at: https://informatics.sepa.org.uk/RBMP3/ [Accessed: May 2023]
[68] NatureScot (2021) SiteLink Map [online]. Available at: https://sitelink.nature.scot/map [Accessed: May 2023]
[69] BGS Geoindex (2021) [online]. Available at: http://mapapps2.bgs.ac.uk/geoindex/home.html [Accessed: May 2023]
[70] James Hutton Institute (2021) National Soil Map of Scotland [online]. Available at: http://map.environment.gov.scot/Soil_maps/?layer=1 [Accessed: May 2023]
[71] SNH (2016) Carbon and Peatland Map [online]. Available at: https://map.environment.gov.scot/Soil_maps/?layer=10 [Accessed: May 2023]
[72] Hydrogeology (2015) BGS 1:625k Hydrogeological map of the UK [online]. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?layer=BGSHydroMap&_ga=2.37485792.1579471652.1665567417-503324093.1665567417 [Accessed: May 2023]
[73] SEPA (2022) Flood Maps [online]. Available: https://scottishepa.maps.arcgis.com/apps/webappviewer/index.html?id=b3cfd390efa44e3b8a72a07cf5767663&showLayers=FloodMapsBasic_5265;FloodMapsBasic_5265_0;FloodMapsBasic_5265_1;FloodMapsBasic_5265_2;FloodMapsBasic_5265_3;FloodMapsBasic_5265_4;FloodMapsBasic_5265_5;FloodMapsBasic_5265_6;FloodMapsBasic_5265_7;FloodMapsBasic_5265_8;FloodMapsBasic_5265_9;FloodMapsBasic_5265_10;FloodMapsBasic_5265_11 [Accessed: May 2023]

Limitations and Assumptions

6.2.4 It is assumed that information received from third parties is complete and up to date.

6.2.5 It is assumed that the design, construction and completed stages of the Proposed Development will satisfy minimum environmental standards, consistent with contemporary legislation, practice, and knowledge.

6.2.6 LoD of up to 15m around the proposed development have been included to allow for micrositing of the UGC and temporary access track at the detailed design stage. Should micrositing take place within the LoD (for example as a result of additional ground investigation information) then the Contractor will be required to take account of the updated alignment as part of the final Soil and Peat Management Plan (for which an outline which sets the parameters for the plan has been set out in Appendix 6.1).

Extent of the Study Area

6.2.7 The Study Area is based upon a 1km radius of the LoD, for hydrologically relevant designations and water supply related surface water receptors (following watercourse pathways). For chemical and sedimentation impacts, it is considered that at distances more than 1km, the Proposed Development is unlikely to have a hydrological impact, as attenuation and dilution of substances is likely to occur. Up to 5km downstream will be considered for any identified sensitive surface water receptors, such as water supplies or hydrologically relevant designated sites.

Consultation Undertaken to Date

6.2.8 Table 6-1 provides a summary of the consultation activities undertaken in support of the preparation of this chapter.

Table 6-1 Consultation responses of relevance to Hydrology, Hydrogeology, Geology and Peat

Organisation	Type of Consultation	Response	How response has been considered
The Highland Council	Email request for PWS data, January 2023.	PWS data for The Highland Council received in January 2023.	PWS data has been considered within the EA report.
Scottish Water	Email request for abstraction data, January 2023.	Scottish Water provided data for all their abstractions in January 2023.	Abstraction data has been considered within the EA report.
SEPA	Email sent to SEPA in April 2023 requesting any registered abstractions data.	SEPA provided registered abstractions in May 2023.	Abstraction data has been considered within the EA report.

6.3 Baseline Environment

Surface Water Hydrology

6.3.1 The Study Area is located within the River Shin catchment and River Fleet catchment, however, there are no SEPA Water Framework Directive (WFD)[67] waterbodies within the Study Area.

6.3.2 A review of OS 1:50,000 mapping indicates that Allt na Fearna Beag River and Torroboll Burn are located approximately 570 m and 90 m downstream of the Proposed Development, respectively, within the Study Area but are not classified by SEPA.

Designated Sites

6.3.3 According to the NatureScot Sitelink[68], there are no international or nationally important designated sites relevant to hydrology, hydrogeology, geology and peat within the Study Area.

Geology

Bedrock Geology

6.3.4 BGS Bedrock Geology 1:50,000 scale mapping[69] indicates the majority of the Study Area is underlain by metamorphic Altnaharra Psammite Formation (psammite and micaceous psammite). Throughout the Study Area, there are areas of the following bedrock formations:

- Igneous bedrock comprised of granite from the Scottish Highland Siluro-devonian Calc-alkaline Minor Intrusion Suite;
- Metamorphic Neoproterozoic Basic Minor Intrusion Suite (Amphibolite);
- Metamorphic Altnaharra Psammite Formation (Semipelite); and
- Igneous Ach'uaine Cluster (Meladiorite, hornblende).

Superficial Geology

6.3.5 BGS Superficial Deposits 1:50,000 scale mapping[69] shows no superficial deposits across the majority of the Study Area. A number of small areas of peat deposits are noted to the east, south and south-west of the Study Area. There is a small area to the east of the Study Area surrounding Torroboll Burn that is underlain by alluvium sedimentary deposits comprised of clay, silt, sand, and gravel.

Soils and Peat

6.3.6 James Hutton Institute of Soils Mapping[70] indicates that the Study Area is underlain by peaty gleys (dystrophic blanket peat with peaty gleyed podzols) and humus-iron podzols.

6.3.7 NatureScot Carbon and Peatland Map[71] indicates that the majority of the Study Area is underlain by Class 2 (*peat soil with occasion peaty soil; peatland or areas with high potential to be restored to peatland*). There is also Class 1 (*peat soil, peatland; nationally important carbon-rich soils and deep peat with high conservation value*) present to the west and south and surrounding Loch Dubh and its tributaries to the east of the Study Area. Class 3 (*predominantly peaty soil with some peat soil; most soils carbon-rich and some areas of deep peat*) and Class 0 (*mineral soil*) are located to the north-west of the Study Area. Additionally, there are smaller areas of Class 5 (*peat soil with no peatland vegetation*) present at the north, west, and south-east of the Study Area.

6.3.8 Peat probing surveys were commissioned by SSEN Transmission, which indicated an average peat depth of 0.46 m within the Study Area, with peat depths ranging from 0.10 to 2.00 m, as presented on Figure 6.1 Peat Depths.

Groundwater

6.3.9 The Study Area is underlain by Northern Highlands groundwater body (ID: 150701), which was classified by SEPA under the WFD in 2020 as having a 'Good' overall status[67].

6.3.10 According to BGS Hydrogeological Map[72], the majority of the Study Area is underlain by the Morar Group low productivity aquifer, where small amounts of groundwater are encountered near surface weathered zones and secondary fractures. There is an unnamed igneous intrusion aquifer (low productivity) from the late Silurian to early Devonian period located around Loch Dubh, to the east of the Study Area.

Public and Private Water Supplies

6.3.11 Data from SEPA, Scottish Water and The Highland Council suggests that there are no PWS and public water supplies within the Study Area.

6.3.12 According to the Scottish Government website[74], the Study Area is not located within a surface water Drinking Water Protected Area (DWPA), however, it is located within a groundwater DWPA.

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

6.3.13 SEPA's guidance on assessing the impacts of developments on GWDTE (LUPS-GU31)[75] requires assessment of GWDTE located within 250m of excavations greater than 1m and within 100m of excavations less than 1m.

