Scottish & Southern Electricity Networks

TRANSMISSION

Consultation Document (Site Selection)

Coire Mashie Substation

May 2025

REF: LT000505

CONTENTS

Appendices

Figures

GLOSSARY

Term	Definition
Alignment	A centre line of an overhead line or underground cable.
Amenity	The natural environment, cultural heritage, landscape and visual quality. Also includes the impact of SSEN Transmission's works on communities, such as the effects of noise and disturbance from construction activities.
Ancient Woodland Inventory (AWI)	The AWI is a provisional guide to the location of Ancient Woodland. It contains three main categories of woodland, all of which are likely to be of value for their biodiversity and cultural value by virtue of their antiquity: Ancient Woodland (1a and 2a); Long-established woodlands of plantation origin (LEPO) (1b and 2b); and other woodlands on 'Roy' woodland sites.
Area of Search	A broad geographical area to identify potential substation site options.
Biodiversity Net Gain (BNG)	A process intended to leave nature in a better state than it started using good practice principles established by the Business and Biodiversity Offset Programme (BBOP) and organisations including CIRIA, CIEEM and IEMA.
Cairngorms National Park (CNP)	A national park and statutory designation in north-east Scotland, established in 2003. The Cairngorms National Park stretches 4,528 km^2 and includes the towns of Aviemore, Kingussie, Grantown-on-Spey and Ballater. The planning system within the park is managed by the Cairngorms National Park Authority.
Consultation	The dynamic process of dialogue between individuals or groups, based on a genuine exchange of views and, normally, with the objective of influencing decisions, policies or programmes of action.
Corridor	A linear area which allows a continuous connection between the defined connection points. The Corridor may vary in width along its length; in unconstrained areas it may be many kilometres wide.
Environmental Appraisal (EA)	When a Proposed Development is unlikely to give rise to significant environmental effects and is not considered an EIA development it would not be subject to an EIA and the preparation of an EIA Report. In this circumstance, an optional EA detailing the results of surveys, and any appropriate mitigation, can accompany a consent application.
Environmental Impact Assessment (EIA)	A formal process codified by EU directive 2011/92/EU, and subsequently amended by Directive 2014/52/EU. The national regulations relevant to electricity developments are set out in The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 for overhead transmission lines and The Town and Country Planning Works (Environmental Impact Assessment) (Scotland) Regulations 2017 for substations and underground cables, as required. The EIA process includes the preparation of an EIA Report by the developer to systematically identify, predict and report on the likely significant environmental effects of a proposed project or development.
GWDTE	Groundwater Dependent Terrestrial Ecosystems.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities.
Kilovolt (kV)	One thousand volts.
Listed Building	Building included on the list of buildings of special architectural or historic interest and afforded statutory protection under the 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' and other planning legislation. Classified categories A – C(s).
Mitigation	Term used to indicate avoidance, remediation or alleviation of adverse impacts.
NNR	National Nature Reserve.
NPF4	National Planning Framework – Fourth Edition.

Term	Definition
NWSS	Native Woodland Survey of Scotland.
Overhead line (OHL)	An electric line installed above ground, usually supported by towers or poles.
Plantation Woodland	Woodland of any age that obviously originated from planting.
PWS	Private Water Supply
Route	A linear area of approximately 1 km width (although this may be narrower/wider in specific locations in response to identified pinch points / constraints), which provides a continuous connection between defined connection points.
Routeing	The work undertaken which leads to the selection of a proposed alignment, capable of being taken forward into the consenting process.
Scheduled Monument	A monument which has been scheduled by Scottish Ministers as being of national importance under the terms of the 'Ancient Monuments and Archaeological Areas Act 1979'.
Semi-natural Woodland	Woodland that does not obviously originate from planting. The distribution of species will generally reflect the variations in the site and the soil. Planted trees must account for less than 30% of the canopy composition.
Sites of Special Scientific Interest (SSSI)	Areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species across Britain.
Special Area of Conservation (SAC)	An area designated under the European Commission (EC) Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Landscape Area (SLA)	Landscapes designated by the Highland Council which are considered to be of regional/local importance for their scenic qualities.
Special Landscape Qualities (SLQ)	The characteristics that make a designated landscape special in terms of landscape and scenery, both individually or combined.
Special Protection Area (SPA)	An area designated under the 'Wild Birds Directive (Directive 74/409/EEC)' to protect important bird habitats. Implemented under the 'Wildlife and Countryside Act 1981'.
Stakeholders	Organisations and individuals who can affect or are affected by SSEN Transmission works.
Substation	A node on the network to allow safe control of the electricity network. This could include convergence of multiple circuits, transformation of voltage or other functions to maintain and operate the electricity network.
Substation Site	Site identified as necessary to deliver all the substation infrastructure requirements e.g. platform, internal access, temporary construction area, drainage including sustainable drainage systems (SuDS), & landscaping.
Substation Platform Area	Area of the stone platform required for the HV infrastructure
The Highland Council (THC)	The Highland Council.
The National Grid	The electricity transmission network in the Great Britain.
Underground Cable (UGC)	An electric cable installed below ground, protected by insulating layers and marked closer to the surface to prevent accidental damage through later earthworks.
Volts	The international unit of electric potential and electromotive force.
WLA	Wild Land Areas.

PREFACE

This Consultation Document has been prepared by ASH design+assessment Ltd. (ASH) on behalf of Scottish Hydro Electric Transmission plc ("the Applicant") who, operating and known as Scottish and Southern Electricity Networks Transmission (SSEN Transmission), owns, operates and develops the high voltage electricity transmission system in the north of Scotland and remote islands.

This Consultation Document invites comments from all interested parties on the substation site options identified for a new 400 kV substation, “Coire Mashie substation”. Coire Mashie substation would be required to connect the consented Earba Pumped Storage Hydro (PSH) scheme to the electricity transmission network, near Kinloch Laggan within the Highlands of Scotland.

The Consultation Document is available online at the project website at:
https://www.ssen-transmission.co.uk/new-coire-mashie-and-earba/

Over the coming months, SSEN Transmission will be actively engaging with Statutory Consultees and stakeholders to further understand constraints and identify potential opportunities for the project. Public consultation events detailing the proposals described in this document will be held at the following time and location:

- 28th May 2025: 14:00 to 19:30 at Laggan Village Hall, Newtonmore, PH20 1AN

Comments on this document should be sent to:

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All comments are requested by **28th June 2025.**

EXECUTIVE SUMMARY

Overview

Scottish and Southern Electricity Networks Transmission (SSEN Transmission), operating under licence as Scottish Hydro Electric Transmission plc, is proposed to construct a new 400 kV substation to connect approximately 1,800 MW of power from the contested Earba Pumped Storage Hydro (PSH) Scheme near Kinloch Laggan in the Highlands of Scotland, to the existing transmission network.

An application for consent under Section 36 of the Electricity Act 1989 was submitted by Gilkes Energy Ltd. for the 'Earba Pumped Storage Hydro (PSH)' project in March 2024. Scottish Ministers granted consent for the project in March 2025.

SSEN Transmission has a statutory duty under Schedule 9 of the Electricity Act 1989 to develop and maintain an efficient, co-ordinated and economical transmission system in its licenced areas. SSEN Transmission has obligations to offer non-discriminatory terms for connection to the transmission system. In line with these duties and obligations, SSEN Transmission has entered into an agreement with Gilkes Energy Ltd., the PSH developer, to provide a connection from the PSH scheme to the National Grid.

To connect Earba PSH scheme to the National Grid a new 400 kV substation would be required. The new substation, referred to in this document as "Coire Mashie substation", would be required to be located within close proximity to the existing Beauly – Denny 400 kV Overhead Line (OHL) to enable onward transmission of electricity. A site selection exercise has been carried out to identify and appraise site options for the substation, the results of which are set out in this Consultation Document.

An underground cable (UGC) between the PSH scheme and Coire Mashie substation would also be required and is referred to in this document as the "Earba PSH Grid Connection". The UGC would be expected to fall under SSEN Transmission's permitted development rights under Class 40 1(a) of The Town and Country Planning (General Permitted Development) (Scotland) Order 1992. As such these works would not require statutory public consultation or specific consent. An appraisal of route options has however been undertaken and the results of this are included as an appendix to this document for completeness (see **Appendix 1**).

Coire Mashie Substation Principal Findings

A total of five site options have been identified as part of this substation site selection exercise, as shown on **Figure 1**. The approach to site selection for Coire Mashie substation is being informed by SSEN Transmission's guidance 'Substation Site Selection Procedures for Voltages at or above 132 kV' which provides a framework to ensure environmental, technical and economic considerations are identified and appraised at each stage of the site selection process. The principal findings of the appraisal are summarised here and presented in more detail in the rest of this document.

From an environmental perspective, of the five site options, Site Options 3, 4 and 5 are highly constrained against a number of environmental topic areas. The development of a substation at Site Options 3, 4 or 5 would have the potential to be a prominent feature within the Cairngorm's National Park (CNP) with limited opportunities for screening, as well as having the potential to impact Annex 1 habitats and qualifying features of nature conservation sites of international importance. Similarly, from an engineering perspective, Site Options 3, 4 and 5 are all highly constrained, particularly regarding construction access routes, and in relation to hazards and interfaces with other infrastructure. Given the highly constrained nature of Site Options 3, 4 and 5, these sites are not preferred from either an environmental or engineering standpoint.

In contrast, Site Option 1 and Site Option 2 are less constrained across environmental topic areas. Both sites offer opportunities to minimise landscape and visual effects in the local area through the use of screening. Due to its more central location within the commercial forestry plantation, Site Option 2 would likely require more extensive tree felling to accommodate the proposed works. However, Site Option 1 would likely require more substantial earth works in order to establish a level site, which could increase on local landscape character.

Site Option 2 also intersects with, and is sited close to, the non-designated cultural heritage asset of the Drum an Aird township, which is of Regional importance. Depending on site design, there may be opportunities to minimise impacts on this site. In terms of engineering constraints, both options received favourable ratings, albeit there were differences across the two sites in terms of topography, site clearance and earthworks requirements. Given these constraints, it is considered that Site Option 1 is slightly preferred over Site Option 2.

Costs were not assessed in detail as part of this site selection process. These will be considered in more detail at the detailed substation design stage when the technical and engineering specifications become clearer.

Site Option 1 is therefore considered the Potential Site Option that offers the best balance of environmental, technical and cost considerations**,** as illustrated on **Figure 9**.

Earba Grid PSH Connection Principal Findings

As summarised in **Appendix 1**, a number of potential UGC route options have been considered to provide a connection between the PSH scheme and the proposed Coire Mashie substation. Installing an UGC at this voltage can be very challenging, but the appraisal has identified potential route options that seeks to minimise environmental and technical constraints where practicable.

Next Steps

The appraisal of site options presented in this document will be reviewed, taking account of feedback received from key stakeholders and from the public consultation. Following the outcome of the consultation, SSEN Transmission will confirm the proposed site option for the project, and further detailed substation design will take place. On identification of a final proposed substation site and design, an application for consent under the Town and County Planning (Scotland) Act 1997[1] (as amended) (the '1997 Act') will be submitted to the planning authority for the proposed substation.

Any comments relevant to the Earba PSH Grid Connection received as part of this consultation will also be reviewed prior to further appraisal of UGC alignment options over the coming months.

All comments are requested by **28th June 2025**. A Report on Consultation (RoC) will be published after the consultation period has ended, which will document the consultation responses received, how these responses have been considered, and the decisions made in light of these responses. The RoC will be made available online on the project website.

[1] Town and Country Planning (Scotland) Act 1997/ Available at: https://www.legislation.gov.uk/ukpga/1997/8/section/46 [Accessed: May 2025].

1. INTRODUCTION

1.1 Overview

1.1.1 This Consultation Document has been prepared by ASH design+assessment Ltd. (ASH) on behalf of Scottish and Southern Electricity Networks Transmission (SSEN Transmission) ("the Applicant") under licence held by Scottish Hydro Electric Transmission plc, who own, operate and develop the high voltage electricity transmission system in the north of Scotland and remote islands.

1.1.2 This Consultation Document invites comments from all interested parties on the substation site options[2] for a new 400 kV substation near Kinloch Laggan in the Highlands of Scotland. The new substation is referred to in this document as "Coire Mashie substation" and is required to connect the consented Earba Pumped Storage Hydro (PSH) scheme to the National Grid.

1.1.3 This document forms part of a consultation exercise to provide information on the Coire Mashie substation site selection and seek comments from stakeholders and members of the public on the proposals.

1.1.4 A new 400 kV grid connection to connect the consented Earba PSH Scheme to the electricity transmission network at Coire Mashie substation would also be required. This is proposed to be a 400 kV underground cable (UGC) between the Earba PSH scheme and Coire Mashie substation, referred to in this document as the "Earba PSH Grid Connection". The UGC would be expected to fall under SSEN Transmission's permitted development rights under Class 40 1(a) of The Town and Country Planning (General Permitted Development) (Scotland) Order 1992. As such these works would not require statutory public consultation or specific consent. An appraisal of route options has however been undertaken and the results of this are included as an appendix to this document for completeness (see **Appendix 1**).

1.1.5 All comments received will inform further consideration of the substation site options, and the Earba PSH Grid Connection.

1.2 Document Structure

1.2.1 This report comprises seven sections as follows:

1. Introduction – setting out the purpose of the Consultation Document;
2. The Proposals – describes the need for the proposals, the proposed technology solutions and typical construction methods;
3. Site Selection Process - sets out the process that has been applied in the selection and appraisal of substation site options;
4. Description of Site Options – describes the substation site options that have been identified for appraisal;
5. Environmental Baseline – describes the local context and baseline environmental context;
6. Comparative Appraisal – appraises each site option against a series of environmental, technical and cost considerations; and
7. Summary and next steps – invites comments on the site assessment process and site options and outlines the next steps.

1.2.2 The main body of this document is supported by a series of figures.

[2] A site area identified as necessary to deliver all the substation infrastructure requirements e.g. platform, internal access tracks, temporary construction area, drainage including Sustainable drainage systems (SuDS), landscaping.

2. THE PROPOSALS

2.1 The Need for the Project

2.1.1 SSEN Transmission owns and maintains the electricity transmission network across the north of Scotland and holds a license under the Electricity Act 1989 to develop and maintain an efficient, co-ordinated and economical system of electricity transmission.

2.1.2 The consented Earba PSH Scheme, being developed by Gilkes Energy Ltd., is a pumped storage hydro scheme that would operate by transferring water between a lower reservoir, Lochan na h-Earba (Loch Earba[3]) and an upper reservoir, Loch a' Bhealaich Leamhain (Loch Leamhain). The planning application was submitted to the Energy Consents Unit (ECU) of the Scottish Government in March 2024 (ECU reference number: ECU00005062)[4] and was consented in March 2025.

2.1.3 The current proposed capacity of the Earba PSH Scheme is 1,800 MW. The scheme requires connection to the electricity transmission network by the latter half of 2029.

2.1.4 To connect Earba PSH scheme to the National Grid, a new 400 kV UGC connection and substation would be required, close to the existing Beauly – Denny 400 kV OHL to enable onward transmission of electricity.

National Planning Policy

2.1.5 Scotland's fourth National Planning Framework (NPF4) was published by the Scottish Government on 13th February 2023[5]. NPF4 is a long-term strategy for Scotland (to 2045) that guides spatial development, sets out national planning policies, designates national developments and highlights regional spatial priorities. Alongside adopted local development plans, NPF4 now forms part of the statutory development plan for decision making in Scotland. In NPF4, transmission infrastructure is supported in both National Development ND3 'Strategic Renewable Electricity Generation and Transmission Infrastructure' and in Policy 11 Energy, however proposals are required to be assessed against all relevant development plan policies.

2.1.6 The Proposed Development would form a vital element to deliver network and grid infrastructure required to deliver the Government's legally binding targets for net zero emissions and renewable energy generation and energy storage objectives.

2.2 Proposed Technology Solution

2.2.1 The proposed technology solution for this substation platform[6] would accommodate the operation of 24 bays of an Air Insulated Substation (AIS) at 400 kV. To facilitate this size of substation, a site of up to 1 km^2 would be required to accommodate the substation platform, cut and fill requirements, temporary construction area, drainage (including Sustainable Drainage Systems (SuDS)), and any immediate landscaping around the substation boundary.

2.2.2 In addition to the size of the site, another key design parameter in substation site selection for this project is the proximity to the existing Beauly to Denny 400 kV OHL. The proposed substation would require connection into this OHL for onward transmission of electricity. Any site option chosen that is not adjacent to the OHL would require a new connection (likely OHL) between the chosen site and the Beauly to Denny OHL.

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[3] Referred to throughout this report as 'Loch Earba'.
[4] ECU (2024) *Earba 1,800MW Pumped Storage Hydro Scheme*, [online] Available at: https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00005062 [Accessed: May 2025].
[5] Scottish Government (2023) *National Planning Framework 4*, [online] Available at: https://www.gov.scot/publications/national-planning-framework-4/, [Accessed: April 2025].
[6] Area of stone platform required for the substation infrastructure.

2.2.3 The proposed technology for the Earba PSH Grid Connection would be a 400 kV double circuit UGC. See **Appendix 1** for further detail.

2.3 Proposal Overview

General Construction Activities

2.3.1 To facilitate construction of the substation, the main elements associated with the construction phase are anticipated to include:

- Enabling works and site clearance;
- Establishment of a temporary construction compound;
- Establishment of suitable laydown areas for materials;
- Construction of necessary access to the substation site, including upgrades to the local road network as required;
- Ground works to achieve a level area at the site;
- Construction of perimeter and site drainage, including sustainable drainage systems (SuDS), where required;
- Delivery of components and materials to site;
- Construction and installation of the substation components and control building;
- Installation of electrical plant;
- Erection of a palisade security fence up to a minimum of approximately 2.4 m in height;
- Remedial works to reinstate the immediate vicinity; and
- Inspections and commissioning.

2.3.2 General construction activities for the UGC are discussed in **Appendix 1**.

Forestry Removal

2.3.3 Construction of the project may require the removal of sections of commercial forest, depending on the choice of the proposed substation site. This would be undertaken in consultation with affected landowners, and the project would comply with the Scottish Government's Control of Woodland Removal Policy (CoWRP).[7]

Access Strategy

2.3.4 For the proposed substation, construction and operational access would be required for the site. Existing tracks, such as estate and forestry tracks, would be utilised where possible, but given the number and type of construction vehicles required it is likely that any existing tracks would be subject to upgrading. Depending on the substation location, new access tracks may also be required.

Programme

2.3.5 It is anticipated that construction of the project would take approximately 24 months, following the granting of consents, although detailed programming of the works would be the responsibility of the Contractor in agreement with SSEN Transmission.

[7] Forestry Commission Scotland (2009) Control of Woodland Removal Policy.

2.4 Biodiversity Net Gain

2.4.1 Biodiversity Net Gain (BNG) is an approach to development that aims to leave the natural environment in a measurably better state than it was pre-development. SSEN Transmission has developed a BNG toolkit based upon the Natural England metric[8], which aims to quantify biodiversity based upon the value of habitats for nature. It is an efficient and effective method for demonstrating whether development projects have been able to maintain or increase the biodiversity value of a development site after construction works.

2.4.2 The BNG toolkit would be applied to the project to quantify the overall potential biodiversity impacts; this includes a biodiversity baseline assessment, analysis of habitat losses due to temporary works and permanent infrastructure, and analysis of biodiversity gains following reinstatement of habitats in areas of temporary construction work.

SSEN Transmission's Biodiversity Ambition

2.4.3 SSEN Transmission is committed to protecting and enhancing the environment by minimising the potential impacts from their construction and operational activities. As part of this approach, SSEN Transmission has made commitments within its Sustainability Strategy (2018)[9] , Sustainability Plan (2019)[10] and RIIO-T2 Business Plan[11], for new infrastructure projects to:

- Ensure natural environment considerations are included in decision making at each stage of a project's development;
- Utilise the mitigation hierarchy to avoid impacts by consideration of biodiversity in project design;
- Positively contribute to the UN and Scottish Government Biodiversity strategies by achieving an overall 'No Net Loss' on new infrastructure projects gaining consent in 2020 onwards and achieving Net Gain on all new projects gaining consent in 2023 onwards; and
- Work with their supply chain to gain the maximum benefit during asset replacement and upgrades.

2.4.4 The design and evolution of this site selection project will be carried out in line with these commitments.

[8] Natural England Biodiversity Metric 3.1 (2022) [online] Available at: https://publications.naturalengland.org.uk/file/5450039124819968 [Accessed: May 2025].
[9] Delivering a smart, sustainable energy future: The Scottish Hydro Electric Transmission Sustainability Strategy (2018) [online] Available at: https://www.ssen-transmission.co.uk/media/2701/sustainability-strategy.pdf [Accessed: May 2025].
[10] Our Sustainability Plan: Turning Ambition into Action. (2019) SHE Transmission. [online] Available at: https://www.ssen-transmission.co.uk/media/3215/our-sustainability-plan-consultation-report.pdf [Accessed: May 2025].
[11] A Network for Net Zero - SSEN Transmission (2022) [online] Available at: https://www.ssen-transmission.co.uk/information-centre/riio-t2-plan-and-uncertainty-mechanisms/ [Accessed: May 2025].

3. SITE SELECTION PROCESS

3.1 Background

3.1.1 The approach to site selection is being informed by SSEN Transmission's guidance 'Substation Site Selection Guidelines for Voltages at or above 132 kV[12] which provides a framework to balance out environmental considerations with technical and economic considerations throughout the site selection process.[13]

3.1.2 The guidance splits the site selection process into stages, as follows:

- Stage 0: Pre-Site Selection Activities – Strategic Connections Options Appraisal;
- Stage 1: Initial Site Screening;
- Stage 2: Detailed Site Selection; and
- Post Site Selection Activities – Consenting Process.

3.1.3 Each stage is an iterative process and involves an increasing level of detail and resolution, bringing environmental, technical and cost considerations together in a way which seeks to achieve the best balance at each stage. The stages carried out can vary depending on the type, nature and size of a project and consultation is carried out at each stage of the process as appropriate.

3.1.4 The Proposed Development is currently at Stage 2: Detailed Site Selection, the objective of which is to identify a proposed site for the substation.

3.2 Stage 1: Initial Site Screening

3.2.1 An initial 10 km Area of Search was developed to identify potential sites that could support the development of a substation site that meets the design parameters. The initial Area of Search was established from a central point to the north of Loch Laggan, near to the Beauly to Denny OHL, and then expanded out by 10 km in each direction, to allow for a thorough consideration of potentially suitable locations.