6.3.14 UKHab surveys within 250m of the Proposed Development were undertaken in October 2022; a number of habitats are recorded within a 250m radius of the Proposed Development, which are indicative of potentially moderate and high groundwater dependency:

- UKHab f2c: upland flushes, fens, and swamps – small coverage towards the north and north-east, with a larger area toward the south-west; and
- UKHab h1b6: wet heathland with cross-leaved heath, uplands – located directly under and to the north of the Proposed Development.

6.3.15 These communities (shown on Figure 4.3 UKHab Survey Results) are often associated with surface water or direct rainfall, with water flowing downslope locally to eventually form or join surface water channels.

Flooding

6.3.16 According to SEPA Flood Maps[73], there are a number of isolated small areas with high surface water flooding risk within the Study Area. No fluvial flood risk is identified within the Study Area.

Future Baseline

6.3.17 There is potential for climate change to impact on future baseline conditions. Climate change studies predict a decrease in summer precipitation and an increase in winter precipitation alongside slightly higher annual average temperatures. This suggests that there may be greater pressures on water supplies in summer months in the future. Storms are predicted to be of greater intensity. Therefore, peak fluvial flows associated with extreme storm events may also increase in volume and velocity.

6.4 Issues Scoped Out

6.4.1 Operational impacts have been scoped out of this assessment as it is not anticipated that direct and indirect environmental risks on the hydrology, hydrogeology, geology and peat receptors would arise as a result of the operation of the Proposed Development, with good design layout, the implementation of mitigation measures and GEMPs protecting against longer-term effects.

6.4.2 Consultation with local authorities have determined that there are no PWS, no surface water public supplies and unlikely to be any SEPA authorised Controlled Activity Regulations (CAR) abstractions within the Study Area. Therefore, water supplies have not been considered within the appraisal.

[74] Scottish Government (2014) Drinking water protected areas – Scotland river basin district: maps [online]. Available at: https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/ [Accessed: May 2023]

[75] SEPA (2017). Land Use Planning System SEPA Guidance Note 31. Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. [online]. Available at: https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf [Accessed: May 2023]

6.4.3 The Proposed Development does not directly cross any watercourses and at this stage it is anticipated that the proposed drainage will not discharge directly to any surface waters. Therefore, hydromorphology impacts are not anticipated and have been scoped out.

6.4.4 There are no designated sites within the Study Area classified for water environment related features. The closest designated site is located approximately 970m east of the Proposed Development; Strath Carnaig and Strath Fleet Moors Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA). Strath Carnaig and Strath Fleet Moors is of importance for relevance to birds and is therefore not considered further in this appraisal.

6.5 Embedded Mitigation

Design Mitigation and Assumptions

Good practice measures

6.5.1 Design mitigation and good practice measures are detailed in Section 2.6, including GEMPs in Table 2-1. The GEMPs were produced by SSEN Transmission to establish relevant mitigation practices and agreed with Statutory stakeholders. A CEMP will be implemented during the construction of the Proposed Development which will be produced by SSEN Transmission's Principal Contractor.

6.5.2 The adoption of the applicable SSEN GEMPs would reduce the probability of an incident occurring and further reduce the magnitude of any incident due to a combination of good site environmental management procedures, including minimised storage soil and peat volumes, soil management, staff training, contingency equipment, and emergency plans.

6.5.3 The GEMPs (Appendix 2.2 applicable to this chapter are:

- Soil management;
- Working in or near water;
- Working in sensitive habitats;
- Working with concrete;
- Watercourse crossings;
- Private water supplies; and
- Bad weather.

6.5.4 The following appraisal assumes that good practice measures (detailed in GEMPs and a CEMP) are implemented on-site. The conditions to prevent pollution and manage drainage will be addressed within the CEMP.

6.6 Appraisal

6.6.1 The potential effects associated with the construction of the Downleads (and associated ancillary infrastructure) and the Proposed UGC include:

- Release of sediment laden runoff to controlled waters;
- Pollution of controlled surface, coastal and groundwater bodies;
- Changes to hydrological regime; and
- Physical disturbance to watercourses.

6.6.2 The potential effects are relevant to both the Downleads (and associated ancillary infrastructure) and Proposed UGC and therefore are described together below as the Proposed Development with specific references to elements of the Downleads and Proposed UGC as required.

6.6.3 As previously noted, operational effects have been scoped out of this appraisal.

Construction Phase Effects

Pollution Incidents / Concrete and Cement Product

6.6.4 During the construction phase, a number of potential pollutants would be present onsite to facilitate civil engineering activities, including oil, fuels, chemicals, unset cement and concrete, and waste and wastewater from construction activities. With chemicals and oil being stored and used onsite there is the potential for an incident. Any pollution incident occurring on the Proposed Development could have a detrimental effect on the water quality of the nearby surface waters, groundwater and / or soils and GWDTE, thereby also indirectly affecting ecology.

6.6.5 Should it be necessary to mix concrete on-site, the measures within GEMP - Working with concrete (Appendix 2.2) - will be adhered to.

6.6.6 The major pathways for cement contaminated water to reach surface water bodies are either overland flow (suspended in surface water runoff into drains and watercourses, especially during periods of high runoff rainfall events) or when areas are subject to 'wash down'. In addition to surface water contamination, pollutants have the potential to infiltrate through soils and to bedrock which therefore can pollute groundwater resources. Thus, potentially impacting the quality of potable water and any GWDTE present.

6.6.7 With the adoption of measures identified in the Working in or near water, Working in sensitive habitats and Working with concrete GEMPs, the potential effects associated with contamination from pollution incidents will be greatly reduced.

Erosion and Watercourse Sedimentation

6.6.8 Existing tracks will be utilised where possible, however, the construction of the temporary access track for the Proposed UGC means there is potential for sediment laden runoff. To mitigate this, following the Sustainable Drainage Systems (SUDS) good practice guidelines[76], agreed with SEPA, is essential. Drainage for the temporary construction compound (including during construction) will also follow SuDS principles and will be agreed with SEPA in advance.

6.6.9 Requirements for soil excavation, transport and storage may lead to additional sedimentation issues at locations where construction activities are necessary.

6.6.10 Excavated material during construction should be stored > 10 m away from and downslope of any adjacent watercourses, ideally > 50 m where possible, to mitigate any risk of runoff from flood or heavy rainfall events and reduce the risk of windborne dry sediment being discharged into the watercourses.

6.6.11 With the adoption of measures identified in the Working in or near water, Working in sensitive habitats, Soil management and Watercourse crossings GEMPs (Appendix 2.2), the potential effects associated with erosion and sedimentation would be greatly reduced.

Modification of Hydrological Pathways

6.6.12 The proposed works have the potential to act as a temporary conduit for the movement of excess runoff/surface flood waters during construction.

6.6.13 This effect is potentially relevant to the installation of the UGCs, foundation upgrades and pre-existing / temporary access track during the construction phase, with the potential to cause localised disruption and interruption to flow pathways.

[76] SEPA (2010) Planning guidance on Sustainable Drainage Systems (SUDS) [online]. Available at: https://www.sepa.org.uk/media/143195/lups-gu2-planning-guidance-on-sustainable-drainage-systems-suds.pdf [Accessed: May 2023]

6.6.14 Considering the design mitigation and construction good practice, specifically the Working in or near water, Working in sensitive habitats, Watercourse crossings and Soil management GEMPs (Appendix 2.2), the effects listed above will be managed to greatly reduce the likelihood of any modification of hydrological pathways.

Flood Risk

6.6.15 There are no SEPA WFD classified waterbodies within the Study Area, however, Allt na Fearna Beag River and Torroboll Burn are located approximately 570 m and 90m downstream of the Proposed Development, respectively, within the Study Area, therefore they are unlikely to be impacted.

6.6.16 Blockages can be caused by inadequate control of earthmoving plant, sedimentation, and poor waste management, all of which could lead to flooding upstream. However, due to the intervening distance between the Proposed Development and the watercourses it is unlikely to occur.

6.6.17 Taking into account the design mitigation and construction good practice, specifically the Watercourse crossing GEMP (Appendix 2.2), the probability of impacts on flood risk would be reduced.

Water Supply and Foul Drainage

6.6.18 The construction works will not require any new water abstractions from local sources. Water supply for welfare facilities will be low volume and will likely be sourced from the main supply, subject to agreement with Scottish Water. Potable water will be from bottle or bowser supply.

6.6.19 Construction foul water will be collected and removed from site for off-site disposal at a licenced premise.

6.6.20 Taking account of good practice measures, the probability of impacts to water supply and foul drainage from construction will be greatly reduced.

Modification of groundwater flows and levels

6.6.21 Excavations and installations could disrupt shallow groundwater systems resulting in the lowering of groundwater levels in the immediate vicinity of the excavations and alterations to flow paths.

6.6.22 Soil water conditions at the Proposed Development are likely to be primarily influenced by surface water and direct rainfall, with groundwater having minimal influence due to the type of bedrock and superficial geology and being underlain by low productivity aquifers. Therefore, installation of the Proposed UGC is unlikely to permanently alter groundwater flows. Should any alterations occur, it would be expected that natural conditions of groundwater level and flow would recur in a short timeframe.

6.6.23 The GWDTE communities identified within the GWDTE Study Area are often associated with surface water or direct rainfall, with surface water flowing downslope locally to eventually form or join surface water channels. These habitats are typically located on moderately sloping ground, away from likely groundwater emergence. Therefore, these communities are unlikely to be critically dependent on groundwater.

6.6.24 Due to the presence of low productivity aquifers underlying the Proposed Development which has small amounts of groundwater in near surface weathered zones and secondary fractures, the likelihood of any GWDTE being impacted by construction is minimal.

6.6.25 Considering the design mitigation and construction good practice, specifically the Working in sensitive habitats, and Soil management GEMPs (Appendix 2.2), the effects listed above will be managed to reduce the likelihood of any effects to groundwater flows and levels, including GWDTE.

Loss and compaction of soils

6.6.26 Soil compaction as a result of construction works within the Proposed Development may damage the vegetation and result in a reduction in soil permeability and rainfall infiltration, particularly on peaty soils

which there is a high presence of within the Study Area, thereby increasing the potential for longer-term erosion from surface water runoff. This would most likely be caused by tracking of heavy plant machinery.

6.6.27 Stockpiled and unvegetated / exposed areas of soils are at risk of desiccation and erosion by wind and water, also potentially causing soil loss.

6.6.28 An Outline Soil Peat Management Plan (Appendix 6.1) was produced using peat probing depths gathered by SSEN Transmission. The results confirmed 1,440m^3 of material excavated, with 100% proposed to be reused for reinstatement surrounding the CSEC and Proposed UGC.

6.6.29 Considering the design mitigation and construction good practice, specifically the Appendix 6.1: Outline Soil and Peat Management Plan and Soil management GEMP (Appendix 2.2), the effects listed above would be managed to reduce the probability of any loss or compaction of soils.

Peat Instability

6.6.30 Peat slides are a natural occurrence that can occur without human interference, but issues such as removal of slope support or increased loading upon slopes can either increase the likelihood of an event occurring or can increase the scale of the failure.

6.6.31 Furthermore, peat slides affect soil (and associated habitats) and potentially downstream surface water systems where soil inundation can lead to sedimentation reducing water quality and modification in drainage patterns.

6.6.32 Peat Landslide Hazard and Risk Assessment (PLHRA) Guidance (Scottish Government 2017) states that Section 37 applications should be assessed in relation to their potential to generate peat landslide risks and that a PLHRA should be a requirement where there is peat within the application boundary. The UGC element of the Proposed Development is classed as Permitted Development under the Town and Country Planning (Scotland) Act 1997 and is therefore not subject to the PLHRA requirements of Section 37 applications. Furthermore, Appendix 6.1 Outline Soil and Peat Management Plan reports the average peat depth within 25m of UGC is 0.55m and the average peat depth in the wider study area is 0.5m, indicating a low peat slide risk.

6.6.33 The Downleads and associated CSEC form the Section 37 aspect of the Proposed Development; however, it is recognised that the site of these elements had been previously excavated for the construction of the existing OHL Tower 31, associated with Lairg Wind Farm. Subsequent site observations note that this has been reinstated with suspected non-peat soils. Therefore, based on the extent of the required development area for the CSEC and Downleads, the suspected non-peat soil type, and depths indicated by nearby measurements, a PLHRA is not considered to be required.

6.6.34 Due to the presence of peatland within the wider Study Area, to avoid exacerbating the potential of peat instability, excavated material or other forms of loading on, or immediately above, breaks of slope or any other potentially unstable slopes should be avoided. Artificial drainage would also be routed to not concentrate flows onto slopes, gully heads or into excavations.

6.6.35 With the adoption of measures identified in the Soil management GEMP (Appendix 2.2) combined with appropriate good practice, site monitoring and pre-construction awareness training, the potential effects associated with peat instability can be reduced.

6.7 Recommendations and Mitigation

6.7.1 A CEMP will be produced by the Contractor and implemented during construction of the Proposed Development. The CEMP will detail best practice construction management measures, including those to manage risks associated with construction of the Proposed Development to the environment and human health, such as those associated with pollution and resource use. Key measures to minimise peat stability risk could include:

- avoidance of removal of slope support;
- avoidance of heavy loading on slopes;
- good drainage practice to ensure flows not concentrated onto slopes or into excavations;
- restricting earthmoving activities during and immediately after intense and prolonged rainfall events; and
- creating and managing of geotechnical risk register or similar management system throughout the detailed design and construction phases.

6.7.2 The CEMP will take into account any discussions undertaken with stakeholders and will be submitted in advance of construction commencement to SEPA and The Highland Council for approval.

6.7.3 Mitigation measures will be monitored by an Environmental Clerk of Works (EnvCoW) throughout construction.

6.8 Cumulative Effects

6.8.1 Chapter 3 identifies other developments such as Dalchorck to Loch Buidhe 132 kV Overhead Line, Lairg II Windfarm (including Re-Design and Deviation from planning condition), and the erection of a temporary 80 m high meteorological mast to be considered as having potential for cumulative effects with the Proposed Development. Even in the event that these other developments present potentially significant effects to the receiving hydrology, hydrogeology, geology and peat environment, given that no likely direct and indirect environmental residual risks have been identified associated with the Proposed Development, and assuming the effective 'source' controls for each individual development and good practice methodology, significant cumulative effects are not anticipated. Furthermore, the differing construction programming and activities that would be anticipated to occur across various developments reduces the probability that water quality and flow issues would be coincident across the catchments.