3.2.2 The Area of Search is broadly centred on Kinloch Laggan, and extends towards Laggan and Dalwhinnie to the east, Loch Pattack to the south, Creag Meagaidh to the west and Sherramore Forest to the north. Part of the Area of Search is located within the Cairngorms National Park (CNP).

3.2.3 Review of the Area of Search was undertaken to establish potential site options that could feasibly be developed to facilitate the requirements of this project. This review gave particular consideration to the size of the area required to construct the substation, the geography and terrain of the area, the sensitive environment which is recognised through the various designations across large parts of the Area of Search, and the proximity to the Beauly to Denny OHL. The review concluded that the only viable site options that could be identified at Stage 1 were areas located within the vicinity of the Beauly to Denny OHL as it passes through Glen Shirra and to the south of the A86 within Strath Mashie. Beyond this area it was deemed that no other site could meet the key design parameters set for the project.

3.2.4 As such, five site options were identified at Stage 1 and it was agreed amongst the project team to take all sites forward to detailed site selection at Stage 2 (as shown on **Figure 1**).

[12] SSEN Transmission (2022) Substation Site Selection Guidelines for Voltages at or above 132kV.
[13] See Appendix 1 for detail of the routeing process for the Earba PSH Grid Connection.

3.3 Stage 2: Detailed Site Selection

3.3.1 As part of the work associated with Stage 1 and Stage 2, in accordance with the steps outlined in SSEN Transmission's approach to substation site selection, the following considerations have been taken into account as far as is practicable and will be considered in more detail during subsequent stages as the design evolves:

- Respect areas of high amenity value and take advantage of the containment of natural features such as woodland, fitting in with the landscape character of the area);
- Take advantage of ground form with the appropriate use of site layout and levels to avoid intrusion into surrounding areas;
- Use space effectively to limit the area required for development, minimising the effects on existing land use and rights of way;
- Alternative designs of substations may also be considered, e.g. 'enclosed', rather than 'open', where additional cost can be justified;
- Consider the relationship of towers and substation structures with background and foreground features, to reduce the prominence of structures from main viewpoints; and
- When siting substations take account of the effects of line connections that will need to be made.

3.3.2 In addition, principles of BNG and the mitigation hierarchy have been considered during the site selection process and will continue to inform detailed site design decisions as the project progresses.

3.3.3 Appraisal of the site options was undertaken against a number of environmental, engineering and cost criteria set out within the SSEN Transmission guidance[14]:

Environmental Criteria

- Natural Heritage – designations, protected species, habitats, ornithology, hydrology, geology and hydrogeology;
- Cultural Heritage – designations and cultural heritage assets;
- People – proximity to dwellings;
- Landscape and visual – designations, landscape character and visual;
- Land Use – agriculture, forestry, recreation and infrastructure; and
- Planning – policy and proposals.

Engineering Criteria

- Connectivity – existing circuits / networks, future development possibilities, interface with SSE distribution and generation, and DNO connection;
- Footprint Requirements – technology, adjacent land use, and space availability;
- Hazards – unique hazards, and existing utilities;
- Ground Conditions – topography, and geology;
- Environmental Conditions – elevation, salt pollution, flooding, carbon footprint, sulphur hexafluoride (SF6), contaminated land, and noise;
- Construction Access - substation access road, and transformer delivery route; and
- Operation and Maintenance – access.

Economic Criteria

- Capital – construction costs; and
- Operational – inspections and maintenance costs.

[14] SSEN Transmission (2022) *Substation Site Selection Guidelines for Voltages at or above 132kV.*

RAG Rating

3.3.4 A RAG rating has been applied to each topic area for each site option, indicating potential constraints to development. A high-level convention for assigning RAG ratings is shown in **Plate 3.1** below.

Plate 3.1: RAG Ratings

Performance	Comparative Appraisal
Most Preferred	Low potential for the development to be constrained
	Intermediate potential for the development to be constrained
Least Preferred	High potential for the development to be constrained

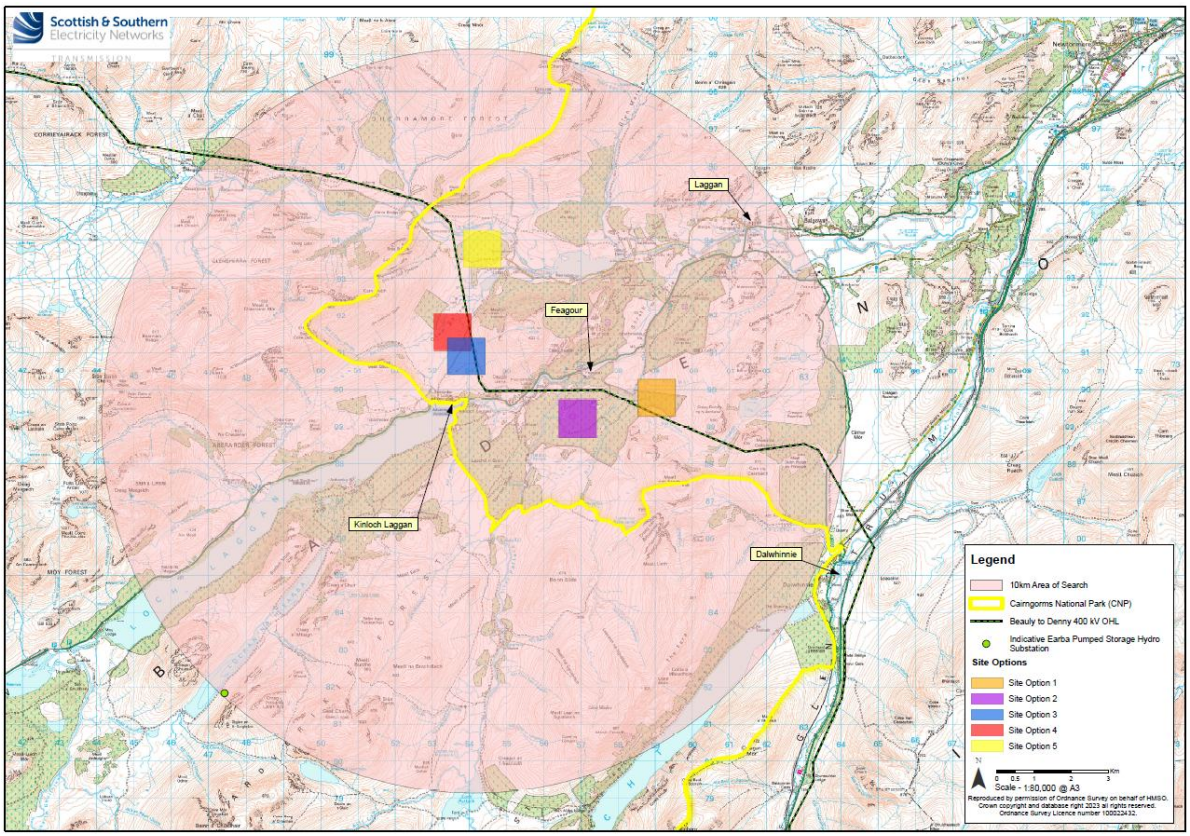
4. DESCRIPTION OF SITE OPTIONS

4.1 Overview

4.1.1 The site options appraised for the Proposed Development are shown on **Plate 4.1** below and **Figure 1** and are described in this section of the report. The five site options are:

- Substation Site Option 1 (Orange);
- Substation Site Option 2 (Purple);
- Substation Site Option 3 (Blue);
- Substation Site Option 4 (Red); and
- Substation Site Option 5 (Yellow).

Plate 4.1: Site Options



4.2 Site Option 1 (Orange)

4.2.1 Site Option 1 represents the most easterly site option, situated approximately 1 to 2 km to the south of Strathmashie and the A86. Site Option 1 is located on sloping ground that rises to the east from approximately 300 m above ordnance data (AOD) to 400 m AOD. The site option is located on an area of upland moorland, part of which is covered by commercial forestry, which is owned and managed by Forestry and Land Scotland (FLS). The River Mashie runs to the west and north of the site, whilst its tributaries the Allt Mor and Allt Tarsuinn run partly through the site option.

4.2.2 The site option is located within the CNP. Approximately 2 km to the south of the site lies Meall nan Eagan (658 m AOD) on the park boundary. Other hill tops such as Creag Doire na h-Achlaise (560 m AOD) and Creag na Doire Duibhe (574 m AOD) are located within 2 km to the east of the site, whereas more prominent summits and Munros are located further afield.

4.2.3 Settlement within the vicinity of the site option and wider area is sparse. A small number of properties are present near Strathmashie and Feagour, approximately 1 km to 1.5 km to the north and north-west of the site option, located along the A86.

4.2.4 Site Option 1 is located adjacent, and primarily to the east, of the existing Beauly to Denny OHL.

4.2.5 The location of Site Option 1 is shown in **Plate 4.1** (see also **Figure 1**), whilst photos of the site are provided in **Plate 4.2**.

Plate 4.2: Site Option 1 Photographs

Photo 1: Looking south-west towards the existing Beauly - Denny OHL from a central point within Site Option 1.

Photo 2: Looking west in the direction of Feagour from the northern extent of Site Option 1.

4.3 Site Option 2 (Purple)

4.3.1 Site Option 2 is located within a commercial forestry plantation which is owned and managed by FLS. The site is gently sloping with undulating ground, with the central part of the site at approximately 320 m AOD. The River Pattack runs between approximately 50 m and 350 m from the western edge of the site option, and the River Mashie passes between approximately 150 m and 500 m from the eastern edge of the site option. Site Option 2 intersects the Dark Gully watercourse, a tributary of the River Mashie.

4.3.2 Site Option 2 contains part of the features associated with Druim an Aird township, a cultural heritage feature of regional sensitivity and the focus at the end of a marked walking trail in the area.

4.3.3 Settlement within the vicinity of the site option and wider area is sparse. A small number of properties are present at Feagour, approximately 0.8 km to the north of the site option. Two of these properties are located on the north side of the A86, whilst one property is located off an access track to the south of the A86. Inverpattack Lodge is located approximately 1 km to the northwest of the site, alongside the A86.

4.3.4 Site Option 2 is located approximately 0.2 km to the south of the existing Beauly to Denny OHL and would therefore require additional OHL infrastructure to form a connection between the two.

4.3.5 The location of Site Option 2 is shown in **Plate 4.1** (see also **Figure 1**), whilst photos of the site are provided in **Plate 4.3**.

Plate 4.3: Site Option 2 Photographs

Photo 1: Looking south from the existing Beauly to Denny OHL towards forestry edge that Site Option 2 would be situated within.

Photo 2: Looking west from FLS tracks on the western edge of Site Option 2 towards the east of the site option.

4.4 Site Option 3 (Blue)

4.4.1 Site Option 3 lies to the north of Loch Laggan within Ardverikie Estate, approximately 1 km to the north of Kinloch Laggan and the A86. The central and western parts of the site are located on gently sloping moorland, at approximately 330 m AOD. The eastern part of the site however comprises more steeply sloping ground, up to approximately 450 m AOD. The watercourse, flowing from Loch na Lairige into Loch Pattack, passes through the northern part of the site, and another watercourse passes through the south. Mountainous terrain is present to the west of the site, with the Stob Coire Dubh munro within 3.5 km of the site.

4.4.2 There are no properties within the immediate vicinity of the site, with a small number of properties located within approximately 600 m to 1 km to the south along or close to the A86, including Aberarder Lodge and properties at Kinloch Laggan.

4.4.3 The location of Site Option 2 is shown in **Plate 4.1** (see also **Figure 1**), whilst photos of the site are provided in **Plate 4.4**.

Plate 4.4: Site Option 3 Photographs

Photo 1: View from track at the southwestern corner of Site Option 3 looking northeast.

Photo 2: View from track to the north of Site Option 3 looking southwest towards Site Option 3 and Loch Laggan.

4.5 Site Option 4 (Red)

4.5.1 Site Option 4 lies to the north of Loch Laggan within Ardverikie Estate, approximately 1 km to the north of Kinloch Laggan and the A86. Site Option 4 partially includes the northwest corner of Site Option 3 whilst extending further north into the Glen Shirra valley within Ardverikie Estate. The AOD of the central point of Site Option 4 is approximately 310 m. The land within the central and eastern part of the site option includes areas of flat, open moorland, with tributaries passing within it northeast to southwest from Loch Crunachdan, which sits approximately 0.7 km to the north-east. In the western part of the site option, the land drops to approximately 290 m AOD, and the site is shown to directly intersect Allt Crunachdan. Mountainous terrain is present to the west of the site, with the Stob Coire Dubh munro within 3 km of the site.

4.5.2 There are no properties within the immediate vicinity of the site, with a small number of properties located within approximately 500 m to 0.9 km to the south along or close to the A86, including Aberarder Lodge and properties at Kinloch Laggan.

4.5.3 The location of Site Option 4 is shown in **Plate 4.1** (see also **Figure 1**), whilst photos of the site are provided in **Plate 4.5**.

Plate 4.5: Site Option 4 Photographs

Photo 1: View from the existing track within Site Option 4, looking west across the open moorland where the rest of the site option is situated across.

Photo 2: View of peatland habitats within Site Option 4, looking south.

4.6 Site Option 5 (Yellow)

4.6.1 Site Option 5 is located within a commercial forestry plantation which is owned and managed by Jahama Highland Estate. The site is gently sloping with undulating ground, with the central part of the site at approximately 290 m AOD. The site option represents the most northerly option, situated within the Upper Spey Valley. The edges of the forestry to the north and south are met with open moorland. The River Spey intersects the north-east and north-west corners of the site option. One tributary of River Spey cuts across the site option, passing through the northwest area. Additional waterbodies in the vicinity include Loch Crunachdan which sits approximately 0.2 km to the south.

4.6.2 There are properties within the vicinity of the site option, including Sherramore Lodge approximately 0.3 km to the east, and the Listed Building, Glenshero Lodge (LB 6901), approximately 0.2 km to the southeast, as well as properties along the non-designated parts of General Wades Military Road, which cuts through the south of the site option itself.

4.6.3 Site Option 5 is located between approximately 150 m and 300 m of the existing Beauly to Denny OHL

4.6.4 The location of Site Option 4 is shown in **Plate 4.1** (see also **Figure 1**), whilst photos of the site are provided in **Plate 4.6**.

Plate 4.6: Site Option 5 Photographs

Photo 1: View from General Wade's Military Road looking west passing directly through the area of Site Option 5.

Photo 2: View from General Wade's Military Road looking east towards the forestry that Site Option 5 would be situated within.

5. ENVIRONMENTAL BASELINE

5.1 Introduction

5.1.1 This section of the report describes the environmental baseline and key constraints within the vicinity of the site options identified. Where the environmental baseline differs or contains additional features in the areas covered by the proposed UGC route options, this has been described in **Appendix 1**. This section makes reference to **Figures 2** to **8** which display the various designations and environmental features discussed throughout.

5.2 Local Context

5.2.1 The Area of Search (illustrated on **Figure 1**) is located in the Inverness-shire area within the Highland region of Scotland. All site options are situated within the CNP. The A86 trunk road, which passes through Strath Mashie and along the northern side of Loch Laggan, is the main transport link through the area.

5.2.2 Settlement within the area is generally sparse and limited to a few scattered properties within Strath Mashie (including at Aberarder Lodge, Kinloch Laggan, Gallovie, Inverpattack, Feagour and Strath Mashie); and the Spey Glen (including shooting lodges and estate properties at Glenshero Lodge, Sherramore and Garvamore).

5.2.3 The area comprises mountainous terrain, which attracts visitors and recreational users to its munro and mountain summits and other outdoor activities. There are large water bodies present, namely Loch Earba and Loch Laggan situated to the southwest of the Area of Search, and a number of watercourses including the River Spey, River Mashie and River Pattack.

5.2.4 A number of hydroelectric operations are present within the general area. Water within Loch Earba is used for the Ardverikie 1 MW hydroelectric scheme, whilst the powerhouse for the Pattack Hydro Scheme sits adjacent to Loch Laggan on Arderikie Estate. In the wider area, approximately 33 km to the south-west is the Lochaber Hydroelectric Scheme, designed to provide electricity for aluminium operations at Fort William. The existing Beauly to Denny 400 kV OHL is also a prominent feature through parts of this area.

5.3 Natural Heritage

Natural Heritage Designations

5.3.1 The following designated sites are present within a 5 km radius of the substation site options (see **Figure 2**):

- Cairngorms National Park - the CNP is the largest such park in the UK and is designated for a unique range of environments, including the largest area of arctic mountain landscape, hosting 25% of Britain's threatened birds, animals, and plants. All site options are located within the CNP.
- Creag Meagaidh National Nature Reserve - the NNR is designated for a range of habitats, including extensive high summit plateau, corries, moss-heath habitat, rare woolly willow, and ancient woodland.
- Creag Meagaidh SAC - designated for a range of habitat types, including acidic scree, alpine / subalpine heaths, blanket bog, clear-water lochs with poor to moderate nutrient levels, dry heaths, montane acid grassland, plants in crevices on acid / base-rich rocks, and wet heathland with cross-leaved heath.
- Creag Meagaidh SPA - designated as a dotterel (*Charadrius morinellus*) breeding ground.
- Creag Meagaidh SSSI - designated for its breeding bird assemblage, rocky slopes, upland assemblage, upland birch woodland, and vascular plant assemblage.
- The River Spey SAC and SSSI - designated for the internationally important species assemblage this river system supports, comprising Atlantic salmon (*Salmo salar*), freshwater pearl mussel (*Margaritifera margaritifera),* otter (*Lutra lutra*), and sea lamprey (*Petromyzon marinus)*.

- Monadhliath SAC and SSSI - designated for blanket bog habitat, as well as additional SSSI designations for the black mountain moth (*Glacies coracina*), breeding bird assemblage, dotterel breeding grounds, upland assemblage, and vascular plant assemblage.
- AWI parcels are present across the locale classified as being of both plantation and semi-natural origin, although not located within any of the site options.
- Kinlochlaggan Boulder Beds SSSI is situated approximately 900 m east of Loch Laggan and is designated for Dalradian geology.

Protected Species

5.3.2 Based upon the presence of suitable habitats and qualifying features of nearby designated sites, a review of baseline information and preliminary site walkovers, the following protected species are considered likely to be present within the local area:

- Atlantic salmon (*Salmo salar*), freshwater pearl mussel (*Margaritifera margaritifera),* otter (*Lutra lutra*), and sea lamprey (*Petromyzon marinus)* are qualifying features of the River Spey SAC / SSSI. Beavers (*Castor fiber*) are also currently being reintroduced to the River Spey. Several watercourses which run through the Area of Search are connected to the River Spey SAC / SSSI, as well as the River Pattack, and may provide suitable habitat for these qualifying species. In addition, Brown trout is a Scottish Biodiversity List (SBL) species likely to utilise several of the watercourses that run through the site options that are connected to the River Spey.
- The distribution, abundance, and connectivity of watercourses / waterbodies indicates there is likely to be otter (*Lutra lutra*) present within the area, with commuting, foraging, and sheltering opportunities present throughout Otter is also a designated feature of the River Spey SAC and SSSI, which supports suitable prey resources for otter such as Atlantic salmon (*Salmo salar*), sea lamprey (*Petromyzon marinus*) and brown trout (*Salmo trutta*).
- No records of water vole (*Arvicola amphibius)* were returned via the desk study. However, the hydrological network and the surrounding riparian habitats provide extensive suitable habitat for water vole within the area.
- Desk-based records of red squirrel (*Sciurus vulgaris*) and pine marten (*Martes martes*) were noted. The well-connected woodland corridors, dominated by coniferous plantation species, provide suitable habitat for red squirrel and pine marten within the area. Several records of red squirrels were returned via the desk study within a 2 km radius of all site options, identified within woodland surrounding Loch Laggan, the A86, and Loch Crunachdan.
- Saving Wildcats translocated 19 wildcats (*Felis sylvestris*) into the CNP in 2023[15]. The mosaic of coniferous and mixed woodlands, including clear-fell areas, in combination with open heathland, grasslands, scrub, and riparian corridors across the area demonstrates a high degree of suitable edge habitat for this European Protected Species, with significant foraging, commuting, and breeding opportunities available throughout the area.
- Further suitable habitat exists for hedgehog (*Erinaceus europaeus*), mountain hare (*Lepus timidus*), reptiles, and amphibians, including the upland heathland, grassland, inland rock, woodland, and wetland. Records of hedgehog, common lizard (*Zootoca vivipara*), palmate newt (*Lissotriton helveticus*) and common frog (*Rana temporaria*) were returned via the desk study within a 2 km radius of the site options. No records were returned for mountain hare.

[15] It is understood that further release plans to translocate wildcats in Strathmashie are planned for 2025. SSEN Transmission will continue to monitor this and engage with Saving Wildcats as the project progresses.

5.3.3 The site options specifically do not support an extensive coverage of broadleaved woodland and, as a result, in combination with the almost ubiquitous wet soil conditions and absence of foraging resources within coniferous plantations, may provide limited suitability for badger (*Meles meles*) and associated sett creation opportunities, with no records of badger returned via the desk study.

5.3.4 No buildings are present within the site options. Based on the low coverage of broadleaved woodland in the wider locale surrounding the site options and the likely absence of suitable trees with Potential Roosting Features (PRF) (based on the low Diameter at Breast Height (DBH)), bat activity is unlikely to extend beyond opportunistic commuting and foraging along linear features, such as woodland edge. As such, bat activity levels across the site options are assumed to be low, with no records of bats returned via the desk study.

5.3.5 Some site options would be situated within a B-Line, which is a series of invertebrate pathways running through countryside and towns, along which habitat restoration and creation for the purpose of invertebrates is prioritised. The habitats within the site options, including the heathland, grassland, woodland, and wetland, all provide a high level of suitability for a range of invertebrate species present in the locale. In particular, the black mountain moth is likely to be present, a designated feature of the Monadhliath SSSI, feeding predominantly on crowberry, a plant found throughout the sites. A number of invertebrate records were returned via the desk study within a 2 km-radius of the site options, covering predominantly odonates, lepidopterans, and hymenopterans.

Habitats

5.3.6 Desk-based review of available habitat data, including AWI and NWSS, together with aerial imagery and site data collected from a high-level walkover conducted in January 2024 was used to identify broad habitat types within the area under the UK Habitat Classification (UKHab)[16].

5.3.7 At higher elevations, the dominant habitat coverage within the area is an upland heathland mosaic, comprising wet heath (UKHab code: h1b6), dry heath (UKHab code: h1b5), blanket bog (UKHab code: f1a5), and degraded blanket bog (UKHab code: f1a6). Dry heath is the least common component of this habitat mosaic, situated on steeper gradients with free-draining scree soils. Bogs are commonly situated within small valleys between prominent topography, as well as across larger expanses of flat ground, typically surrounded by wet heath where the slope gradient increases. Notable extensive bogs are present within Glen Shirra. Wet heath, dry heath, and blanket bog are Annex 1 priority habitats of international importance. Degraded blanket bog is a constituent part of the upland heathland mosaic as a subset of Annex 1 blanket bog and is therefore considered to be of Regional importance.

5.3.8 Coniferous woodlands of plantation origin (UKHab code: w2c), are prevalent across the area. Coniferous woodlands display a variation in maturity with large parcels of clear-fell (where upland heath or acid grassland is generally found), associated with rotational management. Patches of Caledonian Forest and native Scot's pine woodland (UKHab code: w2a5 / w2a) are present within some of the site options as part of a wider woodland mosaic extending through Glen Shirra to surround Loch Laggan. Caledonian Forests are an Annex I habitat of International importance. Native pinewoods are an SBL priority habitat of National (Scotland) importance. The non-native other coniferous plantation woodlands are not covered by the Cairngorms Nature Action Plan but still provide connectivity across the woodland mosaic and are therefore considered to be of Local importance.

5.3.9 Areas of broadleaf woodlands are largely absent from the site options, but present in the wider area. However, patches of scattered downy birches (*Betula pubescens*) exist along the River Spey and along smaller

[16] UK Hab Ltd (2023). UK Habitat Classification Version 2.0. Available at: https://www.ukhab.org [Accessed: January 2024]

watercourses in the wider area. Linear features comprising downy birches are also found at the edges of coniferous plantation woodland, with these treeline features covered within the Cairngorms Nature Action Plan and therefore are of Regional importance.

5.3.10 Acid grasslands are present as an infrequent component of the upland heathland mosaic, situated on ground surrounding watercourses where this habitat is semi-natural. Areas of clear-fell can also, at times, display presence of acid grassland. This grassland type is also present in areas that were historically grazed and are currently grazed by livestock, with this management having excluded typical heathland species, allowing for the dominance of grass species. Acid grasslands are common and widespread within the wider locale and are therefore considered to be of Site level importance.

5.3.11 An extensive hydrological network is present throughout all site options, comprising the River Spey and a large number of associated tributaries of varying forms and lengths. These watercourses are further connected to nine established waterbodies, including Loch Laggan, Loch Earba, Loch Coire Chuir, and Loch Crunachdan. The River Spey is a SBL priority habitat and is considered to be of National (UK) importance. All other watercourses are SBL priority habitats of National (Scotland) importance, with associated tributaries, specifically streams and burns, classified as priorities within the Cairngorms Nature Action Plan[17], and therefore considered to be of Regional importance.

5.3.12 The following internationally important Annex 1 habitats (which are afforded greater protection through their inclusion in Annex 1 of the EU Habitats Directive 92/43/EEC) have been recorded within the area, as part of the UKHab classification survey conducted as part of the high-level site walkover:

- H91C0 Caledonian forest;
- 4030 European Dry Heath;
- 4010 Northern Atlantic wet heaths with Erica tetralix; and
- 7130 Blanket Bog*.

**indicates 'priority habitat' which are afforded a higher level of protection due to their conservation importance*.

5.3.13 No woodland recorded on the AWI is located within any of the site options, but is extensive within the wider area.

5.3.14 GWDTE habitats are extensive throughout the area. Under the Functional Wetland Typology[18], based on the upland topography across the region, these habitats would be classified under either the 'peatland' or 'valley bottom' landscape setting. Habitats classified as having a low to moderate dependency on groundwater include wet heath, which is a dominant habitat across the extensive upland heathland mosaic through the area, as well as peat bogs, which are typically surface-water fed habitats.

5.3.15 There are a number of biodiversity enhancement measures proposed as part of the Earba PSH project[19] relating to extensive bog restoration, native woodland restoration / creation, montane willow scrub and other montane habitat restoration, heathland restoration and management, aquatic and riparian enhancement, and other habitat restoration and management measures. Whilst the detail of these measures is to be developed, it is anticipated such measures would be implemented within the vicinity of the proposed Earba PSH, as well as extending more widely in the local area.

[17] CNPA (2019) *Cairngorms Nature Action Plan 2019-2024,* [online] Available at CairngormsNatureAction19_24PlanFinal.pdf [Accessed: May 2025]
[18] Sniffer (2009) WFD95: *A Functional Wetland Typology for Scotland*. [online] Available at https://www.sniffer.org.uk/Handlers/Download.ashx?IDMF=a6579282-8428-4282-bfc7-17c7e6027601 [Accessed: May 2025]
[19] Gilkes Energy Ltd. (2024) Earba Pumped Storage Hydro Scheme [online] Available at: https://earbastorage.co.uk/documents/ [Accessed: May 2025]

Ornithology

5.3.16 Creag Meagaidh SPA, designated for a dotterel (*Charadrius morinellus*) breeding ground, is located within 1 km of Site Options 3, 4, and 5; 4 km of Site Option 2 and 5 km of Site Option 5. Further afield, Ben Alder SPA and Ben Alder & Aonach Beag SSSI, which are designated for breeding Dotterel (*Charadrius morinellus*), and their upland breeding bird assemblage which includes Black-throated Diver (*Gavia arctica*), are located approximately 10 km to the south of Site Options 1 and 2, and approximately 11 km south of Site Options 3 and 4 and approximately 12.5 km south of Site Option 5.

5.3.17 The site option locations and adjacent landscape include several habitats that are used as the preferred displaying, foraging, roosting or nesting areas for a range of protected or sensitive bird species.

5.3.18 The mountainous and higher-elevation moorland habitats throughout the area support opportunities for breeding and foraging Schedule 1 species (including Hen Harrier (*Circus cyaneus*), Merlin (*Falco columbarius*), Golden Eagle (*Aquila chrysaetos*), and Peregrine (*Falco peregrinus*)), as well as other species listed on the Red List of the Birds of Conservation Concern (BoCC5)[20] (including Black Grouse (*Lyrurus tetrix*), Ring Ouzel (*Turdus torquatus*), and Cuckoo (*Cuculus canorus*)).

5.3.19 Other moorland species are present within the site options located in more open areas, including Meadow Pipit (*Anthus pratensis*), Skylark (*Alauda arvensis*), Snipe (*Gallinago gallinago*), Lapwing (*Vanellus vanellus*), Curlew (*Numenius arquata*) and Wheatear (*Oenanthe oenanthe*).

5.3.20 Extensive woodland habitat and woodland scrub across the area provides suitable habitat for nesting Schedule 1 species such as Goshawk (*Accipiter gentilis*), Osprey (*Pandion haliaetus*) and Crossbill (*Loxia spp.*). In addition, several woodland species included on the Red and Amber List Birds of Conservation Concern are present, including Song Thrush (*Turdus philomelos*), Spotted Flycatcher (*Muscicapa striata*), Swift (*Apus apus*), Bullfinch (*Pyrrhula pyrrhula*), Mistle Thrush (*Turdus viscivorus*), Tree Pipit (*Anthus trivialis*) and Lesser Redpoll (*Acanthis cabaret*).

Geology, Hydrology and Hydrogeology

5.3.21 There are numerous watercourses within the areas surrounding the site options, in particular the River Spey, and its tributary the River Mashie, and the River Pattack and Loch Laggan, which are part of the larger River Spean surface water catchment (see **Figure 4**). The River Spey and part of the River Mashie is an important fishery as well as being a designated SSSI and SPA (as discussed in the first paragraph of **Section 6.3** above).

5.3.22 Part of the River Spey surface water catchment (Spey Dam to Loch Insh) has been designated as a Drinking Water Protected Area (DWPA); however, this designation does not extend to any of the site options considered.

5.3.23 Scottish Environmental Protection Agency (SEPA) floodplain mapping shows floodplains associated with the larger watercourses, but flood extents are generally confined to the watercourse channels. Wider flood extents are noted near the confluences of these larger watercourses with smaller tributaries or lochs. All permanent structures would need to be set back from the watercourse channel to protect against natural processes leading to watercourse meandering and migration, and to provide a buffer from construction activity.

5.3.24 The smaller watercourses are not modelled by SEPA and thus do not have a published floodplain extent, however it is likely that flood extents will be limited to the watercourse corridors. Isolated areas of surface water flooding are noted across the site options and along watercourse corridors. Subject to appropriate design and

[20] Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2021). Birds of Conservation Concern 5: the population status of birds in the United Kingdom, Channel Islands and Isle of Man.

industry standard construction and mitigation, flood risk from surface water flooding can be mitigated, and not pose a risk on or off-site.

5.3.25 Superficial deposits within the area are indicated to mostly comprise of glacial till, with hummocky glacial deposits and peat. Alluvium, and glaciofluvial deposits are mapped adjacent to larger watercourses and areas of higher elevation are shown to be absent of any superficial deposits.

5.3.26 The Carbon and Peatland Map 2016[21] indicates that Class 1 peatland habitats are absent from the site options (see **Figure 3**); however, Class 2 peatland habitats were noted in Site Options 1 and 3. Class 2 Peatland Habitat is defined as '*Nationally important carbon-rich soils, deep peat and priority peatland habitat – Areas of potentially high conservation value and restoration potential*'.

5.3.27 Policy 5 of the National Planning Framework 4 (NPF4) 2023 is intended to protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development. Policy 5d requires that '*where development on peatland, carbon-rich soils or priority peatland is proposed, a detailed site-specific assessment will be required*', with this including peat depth surveys, Peat Landslide Hazard and Risk Assessment (PLHRA), and detailed NVC habitat surveys, including an assessment of condition. These assessments and surveys should then direct project design and siting to ensure compliance with the NPF4 mitigation hierarchy, with a further commitment, under NPF4 Policy 3b, '*wherein developments are required to provide significant biodiversity enhancements (in addition to restoration and offsetting requirements*)'.

5.3.28 The bedrock geology of the site options predominantly comprises several metamorphic bedrock units comprising psammites, semipelites, metacarbonates and quartzites. To the east, in the area of Site Option 1, the ground is underlain by granites of the Strathspey Granites and other small igneous intrusions.

5.3.29 Within the area, the following Geological Conservation Review (GCRs) are noted:

- Rubhan a Magach GCR site is located within the western extent of the Corridor along the northern backs of Loch Laggan. The GCR has been designated for metasedimentary rocks of a turbiditic deposition in the Loch Laggan Formation which is considered nationally important.
- Allt Mhainisteir GCR site is located within the south-eastern extent of the Corridor along the banks of Allt Mhainisteir. The GCR has been designated for excellent outcrop of the Kinlochlaggan succession in the Geal-charn-Ossian Steep Belt.
- Kinlochlaggan Boulder Beds SSSI, which is also designated as Kinloch Laggan Road GCR, is located within the northern extent of the Corridor along the northern banks of the River Pattack before its confluence with Loch Laggan. The SSSI and GCR has been designated for exposure of the Kinlochlaggan Boulder Bed within the Dalradian succession and is considered nationally important.

5.3.30 With the exception of peat areas and areas classified as Geological Conservation Review (GCRs) sites, neither the superficial or solid geology are rare or considered high value. Shallow groundwater is likely to be present in the alluvial deposits and in the upper weathered surface of the bedrock regionally.

5.4 Cultural Heritage

5.4.1 Baseline information on known cultural heritage assets recorded within the vicinity of the site options was obtained from datasets curated by Historic Environment Scotland (HES) (Canmore)[22] and the Highland Historic

[21] Scottish Natural Heritage (2016) *Carbon and Peatland Map*. [online] Available at: https://map.environment.gov.scot/soil_maps/ [Accessed: May 2025]

[22] Historic Environment Scotland (2025) *Canmore*. [online] Available at: https://canmore.org.uk/ [Accessed: May 2025].

Environment Record (HER)[23]. A cultural heritage site walkover also took place in November 2023 to further inform these findings, as illustrated on **Figure 5**.

5.4.2 The following provides a summary of the cultural heritage features and activity in the area from the prehistoric period to the 20th century:

- Prehistoric Period: Evidence for a prehistoric presence in the area is sparse. However, the Pictish hill fort of Dun da Lamh, dominating the junction of Strath Mashie with the Spey suggests the significance of east to west travel and trade along both of these routes, while a small amount of evidence for metalworking suggests the exploitation of local resources either in the prehistoric or early mediaeval periods. Despite the strategically important late prehistoric fort at Dun da Lamh there appears to have been very little prehistoric settlement in this area, although a number of log boats found in Loch Laggan possibly confirm the importance of the Strathmashie east to west route.

- Mediaeval Period: A mediaeval presence is indicated by the early mediaeval cross slab at St Kenneth's Church and the possible hunting lodge on an island in Loch Laggan. The lack of mediaeval settlement can be explained by the continuing use of the same land and resources through into the Early Modern period, masking earlier settlement features.

- Early Modern Period, 16th - 18th centuries: Early Modern townships are known at Tullochroam, Aberarder and Laggan Brae on the north side of Loch Laggan. Kinloch and Gallovie at the head of the loch to the south of the River Pattack, with Druim an Aird and the smaller farmstead site of Sron a'Mhadaidh further east. The settlements would have had associated shieling sites although these have not yet all been located; all of these townships and shielings were abandoned with the introduction of commercial sheep farming in the early 19th century.

- 19th century commercial sheep farming: This short-lived activity, centred around Gallovie farm, is represented by a small number of remote shepherds' cottages, stells and fanks, themselves mostly abandoned as the land was developed as a sporting estate from 1860.

- Mid-19th century sporting estate: Centred around Ardverikie House, this included the construction of roads, a network of stalkers and pony paths through the hills and the planting of large coniferous blocks.

- 20th century: developments include the construction of major hydro-electric schemes, further coniferous planting and features associated with the Newfoundland Overseas Forestry Unit during the second world war.

5.4.3 Recording of some of the non-designated archaeological features is scant, with some detailed survey carried out by the local heritage group and some survey in advance of planting but many areas appearing blank on the archaeological record. Targeted areas were therefore investigated further in November 2023 for the purpose of this appraisal.

Designated Heritage Assets

5.4.4 Designation is the legal recognition of some of Scotland's most important historic sites, buildings, and places. It ensures that these assets are protected by law through the planning system and other regulatory processes. Designation includes Scheduled Monuments (SM) and Listed Buildings (LB). The level of protection and how a site or place is managed can vary, depending on the type of designation.

[23] The Highland Council (2025) *Highland Historic Environment Record*. [online] Available at: https://her.highland.gov.uk/ [Accessed: May 2025].

5.4.5 Within the areas surrounding the site options there are two SMs and seven LBs as listed below:

- Scheduled Monuments:
  - St Kenneth's Kirk, Church and Cross Slab, SM 5703;
  - Dun da Lamh Fort, SM 4361;
- Listed Buildings:
  - Old St Kenneth's Church, burial ground, LB 6907;
  - Kinloch Laggan Lime Kiln, LB 6908;
  - Ardverikie Gatelodge, Gate Piers, Bridge, LB 6911;
  - Garvamore 'Barracks' LB 6899;
  - Glenshero Lodge, LB 6901;
  - Glen Shirra Old Wade Bridge LB 6902; and
  - Garva Bridge, LB 6900.

Non-designated Heritage Assets

5.4.6 In addition to these designated assets, the Highland HER[23] contains details of a number of non-designated assets of archaeological and cultural heritage interest.

5.4.7 The only cultural heritage asset considered to be of Regional significance is Druim an Aird township (HER ref: MHG4482). The remains of buildings, enclosures, a corn drying kiln and dykes are preserved within an area of felling and have been provided with an interpretation panel and access paths. Outwith the cleared area are further associated structures including a head dyke looping south and west round the ridge.

5.4.8 In addition to this asset of Regional significance, the Druim an Aird area contains a number of archaeological features of Local significance, including:

- Winch (HER ref: MHG49166) - probably associated with the Newfoundland Overseas Forestry Unit;
- Drystone structure (HER ref: MHG32742) - either a temporary planter's shelter or a shooting butt; and
- Cairn (HER ref: MHG4913) - one of a series of boundary marker cairns.

5.4.9 Away from the Druim an Aird area there are a large number of unrecorded Early Modern features along Glen Shirra, together with some evidence for metalworking which could be mediaeval or earlier.

5.4.10 Also present within the open moorland, there are remains of fixed survey points for the construction of the Spey reservoir to Loch Laggan tunnel, constructed in 1934. These are minor features of local significance.

5.5 Landscape Character and Visual Amenity

Designations

National Context

5.5.1 All of the site options fall within the CNP. The National Park is a national, statutory designation allocated to landscapes of substantially high quality in which the primary objective is the conservation and enhancement of natural and cultural heritage. Special Landscape Qualities (SLQs) have been defined for the CNP[24] and are listed in **Table 6.1** and shown on **Figure 6**.

[24] Scottish Natural Heritage and Cairngorms National Park Authority (2010): The special landscape qualities of the Cairngorms National Park. Scottish Natural Heritage Commissioned Report, No.375.

5.5.2 To the south, is the boundary of the Rannoch – Nevis – Mamores – Alder Wild Land Area (WLA 14), a very extensive area which stretches over 50 km to the south-west towards Ben Nevis and Glencoe. The more northerly site options, also lie within around 2 km proximity of the Braeroy – Glenshirra – Creag Meagaidh WLA (WLA 19) which covers the mountain areas lying to the west for a distance of around 25 km. Although not strictly a designation, WLAs have been defined by NatureScot as those areas comprising the greatest and most extensive areas of wild characteristics within Scotland and are given protection within the planning system through NPF4. Wild Land Qualities of WLA 14[25] and WLA 19[26] are listed in **Table 5.1.**

Regional Context

5.5.3 All of the site options also lie within the Ben Alder, Laggan and Glen Banchor Special Landscape Area (SLA), which covers Loch Laggan, Strath Mashie and the upper Spey Glen to the east of Garvamore. The Special Qualities of the SLA27 are listed in **Table 5.1**.

Table 5.1: Identified Qualities of Designated and Protected Landscape Areas

SLQs of the Cairngorms National Park	
General Qualities: • Magnificent mountains towering over moorland, forest and strath; • Vastness of space, scale and height; • Strong juxtaposition of contrasting landscapes; • A landscape of layers, from inhabited strath to remote, uninhabited upland; • The harmony of complicated curves; and • Landscapes both cultural and natural. The Mountains and Plateaux: • The unifying presence of the central mountains; • An imposing massif of strong dramatic character; • The unique plateaux of vast scale, distinctive landforms and exposed, boulder strewn high ground; • The surrounding hills; • The drama of deep corries; • Exceptional glacial landforms; and • Snowscapes. Moorlands: • Extensive moorland, linking the farmland, woodland and the high tops; and • A patchwork of muirburn. Glens and Straths: • Steep glens and high passes; • Broad, farmed straths; • Renowned rivers; and Beautiful lochs.	Trees, Woods and Forests: • Dark and venerable pine forest; • Light and airy birch woods; • Parkland and policy woodlands; and • Long association with forestry. Wildlife and Nature: • Dominance of natural landforms; • Extensive tracts of natural vegetation; • Association with iconic animals; • Wild land; and • Wildness. Visual and Sensory Qualities: • Layers of receding ridge lines; • Grand panoramas and framed views; • A landscape of many colours; • Dark skies; • Attractive and contrasting textures; and • The dominance of natural sounds. Culture and History: • Distinctive planned towns; • Vernacular stone buildings; • Dramatic, historical routes; • The wistfulness of abandoned settlements; and • Focal cultural landmarks of castles, distilleries and bridges. The Royal connection: • Recreation: • A landscape of opportunities; and Spirituality.

[25] NatureScot (2019) WLA 14 [online] Available at: https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20Rannoch-Nevis-Mamores-Alder-July-2016-14.pdf [Accessed: May 2025]
[26] NatureScot (2019) WLA 19 [online] Available at: https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20Braeroy-Glenshirra-Creag-Meagaidh-July-2016-19.pdf [Accessed: May 2025]
[27] Horner + Maclennan and Wood, Mike (2011) Assessment of Highland Special Landscape Areas. The Highland Council / Scottish Natural Heritage.

Wild Land Area Qualities (WLQs)

WLA 14

- WLQ1: Mountain ranges and glens of varying landform, but all arresting, with towering, steep and rugged slopes and striking physical features.
- WLQ 2: A strong contrast of wide open peatland lochs and steep-sided mountains that highlight the visibility and awe-inspiring qualities of each.
- WLQ 3: An extensive and remote mountain and peatland interior with a strong sense of sanctuary, appearing even larger due to distant views to surrounding wild land areas.
- WLQ 4: A large area which is visited by many people to experience wild land qualities in different ways, whilst maintaining a sense of remoteness, sanctuary, challenge and risk.
- WLQ 5: An extensive pattern of lochs, lochans, burns and bog that highlight the ruggedness of the landform, limit access and contribute to the sense of naturalness.

WLA 19

- Rounded hills and plateaux that are awe-inspiring in their massive scale and simplicity, whilst geological features and rivers contribute strongly to the sense of naturalness.
- A strong contrast of experience between the hills and plateaux with the straths, glens and corries, varying in their accessibility, exposure and visibility of human elements.
- A hidden interior that is simple in landform and land cover, contributing to a perceived 'emptiness' and a strong sense of remoteness and sanctuary.
- Access and recreation focused around the margins, with an interior that is visited by few and possesses a sense of solitude, physical challenge and risk.
- Long, remote glens that penetrate far into the hills and plateaux: some arresting by virtue of their narrowness and steep side-slopes, and some because of their openness against a surrounding backcloth of towering mountains.

Special Qualities of the Ben Alder, Laggan and Glen Banchor SLA

Ever Changing Compositions:

- This SLA comprises a contrasting combination of landform and land use, forming a fairly confusing composition and a varied character of views.
- A dynamic sense of place is experienced through ever changing combinations of high mountain, craggy knolls and ridges, smooth moorland, dark coniferous forest and native broadleaf woodland, flat farmed strath and open loch.
- This area includes some striking landscape features: Coire Ardair, on Creag Meagaidh is one of Scotland's most dramatic mountain corries: Creag Dhubh, near Newtonmore is one of Scotland's most impressive roadside crags: And the Dirc Mhór, off the beaten track in the hills west of Dalwhinnie, is one the country's best examples of a glacial meltwater channel.
- Loch Laggan, an extensive body of open water flanked by wooded shores and slopes, separates the Aberarder and Ardverikie Forests. This provides the focus for long ranging panoramas and intimate vistas, particularly for users of the A86.
- Glen Banchor in the north is enclosed by a complex pattern of craggy hills and deep glens and displays a lonely character despite its relative proximity to Newtonmore and the busy A9 corridor.
- The Monadhliath Mountains form a simple landform horizon to the north in contrast to Ben Alder and Creag Meagaidh which are more variable in form.
- Creag Meagaidh which is National Nature Reserve is popular with visitors all year round and particularly in the winter as it provides challenging walking and ice climbing.
- Ben Alder is remote from public access routes and a visit requires a long walk in, with consequent qualities of wildness.