6.9 Summary

6.9.1 The following sensitive hydrology, hydrogeology, geology and peat receptors along the Proposed Development have been identified:

- Surface water bodies;
- Groundwater bodies;
- Flooding;
- GWDTE; and
- Class 1 and Class 2 peat presence.

6.9.2 The appraisal demonstrated how the Proposed Development would affect the above sensitive receptors. Through successful application of the embedded and additional mitigations identified in Sections 2.6 and 6.7, and those contained within Appendix 6.1: Outline Soil and Peat Management Plan, the appraisal has concluded that impacts from the Proposed Development can be mitigated to prevent any likely direct and indirect environmental residual risks on the hydrology, hydrogeology, geology and peat receptors.

7. LANDSCAPE AND VISUAL

7.1 Introduction

7.1.1 This chapter appraises the effect of the Proposed Development on the landscape and on visual amenity. It describes and analyses the existing landscape of the area that may be affected and considers its sensitivity to the Proposed Development. It defines the extent to which the Proposed Development would be visible and illustrates and analyses a representative sample of views to give a clear indication of the effect the Proposed Development might have on visual amenity. The Proposed Development is described in Chapter 2 above.

7.1.2 This Landscape and Visual Appraisal (LVA) has been carried out broadly in accordance with best practice guidance (see below) in relation to Landscape and Visual Impact Assessment (LVIA) and Environmental Impact Assessment (EIA). It is important to note, however, that the Proposed Development has been confirmed as a non-EIA development and, therefore, the scope of this LVA reflects the nature and scale of the Proposed Development.

7.2 Methodology

Information Sources

7.2.1 The following sources of information have been used to inform this report:

- desk study – a desk-based review of existing information and online resources in order to inform the field surveys and subsequent appraisal; and
- field survey – undertaken on 21 September 2022 to verify the desk study findings, confirm the extent of visual influence, undertake the appraisal and to take photographs.

Best Practice Guidance

7.2.2 This appraisal has been carried out broadly in accordance with best practice guidance with reference to the following:

- 'Guidelines for Landscape and Visual Impact Assessment', 3rd Edition (2013), Landscape Institute and Institute of Environmental Management and Assessment (GLVIA3); and
- 'Landscape Character Assessment – Guidance for England and Scotland' (2002), Countryside Agency and Scottish Natural Heritage.

Significance

7.2.3 For both the landscape and visual appraisals, the significance of effect derives from the combination of the magnitude of change and the sensitivity of the landscape or visual receptor. Significance in this appraisal is used in its ordinary English meaning of 'of importance' or 'worthy of attention' to highlight any changes to landscape character or visual amenity of particular note. A full methodology is set out in Appendix 7.1.

Nature of Landscape and Visual Effects

7.2.4 The appraisal considers distinct but closely related areas: landscape character and visual amenity. These are described below.

Landscape

7.2.5 The character of the landscape derives from a combination of physical factors, natural processes, and human intervention.

7.2.6 Landscape effects are a combination of the physical changes to the fabric of the landscape arising from the Proposed Development and perceptual changes – the way these physical changes alter how the landscape is

perceived. The landscape appraisal considers the effect of the Proposed Development on the landscape as a whole; effects on significant individual elements of the landscape; and effects on characteristic combinations or patterns of elements and how these are seen to affect its character and quality.

7.2.7 Landscape character is generally considered to be a resource in its own right, which exists whether or not there are people present to experience it.

Visual

7.2.8 Visual appraisal is concerned with the views that are available to people who may be affected by the Proposed Development and their perception and responses to changes in these views.

7.2.9 Visual effects arise from changes in the composition and character of views available in the area affected. The appraisal considers the likely change that would be experienced, including the effects both on specific views and on general visual amenity.

7.2.10 For the purposes of appraisal, whilst it is the people living, working, passing through or enjoying recreational activities in the area who see the views and enjoy the visual amenity, it is the places they may occupy that are mapped and described as the 'receptors' of the views.

7.2.11 Effects are defined as beneficial, neutral, or adverse. The decision regarding whether an effect is beneficial or adverse and the decision regarding the significance of effect are entirely separate. It is based on professional judgement and is acknowledged as a 'particularly challenging' aspect of assessment by GLVIA3 in its paragraph 2.15.

7.2.12 Neutral effects are those which overall are neither positive nor negative but may incorporate a combination of both. Beneficial effect would be for example providing enhancement or improvement to the landscape. Adverse effects result in the loss of characteristic elements or degradation of the landscape for example.

Extent of the Study Area

7.2.13 The Study Area for the visual appraisal is the area from which the Proposed Development may be seen (by definition, visual effects can only occur where at least some part of the development is visible). The Study Area for the landscape appraisal is also defined by the area from which the Proposed Development may be seen but the appraisal considers potentially affected landscapes in terms of the character area or unit as a whole, not just the part from which there may be visibility.

7.2.14 Due to the limited extent and type of the Proposed Development and the fact that it would be perceived in the context of existing OHL and wind turbines, based on experience and desk-based research, a Study Area of a 2 km radius from the Proposed Development was considered appropriate for this appraisal in order to focus on any potential significant landscape and visual effects.

Baseline Data Collation

7.2.15 Information has been gathered primarily from a field survey and desk study, as listed under 'Information Resources' above.

7.2.16 Relevant planning policy documents and publications that have been taken into consideration include:

- NatureScot's Scotland Landscape Character Types[77];
- The Highland Council - Highland-wide Local Development Plan[78]
- The Highland Council - Sutherland Local Plan[79]

[77] Scottish Landscape Character Types Map and Descriptions 2019, NatureScot https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

[78] https://www.highland.gov.uk/info/178/local_and_statutory_development_plans/199/highland-wide_local_development_plan

[79] https://www.highland.gov.uk/downloads/file/5114/appendix_3_-_landscape_character_assessment

- online mapping including Ordnance Survey maps, Google Earth Pro and Google Street View.

7.2.17 Relevant policies to the Proposed development in The Highland Council - Highland-wide Local Development include:

- Policy 36: Development in the Wider Countryside: outwith Settlement Development Areas, development proposals will be assessed for the extent to which they are acceptable in terms of siting and design; are sympathetic to existing patterns of development in the area and; are compatible with landscape character and capacity.
- Policy 57: Natural, Built and Cultural Heritage: 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, (…) and that for features of local/regional importance we will allow developments if it be satisfactorily demonstrated that they will not have an unacceptable impact on the natural environment, amenity and heritage resource.
- Policy 67: Renewable Energy Developments (…) 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 (…), having regard in particular to any significant effects on the following: (..) visual impact and impact on the landscape character of the surrounding area (the design and location of the proposal should reflect the scale and character of the landscape and seek to minimise landscape and visual impact, subject to any other considerations); amenity at sensitive locations, including residential properties, work places, and recognised visitor sites (in or outwith a settlement boundary);
- Policy 69: Electricity Transmission Infrastructure: (…) the Council will support proposals which are assessed as not having an unacceptable significant impact on the environment, including natural, built and cultural heritage features.

Limitations and Assumptions

7.2.18 The LVA has been carried out by assuming the worst case of greatest visibility i.e., on a clear, bright winter's day with no screening from deciduous foliage.

7.2.19 The Zone of Theoretical Visibility (ZTV) (see Figure 7.2) is based on a 'bare ground' Digital Terrain Model (DTM) and it identifies land that is theoretically visually connected to the Proposed Development. However, the ZTV does not take into account the screening effects of built form, forestry, vegetation, distance, and visibility (e.g., weather conditions); all of which can prevent or reduce visibility. The ZTV was produced from the 5m height of the Proposed Development.