Wild Land Area Qualities (WLQs)
Historic Landscape: • This area comprises a range of features that lend a sense of history to the landscape, including medieval castles such as the ruinous castle on Eilean an Righ in Loch Laggan, depopulated medieval townships with many associated shielings in the hills, and post medieval crofting townships and farmsteads. • There is a picturesque sequence of contrasts between upland mountains and settled straths which are enhanced by castles and lodges. • Cluny Castle and Glen Trium House, with their small-scale policy landscapes, give the area an added visual richness. • Current day settlement is heavily concentrated around the banks of the River Spey and, to a lesser extent, the River Truim. Prehistoric settlement is especially pronounced and present in significant concentrations along the River Spey to the south-west of Newtonmore. This area was clearly of importance in the Bronze and Iron Ages. Also present are more contemporary defensive structures, such as the Fort at Dun da Lamh (Black Craig).

Landscape Character Types (LCTs)

5.5.4 All of the site options are located within one Landscape Character Type (LCT) from the NatureScot National Landscape Character Assessment[28]: LCT 126: Upland Glen – Cairngorms. However, this area is subdivided into a number of different Landscape Character Areas (LCAs) by the CNP Landscape Character Assessment.

5.5.5 The CNP Landscape Character Assessment identifies LCAs for two different landscape types: Upland Areas; and Glens and Straths. These separate groups of LCAs overlap each other in some areas but have been considered separately in relation to their key characteristics and focus.

5.5.6 A high level sensitivity appraisal has been undertaken to establish the broad landscape sensitivity to development of the type proposed (large scale substation development) and is summarised in **Table 6.2**.

Table 5.2: Landscape Character Area Sensitivity

CNP LCA	Sensitivity
Upland Areas	
Ardverikie Hills	Medium
The Monadhliath: South Monadhliath	High
Straths and Glens	
Ardverikie: Glen Shirra	High
Ardverikie: Pattack Glen/Strath Mashie	Medium (locally High within the valley floor)
Spey Headwaters: Spey Dam	High
Spey Headwaters: Upper Glen of the Spey	High

Potential Visual Receptors

5.5.7 Potential visual receptors include people living, working and visiting within the area surrounding the site options. These receptors can be classified into three groupings:

[28] NatureScot (2019) Landscape Character Assessment of Scotland [online] Available at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions [Accessed: May 2025]

- People occupying buildings;
- People using routes; and
- People at other locations who are likely to be involved in appreciation of the view.

Building-based Visual Receptors

5.5.8 Buildings within the area are limited to a few scattered properties focussed within Strath Mashie (including Kinloch Laggan, Gallovie, Inverpattack, Feagour and Strath Mashie); and the Spey Glen (including a range of shooting lodges and estate properties at Glenshero Lodge and Sherramore and Garvamore).

Route-based Visual Receptors

5.5.9 The A86 trunk road passes through Strath Mashie and along the northern side of Loch Laggan. This is a narrow and winding, but main arterial route and is frequently used by tourists. Views are often enclosed by surrounding woodland, forest and crags. A minor, single-track public road also passes along the Spey Glen (General Wade's Military Road) and is popular with recreational users.

5.5.10 The area is popular for recreational use with many off-road tracks used by walkers and cyclists. These include Core Paths and long distance Scottish Hill Tracks, identified by the Scottish Rights of Way Society (Scotways), routes to mountain summits and other low level routes through glens and forest areas. Notable routes include:

- Core Paths / mountain routes around Feagour within coniferous forest areas;
- A Core Path and Scottish Hill Track route up the River Pattack, via Gallovie;
- Scottish Hill Track Routes following General Wade's Military Road through the Spey Glen, and south-east from Feagour through the Arderikie Hills towards Dalwhinnie;
- Upland tracks through Glen Shirra, between Strath Mashie and the Spey Glen; and
- The unofficial 'East Highland Way' a published route following forest tracks through Strath Mashie crossing the A86 at Feagour and continuing north-east to the River Spey.

Other Potential Visual Receptors

5.5.11 Other locations where visual receptors may be present, include the car parking areas at Garva Bridge, Feagour and the Laggan Wolftrax and various mountain summits on the ridge between Strath Mashie and the Spey, including Carn Dubh and Stob Coire Dubh.

5.6 Land Use and Recreation

5.6.1 This section considers land use and recreation within the areas surrounding the site options, specifically forestry, agriculture and recreational use.

Forestry

5.6.2 Forestry is a common land use within the area and there are a number of productive conifer plantations on a fell and restock cycle, concentrated to the eastern and northern areas surrounding the site options.

5.6.3 The forests and woodlands are both privately and publicly owned. The forestry plantations within Strath Mashie at Achduchil, Black Wood and Feagour are owned and managed by FLS, whilst the plantations to the south of Kinloch Laggan are owned and managed bya Ardverikie Estate. Within the Spey Valley, plantations to the west of the Spey reservoir managed by Jahama Highland Estates. Woodland areas owned by Ardverikie Estate are managed with an open-ended programme of re-forestation whereby extensive areas of forestry are being re-

generated and re-planted. Where possible, the estate is planting a mix of native tree species which will provide not only diverse habitat, but also contribute towards land stabilisation.[29]

5.6.4 Within the area, there are areas consented for forestry planting schemes. These can be seen on **Figure 7**, but as they are proposals, they are further discussed below under **Section 5.8** (**Current Applications**).

5.6.5 Within the Area of Search there are woodlands included on the AWI, classified as being of both plantation and semi-natural origin, and woodlands included within the NWSS (as discussed in **Section 5.2**).

Agriculture

5.6.6 Areas of agricultural land are classified by The Macaulay System of Land Capability for Agriculture[30] which ranks land based on its potential for productivity and cropping flexibility. There are seven classes in total, where Class 1 has the highest potential for agriculture and Class 7 has the lowest.

5.6.7 The majority of the land to the south and northeast of the site options is Class 6.2 and 6.3, which is land capable of rough grazing with moderate to low quality plants. Towards the northwest, near Kinloch Laggan, there is some Class 6.1 land capable of rough grazing with high quality grazing, as well as Class 5.2 and 5.3 land, which is capable of use as improved grassland and in some areas, sward establishment.

Recreation

5.6.8 There are points of recreational interest scattered throughout the area.

5.6.9 Given the mountainous terrain, the area is popular with outdoor enthusiasts and comprises a number of mountain routes, core paths and Scottish Hill Tracks, including (see **Figure 8**):

- Mountain Route to Beinn na Lap Munro, passing along the southern edge of Loch Laggan;
- Mountain route for Beinn a Chlachair Munro, passing along the southern edge of Loch Earba;
- Mountain/Munro routes for Carn Liath, S.Poite Coire Ardair and Creag Meagaidh;
- Core Path LBS1a: The River Spey;
- Core Path UBS8: Glen Banchor;
- Core Path UBS20: Gorstan Path;
- Core Path UBS22: Blackwood Trail;
- Core Path UBS23: General Wade's Military Road;
- Core Path UBS24: Pattack Walk;
- Core Path UB2S5: Drum an Aird Path;
- Core Path UBS26: Falls of Pattack;
- Core Path UBS30: Corrieyairack Link;
- Scottish Hill Track 200: Dalwhinnie to Feagour (Strath Mashie);
- Scottish Hill Track 201: Kingussie to Laggan;
- Scottish Hill Track 234: Newtonmore to Laggan by Glen Banchor;
- Scottish Hill Track 235: Laggan to Fort Augustus by the Corrieyairack Pass; and
- Scottish Hill Track 236a: Laggan to Whitebridge.

[29] Ardverikie Estate - Wildlife at Ardverikie [online] Available at https://ardverikie.com/the-estate/wildlife [Accessed: May 2025]
[30] The James Hutton Institute. (2020). *Land Capability for Agriculture in Scotland*. [online] Available at: https://www.hutton.ac.uk/learning/exploringscotland/land-capability-agriculture-scotland [Accessed: May 2025]

5.6.10 Other outdoor activities in the area include climbing, fishing, mountain biking (including at the Laggan Wolftrax Mountain biking centre) and other activities offered by the outdoor adventure company Highland Activities on Ardverikie Estate at Kinloch Laggan. The estate is also popular for its scenery and has featured in various film and tv series, including BBC series the Monarch of the Glen and The Crown.

5.6.11 Holiday accommodation within the Area of Search is offered at both Arderikie Estate and Jahama Highland Estate.

5.7 Planning

National Policy

5.7.1 Scotland's fourth National Planning Framework (NPF4) was published by the Scottish Government on 13th February 2023. NPF4 is a long-term strategy for Scotland and is the spatial expression of the Government's Economic Strategy and plans for development and investment in infrastructure.

5.7.2 The Proposed Development is identified in NPF4 as a National Development under National Development (ND) 3: Strategic Renewable Electricity Generation and Transmission Infrastructure' which recognises that "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." Furthermore, pumped hydro storage, for which this project would facilitate a connection to the grid, is also identified as National Development under ND2: Pumped Hydro Storage. The Proposed Development therefore forms a vital element to deliver network and grid infrastructure required to deliver the Government's legally binding targets for net zero emissions and renewable energy electricity generation objectives.

Local Policy

5.7.3 The Scottish Development Plan system is composed of Strategic Development Plans (SDPs) and Local Development Plans (LDPs). While the SDPs offer policy guidance regarding land use and new development for the four major city regions, the LDPs furnish detailed and site-specific planning policies for an area, encompassing all local authority areas and aligning with the SDP where relevant.

5.7.4 Whilst the project is within the Highlands region of Scotland, all of the site options fall within the Cairngorms National Park (CNP). The planning system in the CNP is managed by the Cairngorms National Park Authority.

Cairngorms National Park Local Development Plan 2021

5.7.5 The current Local Development Plan in the CNP comprises the Cairngorms National Park Local Development Plan[31], which was adopted by the Cairngorms National Park Authority in March 2021. Where there are inconsistencies in policy between the Cairngorms National Park Local Development Plan and NPF4, NPF4 will prevail.

5.7.6 The Cairngorms National Park Local Development Plan provides a more local context for assessing development proposals. It sets out both the broad strategic themes in its vision statement, as well as local planning matters. It is aimed at setting out a strategy for future built development within the National Park, focusing on a 5-year period until 2025, but with consideration for development proposals within the 10-year period until 2030.

[31] Cairngorms National Park Authority (2021) *Cairngorms National Park Local Development Plan*. [online] Available at: https://cairngorms.co.uk/planning-development/ldp-2021/ [Accessed: May 2025].

5.7.7 The Cairngorms National Park Local Development Plan contains no policies that relate specifically to the development of electricity infrastructure. However, there are several policies on the protection of cultural and environmental assets, infrastructure and development that mention or could be relevant in the consideration of this project. These include:

- Cairngorms National Park LDP – Policy 2 – Supporting Economic Growth;
- Cairngorms National Park LDP – Policy 3 – Design and Placement;
- Cairngorms National Park LDP – Policy 4 – Natural Heritage;
- Cairngorms National Park LDP – Policy 5 – Landscape;
- Cairngorms National Park LDP – Policy 7 – Renewable Energy;
- Cairngorms National Park LDP – Policy 8 – Open Space, Sport and Recreation;
- Cairngorms National Park LDP – Policy 9 – Cultural Heritage;
- Cairngorms National Park LDP – Policy 10 – Resources; and
- Cairngorms National Park LDP – Policy 11 – Developer obligations.

Highland-wide Local Development Plan

5.7.8 The existing Development Plan for the region involving the proposed development, is the Highland-wide Local Development Plan (HwLDP).

5.7.9 The HwLDP is a strategic planning document created by THC, which covers the entire Highland Council area in Scotland. It sets out the broad strategic themes alongside local land use planning policies and proposals. The HwLDP includes policies concerning the preservation of natural and cultural heritage, residential quality of life, flood prevention, and other matters pertinent to this project.

5.7.10 The HwLDP notes "*additional electricity transmission and distribution infrastructure will need to be developed in Highland in order to realise the region's potential contribution to renewable electricity generation and serve local needs*" (pg. 121). Policy 69 in the Highland-wide local Development Plan outlines THC's policy on Electricity Transmission Infrastructure, detailing that projects will be considered on the "strategic significance in transmitting electricity from areas of generation to areas of consumption." This recognises pumped storage as fulfilling this requirement due to the supporting electrical infrastructure aligning with Policy 69.

Planning Proposals

5.7.11 A review of planning proposals within the 10 km Area of Search has been undertaken.

Current Applications

5.7.12 A Section 37 application for the Melgarve Cluster Project (which consists of wind farm OHL / UGC connections into Melgarve substation) was submitted in April 2024 and is currently under consideration by Scottish Ministers (ref: ECU00004850). This proposed project lies approximately 5 km north-west of the closet site option.

5.7.13 An application was submitted for the erection of 25 m high telecoms tower, antenna, equipment cabins, compound and formation of access track in an area to the north of Kinloch Laggan, southwest of Meall an t-Sìthein summit in February 2023. This application is currently under consideration with THC (ref: 23/00818/FUL).

5.7.14 Within the village of Laggan and the hamlet of Kinloch Laggan, there are some local applications for extensions to houses and changes of use of properties.

Consented Development

5.7.15 Within the area around the substation site options, there are some consented planting schemes (see **Figure 7**). Forestry Grant Scheme (FGS) (Ref: 23FGS76176)[32] at the Lower Pattack Wood to the east of Loch Laggan for woodland creation has been consented. Also, in the northern part of Aberarder Estate, there are consented planting areas. This is the Aberarder planting scheme which was consented in 2018 as part of a RWE Renewables planting scheme. Although no longer linked to RWE Renewables, planning was started on the blocks in 2023.

5.7.16 On the existing forestry track on approach to Site Option 1, FLS received approval in August 2024 for the installation of bridge to replace collapsed culvert (REF:24/03607/PNO)[33].

5.7.17 The Earba Pumped Storage Hydro PSH Scheme that this substation project is intended to serve, is also consented. The application was submitted to the Energy Consents Unit (ECU) of the Scottish Government in March 2024 and the Scottish Ministers granted Section 36 consent for the project in March 2025.

[32] Scottish Forestry (2025), *Public Register - Case Details: The Pattack Woodland Creation*, online resource available at: casebook.forestry.scot/w/webpage/805BECBF1?context_record_id=25756229&webpage_token=727de9933aa47c172deca5dfb61f662ae6d820f3003c6fd7768610792c18492e, [Accessed: February 2025].

[33] THC Planning Portal (2025) *24/03607/PNO: Installation of bridge to replace collapsed culvert*, online resource available at: https://wam.highland.gov.uk/wam/applicationDetails.do?activeTab=summary&keyVal=SIMHNRIHMRL00, [Accessed: May 2025].

6. COMPARATIVE APPRAISAL

6.1 Introduction

6.1.1 This section provides a summary of the potential environmental, technical and economic constraints identified for each substation site option. Reference should also be made to **Figures 2** to **8**. For the comparative appraisal relating to the UGC route options of the Earba PSH Grid Connection, please refer to **Appendix 1**.

6.2 Environmental Topic Areas

Natural Heritage

Natural Heritage Designations

6.2.1 All site options are situated within the CNP (see **Figure 2**).

6.2.2 Site Option 5 is shown to intersect the River Spey SAC and SSSI, although it is anticipated that direct impacts would be avoided through detailed design. No other designated sites would be directly impacted by any of the site options.

6.2.3 All site options are hydrologically connected to the River Spey SAC / SSSI. Site Option 1 and 2 intersect tributaries of the River Mashie, including Allt Mor and Allt Tarsuinn within Site Option 1 and Dark Gully Burn within Site Option 2, which flow into the River Spey SAC (and by extension the River Spey SSSI) approximately 800 m north and 2.7 km north respectively (measured along watercourses). Site Option 4 intersects Allt Crunachdain and several of its tributaries, flowing through Glen Shirra to Loch Crunanchdan, which connects through to the River Spey SAC / SSSI, approximately 3.7 km north-east. As noted above, Site Option 5 directly intersects the River Spey SAC / SSSI along its northern border, as well as a smaller unnamed tributary flowing through Blar Mor. Whilst it could be expected that direct impacts would be avoided, the location of this site option would likely be immediately adjacent to the River Spey SAC / SSSI.

6.2.4 Site Options 3, 4 and 5 are ecologically connected to the Creag Meagaidh designated sites (SAC, SPA, SSSI and NNR) through the open heathland and blanket bog that extend around the eastern edge of Loch Laggan.

6.2.5 Site Options 3, 4 and 5 are partially ecologically connected to the Monadhliath SAC and SSSI through the open heathland and blanket bog that extends northward through Glen Shirra. This habitat corridor is intersected by the River Spey and General Wade's Military Road.

6.2.6 No site options would intersect any woodland recorded on the AWI, but Site Option 1 would intersect some native pine woodland on the NWSS. No woodland clearance would be required to facilitate the development of Site Option 3 or 4. Site Options 1, 2 and 5 though could require targeted native woodland clearance which could potentially generate fragmentation and increase isolation of surrounding AWI or NWSS parcels.

6.2.7 As such, based on the connectivity and potential impacts on designated sites, and the inclusion of all site options within the CNP, Site Options 1, 2, 3 and 4 have been allocated an **Amber** RAG rating. Given the proximity of Site Option 5 to the River Spey SAC and SSSI, this site has been allocated a **Red** RAG rating.

Protected Species

6.2.8 Suitable habitat is present within the local area of all site options for otter, water vole, red squirrel, pine marten, wildcats, amphibians, reptiles, fish, and invertebrates.

6.2.9 Site options containing coniferous and mixed woodlands (Site Options 1, 2 and 5) are more likely to support red-squirrel, pine marten, and wildcat; particularly where there is variation in woodland structure, type, and

maturity, and where well-connected habitat corridors are present. Where these woodlands are in a mosaic with heathland, grassland, and riparian habitats, such as across Site Option 1 and 5, further significant foraging opportunities for wildcat are present within associated edge habitats. As such, where woodland vegetation is to be removed / altered to facilitate the development, potential impacts on associated protected species are likely, including the loss / fragmentation of suitable habitat and reduction in associated resource provisioning.

6.2.10 Site options comprising open heathland, grassland and bog habitats, such as Site Options 1, 3, and 4, are more likely to support associated protected species, specifically amphibians, reptiles, and invertebrates, with further suitability present for wildcat where in a mosaic with woodland habitats. As such, where heathland, grassland and bog habitats are affected, potential impacts on protected species such as the loss/ fragmentation of suitable habitat and resources are likely

6.2.11 For all site options, hydrological connectivity to the River Spey SAC / SSSI presents the potential for indirect effects on qualifying interests of these designated sites, as well as other riverine species, such as water vole, many of which are recognised as particularly sensitive to changes in water quality. This is a particular concern for Site Option 5 given its location immediately adjacent to the River Spey.

6.2.12 Whilst habitat loss and potential impacts on fragmentation are applicable for all options, it is considered that subject to control measures, good practice, and appropriate mitigation, informed by further targeted surveys, impacts on protected species can be reduced, minimised, and/ or avoided as part of any necessary Species Protected Plans (SPP) for the project.

6.2.13 Based on the constraints noted, and considering the mitigation measures that could be put in place, Site Options 1, 2, 3 and 4 have been allocated **Amber** RAG ratings, whilst Site Option 5 has been allocated a **Red** RAG given its location immediately adjacent to the River Spey.

Habitats

6.2.14 The open moorland habitats of Site Option 1 typically comprise wet heath, an Annex 1 habitat. This habitat is a constituent part of the upland heathland mosaic, which further comprises Annex 1 blanket bog, dry heath, and degraded blanket bog. There is some evidence of Annex 1 priority habitat blanket bog within Site Option 1, as well as dry health - the least common components of the upland heathland mosaic. The woodland parts of Site Option 1 comprise coniferous plantation woodlands, with native pine woodland found within smaller patches.

6.2.15 Site Option 2 is located within Coniferous plantation woodland, which constitutes the dominant woodland found across this site. Native pine woodlands are also found in areas to the east and north of Site Option 2. These constitute areas of native semi-natural pine woodland and are an SBL priority habitat considered to be of national importance with Caledonian Pine woods and Annex I habitat of international importance. Some loss of this habitat may be unavoidable, and clearance of surrounding plantation woodland could generate fragmentation across this habitat mosaic.

6.2.16 Site Options 3 and 4 contain wet heath as the dominant Annex 1 habitat present within the site options, with Annex 1 priority blanket bog habitat also found extensively in both site options. Blanket bog is an irreplaceable habitat that is afforded additional protection under NPF4. Impacts on wet heath and blanket bog would be unavoidable for either site option.

6.2.17 Site Option 5 is mainly located within Coniferous plantation woodland, with smaller patches of native pine towards the edge of the site option. Annex 1 wet heath is also found towards the edges of the site option, outwith the plantation woodland.

6.2.18 Acid grassland is found scattered throughout all site options, near watercourses and in areas of clear fell. These patches of grassland are associated with areas of historic livestock grazing, as well as adjacent to

watercourses where soil conditions differ to surrounding heathland. Subject to control measures, good practice, and appropriate mitigation, potential impacts on this habitat could be minimised and/ or avoided.

6.2.19 On the above basis, Site Options 3 and 4 have been allocated a **Red** RAG rating and Site Options 1, 2 and 5 have been allocated an **Amber** RAG rating.

Ornithology

6.2.20 The Creag Meagaidh SPA is designated only for breeding Dotterel. This ground-nesting species typically nests within alpine habitats above 700 m above sea level within this region, and as such, no loss of suitable breeding habitat is predicted across all site options. Furthermore, based on the proximity of the site options to the SPA (specifically Site Option 4, approximately 1.58 km east), no direct disturbance to nest sites and no significant loss of foraging grounds is expected from the proposed development. As such, subject to good practice and control measures, potential impacts on Dotterel within the Creag Meagaidh SPA can be avoided.

6.2.21 It is possible that habitat loss during construction activity at all site options could impact protected bird species or lead to longer-term effects from the proposed works through disturbance or displacement from their preferred displaying, roosting, nesting or foraging area.

6.2.22 As there is no infrastructure currently present at any of the site options, a breeding bird survey and Black Grouse lek monitoring will be required to assess the likely ornithological constraints for each site option and to ensure impacts on the bird life of the area will be minimised. Furthermore, a pre-construction survey will be required to inform appropriate mitigation measures ensuring that the proposed works can continue with minimal disruption (e.g. timings of works, deployment of buffer zones around any active nests, provision of an Ecological Clerk of Works (ECoW), etc).

6.2.23 Due to the variety of habitats and topographic locations of the site options, each has a range of bird species that may be impacted by the construction and operation of a substation. The site options within plantations (Site Option 2 and 5) would be likely to impact on fewer species, whereas the site options on moorland edge or within more preferred bird nesting or foraging locations are likely to impact more species (Site Option 1, 3 and 4). Site Options 3 and 4 in particular are within open moorland habitats suitable for several Schedule 1 / Annex I species to breed and forage.

6.2.24 Therefore, Site Options 2 and 5 have been allocated a RAG rating of **Green** for ornithology; Site Option 1 has been allocated a RAG rating of **Amber**; and Site Options 3 and 4 have been allocated a RAG rating of **Red**.

Geology, Hydrology and Hydrogeology

6.2.25 Priority peatland mapping highlights that Site Option 1 and Site Option 3 are located in areas where Class 2 priority peatland are recorded (see **Figure 3**). Site Option 2 is located in an area of Class 4 and 5 priority peatland whilst Site Options 4 and 5 are not shown to be located within an area designated as priority peatland, however BGS superficial mapping indicates some peat may be present within Option 4. Class 4 peatland are considered areas unlikely to be associated with peatland habitats or unlikely to include carbon-rich soils, whereas Class 5 peatlands are considered areas whereby no peatland habitats are typically found but soils may be carbon rich with areas of deep peat.

6.2.26 High quality peatland will need to be protected and safeguarded. It is anticipated that higher-class areas can largely be avoided, and micro siting can be used to mitigate potential effects. Further assessment of peat, informed by peat probing and condition assessment, will be required and if peat deposits are found, these will form a key design constraint to the emerging design of the preferred site option.

6.2.27 Watercourses are located within all of the site options considered (see **Figure 4**). All permanent structures would need to be set back from the watercourse channel to protect against exposure from natural processes leading to watercourse meandering and migration. Should watercourse diversions be required to form a suitable development footprint, hydraulic modelling will be required to determine appropriate channel alignments, and it will need to be shown that flood risk (to the development and to neighbouring land) is not increased as a consequence of the development. SEPA has a presumption against culverting, and it is unlikely that culverting of watercourses beneath any proposed platform would be consented by SEPA.

6.2.28 SEPA floodplain mapping shows floodplains associated with the larger watercourses and lochs. Flood extents are largely confined to the watercourse channels. Wider flood extents are noted near the confluences of these larger watercourses with smaller tributaries or lochs, particularly within Site Options 4 and 5. Potential for flood risk during the construction stage and the siting of construction related infrastructure would need to be given appropriate consideration for all site options. SEPA does not publish flood extents for smaller water catchments and should the preferred site option be located near to a small watercourse hydraulic modelling may be required to determine local floodplain extents.

6.2.29 Isolated areas of surface water flooding are noted across all the site options, in particular Site Option 2 and 5. Subject to best practice construction and mitigation, any flooding caused by surface water flooding can be minimised during the design phase of development, and not pose a risk on or off-site.

6.2.30 THC PWS database indicates that there are no PWS within the any of the site options, however, a single PWS is noted within 500 m of Site Option 2 and Site Option 5. It is noted that THC PWS database does not represent a complete dataset of private water supplies. Therefore, potential impacts on PWS will need to be assessed further, however subject to appropriate best practice construction methods which will safeguard water flows paths and water quality, it is likely that potential impacts can be mitigated.

6.2.31 All site options have been allocated a RAG rating of **Amber** for Geology, Hydrology and Hydrogeology.

Cultural Heritage

Designated Heritage Assets

6.2.32 No designated heritage assets would be directly affected by any of the site options (see **Figure 5**). The potential for indirect effects in the form of visual intrusion and alterations to setting requires consideration for some of the site options as described in the following paragraphs.

6.2.33 Site Option 1 would have potential for indirect visual impacts and impacts on the setting of Dun da Lamh Fort, SM 4361, which is a late prehistoric defensive site strategically placed at the junction of the River Spey and Strath Mashie. Its primary function would appear to be to control movement along these two important east-west routes. As such, vistas from the fort could be sensitive to visual intrusion. The effects of this site option would likely be reduced by distance, being around 3 km from the fort, and by pre-existing and historic alterations to the landscape in the form of extensive coniferous plantations. There are no known contemporary defensive or settlement sites or distinctive landscape features westwards with which the fort might once have had a visual relationship. An **Amber** RAG rating has been given to Site Option 1 for cultural heritage designations.

6.2.34 Site Option 2 could also have potential for indirect visual impacts and impacts on the setting of Dun da Lamh Fort, but as per Site Option 1, the effects of this site option would likely be reduced by distance, being around 3 km from the fort, and by pre-existing and historic alterations to the landscape in the form of extensive coniferous plantations. An **Amber** RAG rating has been given to Site Option 2 for cultural heritage designations.

6.2.35 Site Option 3 would not be expected to indirectly impact any designated heritage assets and it has therefore been allocated a **Green** RAG rating.

6.2.36 Site Option 4 would have potential for indirect visual impacts and impacts on the setting of Glenshero Lodge, LB 6901. This shooting lodge, dating to around 1835, is assumed to have been built in a location both practical, affording access to both deer forests and fishing, and to enjoy vistas of the landscape features considered in the 19th century to be attractive. While the main aspect of the building faces east down the River Spey, vistas from the other aspects and from the small area of the garden could be considered sensitive to impacts from Site Option 4 (approximately 1.4 km south-west). An **Amber** RAG rating has been given to Site Option 4 for cultural heritage designations.

6.2.37 Site Option 5 would be approximately 1 km east of Garvamore 'Barracks' LB6899, although the designation's main aspect faces south. To the east of the designation in the direction of Site Option 5, there are modern buildings and structures including pylons of the existing Beauly to Denny OHL. Garvamore Barracks would not be considered to be particularly sensitive to impacts on setting, being a practical structure associated with transport and communication, its location being dictated by proximity to the adjacent General Wade's Military Road (this section of the road is non-designated). Similarly to Site Option 4, Site Option 5 would also have potential for indirect visual impacts and impacts on the setting of Glenshero Lodge approximately 170 m south-east. Approximately 1.7 km north-west of Site Option 5 is Glen Shirra Old Wade Bridge LB6902 and Garvamore, Garva Bridge, LB6900 which are practical structures set in the landscape as part of General Wade's Military Road (this section is non-designated). Appreciation of the structures would be from close proximity with no requirement for a relationship to other landscape features. Site Option 5 could also have potential for indirect visual impacts and impacts on the setting of Dun da Lamh Fort, but as per Site Option 1 and Site Option 2, the effects of this site option would likely be reduced by distance, being around 3 km from the fort, and by pre-existing and historic alterations to the landscape in the form of extensive coniferous plantations. An **Amber** RAG rating has been given to Site Option 5 for cultural heritage designations.

6.2.38 The following designated heritage assets would not be expected to be indirectly affected by any of the site options: St Kenneth's Kirk, Church and Cross Slab, SM 5703; Old St Kenneth's Church, burial ground, LB6907; Kinloch Laggan Lime Kiln, LB 6908; and Ardverikie Gatelodge, Gate Piers, Bridge, LB 6911. These sites are approximately 5 km west of Site Option 1, approximately 2.8 km west of Site Option 2, approximately 700 m south of Site Option 3, approximately 1.3 km south of Site Option 4, and approximately 3.5 km south of Site Option 5. They are located on the valley floor where rising ground to the north and dense plantation to the south would prevent any likely visibility.

Non-designated Heritage Assets

6.2.39 Within Site Option 1, there are two recorded cultural heritage assets, both of local significance and low sensitivity to damage. These are a small drystone constructed cairn, MHG49139, and a trackway or drove road, MHG49138, both assumed to be of early Modern or Modern date. It is likely that the development of Site Option 1 would result in the removal of the cairn and the breaking of the line of the drove route. These are minor features of local significance and any damage or removal to these features would require to be preserved by record and included on the HER. A **Green** RAG rating has therefore been applied to Site Option 1 for non-designated heritage assets.

6.2.40 Site Option 2 contains a cultural heritage asset considered to be of Regional significance. This is the Druim an Aird township (HER ref: MHG4482), which the site option directly intersects and could result in the destruction of some or all of these features. In addition to this asset, Site Option 2 contains a number of archaeological features of Local significance, including:

- Winch, MHG49166, probably associated with the Newfoundland Overseas Forestry Unit, located at NGR 256570 789630, within the north-western extent of Site Option 2;
- Drystone structure, MHG32742, either a temporary planter's shelter or a shooting butt of 20th century date, located at NGR 256480 789210, just within the western edge of Site Option 2, adjacent to a forestry access road;
- Cairn, MHG49131, one of a series of boundary marker cairns located at NGR 257230 789050, within the south-east extent of Site Option 2; and
- Cairn, MHG32734, one of a series of boundary marker cairns, located at NGR 257290 789090, within the south-east extent of Site Option 2.

6.2.41 The development of Site Option 2 could result in the destruction of some or all of these features, though minor features of local significance could be adequately protected by preservation by record. A Red RAG rating has been applied to Site Option 2 for non-designated heritage assets, predominately on the basis of the Druim an Aird township. It would be anticipated though, that should Site Option 2 be taken forwards, a footprint that does not directly impact the site could be achieved as the design process progresses and impacts could be minimised. Should this be achieved, then a potential reduction to an **Amber** RAG rating would be given.

6.2.42 Within Site Option 3 and Site Option 4 there are a number of remains of fixed survey points for the construction of the Spey Reservoir to Loch Laggan Tunnel. The development of Site Option 3 or Site Option 4 would likely result in the removal of two of these fixed survey points. However, the remaining points to the north and south would be unaffected. In addition, in the area surrounding Site Option 4, there are unrecorded Early Modern features of local significance along the Glen Shirra valley floor to the west. Nevertheless, given these are minor features of local significance and any damage or removal to these features would require to be preserved by record and included on the HER, a **Green** RAG has been applied for Site Options 3 and 4 for non-designated heritage assets.

6.2.43 There is no non-designated cultural heritage assets recorded within the footprint of or within 100 m of Site Option 5. A **Green** RAG rating has therefore been applied for non-designated heritage assets.

Landscape and Visual

Designations

6.2.44 All of the site options are located within the CNP and Ben Alder, Laggan and Glen Banchor SLA (see **Figure 6**). Of the two designations, the CNP carries more weight, being a national level designation but SLQs of the SLA are to some extent more specific and relevant at the local level.

6.2.45 Site Options 1 and 2, are located in areas characterised by coniferous forest plantation on the south side of Strath Mashie. This area is less demonstrative of the SLQs of the CNP and SLA and therefore these options are less likely to lead to notable effect on SLQs. Site Option 1 also falls on the boundary of WLA 14 although, given the forested context and the position on the very edge of a vast WLA, this is unlikely to lead to any notable effects on the WLA. Nevertheless, the position of these sites within a number of designated or protected areas is likely to lead to some level of constraint.

6.2.46 Site Options 3 and 4 are situated in elevated, open locations within Glen Shirra where SLQs of the CNP are more present and therefore effects on SLQs of the CNP and SLA are much more likely to occur as a result of the proposed development. This would be likely to lead to a notable constraint.

6.2.47 Site Option 5 would be situated in a central location within the Spey Glen, recognised as an important point of arrival to the CNP. This is a prominent location, likely to lead to effects on a number of the SLQs of the CNP and the SLA.

6.2.48 On the above basis, Site Options 1 and 2 have been allocated an **Amber** RAG rating, while Site Options 3, 4 and 5 have been allocated a **Red** RAG rating.

Landscape Character

6.2.49 Site Options 1 and 2 are located within the Pattack Glen/Strath Mashie LCA. This is considered to have a medium overall sensitivity to change of the type proposed, although higher sensitivity though strath floor areas. These options would both be located within areas characterised by coniferous forest plantation, although Site Option 1 is slightly more remote. These areas are considered to have a reasonably good opportunity to accommodate a substation without wider landscape implications, with the patterns of managed forestry, felling and re-planting giving potentially good opportunities for mitigation measures, particularly in relation to Site Option 2. The location of these site options on the southern side of Strath Mashie would also limit the need for a grid connection to cross the more sensitive areas of the strath floor. Due to its slightly more remote location and steeper slopes, Site Option 1 would likely have a greater requirement for cut/fill which could increase the size of the footprint in comparison to Site Option 2.

6.2.50 Site Options 3 and 4 are both located in Glen Shirra, with Site Option 3 being slightly further south, and Site Option 4 more towards the north of the glen. This area is covered by the Glen Shirra LCA, which has been identified as having a high sensitivity to change of the type proposed due to its open, upland qualities with limited opportunities for mitigation (see Appendix 3 for further details). A substation located in either of these locations would be likely to be prominent and would noticeably change the character of this upland glen, with Site Option 4 also, likely to form a prominent focus in the framed views of Glen Shirra when seen from the Spey Glen.

6.2.51 Site Option 5 would be located centrally within the Spey Glen on the transition between the Spey Headwaters: Spey Dam and Upper Glen of the Spey LCAs, both considered to have a High sensitivity to development of the type proposed. Locally the site covers a small forest plantation area situated within the floor of the Spey glen within a broader pattern of similar scale forest areas, pasture and scattered settlement. Although the Beauly – Denny OHL is already present crossing through the glen, the introduction of this scale of infrastructure within a landscape of relatively small-scale patterns and rural domestic character would lead to notable landscape change, likely to form a very prominent focus within the central part of the glen.

6.2.52 On the above basis, a **Green** RAG rating is applied to Site Option 2, an **Amber** RAG rating has been allocated for Site Option 1, and the RAG rating for landscape character for Site Option 3, 4 and 5 is **Red**.

Visual Amenity

6.2.53 Views from properties would be relatively limited for most of the site options (see **Figure 6**). However, there are a number of properties close to Site Option 5 including Glenshero Lodge, Sherramore and Garvamore, where notable views would be very likely and difficult to mitigate. There would also be some potential for views from these properties of Site Option 4, framed within Glen Shirra. Elsewhere, there could be glimpsed views of Site Options 1 or 2 from properties and the A86 around Feagour and Strathmashie. These are most likely to be affected by access to the sites, but would be limited and likely to be able to be mitigated.

6.2.54 There are also a number of forest walks around Site Option 2 including a Core Path commencing at Feagour, with the potential to be directly affected and therefore with a likelihood of visual effects for recreational users, although it is likely that these could be accommodated within the design. A long distance Scottish Hill Track

(Track 200 Dalwhinnie – Feagour) also crosses Site Option 1, but is unmarked on the ground and it is likely that this route could be accommodated into the design with effective mitigation. There could also be views from a number of Laggan Wolftrax Mountain bike routes, although these would be limited with receptors likely to be mostly focussed on the trails.

6.2.55 Tracks through Glen Shirra which are popular for walkers and cyclists also pass through or adjacent to Site Options 3 and 4, which would be highly visible from these routes with little opportunity to mitigate visual effects.

6.2.56 The visual amenity RAG rating is therefore **Red** for Site Option 5, **Amber** for Site Options 2, 3 and 4, and **Green** for Site Option 1 where fewer receptors would be likely to be affected.

Land Use

Agriculture

6.2.57 The agricultural land within the site options is predominately identified as being of land capable for rough grazing only (6.2 and 6.3). There are some areas of land capable for improved grassland in Site Options 3, 4 and 5 (4.2 and 5.3), however these are not particularly sensitive or fertile category any impacts on agriculture as a result of either option is considered to be low.

6.2.58 As all options would affect lower quality agricultural land only, a **Green** RAG rating has been applied to all site options.

Forestry

6.2.59 For any sites located within forestry, felling would be required as part of enabling works to be able to establish a site working area. Felling may also be required to establish OHL tie ins. Furthermore, the potential need for management felling is relevant to commercial forestry areas and should be considered. Management felling involves felling to a certain point in a woodland compartment (a 'green edge') to reduce the risk of windthrow, which is the potential uprooting of trees by wind.

6.2.60 Site Options 1 and 2 are located on FLS land. Felling of commercial forestry at both sites would be required to construct the substation at either site option. For Site Option 1, whilst a large part of the site would require to be felled, this part of the plantation is located at its eastern edge and therefore the extent of management felling beyond this area is likely to be limited. As such, an **Amber** RAG rating has been applied to Site Option 1.

6.2.61 For Site Option 2, given its central location within plantation, the extent of direct felling to accommodate a substation site here would be greater than Site Option 1, and there would be potential for extensive management felling requirements. There would also be additional felling requirements for any OHL tie ins back to the existing Beauly to Denny OHL. As such, a **Red** RAG rating has been allocated to Site Option 2.

6.2.62 There is no commercial forestry located within, or in close proximity to Site Options 3 or 4. Therefore, a **Green** RAG rating has been given to these site options.

6.2.63 Site Option 5 sits predominately within commercial forestry that is privately owned and managed by Jahama Highland Estate. This is a relatively small and isolated woodland block, and therefore any development of a substation site within this location would require the entire block to be felled. As such, a **Red** RAG rating has been allocated.

Recreation

6.2.64 Site Option 1 is located directly across the route of a long-distance Scottish Hill Track (Track 200 Dalwhinnie – Feagour) (see **Figure 8**). Whilst this section of the track is unmarked on the ground, a diversion to this track would likely be required during construction and operation, and appropriate measures would need to be put in place during the construction phase to ensure the safe and continued use of this diverted path where any interaction between construction activities and recreational users is likely.

6.2.65 Site Option 2 includes a short section (approximately 125 m) of the Core Path UBS25 Drum and Aird Path, and includes a further section of track (not part of the core path) which forms a circuit loop back to Feagour. At Feagour, approximately 900 m south of Site Option 2, the Scottish Hill Track (200) and Core Path UBS25 overlap close to the junction with the A86. At these locations, there is potential for interaction with construction traffic which would need to be carefully managed during the construction period. To the west of Site Option 2, another core path (Core Path UBS26 Falls of Pattack) is present approximately 900 m to the west. The unofficial long distance East Highland Way also passes to the north and would be likely to interact with the access to this site option.

6.2.66 Site Options 3 and 4 are crossed by tracks through Glen Shirra which, although not part of any formal route, are likely to be used by recreational users crossing between Kinloch Laggan and the Spey Valley. There is some potential for interaction with recreational users during construction, and a diversion to this route would be required during construction and operation, and appropriate measures would need to be put in place during the construction phase to ensure the safe and continued use of this diverted path where any interaction between construction activities and recreational users is likely.

6.2.67 Site Option 5 would be situated adjacent to, or potentially directly affect, the minor road to Garva Bridge (General Wade's Military Road), which also forms part of Scottish Hill Track (SHT236a). This is a popular route used by cyclists and walkers and also provides access to the car park at Garva Bridge which is the commencement point for recreational users ascending local mountains, including the Munro, Geal Charn. There would therefore be some potential to disrupt recreational activities and access management measures would be required, although it is anticipated that direct impacts on the minor road would be avoided.

6.2.68 Based on the above, all site options have been allocated an **Amber** RAG rating for recreation given the mitigation measures that could be put in place to minimise disruption to recreational users.

Planning Context

Policy

6.2.69 Adherence to National, Regional and Local planning policy will in large part depend on avoiding or minimising potential constraints noted above, particularly in relation to potential impacts on the natural environment given presence of designated sites and areas of landscape importance, including the Cairngorms National Park.

6.2.70 As such, given the potential constraints noted above, an **Amber** RAG rating has been applied to Site Option 1 and Site Option 2. Whilst these sites are both located within the Cairngorms National Park, opportunities exist to minimise the potential effects on the National Park through appropriate siting and screening of the project.

6.2.71 Opportunities to minimise the potential effects on the National Park are fewer for Site Option 3, Site Option 4, and Site Option 5. This is as Site Option 3 and Site Option 4 are situated in elevated, open locations within Glen Shirra where SLQs of the CNP are more present, and Site Option 5 would be situated in a central location within the Spey Glen, recognised as an important arrival point to the CNP. Furthermore, these site options are more closely located to other environmentally designated sites of international and national importance.

Therefore, given the potential effects on the National Park, other designated landscapes and sites of nature conservation, a **Red** RAG rating has been allocated to Site Options 3, 4 and 5.

Proposals

6.2.72 Site Option 3 and to some extent, Site Option 4 would have the potential to interact with the proposed telecoms tower and associated works (ref: 23/00818/FUL). If the project is granted consent, its access track would pass through Site Option 3 and possibly Site Option 4. Also, the majority of the Aberarder planting scheme is within Site Option 3 and some also falls within Site Option 4 (see **Figure 7**). Site Option 3 therefore receives a **Red** RAG rating while Site Option 4 receives an **Amber** RAG rating for proposals.

6.2.73 There are no other proposals within the site options or their general vicinity that would be likely to pose a constraint. Athough the proposed installation of a bridge to replace a collapsed culvert would near to Site Option 1, the works are not expected to be a constraint to development and would likely be completed by the time of construction. Therefore, a **Green** RAG rating has been allocated to Site Options 1, 2 and 5.

6.3 Engineering Topic Areas

Connectivity

Existing circuits/networks

6.3.1 Site Options 1, 3, and 4 for the Coire Mashie substation would be crossed by the existing 275 kV and 400 kV Beauly-Denny OHL. This introduces a significant constraint, as the OHLs may require temporary diversion or a staged connection into the new Coire Mashie substation. These requirements could impact the construction duration, influence the preferred orientation of the substation, and extend the overall project programme. Site Option 1 and 4 have received an **Amber** RAG rating, while Site Option 3 which would have the most interaction with the existing OHLs would be **Red**.

6.3.2 Site Options 2 and 5 are situated approximately 200 m – 300 m away from the existing Beauly-Denny OHL. This separation allows the entire substation to be built offline, independent of any staging or temporary diversion requirements. As a result, these sites are expected to enable a more efficient construction process with reduced risk of delay and have received a **Green** RAG rating.

Future Development Possibilities

6.3.3 All five site options are similar in relation to future development possibilities. In the case of AIS technology, future expansion would be challenging due to its large footprint, which requires additional space for AIS bays. The surrounding area's limitations further complicate this, making expansion difficult so a **Red** RAG rating has been allocated to all.

Interface with SSE Distribution and Generation

6.3.4 A review of the available Scottish Hydro Electric Power Distribution (SHEPD) LTDS Geographic Map and publicly accessible Open Infrastructure maps[34] has been conducted. Based on the available information, the only existing Distribution and Generation asset near all proposed sites is the Loch Laggan tunnel, which connects Loch Crunachdan with Loch Laggan. The tunnel runs beneath Site Options 3 and 4, with a smaller overlap under Site Option 4 and a more significant overlap under Site Option 3.