7.2.20 The appraisal of visual effects on residential receptors has been undertaken from publicly accessible locations only. Assumptions have therefore been made on the main outlooks and importance of views from the identified residential receptors.

7.3 Baseline Environment – Landscape

7.3.1 At a regional scale, the Proposed Development lies within the Rounded Hills – Caithness & Sutherland Landscape Character Type (LCT) (no.135) as defined by NatureScot's Landscape Character Types of Scotland and as shown on Figure 7.1. Key characteristics of the Rounded Hills – Caithness & Sutherland LCT relevant to the Proposed Development include:

- Rolling hills forming broad, subtly rounded summits but with some more pronounced hills also occurring.
- Hills cut by numerous narrow burns and small lochans lie within dips, corries and on plateau summits.
- Predominantly dense heather ground cover and moorland grasses, but also some areas of bog.
- Wind farms located in more accessible and generally lower rolling hills, either close to extensive forestry or the high voltage transmission line aligned broadly parallel to the south-east Sutherland coast.

- Convex character of hill slopes limiting distant visibility and views of the hill tops when travelling through the landscape.
- Views into the interior of the hills very restricted.

7.3.2 The Farmed and Forested Slopes with Crofting LCT (no.145) lies within the northwest of the Study Area, on lower ground on the slopes of Achany Glen. Key characteristics that are relevant to the Proposed Development include:

- North-west/south-east grain of the landform of ridges and valleys.
- Particularly rough and coarse-textured landscape on upper hill slopes, comprising extensive mixed semi-natural woodland and fragments of heath and wetter moss.
- Semi-enclosed character of this well-wooded landscape with occasional views.
- Attractive views from small roads high up the slopes, giving views to the Rounded Hills – Caithness & Sutherland.

7.3.3 The local context is typical of the Rounded Hills – Caithness & Sutherland LCT. The Proposed Development is located on rolling hills that slope gently to the west, towards the Farmed and Forested Slopes with Crofting LCT. The Torroboll Burn lies approximately 75m to the north of the Proposed Development, on an east to west alignment along a broad valley that cuts the hillside to the south of Cnoc na h-Inghinn. This characteristic hillside landform is showcased by an extensive, almost uninterrupted landcover of heather and moorland grasses. In this open landscape, the existing Lairg Wind Farm, the Dalchorck to Loch Buidhe 132 kV OHL and access tracks are prominent features in the proximity of the Proposed Development, providing a context which is influenced by energy infrastructure.

National and Regional Landscape Designations

7.3.4 As stated in Table 3-1 in Section 3.2 above, there are no national or local designations within or in proximity to the Proposed Development and therefore they will not be considered any further in this document.

7.4 Baseline Environment – Visual

7.4.1 Visual receptors are "the different groups of people who may experience views of the development" (GLVIA3, para 6.3). The baseline desk study, including the use of the ZTV, was used to identify those groups who may be affected, as shown in Figure 7.2.

7.4.2 The Proposed Development lies on west facing hill slopes that drop gently towards the Achany Glen. The rising topography of Cnoc na h-Inghinn to the north-northeast, and Leathad Creagach and Cnoc Cracail to the east and south, would limit most views in these directions.

7.4.3 To the west, the Proposed Development would be visible at a distance of at least 1 km from the valley around Torroble, particularly where views are directed along the Torroboll Burn valley. However, the nuanced hillside topography and the relatively abundant tree cover on the valley would limit most views of the Proposed Development in this direction, which in addition would be perceived in the context of larger infrastructure, such as the existing OHL and Lairg Windfarm.

7.4.4 Taking into account the limited visibility of the Proposed Development, the key visual receptors are limited to the following (Table 7-1):

Table 7-1: Identified Visual Receptors

Type of Receptor	Identified Receptors
Residential	• Scattered residential properties at Torroble.

Type of Receptor	Identified Receptors
Recreational	• Visitors to holiday accommodation premises in Torroble. • Hillwalkers in the vicinity of the Proposed Development.
Transport and Commercial	• People driving, walking or cycling along the minor roads between Torroble and Tomich.

7.5 Embedded Mitigation

7.5.1 An alignment selection process was undertaken which identified three different potential UGC alignments and their environmental and engineering constraints. The alignment selected was the option with the least landscape and visual effects.

7.5.2 Following construction, there will be a full reinstatement of the surface layers on the temporary stone access tracks and temporary construction compound / laydown area to aid the restoration of the heather and grass moorland.

7.5.3 This will be done in line with SSEN Transmission's Biodiversity Net Gain assessment for the Proposed Development. (See Section 4.8)

7.5.4 The mitigation of effects on the landscape and visual resource during construction are integral to the construction process under the 'Considerate Constructors' process that is now routinely followed, such as tidy site management to reduce visual clutter associated with the works; and use of construction lighting in accordance with best practice to minimise lighting intrusion to surrounding sensitive receptors. Such mitigation measures will be included within a CEMP which will be prepared by the Principal Contractor.

7.6 Appraisal

Introduction

7.6.1 The following paragraphs primarily consider the permanent (Operational Phase) effects of the Downleads (and associated ancillary infrastructure). The Proposed UGC, by its nature, will not be visible following reinstatement and establishment of the landcover. Therefore, no permanent effects from the Proposed UGC are anticipated and it is not assessed further for the Operational Phase.

7.6.2 The landscape and visual effects of the Downleads (and associated ancillary infrastructure) during construction would be short-term and temporary and would not be materially different from the permanent effects. Construction phase effects are therefore summarised at the end of this section to avoid repetition.

Landscape effects (Permanent / Operational Phase) – Downleads & associated ancillary infrastructure only

Landscape Character

7.6.3 The Proposed Development lies within the Rounded Hills – Caithness & Sutherland Landscape Character Type (LCT) (no.135)

7.6.4 Due to its relatively small scale in comparison with the surrounding infrastructure of Lairg Wind Farm and the Dalchorck to Loch Buidhe 132 kV OHL, and the fact that part of the Proposed Development is a UGC, the Proposed Development would very slightly increase the presence of infrastructure in the LCT.

7.6.5 To accommodate the new bellmouth and platform for the CSE compound, a small area of existing heather and grass moorland would have to be removed permanently, affecting one of the key characteristics of the LCT (dense heather ground cover and moorland grasses) very locally.

7.6.6 The Proposed Development is not anticipated to have any effects on the Farmed and Forested Slopes with Crofting LCT.

7.6.7 Considering the scale of the Proposed Development in the surrounding landscape and in the context of existing infrastructure, its effects on the landscape character are anticipated to be negligible.

Visual Effects (Permanent / Operational Phase) – Downleads & associated ancillary infrastructure only

Residential Receptors

7.6.8 The nearest local residents would be the properties to the east of Torroble, approximately 1.1 km to the west-northwest of the Proposed Development.

7.6.9 Distance, topography and intervening vegetation would limit most views of the Proposed Development from these properties.

7.6.10 Where glimpsed views of the Proposed Development are available, this would be seen in the context of the existing Lairg Windfarm and Switching Station and the Dalchorck to Loch Buidhe 132 kV OHL, and not a particularly noticeable addition. Therefore, the visual effects of the Proposed Development on the identified residential receptors are anticipated to be negligible.