[34] Open Infrastructure Map (2025) *Open Infrastructure Map*. [online] Available at: https://openinframap.org/#2/26/12 [Accessed May 2025].

6.3.5 The RAG ratings for the interface with SSE Distribution and Generation indicate that a **Red** RAG Rating for Site Options 3 and 4 due to potential clashes with the tunnel should be allocated. All other site options (1, 2, and 5) are rated **Green** indicating minimal risk of interference.

DNO Connection

6.3.6 A review of the SHEPD Geographic Map shows the closest 33 kV power line, which is owned by SHEPD (DNO). This 33 kV line is originally fed from the Boat of Garten Substation (2x60 MVA), although the available capacity has not been assessed. It is currently unknown whether this substation can support an additional T-off to supply the Coire Mashie Auxiliary loads. Therefore, a formal application should be made to the DNO to determine the exact point of connection during the detailed design stage.

6.3.7 The distances from the site options to the 33 kV power line vary. Site Option 1 is approximately 5 km away, Site Option 2 is around 8 km, Site Options 3 and 4 are approximately 12.5 km away, and Site Option 5 is about 13 km away. Based on these distances, Site Option 1 has been allocated an **Amber** RAG rating, indicating a moderate level of risk. While all other site options have been allocated a **Red** RAG rating, indicating high risk.

Footprint Requirements

Technology

6.3.8 AIS is a reliable and well-known technology, with familiar maintenance procedures and lower equipment capital costs. However, it requires a large substation footprint and may not be ideal in locations with high wind speeds (around 58 m/s), as all available sites are more than 200 m above sea level, which aligns more with the requirements for enclosed substations according to SSEN specifications. The RAG rating for all of the site options is **Red** for the AIS technology, reflecting high risk.

Adjacent Land Use

6.3.9 A high-level assessment of a temporary construction compound location which would be considered adjacent land use has been conducted. A 200 x 200 m TCC footprint has been considered, with three potential locations:

- Inside the AIS boundary;
- Near the AIS Substation; and
- Off the haul road or main access road.

6.3.10 The temporary construction compound footprint would be refined based on project needs and contractor input. Additional space and potential earthworks may be required, so all site options received an **Amber** RAG rating for Adjacent Land Use, indicating a medium level of risk.

Space Availability

6.3.11 A high-level assessment of substation positions was conducted using OS mapping and terrain data to evaluate the feasibility of each site option. Initial earthwork assumptions were based on 1:3 slopes, with cut and fill balanced, but these will be refined once ground conditions are confirmed. Preliminary platform levels were also considered.

6.3.12 For each site option, both best and worst-case scenarios for earthworks were assessed. Watercourse diversions and woodland impacts have the potential to constrain the positioning of the site options. A RAG rating of **Red** has been applied to Site Option 5 due to ground conditions, while all other site options have been allocated **Amber** RAG Rating.

Hazards

Unique Hazards

6.3.13 Site Options 1, 3, and 4 would have the potential to be affected by the existing 275 kV and 400 kV Beauly-Denny OHL, which crosses over them. Depending on the final design and location, it may be necessary to temporarily divert the OHLs or put control measures in place to avoid working near live circuits.

6.3.14 The main hazards include construction traffic, working near existing OHLs, potential below-ground services, and construction on steep slopes. Additionally, a UXO (Unexploded Ordnance) risk assessment was carried out, and it was found that all sites could potentially have unrecorded UXOs posing risks during ground investigations. A detailed UXO desk study is recommended for whichever site option is proceeded with.

6.3.15 Health and safety impacts for each site were also assessed, with some sites having notable hazards such as proximity to high-voltage lines, moderate-to-high radon potential, and rivers crossing the sites. Additionally, Site Options 3 and 4 have challenges due to the Loch Laggan Tunnel passing beneath them, which complicates construction feasibility.

6.3.16 On basis of the above hazards, Site Option 2 has been allocated a **Green** RAG rating while Site Options 1 and 5 have been allocated **Amber** RAG Rating. Site Option 3 and 4 have been allocated a **Red** RAG rating.

Existing Utilities

6.3.17 The existing utilities at the substation sites were reviewed based on a utilities search by Atkins Realis in March.[35]

6.3.18 Site Option 1 has minimal utility rerouting, with only two SSEN Transmission OHLs crossing the southern part. It offers efficient potential for future connections. Site Option 2 and 5 have no utilities within the boundary. These three site options have thus been allocated a **Green** RAG rating.

6.3.19 Site Option 3 and 4 have two SSEN Transmission OHLs crossing them site and the Loch Laggan Tunnel running beneath. The tunnel's depth and location are currently unknown, creating uncertainty. Both site options have been allocated a **Red** RAG rating.

Ground Conditions

Topography

6.3.20 The topographic profile of the site options was assessed using Ordnance Survey mapping and aerial imagery, without a site walkover or specific data verification. Geotechnical risks and site-specific opportunities were evaluated for each site option.

6.3.21 Site Option 1 has steep slopes up to 1 in 6 (10º), requiring significant cut/fill work. The topography may limit Ground Investigation (GI) work, but layout optimisation could reduce earthworks and as such a **Red** RAG rating has been applied to Site Option 1.

6.3.22 Site Option 2 features shallow gradients (1 in 13, 4º) with moderate cut/fill work expected. GI work may be limited, but the substation layout could minimize earthworks. Site Option 3 has flat areas but slopes up to 1 in 5 (12º), with moderate to significant cut/fill work needed. GI work may face some restrictions, though layout optimization could help. Site Option 4 has shallow gradients (1 in 10, 6º) and moderate cut/fill requirements,

[35] Ref: Utility Search Report 218402; 218403 and 219087.

with potential GI work restrictions. Layout optimization could reduce earthworks. An **Amber** RAG rating has therefore been applied to Site Option 2, 3 and 4.

6.3.23 Site Option 5 has shallow gradients and offers the best opportunity for optimizing earthworks with detailed topographic surveys. A **Green** RAG rating would be applied to Site Option 5.

6.3.24 The RAG rating for topography for each of the site options indicate that most sites require further investigation, with Site Option 5 rated most favourable for topography.

Geology

6.3.25 A geological review of the proposed site areas was conducted using British Geological Survey mapping[36] and historical sources[37] to assess ground conditions and geotechnical risks.

6.3.26 Site Option 1 has Glacial Till over shallow rock, offering a solid foundation. However, unproven ground conditions, potential obstructions, and moderate to high radon levels present risks. Site Option 1 has been RAG rated **Amber** due to uncertainties; a site-specific ground investigation would be recommended.

6.3.27 All remaining site options have been allocated a **Red** RAG rating. Site Option 2 also has Glacial Till and Hummocky Glacial Deposits, but with significant peat deposits that pose risks of settlement and foundation failure. High radon potential adds to the challenges. Site Option 3 features 60% Glacial Till and 40% peat deposits, with similar settlement risks. The Loch Laggan Tunnel may obstruct excavation, and radon potential is a concern. Site Option 4 shares similar ground conditions to Option 3, including peat deposits and the Loch Laggan Tunnel, along with radon risks. Site Option 5 has Glacial Till with significant peat deposits (60%) and other potential obstructions.

Environmental Conditions

Elevation

6.3.28 All proposed site options are located at elevations around 300 m AOD (ranging between 280 m to 420 m). The calculated high wind speed for the area is around 58 m/s. All site options would be highlight constrained on this basis and are RAG rated **Red** due to the potential impact of high elevation and wind conditions.

Salt Pollution

6.3.29 All site options are located more than 10 km away from the coastline and are not expected to be subject to salt pollution. The salt pollution RAG Rating shows that all site options are therefore RAG rated **Green**, indicating no constraints regarding salt pollution.

Flooding

6.3.30 A review of available flood risk data has been conducted as part of the flood risk assessment Level 1 study for the site options.

6.3.31 The site options would generally have a low risk of ground water flooding. Site Option 2 would also have low rates of surface water runoff, and although several burns may need diversion and there are small areas of

[36] British Geological Survey, (2022) *Geology of Britain Viewer*. [online] Available at: https://www.bgs.ac.uk/map-viewers/geology-of-britain-viewer/ [Accessed May 2025]
[37] National Library of Scotland, (2025) *Georeferenced Maps Viewer*. [online] Available at: https://maps.nls.uk/geo/explore/#zoom=5.0&lat=56.00000&lon=-4.00000&layers=6&b=ESRIWorld&o=100 [Accessed May 2025].

shallow peat, the substation platform location could be modified to avoid them. Site Option 2 has therefore been allocated a **Green** RAG rating.

6.3.32 Site Option 1 has steep gradients, and moderate upstream catchments may lead to rapid runoff and moderate surface water runoff, several burns would also need diversion. Site Option 5 has medium to high risk of river flooding and surface water flooding, with significant peat areas. An **Amber** RAG rating has been allocated for Site Option 1 and 5.

6.3.33 Site Option 3 has steep gradients and significant upstream catchments which may cause rapid runoff and large surface water runoff. Flood risk from peat and a loch, along with possible issues from the Laggan tunnel, add to the challenges. Site Option 4 is also highly constrained. There would be a high risk of river and surface water flooding due to steep gradients, upstream catchments, and peat. Additional flood risks from the Allt Crunachdain watercourse and potential groundwater flooding would also be present, as well as the risk of Laggan tunnel failure. A **Red** RAG rating has therefore been allocated for Site Option 3 and 4.

6.3.34 The development of any site option would require further flood risk assessment and suitable surface water runoff management. Site drainage system would be provided to manage surface water from and approaching the site. Minimum finished floor levels and minimum flood sensitive infrastructure levels will be set to manage the residual flood risk.

Carbon Footprint

6.3.35 The carbon footprint of each substation option includes emissions from construction, maintenance, and disposal, with a focus on equipment, transportation, and waste generation.

6.3.36 For equipment and infrastructure, all AIS options are similar, but AIS requires more equipment, resulting in a higher carbon footprint compared to GIS options, which have a smaller scale and fewer equipment needs.

6.3.37 Regarding transportation and logistics, earthworks and access road requirements would be significant. Site Option 1, with steep slopes, would require the most earthworks, increasing its carbon footprint. Site Option 2 would require moderate earthworks, but good access helps reduce transportation emissions. Site Option 3 would involve moderate earthworks and a less-developed access road, increasing transportation emissions. Site Option 4 would be similar to Site Option 3 but with slightly fewer earthworks. Site Option 5 would require substantial earthworks and access upgrades, further increasing emissions.

6.3.38 For waste generation and disposal, Site Options 1 and 5, would require the most earthworks and would generate the most waste, contributing more to the carbon footprint. The other site options, with less earthwork, would generate less waste. Therefore, Site Option 1 and Site Option 5 would have the highest carbon footprints due to extensive earthworks and access road upgrades and have been allocated a **Red** RAG rating, and Site Option 2, 3 and 4 have been allocated an **Amber** RAG rating.

SF6

6.3.39 SF6 (sulphur hexafluoride) is a gas electrical insulator that is used between conductors of Gas Insulated Switchgear (GIS). The substation technology proposed for Coire Mashie substation however, is Air Insulated Switchgear (AIS). In AIS, the live electrical conductors are separated from earth by electrical insulators and from each other by air.

6.3.40 As all five site options would use air rather than SF6, they are all allocated a **Green** RAG rating for SF6 usage.

Contaminated Land

6.3.41 A review of SF6 contamination beneath the proposed site options found limited risks, mainly from made ground, as the area is largely undeveloped and forested.

6.3.42 For all site options contamination from the access tracks for the OHLs and forestry plantations in the area would be possible with potential for contaminants such as metals, asbestos, hydrocarbons, and others. In relation to Site Option 2, there is potential for contaminants such as asbestos, hydrocarbons, fuel/diesel, organic compounds, inorganic compounds at Feagour Quarry to the northwest of the site option, however, the extents are limited, and it is considered a low risk. For Site Options 3 and 4 there is also possible contamination from the tunnel that passes under the site options. All site options though, are allocated a **Green** RAG rating for contamination, indicating minimal and localised risks, with further investigation recommended to assess contamination levels.

Noise

6.3.43 The noise evaluation for the site options was conducted using the SSEN Transmission Noise Selection Screening Tool[38], which assessed potential noise impacts based on proximity to noise receptors.

6.3.44 Site Options 1, 2, and 5 were identified as Highly constrained due to their locations near sensitive noise receptors, resulting in a **Red** RAG rating. Site Options 3 and 4 were categorised as having Moderate impact, meaning their noise effects would be less severe. These site options received an **Amber** RAG rating. Further investigation and possible mitigation would be required for any site option.

Construction Access

Substation Access Road (from public road)

6.3.45 The assessment of substation access roads has been carried out to evaluate each site option's feasibility in terms of existing infrastructure, civil works required, and potential impacts on the surrounding environment. The findings are based on available public data, OS Maps, and Transport Scotland data.

6.3.46 Site Option 1 and Site Option 2 would have the potential to use existing forestry track access which would assist the construction programme, though Site Option 1 would require this access to be extended by approximately 3 km. The proposed access bellmouth locations would have good visibility and would allow left off turns, which is beneficial for traffic flow on the A86. Road improvement works, such as road widening, strengthening and meeting maximum gradient allowance of 8%, would be required to allow for Abnormal Indivisible Loads (AIL) delivery. An **Amber** RAG rating has therefore been applied to Site Option 1 and 2.

6.3.47 For Site Option 3 and Site Option 4, a new road would be required following the existing farm tracks which follow more favourable topography. However significant cut and fill would be required to create suitable routes for construction. A **Red** RAG rating has therefore been applied to Site Option 3 and Site Option 4.

6.3.48 Site Option 5 would be accessed directly off General Wade's Military Road. Although no additional road would be required significant improvements to the road would be required to accommodate construction traffic. This road would also have a significant impact on residential areas. A **Red** RAG rating has therefore been applied to Site Option 5.

[38] A simple excel spreadsheet to undertake the calculation on all SSEN Transmision substation site selection projects.

Transformer Delivery Route

6.3.49 The Traffic Route Assessment for transformer delivery to the Coire Mashie substation site options evaluated key traffic routes and identified potential constraints affecting equipment transport. The assessment used public data, OS Maps, and Transport Scotland data. The roads that would be expected to be used for transport would be as follows:

- The A9 could be used to access all site options and is a primary dual-carriageway road suitable for all construction traffic, with no major constraints.
- The A86 could be used to access all site options and spans 19 km in the north and 11 km in the south. It has some constraints, including pinch points, narrow sections, and the need for passing places. Certain bridges would require clearance checks, and settlements along the route could cause congestion, especially for AIL deliveries.
- The A889 could be used to access all site options and is a 14 km long double-lane road, which would provide an alternative to the northern part of the A86. Though shorter and with fewer settlements, it shares similar constraints like pinch points and the need for heavy load assessments.
- AIL2 would likely only be used to access Site Option 5 and is a single lane dirt track directly from A86 at Achduchi towards General Wade's Military Road, which comprises of a 2 km undulating road. The track comprises of gentle slopes with peak slopes of approximately 3%. Additionally, there are height restrictions of 4.8 m present to facilitate clearance to OHL along the dirt track.
- General Wade's Military Road would likely only be used to access Site Option 5 and is a 3.3km long section of single lane road with asphalt which is in poor condition in places. The road will require road improvements to facilitate construction traffic access.

6.3.50 All site options would likely require the use of the A86 and potentially the A889 so all are considered to have an **Amber** RAG rating due to the constraints described above for those roads. Site Option 5 which would likely require the use of AIL2 / General Wade's Military Road so would be highly constrained based on the above. A **Red** RAG rating has therefore been allocated to Site Option 5.

Operations and Maintenance

Access

6.3.51 For operations and maintenance access to the substation site options, the access routes would follow the same pathways as those used for construction and advanced access. Therefore, the RAG ratings assigned to operations and maintenance access are the same as those assigned for construction access.

6.3.52 Site Options 1 and 2 are the most feasible for access, requiring only moderate improvements so have an **Amber** RAG rating. Site Options 3, 4, and 5 would have significant access constraints and are therefore allocated a **Red** RAG rating.

6.4 Costs

6.4.1 Costs were not assessed in detail as part of this site selection process. These will be considered in more detail as the substation design progresses, when the technical and engineering specifications become clearer.

Capital

6.4.2 The capital cost RAG ratings are based on anticipated construction, diversions, road improvement, felling land assembly and consent mitigation costs. At this stage, all site options have been allocated a **Green** RAG rating for capital costs. Site Option 3 is considered the lowest cost, with all other options under 120 % of this.

Operational

6.4.3 Operational requirements were not considered at this stage. As such, all site options have been allocated a **Green** RAG rating.

6.5 Comparative Analysis Summary

6.5.1 **Table 6.1** displays the environmental, engineering and cost appraisal RAG ratings for the site options considered.

6.5.2 From an environmental perspective, of the five site options, Site Options 3, 4 and 5 are highly constrained against a number of environmental topic areas. The development of a substation at Site Options 3, 4 or 5 would have the potential to be a prominent feature within the Cairngorm's National Park (CNP) with limited opportunities for screening, as well as having the potential to impact Annex 1 habitats and qualifying features of nature conservation sites of international importance. Similarly, from an engineering perspective, Site Options 3, 4 and 5 are all highly constrained, particularly regarding construction access routes, and in relation to hazards and interfaces with other infrastructure. Given the highly constrained nature of Site Options 3, 4 and 5, these sites are not preferred from either an environmental or engineering standpoint.

6.5.3 In contrast, Site Option 1 and Site Option 2 are less constrained across environmental topic areas. Both sites offer opportunities to minimise landscape and visual effects in the local area through the use of screening. Due to its more central location within the commercial forestry plantation, Site Option 2 would likely require more extensive tree felling to accommodate the proposed works. However, Site Option 1 would likely require more substantial earth works in order to establish a level site, which could increase on local landscape character. Site Option 2 also intersects with, and is sited close to, the non-designated cultural heritage asset of the Drum an Aird township, which is of Regional importance. Depending on site design, there may be opportunities to minimise impacts on this site. In terms of engineering constraints, both options received favourable ratings, albeit there were differences across the two sites in terms of topography, site clearance and earthworks requirements. Given these constraints, it is considered that Site Option 1 is slightly preferred over Site Option 2.

6.5.4 Costs were not assessed in detail as part of this site selection process. These will be considered in more detail at the detailed substation design stage when the technical and engineering specifications become clearer.

6.5.5 As can be seen in **Table 6.1** and from the above, this site selection appraisal indicates that Site Option 3, 4 and 5 are highly constrained in relation to environmental and engineering considerations. Site Option 1 and Site Option 2 are less constrained and are fairly comparable. Site Option 1 though is the site which offers the most balanced solution taking into account environmental, technical and cost considerations. Should this site be taken forward following consultation, it would be subject to further review during the detailed design stage to minimise and, where practicable, mitigate likely significant environmental effects. **Site Option 1** is therefore considered the Potential Site Option on these grounds and can be seen on **Figure 9**.

6.5.6 As summarised in **Appendix 1**, the appraisal of route options in relation to environmental, engineering and cost considerations conclude that the most favourable connection supports Site Option 1 being the Potential Site Option to facilitate a connection with the National Grid. Site Option 2 could also accommodate a UGC connection; however, route options to Site Options 3, 4 and 5 are highly constrained from both environmental and technical perspectives.

Table 6.1: Coire Mashie Substation – RAG Ratings

	Category	Sub-Topic	Site Option 1	Site Option 2	Site Option 3	Site Option 4	Site Option 5
Environmental	Natural Heritage	Designations	A	A	A	A	R
		Protected Species	A	A	A	A	R
		Habitats	A	A	R	R	A
		Ornithology	A	G	R	R	G
		Geology, Hydrology and Hydrogeology	A	A	A	A	A
	Cultural Heritage	Designations	A	A	G	A	A
		Cultural Heritage Assets	G	R *	G	G	G
	Landscape and Visual	Designations	A	A	R	R	R
		Character	A	G	R	R	R
		Visual	G	A	A	A	R
	Land Use	Agriculture	G	G	G	G	G
		Forestry	A	R	G	G	R
		Recreation	A	A	A	A	A
	Planning	Policy	A	A	R	R	R
		Proposals	G	G	R	A	G
Engineering	Connectivity	Existing Circuits / Network	A	G	R	A	G
		Future Development	R	A	R	R	R
		Interface	G	G	R	R	G
		DNO Connection	A	R	R	R	R
	Footprint Requirements	Technology	R	R	R	R	R
		Adjacent Land use	A	A	A	A	A
		Space Availability	A	A	A	A	R
	Hazards	Unique Hazards	A	G	R	R	A
		Existing Utilities	G	G	R	R	G
	Ground Conditions	Topography	R	A	A	A	G
		Geology	A	R	R	R	R
	Environmental Conditions	Elevation	R	R	R	R	R
		Salt Pollution	G	G	G	G	G
		Flooding	A	G	R	R	A
		Carbon Footprint	R	A	A	A	R
		SF6	G	G	G	G	G
		Contaminated Land	G	G	G	G	G
		Noise	R	R	A	A	R
	Construction Access	Access Road	A	A	R	R	R
		Transformer Route	A	A	A	A	R
	Operation & Maintenance	Access	A	A	R	R	R
Cost	Costs	Capital	G	G	G	G	G
		Operational	G	G	G	G	G

** Could be reduced to Amber should a footprint that does not directly impact the Druim an Aird township be achieved.*

7. SUMMARY AND NEXT STEPS

7.1 Overview

7.1.1 SSEN Transmission places great importance on, and is committed to, consultation and engagement with all parties, or stakeholders, likely to have an interest in proposals for new projects such as this. Stakeholder consultation and engagement is an essential part of an effective development process.

7.1.2 This Consultation Document summarises the environmental, technical and economic appraisal of new 400 kV substation required to connect the proposed Earba PSH scheme, near Kinloch Laggan in the Highlands of Scotland, to the National Grid.

7.1.3 To facilitate connection of the proposed Earba PSH scheme to the Coire Mashie substation, a new 400 kV UGC grid connection from the Earba PSH scheme is also required. Whilst this consultation focuses on the substation site selection, comments regarding the 400 kV UGC grid connection will be taken into consideration, and **Appendix 1** comprises a route stage appraisal for the UGC.

7.1.4 Comments are sought from stakeholders on the site options considered. When providing your comments and feedback, SSEN Transmission would be grateful for your consideration of the questions below:

- **Has the requirement for the project been clearly explained?**
- **Are there any additional factors, or environmental features, that you consider important and should be brought to the attention of the project team?**
- **Do you have any preference of which site is selected or other comments regarding the potential site or project?**
- **Following review of the information provided, how would you describe your understanding of the project?**
- **Do you have any preference for which UGC route option is selected or any other comments regarding the potential route options?**
- **Overall, how do you feel about the project?**

7.1.5 Consultation events will be held on 28th May 2025: 14:00 to 19:30 at Laggan Village Hall, Newtonmore, PH20 1AN. The responses received from these consultation events, and those sought from statutory consultees and other key stakeholders, will inform further consideration of site options.

7.1.6 All comments on the site options and selection process are requested by **28th June 2025**. Following consultation events and a review of consultation responses, a Report on Consultation will be produced which will document the consultations received, and the decisions made in light of these responses to inform the selection of a proposed substation site, as well as a proposed route for the UGC connection.

Scottish & Southern Electricity Networks
TRANSMISSION

Laggan

Feagour

Kinloch Laggan

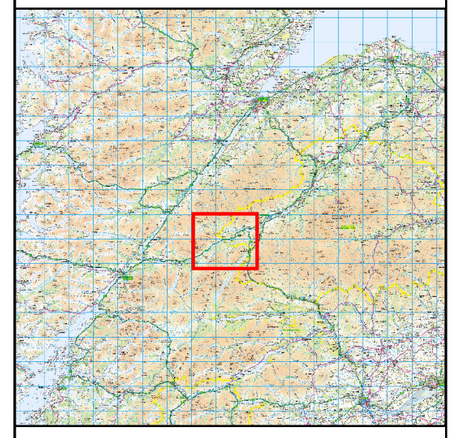
Dalwhinnie

Legend

- 10km Area of Search
- Cairngorms National Park (CNP)
- Beauly to Denny 400 kV OHL
- Indicative Earba Pumped Storage Hydro Substation

Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5



N

0 0.25 0.5 1 1.5 2 2.5 km

Scale - 1:80,000 @ A3

Project: LT00505 - Coire Mashie Substation

Title: Figure 1a: Area of Search

Drawn by: MT Date: 04/10/2024

Drawing: 123021-D1-ESSR-1.0.0

Scottish & Southern Electricity Networks
TRANSMISSION

Laggan

Feagour

Kinloch Laggan

Legend

- Area of Search
- Beauly to Denny 400 kV OHL
- Cairngorms National Park (CNP)

Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

N

0 0.25 0.5 1 1.5 2 km

Scale - 1:40,000 @ A3

Project: LT00505 - Coire Mashie Substation

Title: Figure 1b: Site Options

Drawn by: MT Date: 03/10/2024

Drawing: 123021-D1b-ESSR-1.0.0

Scottish & Southern Electricity Networks

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Monadhliath (SAC)

Monadhliath (SSSI)

Blargie Craig (GCR)

River Spey (SSSI)

River Spey (SAC)

Creag Meagaidh (SPA)

Creag Meagaidh (SSSI)

Creag Meagaidh (SAC)

Creag Meagaidh (NNR)

Kinloch Laggan Road (GCR)

Allt Mhainisteir (GCR)

Legend

Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

Natural Heritage Designations

- Cairngorms National Park (CNP)
- Special Protection Area (SPA)
- Special Areas of Conservation (SAC)
- Sites of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)
- Geological Conservation Review (GCR)

Ancient Woodland Inventory (AWI)

- Ancient Woodlands (Class 1a and 2a)
- Other woodlands on 'Roy' woodland sites (Class 3)

N

0 0.25 0.5 1 1.5 2 km

Scale - 1:40,000 @ A3

Project: LT00505 - Coire Mashie Substation

Title: Figure 2 - Natural Heritage Designations including ancient woodland

Drawn by: MT/CG Date: 03/10/2024

Drawing: 123021-D2-ESSR-1.0.0

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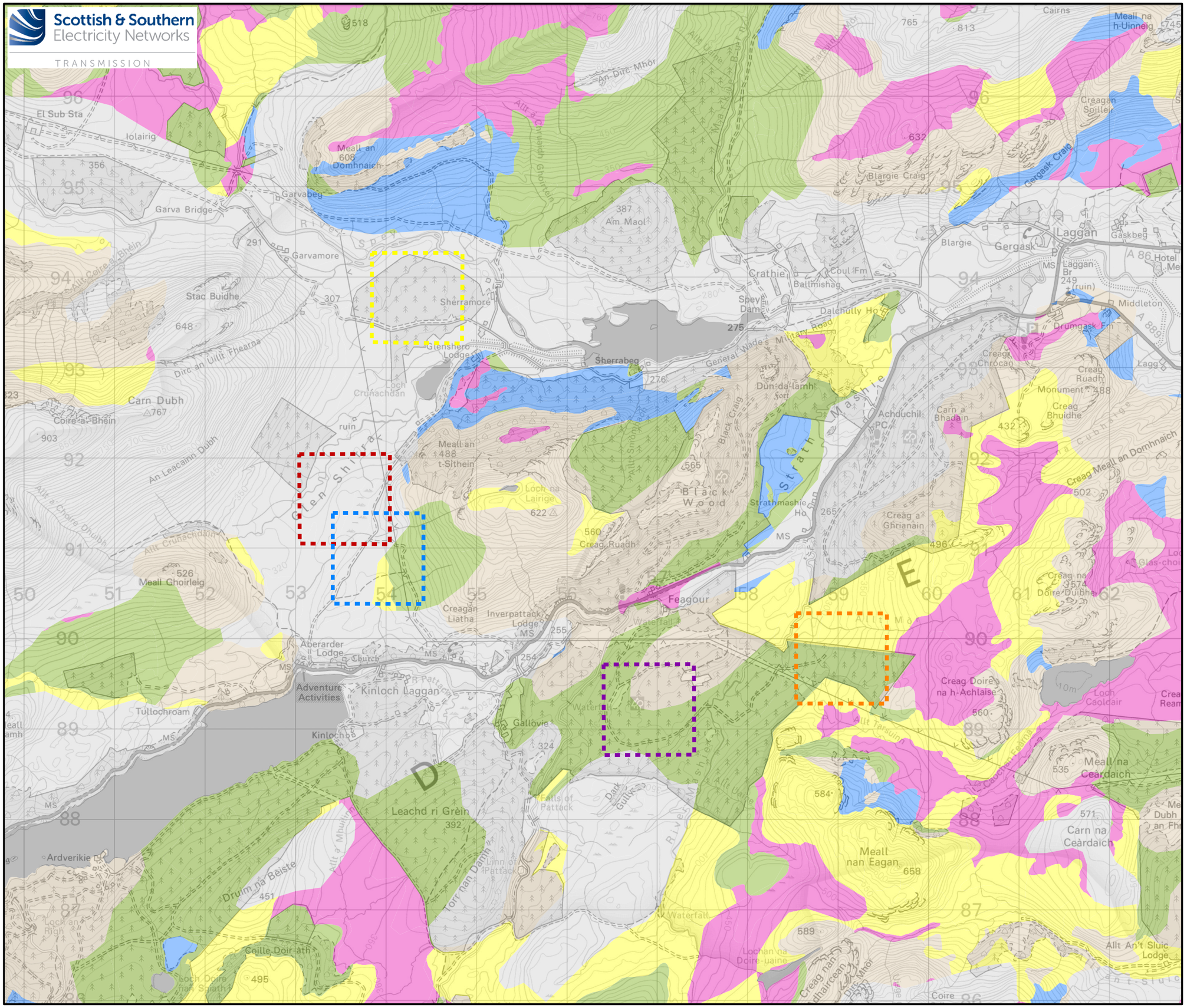

Legend

Site Options

🟧 Site Option 1

🟪 Site Option 2

🟦 Site Option 3

🟥 Site Option 4

🟨 Site Option 5

Carbon and Peatland 2016 Classification

⬛ Non-soil (i.e. loch, built up area, rock and scree)

⬜ Mineral soils - Peatland habitats are not typically found on such soils

🟪 CLASS 1 All vegetation cover is priority peatland habitats. All soils are carbon-rich soils and deep peat

🟨 CLASS 2 The vegetation cover is dominated by priority peatland habitats. All soils are carbon-rich soil and deep peat

🟦 CLASS 3 Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat

🟫 CLASS 4 Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils

🟩 CLASS 5 Soil information takes precedence over vegetation data. No peatland habitat recorded. May also show bare soil. All soils are carbon-rich soil and deep peat

N

0 0.25 0.5 1 Kilometres

Scale - 1:40,000 @ A3

Project: LT00505 - Coire Mashie Substation

Title: Figure 3 - Peatland Classification

Drawn by: MM
Date: 13/05/2025

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Monadhliath SSSI
Monadhliath SAC
Garva Bridge GCRS
River Spey SSSI
Blargie Craig GCRS
River Spey DWPA
River Spey SAC
Creag Meagaidh SAC
Creag Meagaidh SPA
Creag Meagaidh SSSI
Allt Crunachdain Catchment
River Spey Catchment
River Spean Catchment
Kinloch Laggan Road GCRS
Kinlochlaggan Boulder Beds SSSI
River Mashie Catchment
River Pattach - Loch Laggan to Loch Pattack Catchment
Allt Mhainisteir GCRS
River Truim DWPA

Legend

Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

Local Hydrology and Designations

- Special Areas Of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Geological Conservation Review Site (GCRS)
- River Spey / River Spean Catchment Boundary
- Sub Catchment Boundary; Allt Crunachdain
- Watercourse (OS OpenMap Local)
- Waterbody (OS OpenMap Local)
- River Flood Extent (2085)
- Surface Water Flooding - Medium Likelihood
- Drinking Water Protected Areas
- THC Private Water Supply Database

N

0 0.25 0.5 1 Kilometres

Scale - 1:40,000 @ A3

Project: LT00505 - Coire Mashie Substation

Title: Figure 4 - Local Hydrology

Drawn by: MM Date: 13/05/2025

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Garva Bridge, LB 6900
Glen Shirra Old Wade Bridge, LB 6902
Glenshero Lodge, LB 6901
Dun da Lamh Fort, SM 4361
5. MHG49166
St Kenneth's Kirk, Church and Cross Slab, SM 5703
Old St Kenneth's Church, burial ground, LB 6907
Druim an Aird Township
4. MHG49134
3. MHG49138
2. MHG32734
1. MHG32742
Ardverikie Gatelodge, Gate Piers, Bridge, LB 6911
Kinloch Laggan Lime Kiln, LB 6908

Legend

Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

Cultural Heritage Designations

- Scheduled Monuments (SM)

Listed Buildings Categories

- Category A
- Category B
- Category C

Historic Environment Record (HER) Assets

- Military Roads - Undesignated
- Historic Environment Record (HER): Monument Point Features
- Historic Environment Record (HER): Monument Polygon Features
- Druim an Aird Township and associated features

Cultural Heritage Assets

1 - Strathmashie, Drystone structure
2 - Druim an Aird South, Cairn & Boundary Marker Cairn
3 - Leacainn Trackway
4 - Allt Tarsuinn Shelter
5 - Newfoundland Overseas Forestry Unit 'Winch'

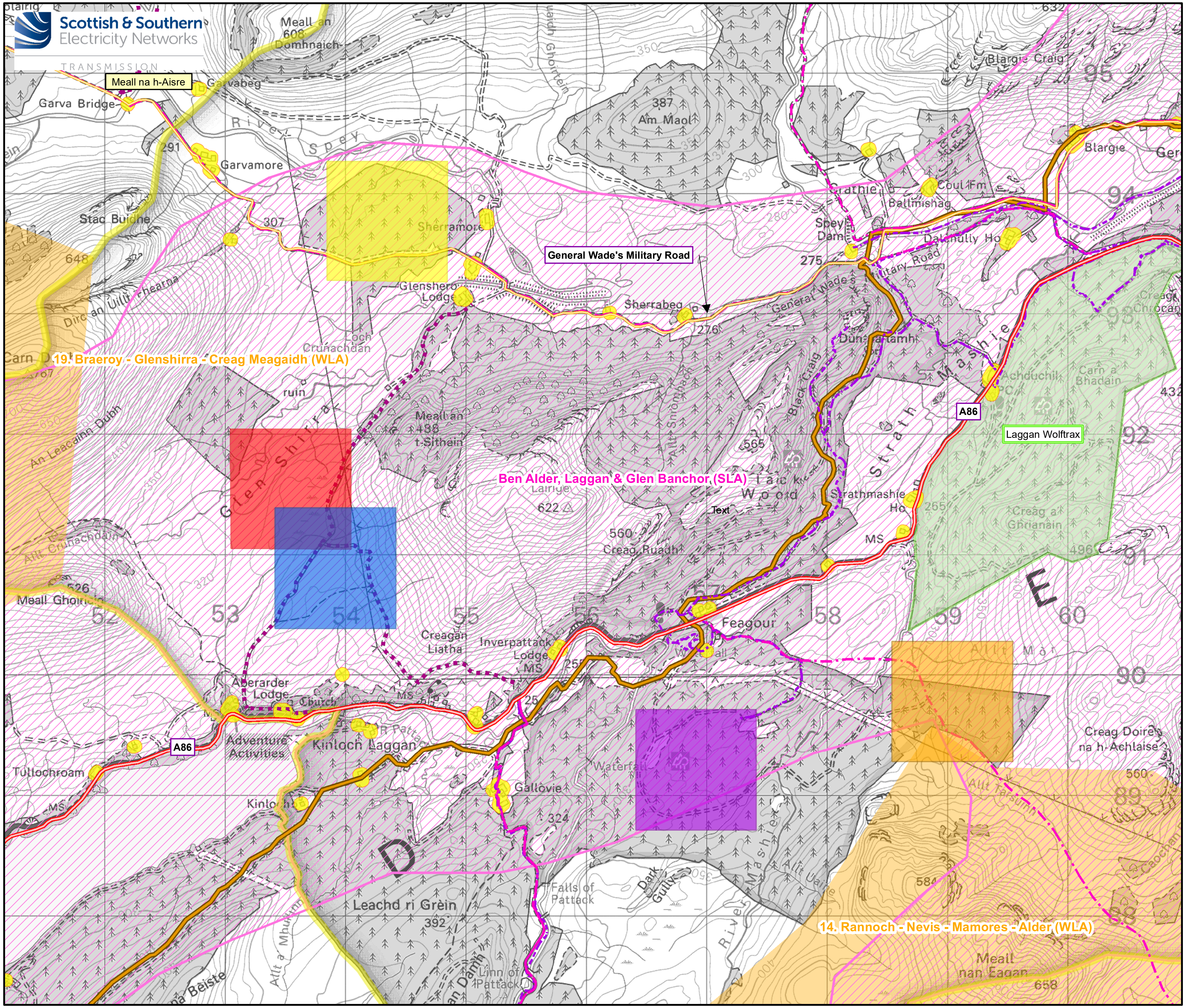
N
0 0.25 0.5 1 1.5 km
Scale - 1:35,000 @ A3

Project: LT00505 - Coire Mashie Substation

Title: Figure 5: Cultural Heritage

Drawn by: MT Date: 11/05/2025

Drawing: 123021-D6-ESSR-1.0.0



Scottish & Southern Electricity Networks
TRANSMISSION
Meall na h-Aisre
General Wade's Military Road
19. Braeroy - Glenshirra - Creag Meagaidh (WLA)
Ben Alder, Laggan & Glen Banchor (SLA)
14. Rannoch - Nevis - Mamores - Alder (WLA)
Laggan Wolftrax
A86
Garva Bridge
Garvabeg
Garvamore
Stac Buidhe
Sherramore
Glenshero Lodge
Sherrabeg
Am Maol
Blargie Craig
Blargie
Coul Fm
Ballmishag
Spey Dam
Dalchully Ho
Dunachtamh
Black Craig
Achduchil
Carn a Bhadain
Strathmashie Ho
Creag a Ghrianain
Creag Ruadh
Meall an t-Sithein
Glen Shirra
Crunachdan
Meall Ghoirleig
Creagan Liatha
Inverpattack Lodge
Feagour
Aberarder Lodge
Adventure Activities
Kinloch Laggan
Tullochroam
Gallovie
Waterfall
Falls of Pattack
Linn of Pattack
Dark Gully
Leachd ri Grèin
Creag Doire na h-Achlaise
Meall nan Eagan
Text

Legend

Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

Designated & Protected Landscape

- Cairngorms National Park (CNP)
- Special Landscape Areas (SLA)
- Wild Land Area (WLA)

Potential Visual Constraints

- A Road
- Minor Road
- Scottish Hill Tracks*
- Core Paths*
- Mountain Routes
- East Highland Way
- Buildings (50m Buffer)
- Laggan Wolftrax

* Names can be seen on Figure 8

N

0 0.25 0.5 1 1.5 km

Scale - 1:30,000 @ A3

Project: LT00505 - Coire Mashie Substation

Title: Figure 6: Landscape & Visual Constraints

Drawn by: MT | Date: 03/10/2024

Drawing: 123021-D7-ESSR-1.0.0

Scottish & Southern Electricity Networks
TRANSMISSION

Legend

Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

Forestry & Woodland

- National Forestry Estate (NFE)

Native Woodland of Scotland

- Native woodland
- Nearly-native woodland
- Open land habitat
- Plantations on Ancient Woodland Sites (PAWS)

Planting Schemes

- Lower Pattack Wood Forestry Grant Scheme (FGS) (proposed)
- Aberarder Planting Scheme (consented)

Ancient Woodland can be seen on Figure 2.

N

0 0.25 0.5 1 1.5 km

Scale - 1:30,000 @ A3

Project: LT00505 - Coire Mashie Substation

Title: Figure 7 - Forestry

Drawn by: UM/ MT/CG Date: 11/05/2025

Drawing: 123021-D9-ESSR-1.0.0

Scottish & Southern Electricity Networks
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Track No. 235: Laggan to Fort Augustus by the Corrieyairack Pass
Track No. 234: Newtonmore to Laggan by Glen Banchor
LBS1a: The River Spey
UBS23: Corrieyairack Link
UBS30: General Wade's Military Road
Track No. 236a: Laggan to Whitebridge
UBS20: Gorstan Path
Track No. 201: Kingussie to Laggan
UBS22: Blackwood Trail
UBS8: Glen Banchor
UBS22: Blackwood Trail
UBS24: Pattack Walk
UBS25: Drum an Aird Path
UBS26: Falls of Pattack
Track No. 200: Dalwhinnie to Feagour (Strath Mashie)
Laggan Wolftrax
Adventure Activities

Legend

Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

Recreational Interests

- Scottish Hill Tracks
- Core Paths
- Mountain Routes
- East Highland Way
- Laggan Wolftrax

Land Use

- A Road
- Minor Road

N

0 0.25 0.5 1 1.5 km

Scale - 1:30,000 @ A3

Project: LT00505: Coire Mashie Substation

Title: Figure 8: Land Use & Recreation

Drawn by: MT/CG Date: 09/05/2025

Drawing: 123021 -D11-ESSR-1.0.0

Scottish & Southern Electricity Networks
TRANSMISSION

Legend

Potential Site Option

Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

N

0 0.25 0.5 1 1.5 2 km

Scale - 1:40,000 @ A3

Project: LT00505 - Coire Mashie Substation

Title: Figure 9 : Potential Site Option

Drawn by: MT Date: 04/10/2024

Drawing: 123021-D12-ESSR-1.0.0

Scottish & Southern Electricity Networks

TRANSMISSION

Appendix 1

Earba PSH Scheme Grid Connection:

Route Options Appraisal

May 2025

REF: LT000513 - 515

CONTENTS

Figures

1. INTRODUCTION

1.1 Purpose of Document

1.1.1 This Appendix describes the appraisal of route[1] options for a new 400 kV underground cable (UGC) to connect the consented Earba Pumped Storage Hydro (PSH) Scheme to the electricity transmission network at the proposed Coire Mashie substation.

1.1.2 The UGC would be expected to fall under SSEN Transmission's permitted development rights under Class 40 1(a) of The Town and Country Planning (General Permitted Development) (Scotland) Order 1992. As such these works would not require statutory public consultation or specific consent. However, the connection will be subject to a route and alignment selection exercise, in accordance with SSEN's routeing guidance.[2] The appraisal of potential route options is included in this Appendix.

1.1.3 The connection would commence from the Earba PSH Scheme's powerhouse located by the shore of Loch Earba at approximate National Grid Reference (NGR) 247493, 781861, before terminating at one of the five site options in consideration for Coire Mashie substation.

1.2 Technology Solution

1.2.1 The proposed technology solution for this 400 kV connection is UGC.

General UGC Construction Activities

1.2.2 It is anticipated that the Installation of an UGC, would involve the following tasks:

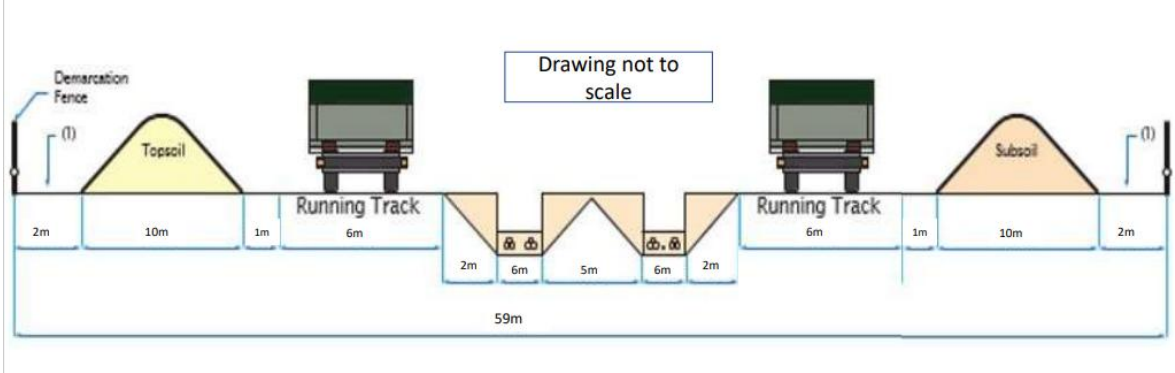
- Establish a working corridor (approximately 60 m wide) centred on the cable centreline;
- Installation of an access haul road and bridges where/if required;
- Excavate a trench up to 1.5 m in depth and 2 m wide, widening through benching and battering where stability and safety concerns arise;
- Clear out all materials likely to damage cable ducts, e.g. clods, rocks, stones and organic debris, and employ use of pumps to remove any water;
- Installation of ducting within the trench, surrounded by engineered backfill in suitable layers for protection, with protection tile and warning tape placed above the cable line, reinstatement to sub-soil level;
- Excavation and formation of power cable joint bays with above ground electrical link pillars and associated demarcation; reinstate excavated surface layers in reverse order;
- Transportation of and installation of power cable;
- Mobilisation of jointing containers and jointing of power cable;
- Reinstatement of joint bays and installation of fencing at link pillar locations; and
- Reinstate excavated surface layers in reverse order.

1.2.3 **Plate 1.1** shows a diagram of a typical UGC construction corridor.