Recreational Receptors

7.6.11 Hillwalkers walking in the vicinity of the Proposed Development could have views of the Proposed Development; however, this would be in the context of existing infrastructure. Furthermore, since the Proposed Development is not located in an area of particularly high recreational value, this would affect only a very small number of recreational receptors, and therefore the visual effects of the Proposed Development on the identified recreational receptors are anticipated to be negligible.

Transport and Commercial Receptors

7.6.12 People travelling along the minor roads between Torroble and Tomich could have views of the Proposed Development. Due to distance, intervening topography and vegetation and the fact that the Proposed Development would be seen in the context of existing infrastructure, it is not anticipated that the Proposed Development would affect the visual amenity of transport receptors,

7.6.13 The visual effects of the Proposed Development are therefore anticipated to be negligible.

Construction Phase - Downleads (including associated ancillary infrastructure) & the Proposed UGC

7.6.14 Areas of heather and grass moorland have the potential to be impacted by the temporary access track and spoil areas associated with the Proposed UGC; and the ancillary works to the Downleads (comprising permanent bellmouth, CSEC and temporary construction compound). However, it is understood that the temporary areas will be reinstated to their original condition, in line with SSEN Transmission's Biodiversity Net Gain assessment for the Proposed Development, which would aid the restoration of the moorland and the local landscape character.

7.6.15 People notice movement and active change more than they notice fixed objects. The changing nature of the Proposed Development as it is being built and the presence of a construction compound and large on-site machinery, often with hazard lights, would be noticeable. Also, the general noise and activity associated with construction sites may attract attention and cause viewers to see more than they would otherwise notice. These effects, however, would be temporary and short term in nature.

7.6.16 As such, the overall effects on the landscape and on visual amenity during the construction phase would be slightly greater than on completion, but still not significant.

Summary

7.6.17 Based on the above considerations, the Proposed Development would not result in any long-term significant effects on the landscape fabric, landscape character, special qualities of landscape designations, and on visual amenity.

7.7 Recommendations and Mitigation

7.7.1 There are no recommendations for secondary mitigation.

8. SUMMARY OF MITIGATION MEASURES

8.1 Introduction

8.1.1 This chapter presents a compilation of the mitigation measures outlined in the preceding chapters of this Report. It also contains the mitigation measures proposed within Appendix 6.1 – Outline Soil and Peat Management Plan. Table 8-1 displays, by topic, the mitigation or monitoring measures to be implemented. Each measure is assigned a code for ease of reference.

8.1.2 Embedded mitigation comprising 'Design Mitigation' and general 'Construction Good Practice' has been incorporated into the description of the Proposed Development; and as such has been assessed as being part of the development proposals. SSEN Transmission's General Environmental Management Plans (GEMPs) (Appendix 2.2) and Species Protection Plan (SPPs) (Appendix 2.3) have been included within the schedule of environmental mitigation for completeness.

8.1.3 The following mitigation codes are used in Table 8-1:

- GE – General mitigation measures;
- E – Ecology and Nature Conservation;
- CH – Cultural Heritage;
- HYD – Hydrology, Hydrogeology, Geology and Soils; and
- LV – Landscape and Visual.

8.1.4 In all instances, the Principal Contractor will have responsibility for implementation of the mitigation or monitoring measures.

Table 8-1 Schedule of Mitigation

Topic	Phase	Mitigation Reference	How response has been considered
General	Construction Phase	GE1	The Principal Contractor will be required to produce and implement a Noise Management Plan for the construction phase. The plan will be taken forward by the Principal Contractor for any post construction works of a similar nature that are associated with the Proposed Development e.g. maintenance. The plan will be agreed with SSEN Transmission prior to construction commencing. Compliance with the relevant EC Directives and UK Statutory Instruments that limit noise emissions of a variety of construction plant; and guidance set out in BS 5228-1:2009+A1:2014 which covers noise control on construction sites.
General	Construction Phase	GE2	A Site Water Management Plan will be developed to manage potential risks to the water environment including silt mitigation and its locations, dewatering of excavations inclusive of pump locations, monitoring points, cut off drains, and SuDS (incl. compound). In addition, this plan will show how rivers downstream will be protected from sedimentation or pollution resulting from the project activities. The Site Water Management Plan will include a drawing of the Proposed Development, as well as any access tracks detailing all locations of water mitigation measures. All relevant activities will be undertaken in compliance with the Controlled Activities Regulations. The plan will be to a standard to support a construction licence (CSL), which the Principal Contractor is required to apply for.

Topic	Phase	Mitigation Reference	How response has been considered
			SSEN Transmission's GEMPs for 'Oil Storage and Refuelling', 'Soil Management', and 'Working with Concrete' (Appendix 2.2) will be adhered to.
General	Construction Phase	GE3	A Construction Traffic Management Plan (CTMP) will be developed by the Contractor, which will be agreed with The Highland Council roads team in advance of construction. The CTMP will contain measures which will ensure the following: • A driver induction will be undertaken to include a safety induction, speed control and the identification of specified access routes. • Adoption of car sharing where possible to reduce the number of vehicles arriving and departing from the site. • HGV's adhere to weight restrictions on roads in the area.
General	Construction Phase	GE4	Soil management will follow the general guidance set out in SSEN Transmission's GEMP - 'Soil Management' (Appendix 2.2). Additionally, reinstatement shall be completed as soon as practicably possible in order to prevent environmental disturbance.
General	Construction Phase	GE5	Dust will be managed through implementation of standard control measures such as management of stock piles to supress dust and road cleaning in accordance with SSEN Transmission's GEMP – 'Dust Management' (Appendix 2.2).
General	Construction Phase	GE6	Waste Management will be in accordance with Section 34 (Scotland) of the Environmental Protection Act, SSEN Transmission's GEMP – 'Waste Management' (Appendix 2.2) and the waste hierarchy.
General	Construction Phase	GE7	An Environmental Emergency Response Plan will be developed by the Principal Contractor to deal with, among other things, accidental spills / leaks. Appropriate spill kits will be located on site and in key vehicles. Site staff will be trained in their use and provided with advice on action(s) to be taken and who should be informed in the event of a pollution incident. Emergency response teams and contractors, their locations and response times will be identified in the plan.
General	Construction Phase	GE8	On-site welfare facilities will be adequately designed and maintained to ensure all sewage is disposed of appropriately. This may take the form of an on-site septic tank with soak away, tankering and off-site disposal depending on agreement with SEPA; or discharge to foul sewer.
General	Construction Phase	GE9	The proposed timing of works dictates that work will have to be undertaken during winter months, details will be provided of how the Site will be managed to address this. SSEN Transmission's GEMP – 'Bad weather' (Appendix 2.2) will be adhered to.
General	Construction Phase	GE10	Local residents will be kept informed by the Principal Contractor of any potentially disruptive activities and actions being taken to mitigate the impact of these activities.

Topic	Phase	Mitigation Reference	How response has been considered
General	Construction Phase	GE11	No excavations will be left open overnight, unless a ramp with a 45 degree angle is included to allow animals to escape should they fall in. All excavations will be backfilled immediately where possible.
General	Construction Phase	GE12	Where construction has not commenced within 12 months and conditions for species may have changed, surveys will be repeated in order to provide the most accurate and up to date recommendations for the Site.
Ecology and Nature Conservation	Construction Phase	E1	Artificial lighting will not directly illuminate watercourses, natural linear features and adjacent habitat within the Site and surrounding area in line with guidance[80], so as to avoid discouraging otters and bats and other foraging wildlife from using the Site.
Ecology and Nature Conservation	Pre-Construction Phase	E2	Pre-construction survey to identify nesting birds (within 48 hours prior to construction works due to occur within the nesting bird season (recognised as March to August, inclusive). To be undertaken by a Suitably Qualified Ecologist (SQE).
Ecology and Nature Conservation	Pre-Construction / Construction Phase	E3	Embedded mitigation relevant to this ecology and nature conservation includes reliable tried and tested measures documented within SSEN Transmissions General Environment Management Plans (GEMPs) (Appendix 2.2).
Ecology and Nature Conservation	Construction Phase	E4	Adherence to the relevant general binding rules specified in the Water Environment (Controlled Activities) (Scotland) Regulations 2011, as amended (CAR) and any project-specific registrations or licences required prior to any construction works commencing.
Ecology and Nature Conservation	Construction Phase	E5	Design and generic embedded mitigation of relevance to protected and priority species comprises SSEN Transmission's Species Protection Plan (SPP) (Appendix 2.3). These SPPs detail a mitigation hierarchy to avoid or minimise impacts on protected or priority species. Impact avoidance and mitigation measures detailed typically include: • Pre-construction surveys and monitoring undertaken by an Environmental Clerk of Works (EnvCoW); • Sensitive working methods and avoidance of sensitive areas (such as resting sites) or supervision of works in close proximity to such sites; and • Application for the relevant Protected Species Development Licence from NatureScot if impacts on certain protected species cannot be avoided. Works will then proceed under the conditions of the licence issued.
Ecology and Nature Conservation	Pre-Construction / Construction Phase	E6	Pre-construction environmental inductions will be given to all construction staff, including information on sensitive habitats, species and legislation

[80] Institution of Lighting Professionals (ILP) (2018). Bats and artificial lighting in the UK. Bats and the Built Environment series, Guidance Note 08/18

Topic	Phase	Mitigation Reference	How response has been considered
Ecology and Nature Conservation	Construction Phase	E7	Any excavations required for the cable trench will be kept free from water by use of mobile pumps, with water pumped to a suitable location as agreed on site by the EnvCoW and in accordance with SSEN Transmission's GEMPs (Appendix 2.2). Drainage design measures to ensure the discharge will not result in pollution to surface water will be set out in the CEMP. Embedded mitigation to reduce the scale of impact on bog habitat will include sensitively and effectively managing peat and soils by adhering to the measures outlined in the GEMPs (Appendix 2.2) and the Outline Soil and Peat Management Plan (Appendix 6.1). Good practice methods include careful removal of vegetated turves, short timescales between lifting and replacement of turves (with a four week reinstatement objective) and ensuring stored turves are kept in good condition (including watering when weather conditions could lead to desiccation). Revegetation of bare soil with native vegetation and excavated material will be re-used as close to excavation location as practicable and as soon as possible. All excavated material from the UGC trench will be carefully stored a minimum of 10 m from any watercourses and 50 m from any watercourse identified on Ordnance Survey 50,000 scale mapping, with soil mounds and restoration depths no higher than 2 m and with stable banking. Care will be taken to prevent any risk of runoff or windborne dry sediment being discharged into watercourses.
Ecology and Nature Conservation	Construction Phase	E8	Upland Heath habitat - Reinstatement of the surface layers will be completed by returning the remaining excavated material to the trench in layers, in reverse order with the existing vegetation placed on the trench where possible. The trenches will be open for a maximum of four weeks. On the successful installation of the cables, all temporary works will be removed and the land reinstated.
Ecology and Nature Conservation	Construction Phase (including site clearance)	E9	Otters - Construction activities would be undertaken during daytime periods only, avoiding periods when otters are thought to be most active. Works within a potential disturbance zone of any identified resting sites will be licensed and supervised by the EnvCoW following all mitigation measures outlined in the SSEN otter SPP (Appendix 2.3). The responsibility of obtaining licences will be that of the contractor. Pollution prevention measures, outlined in the GEMP (Appendix 2.2) and CEMP will also minimise the potential for the release of sediment into watercourses.
Ecology and Nature Conservation	Construction Phase (including site clearance)	E10	Water Vole - Construction activities will be supervised by the EnvCoW and follow all mitigation measures outlined in the SSEN water vole SPP (Appendix 2.3). Pollution prevention measures, outlined in the GEMP (Appendix 2.2) and CEMP will also minimise the potential for the release of sediment into watercourses.
Ecology and Nature Conservation	Construction Phase	E11	Badger - Any disturbance/displacement would be temporary, licenced accordingly (should setts be found to be present during pre-construction surveys) and be unlikely to significantly affect the local population.

Topic	Phase	Mitigation Reference	How response has been considered
	(including site clearance)		Construction activities would be undertaken during daytime periods only, avoiding periods when badgers are most active. Works will follow all mitigation measures outlined in the SSEN badger SPP (Appendix 2.3), as well as those detailed in the CEMP, enforced by the EnvCoW.
Ecology and Nature Conservation	Construction Phase (including site clearance)	E12	Pine Marten - Construction activities will be supervised by the EnvCoW and follow all mitigation measures outlined in the SSEN pine marten SPP (Appendix 2.3).
Ecology and Nature Conservation	Construction Phase (including site clearance)	E13	Birds -Schedule 1 species - In the unlikely event that breeding distribution changes to the extent that a nest site location is present within a ZoI for disturbance from the Proposed Development, mitigation will be will be implemented through a bird SPP (Appendix 2.3).
Ecology and Nature Conservation	Construction Phase (including site clearance)	E14	Birds -additional species - Appropriate mitigation including timing of construction to avoid breeding bird season (March to August, inclusive) where possible, aderhance to SSEN Bird SPP (Appendix 2.3), and supervision of works by an EnvCoW, will mean that there is unlikely to be a significant effect on birds. The EnvCoW will provide on-site guidance, in particular regards to nesting birds and will undertake regular searches for bird nests within the works area. If an active bird nest is identified or suspected, the EnvCoW will establish an exclusion zone around the nest (physically demarcated) in which no works will occur until the nest has naturally become inactive (e.g. chicks fledged) as determined by the EnvCoW. The extent of the exclusion zone will be dependent on the species.
Ecology and Nature Conservation	Construction Phase (including site clearance)	E15	Amphibians and reptiles - Site walkovers ahead of site work, presence of the EnvCoW and implementation of a CEMP. As such neither species group is predicted to be adversely affected.
Ecology and Nature Conservation	Construction Phase (including site clearance)	E16	Brown hare and mountain hare - Site walkovers ahead of site work, presence of the EnvCoW and implementation of a CEMP. As such neither species is predicted to be adversely affected.
Cultural Heritage	Construction Phase	CH1	Heritage assets with visible remains within the construction areas of the Proposed Development and the limit of deviation will be demarcated prior to commencement of construction of the proposed temporary stone access track to ensure visibility of the asset location to all members of the construction crew, and avoidance during this phase. Demarcation would be achieved using high visibility marker posts set 5 m from the edge of the heritage assets, with the markers retained throughout the construction phase. Demarcation of the assets would be the responsibility of the Principal Contractor, with identification of the assets made on the ground by a qualified archaeologist using the baseline information provided in the Gazetteer (Appendix 5.1).

Topic	Phase	Mitigation Reference	How response has been considered
			The heritage assets that fall within the construction area and the limit of deviation, to be demarcated are: • Possible sheiling hut (HA08) • Possible cairn (HA10) • Rubble feature (HA11)
Cultural Heritage	Construction Phase	CH2	Given the high potential for encountering sub-surface archaeological remains, it is recommended that an archaeological watching brief be implemented for all ground-breaking works during construction. This will allow for a permanent record of any hitherto unknown archaeological remains that may exist within the Proposed Development.
Cultural Heritage	Construction Phase	CH3	Where preservation in situ of the cairn (HA10) and any archaeological remains discovered during the watching brief, is not possible, preservation by record will be undertaken in advance of construction to mitigate the impact upon the heritage assets. This would take the form of an archaeological excavation of the archaeological remains.
Cultural Heritage	Pre-Construction	CH4	Prior to the implementation of any mitigation, a Written Scheme of Investigation would be drafted in consultation with HCHET. This document would detail the precise methodology of any archaeological work to be undertaken and any subsequent phases of assessment.
Hydrology, Hydrogeology, Geology and Soils	Construction Phase	HYD1	A CEMP will be produced by the Contractor and implemented during construction of the Proposed Development. The CEMP will detail best practice construction management measures, including those to manage risks associated with construction of the Proposed Development to the environment and human health, such as those associated with pollution and resource use. Key measures to minimise peat stability risk could include: • avoidance of removal of slope support; • avoidance of heavy loading on slopes; • good drainage practice to ensure flows not concentrated onto slopes or into excavations; • restricting earthmoving activities during and immediately after intense and prolonged rainfall events; and • creating and managing of geotechnical risk register or similar management system throughout the detailed design and construction phases. The CEMP will take into account any discussions undertaken with stakeholders and will be submitted in advance of construction commencement to SEPA and The Highland Council for approval. Mitigation measures will be monitored by an Environmental Clerk of Works (EnvCoW) throughout construction.
Hydrology, Hydrogeology, Geology and Soils	Construction Phase	HYD2	Existing tracks will be utilised where possible, however, the construction of the temporary access track for the Proposed UGC means there is potential for sediment laden runoff. To mitigate this, following the Sustainable

Topic	Phase	Mitigation Reference	How response has been considered
			Drainage Systems (SUDS) good practice guidelines[81], agreed with SEPA, is essential. Drainage for the temporary construction compound (including during their construction) will also follow SuDS principles and will be agreed with SEPA in advance. Excavated material during construction will be stored > 10 m away from and downslope of any adjacent watercourses, ideally > 50 m where possible, to mitigate any risk of runoff from flood or heavy rainfall events and reduce the risk of windborne dry sediment being discharged into the watercourses.
Hydrology, Hydrogeology, Geology and Soils	Construction Phase	HYD3	To avoid exacerbating the potential of peat instability, excavated material or other forms of loading on, or immediately above, breaks of slope or any other potentially unstable slopes will be avoided. Artificial drainage will also be routed to not concentrate flows onto slopes, gully heads or into excavations.
Hydrology, Hydrogeology, Geology and Soils	Construction Phase	HYD4	It is expected that prior to construction commencing, in accordance with the CEMP, the contractor will provide a plan detailing potential locations for temporary storage and an outline programme indicating the duration and quantity of stored peat and measures to mitigate and/or capture sediment runoff from stored material. At all times the primary objectives will be to minimise both the time and volume of temporary storage and to prevent sedimentation of any watercourse or waterbody. Where practical, excavated peat will immediately be used locally for reinstatement and/or landscaping.
Hydrology, Hydrogeology, Geology and Soils	Construction Phase	HYD5	Good practice methods include careful removal of vegetated turves, short timescales between lifting and replacement of turves (with a four week reinstatement objective) and ensuring stored turves are kept in good condition (including watering when weather conditions could lead to desiccation). Revegetation of bare soil with native vegetation will be undertaken as soon as practicable. Excavated material will be re-used as close to excavation location as practicable and as soon as possible. The contractor will follow standard good practice with regards to soil/peat storage, as stated in the CEMP. This will include temporary storage of materials at a minimum distance of 10 m from any watercourses and 50 m from any watercourse identified on Ordnance Survey 50,000 scale mapping, with soil mounds and restoration depths no higher than 2 m and with stable banking. Elements of the management and re-use of excavated material will require approval from statutory stakeholders, including SEPA, taking account of reducing erosion/compaction, protecting the soils from pollution and retaining/enhancing soil functionality as a resource.
Hydrology, Hydrogeology, Geology and Soils	Construction Phase	HYD6	Subject to gradients and ground conditions, preference will be given to lower impact access solutions including the use of low pressure tracked personnel vehicles and temporary track solutions in boggy / soft ground areas to reduce any damage to, and compaction of the ground. These journeys would

[81] SEPA (2010) Planning guidance on Sustainable Drainage Systems (SUDS) [online]. Available at: https://www.sepa.org.uk/media/143195/lups-gu2-planning-guidance-on-sustainable-drainage-systems-suds.pdf [Accessed: May 2023]

Topic	Phase	Mitigation Reference	How response has been considered
			be kept to a minimum to minimise disruption to habitats along the Proposed Development.
Hydrology, Hydrogeology, Geology and Soils	Construction Phase	HYD7	There are a number of opportunities to reduce the extent of excavation and/or increase the extent of re-use opportunities as good practice measures. These include: • reducing excavation depth required for Site infrastructure; • avoiding excavation of the new CSEC by using less intrusive methods to achieve a sufficient degree of levelling; • re-use of all excavated material for engineering fill and landscaping; and • appropriate re-use of excavated material for reinstatement on disturbed ground. Applying the reasonable assumptions discussed above, it is expected there will be sufficient re-use opportunities to balance excavation values. It is considered that all excavated material could be re-used (i.e. balance) with no material needing to be brought onto Site for restoration. All excavated material will be re-used nearby and in as short a timeframe as is feasible during the construction phase. Additionally, locally excavated peat could be used to aid habitat management of the Site. In the event that there is an excess of excavated material, application of additional options at the detailed design and construction phases will be required, as outlined above, in order to avoid off-Site disposal. Furthermore, if no Site use is available, off-Site re-use options should be explored, with appropriate disposal as waste considered only as the final option, in line with the "waste hierarchy"[82] and discussion with SEPA.
Hydrology, Hydrogeology, Geology and Soils	Construction Phase	HYD8	The adoption of the applicable SSEN GEMPs (Appendix 2.2) (which must be adhered to by the Principal Contractor) would reduce the probability of an incident occurring and further reduce the magnitude of any incident due to a combination of good site environmental management procedures, including minimised storage soil and peat volumes, soil management, staff training, contingency equipment, and emergency plans.
Landscape and Visual	Construction Phase	LV1	The mitigation of effects on the landscape and visual resource during construction are integral to the construction process under the 'Considerate Constructors' process that is now routinely followed, such as tidy site management to reduce visual clutter associated with the works; and use of construction lighting in accordance with best practice to minimise lighting intrusion to surrounding sensitive receptors. Such mitigation measures will be included within a CEMP which will be prepared by the Principal Contractor.

[82] Scottish Environment Protection Agency (2010b). Development on Peatland Guidance – Waste. [online] Available at: http://www.sepa.org.uk/media/144152/development_on_peatland_guidance_final_august_2010.pdf or via http://www.sepa.org.uk/environment/energy/renewable/ [Accessed: May 2023].