[1] A linear area of approximately 1 km width (although this may be narrower/wider in specific locations in response to identified constraints), which provides a continuous connection between defined connection points.

[2] SSEN Transmission (2020). *Procedures for Routeing Overhead Lines and Underground Cables of 132 kV and above*, Revision 2.

Plate 1.1: Example of a typical UGC Construction Corridor



Forestry Removal

1.2.4 Construction of the project will likely require the removal of sections of commercial forest. This would be undertaken in consultation with affected landowners, and the project would comply with the Scottish Government's Control of Woodland Removal Policy (CoWRP).[3]

1.2.5 An Operational Corridor (OC) would be required to enable the safe operation and maintenance of the UGC. This would vary depending on the type of woodland (based on species present) in proximity to the connection. The OC that has been preliminarily assumed at this stage is 90 m.

Access Strategy

1.2.6 For the 400 kV UGC, a construction haul road would be required within the UGC construction corridor to facilitate its construction. Once installed, it is anticipated that the construction corridor would be reinstated, with an OC being maintained.

Programme

1.2.7 It is anticipated that construction of the project would take approximately 24 months, following the granting of consents, although detailed programming of the works would be the responsibility of the Contractor in agreement with SSEN Transmission.

[3] Forestry Commission Scotland (2009) Control of Woodland Removal Policy.

2. ROUTE SELECTION PROCESS

2.1 Overview

2.1.1 The approach to route selection was informed by SSEN Transmission's guidance 'Procedures for Routeing Overhead Lines and Underground Cables of 132 kV and above'[4]. The guidance sets out SSEN Transmission's approach to selecting a route for an OHL or UGC. This document helps SSEN Transmission to meet its obligations under Schedule 9 of the Electricity Act 1989, which requires transmission license holders:

- to have a regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interests; and
- to do what they reasonably can to mitigate any effect that the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.

2.1.2 The guidance develops a process which aims to balance these environmental considerations with technical and economic considerations throughout the route options process.

2.1.3 The guidance splits the routeing stage of a project into the following principle stages:

- Pre-Routeing Activities: Selection of proposed connection option;
- Stage 0: Routeing strategy development;
- Stage 1: Corridor Selection;
- Stage 2: Route Selection; and
- Stage 3: Alignment Selection.

2.1.4 Each stage is an iterative process and involves an increasing level of detail and resolution, bringing environmental, technical and cost considerations together in a way which seeks to achieve the best balance. The stages carried out can vary depending on the type, nature and size of a project.

2.2 Stage 1: Corridor Selection

2.2.1 A Corridor was identified within which the identification and assessment of route options could be completed (see **Figure 1.1**). The Corridor was developed to encompass a range of feasible route options between the connection point of the proposed Earba PSH substation and the five proposed Coire Mashie substation site options shown in **Figure 1.1**.

2.2.2 No other Corridor options were identified due to the distance and geography between the identified connection points between the PSH scheme and the proposed substation site options, which constrain any alternative corridor options.

2.3 Stage 2: Route Selection

2.3.1 Route options were initially identified following desk-based review, partially informed by prior knowledge and experience of the area and making use of landform. Route options were identified at varying widths in order to take account of known physical and development constraints in the area such as topography and waterbodies.

2.3.2 Appraisal of the route options was undertaken against a number of criteria set out within the SSEN Transmission guidance[4] and listed below:

[4] SSEN Transmission (2020). *Procedures for Routeing Overhead Lines and Underground Cables of 132 kV and above*, Revision 2.

Environmental Criteria

- Natural Heritage – designations, protected species, habitats, ornithology, hydrology, geology and hydrogeology;
- Cultural Heritage – designations and cultural heritage assets;
- Landscape and visual – designations, landscape character and visual;
- Land Use – agriculture, forestry, recreation and infrastructure; and
- Planning – policy and proposals.

Engineering Criteria

- Infrastructure Crossings – major crossings (OHLs, rail, river, canals, pipelines) and road crossings;
- Environmental Design – elevation, contaminated land, and flooding;
- Ground Conditions – terrain, rock and peat;
- Construction / Maintenance – access and angles of deviation, and cable haul road;
- Proximity – windfarms, communication masts, urban environments and metallic pipes;
- Design – reactive compensation, joint bays and link box chambers; and
- Other – DNO crossings.

2.3.3 Costs were not assessed in detail as part of this route selection process, however preliminary ratings based on route lengths, tree felling, and anticipated compensatory planting have been included in this Appendix.

RAG Rating

2.3.4 For each route option, a RAG rating has been applied to each topic area following appraisal, indicating potential constraint to development. A high-level convention for assigning RAG ratings is shown in **Plate 2.1** below. More detailed guidance for topic specific considerations is included in **Annex 10** of SSEN Transmission's approach to routeing.

Plate 2.1: RAG Ratings

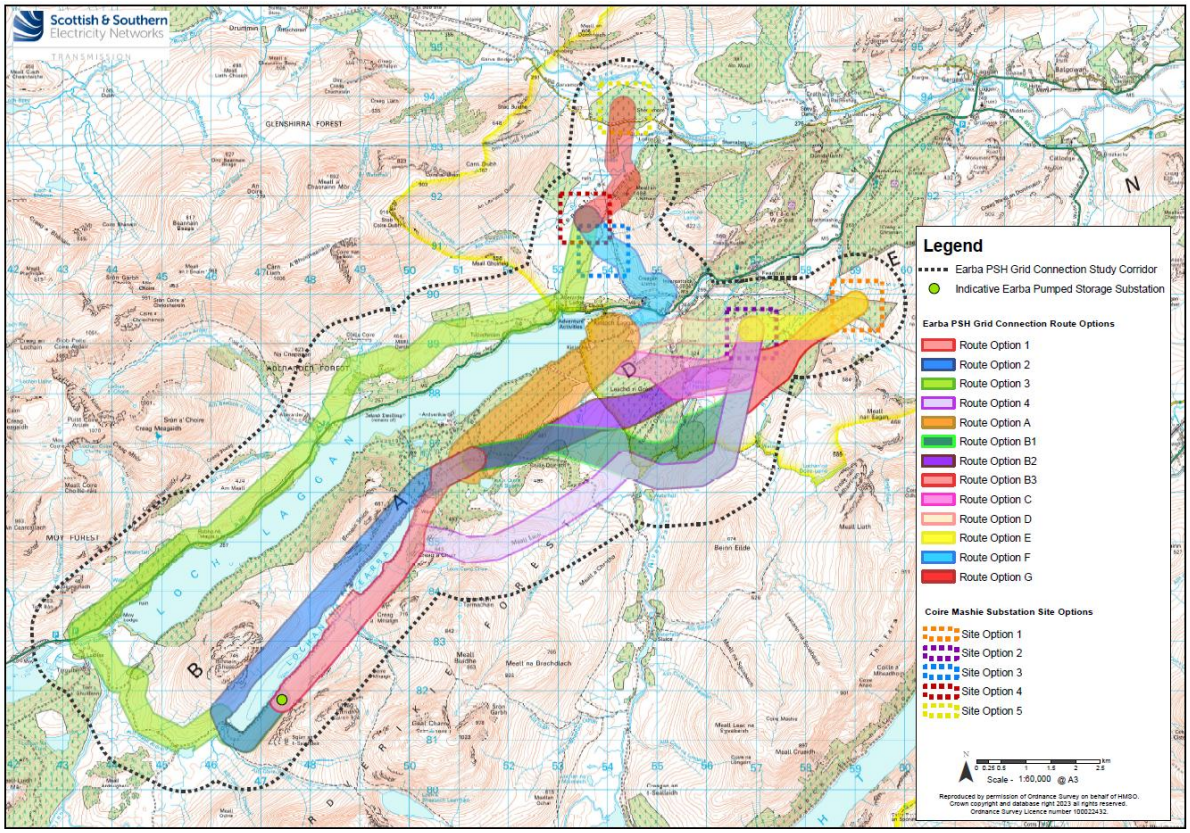
Performance	Comparative Appraisal
Most Preferred  **Least Preferred**	Low potential for the development to be constrained.
	Intermediate potential for the development to be constrained.
	High potential for the development to be constrained.

3. DESCRIPTION OF ROUTES

3.1 Introduction

3.1.1 This section of the report describes the route options identified for appraisal. There are a total of 13 route options, as shown on **Plate 3.1** (see also **Figure 1.1**).

Plate 3.1: Earba Grid PSH Grid Connection Route Options



3.2 Route Options

3.2.1 Those route options that originate at the proposed Earba PSH scheme connection point are numbered one to four. The remaining nine route options (lettered) either provide connections from Route Options 1 to 4, or from other lettered route options to facilitate a connection to one of the five Coire Mashie substation site options. A summary of each route option is provided below:

- **Route Option 1** commences at the proposed Earba PSH and travels north-east along the south and eastern edge of Loch Earba for approximately 4.5 km along steep terrain before travelling north-east for approximately 1.5 km, encompassing existing access tracks, and passing over tributaries of the Allt Labhrach. Route Option 1 terminates within the woodland on gently sloping land where it could connect into lettered Route Option A or Route Option B1, B2 or B3.

- **Route Option 2** commences at the proposed Earba PSH and initially travels south-west along the eastern edge of Loch Earba for approximately 1.5 km before reaching the most western extent of the loch. The route option would then travel along the western and northern banks of Loch Earba for approximately 8 km towards the eastern extent of the loch, passing below Binnein Shuas. Route Option 2 then continues travelling north-east through gently sloping woodland, crossing over river Allt Labhrach, before following the same path as Route Option 1 for approximately 1 km. Route Option 2 terminates at the same location as Route Option 1 within the forestry area, where it could connect to lettered Route Option A or Route Option B1, B2 or B3.

- **Route Option 3** commences at the proposed Earba PSH and initially follows a similar path to Route Option 2, travelling south-west along the eastern edge of Loch Earba for approximately 1.5 km, curving around the southern edge of Loch Earba before turning south-west away from Binnein Shuas. The route option then proceeds north-west across open gently sloping moorland, within the vicinity of an existing track, for approximately 4 km. After crossing the River Spean and the A86, Route Option 3 follows the A86 in a general north-easterly direction, to the north of Loch Laggan for approximately 14 km passing over areas of steep terrain across areas of woodland and open moorland, and crossing a number of watercourses including Allt Coire Ardair and Allt Coire Choille-rais. Within the vicinity of Aberarder Lodge, the route option heads in a more northerly direction to connect into Coire Mashie Site Option 3 or 4, or join Route Option G.

- **Route Option 4** would commence at the proposed Earba PSH and initially follow Route Option 1 for approximately 4 km, until it reaches Creag a' Chuir where it would turn east and ascend steep slopes and rocky crags. It would then travel in a general north-east direction towards Torr nan Damh forest. Route Option 4 then travels east around the southern edge of the forest, crossing over River Pattack, before traveling north crossing open moorland and then forestry, before reaching Coire Mashie substation Site Option 2 where it terminates.

- **Route Option A** begins approximately 1 km to the north-east of Loch Earba. The route option would originate from either Route Option 1 or Route Option 2 at the north-eastern extent of Loch Earba, between Loch an Righ and Loch Doire nan Sgiath, and travel through forestry to terminate at Kinloch Laggan. Existing forestry and estate tracks are present within the route option. Route Option A has the potential to connect to all 5 Coire Mashie substation site options through a combination of the other lettered route options.

- **Route Option B1** would originate from Route Option 1 or Route Option 2 and would begin where they terminate, approximately 1.5 km north-east of Loch Earba. It would travel in an easterly direction, to the north of Coille Doir - àth and continuing across open moorland towards Torr nan Damh forest, where it would encompass the southern extent of the forest, and areas of open moorland. The route would then cross an area referred to as the Dark Gully, before entering forestry again to reach Coire Mashie substation Site Option 2 where it terminates. From here though, Route Option B1 has the potential to connect to Coire Mashie substation Site Option 1 through an eastward connection via Route Option E.

- **Route Option B2** would originate from Route Option 1 or Route Option 2, and would begin where they terminate, approximately 1.5 km north-east of Loch Earba. It would travel immediately north-east, to the north of Coille Doir - àth and continue through Torr nan Damh forest, crossing the River Pattack, to terminate at Coire Mashie substation Site Option 2. From here though, Route Option B2 has the potential to connect to Coire Mashie substation Site Option 1 through an eastward connection via Route Option E.

- **Route Option B3** would originate to the east of the River Pattack and Dark Gully along the eastern edge of Route Option B1 and Route Option B2. Route Option B3 would then travel north-east for approximately 3 km through predominantly forested land, crossing over the River Mashie. Route Option B3 would continue on to Site Option 1 where it would terminate. Route Option B3 may require crossing the path of the existing Beauly to Denny OHL.

- **Route Option C** would originate from the northern end of Route Option A, travelling east for approximately 4 km. The route begins within Leachd ri Grèin forest before it crosses the River Pattack (including the Falls of Pattack) and open moorland. At Dark Gully, it would then follow Route Option 4 to terminate at Coire Mashie substation Site Option 2. From here though, Route Option C has the potential to connect to Coire Mashie substation Site Option 1 through an eastward connection to Route Option E.

- **Route Option D** would originate from the northern end of Route Option A and travel east for approximately 2 km. The route option begins at Kinloch Laggan and proceeds east along the southern edge of River Pattack, passing properties at Gallovie and intermittently through open moorland and forestry. It would then cross the River Pattack, before reaching Coire Mashie substation Site Option 2, where it terminates. From here though, Route Option D has the potential to connect to Coire Mashie substation Site Option 1 through an eastward connection to Route Option E.

- **Route Option E** would originate within the area of Corie Mashie substation Site Option 2 and could offer an extension to Route Option B1, Route Option B2, Route Option C or Route Option D by travelling east through forestry for approximately 2 km to reach Coire Mashie substation Site Option 1. Route Option B3 may require crossing the path of the existing Beauly to Denny OHL.

- **Route Option F** is approximately 3 km length in total and would originate from the north Route Option A by Kinloch Laggan. It would initially travel to the north-east, crossing the River Pattack and the A86, before turning north-west to proceed over steep terrain then open moorland where it would terminate within the area of Coire Mashie substation Site Option 3 and Site Option 4. Route Option F has the potential to connect to Coire Mashie substation Site Option 5 through a northern connection via Route Option G. Route Option F would require crossing the path of the existing Beauly to Denny OHL.

- **Route Option G** is approximately 2.5 km length in total and would originate within the area of Corie Mashie substation Site Option 4 and could offer an extension to Route Option 3 or Route Option F by travelling across open moorland to reach Meall an t - Sìthein Summit, before proceeding north, passing Loch Crunachdan to the east to reach Coire Mashie substation Site Option 5 where it terminates. Route Option G would require crossing the path of the existing Beauly to Denny OHL.

4. COMPARATIVE APPRAISAL

4.1 Overview

4.1.1 This section provides a summary of the potential environmental, technical and economic constraints identified for each route option. Relevant environmental baseline information is provided in **Section 5** of the Consultation Document relevant to the UGC routeing appraisal. Key constraints relevant to the route options are also shown on **Figure 1.2** and cultural heritage constraints are on **Figure 1.3**.

4.2 Environmental Topic Areas

Natural Heritage

Designations

4.2.1 Route Options 3, B3 and G have been allocated a **Red** RAG rating, with Route Option 3 directly intersecting the Creag Meagaidh SSSI / NNR (see **Figure 1.2**). Route Option B3 and Roue Option G would intersect several tributaries and surrounding riparian habitats of the River Spey, presenting potentially significant risks to the designated species of this watercourse, associated with required linear excavations, habitat clearance, and bank / channel alterations across several watercourses. Based on the lack of connectivity with relevant designated sites and the associated potential impacts, Route Options C, D and E have been allocated a **Green** RAG rating. The remainder of the route options have been allocated an **Amber** RAG rating due to the potential to impact designated sites.

4.2.2 In terms of woodland recorded on the AWI, potential impacts are most notable within Route Option 3, which contains the greatest coverage of irreplaceable ancient woodland with connectivity to equivalent habitat in the Creag Meagaidh designated sites. The AWI also depicts a large parcel of ancient woodland extending down the centre of Route Option A; however, based on the NWSS, as well as habitat data gathered during the preliminary site walkover, this woodland is instead characterised by non-native rotational plantation, which has likely been planted on an ancient woodland site (PAWS). As such, the impact of woodland clearance within this route option is expected to be lower than the AWI mapping suggests. Route Option B1 and Route Option B3 also contain AWI where linear clearance and subsequent fragmentation could be required, though this could be avoided through considerate route design.

Protected Species

4.2.3 All route options pass through a similar mix of habitats, comprising a mosaic of upland heathland habitats, particularly across areas of higher elevation, with a further mosaic of woodlands of both plantation and semi-natural origins surrounding Loch Laggan. An extensive hydrological network is also present, extending across each route option.

4.2.4 Whilst potential impacts on protected species are present within all route options, including habitat loss / fragmentation and death, injury and / or disturbance of individuals / populations, the extensive coverage of suitable habitat within Route Option 3 may lead to the greatest impacts on protected species. Route Option 3 has therefore been allocated a **Red** RAG rating, whilst all remaining numbered and lettered route options have been allocated **Amber** RAG ratings.

Habitats

4.2.5 All route options contain internationally-important Annex I habitats and / or irreplaceable ancient woodland. Based on the extensive coverage of these habitats, Route Options 3, 4, B1, E, F and G have been allocated a **Red** RAG rating. Route Options 1, 2, A, B2, B3, C, and D have been allocated an **Amber** RAG rating given potential for impacts to be reduced through appropriate control measures and micrositing.

Ornithology

4.2.6 In relation to ornithology, the SPA is considered in **Natural Heritage Designations**.

4.2.7 Route Option 1 and Route Option 2 have been allocated an **Amber** RAG rating due to the potential disturbance and loss of habitat during construction. Route Option 3 and Route Option 4 have been allocated a **Red** RAG Rating due to the potential for high displacement and disturbance to breeding or foraging birds, in particular the presence of Golden Eagle for Route Option 4.

4.2.8 Route Options B2, F and G were allocated an **Amber** RAG rating as the saturated open moorland where they are situated has more potential bird constraints, whilst Route Option B1 is allocated a **Red** RAG rating as this route option is likely to disturb several protected species, regardless of appropriate mitigation being implemented. The remaining route options (A, B3, C, D and E) run predominantly through forested habitat, and have been allocated a **Green** RAG rating due to the risk of disturbance to breeding birds being low.

Geology, Hydrology and Hydrogeology

4.2.9 Priority peatland mapping highlights that Route Option 2, Route Option 3, Route Option 4 and Route Option B1 would pass through areas of Class 1 and 2 peatlands. Small areas of Route Option A, B3, C, E and F will also intersect areas of Class 1 or 2 peatlands however, it is anticipated that the priority peatland could be avoided within these routes. Route Option 3 and Route Option B1 would pass through the largest area of Class 1 and 2 peatlands. Site specific peat probing has been undertaken across parts of all the route options except for Route Option F and G. The deepest areas of peat (4.8 m) are noted within Route Option 4 and B1 which coincides with areas designated as Class 1 peatland within the centre of the route options. Further peat probing will be required whichever option is chosen and it will be necessary to show that the deepest peat has been avoided. A peat management and peat landslide hazard risk assessment will be required where peat deposits are crossed.

4.2.10 Watercourse crossings would be necessary for all route options, and all permanent structures would need to be set back from the watercourse channel to protect against exposure from natural processes leading to watercourse meandering and migration.

4.2.11 SEPA floodplain mapping shows floodplains associated with the larger watercourses. Flood extents are generally confined to the watercourse channels. Wider flood extents are noted near the confluences of these larger watercourses with smaller tributaries or lochs, particularly within Route Option 1, Route Option 2, Route Option B1, Route Option D, F and G associated with flooding of Allt Coire a'Chlachair, River Pattack and Allt Crunachdain respectively.

4.2.12 Potential for flood risk during the construction stage and the siting of construction related infrastructure would need to be given appropriate consideration for all route options.

4.2.13 THC private water supplies database indicates several private water supplies within Route Option 3, Route Option A and Route Option F. In addition, private water supplies are noted within 250 m of Route Option B2, C and D. Potential impacts on private water supplies would need to be assessed further, however subject to appropriate alignment and best practice construction methods it is likely that potential impacts can be mitigated.

4.2.14 All route options have therefore been allocated a RAG rating of **Amber** for Geology, Hydrology and Hydrogeology.

Cultural Heritage

Cultural Heritage Designations

4.2.15 No direct impacts on designated cultural heritage sites are anticipated for any route option. Given the nature of UGC, there will be no long term visual impact on designated sites in the area. As such, all route options have been given a **Green** RAG rating.

Cultural Heritage Assets

4.2.16 In relation to cultural heritage assets, UGC would generally have the potential to damage sub-surface and unidentified features. The route options which contain archaeological features of importance are listed below and can be seen on **Figure 1.3**.

4.2.17 Route Option 3 contains archaeological features that suggest a pre-historic presence:

- A'Choille Mhor/Meall Damh, MHG 46349 and MHG 30718; and
- Tullochroam township, MHG 27121 at NGR 251900 789400.

4.2.18 Within the vicinity of Route Option 4, Route Option B and Route Option C, archaeological sites recorded on the Highland HER include the Cramlets/Dark Gully, cairns and building remains, MHG 32735. Route Option 4 and Route Option B contain an additional site recorded on the Highland HER site of the River Pattack, Enclosure, MHG27128. Route Option B3 would also pass over MHG49206, the Cramlets West.

4.2.19 These sites would be considered of regional significance and therefore of medium sensitivity to damage. Therefore, Route Option 3, Route Option 4, Route Option B1, Route Option B2, Route Option B3 and Route Option C have been given an **Amber** RAG rating.

4.2.20 Route Option 4, C, B1, B2 and E contain Druim an Aird, Township, MHG4482. This site is of Regional importance and is recorded on the Highland HER. Further sensitivity is added by the historical associations and by the adoption of this site for interpretation for visitors and walkers. Therefore, these five route options have been given a **Red** RAG rating. However, it should be noted if Route Option 4, C, B2 or B3 were to connect into Route Option B3 rather than turn north into substation Site Option 2, they would not interact with Druim an Aird and would likely have an Amber RAG rating.

4.2.21 All remaining route options have been allocated a **Green** RAG rating (Route Options 1, 2, A, D, F, G).

Landscape and Visual

Designations

4.2.22 All of the numbered route options would be situated, in full or in part, within designated or protected landscapes of both regional and national significance.

4.2.23 Both Route Options 3 and Route Option 4 enter into the CNP for short sections at their north-eastern end. For Route Option 4, this would be within an area characterised by coniferous forest plantation edge and less likely to influence the SLQs of the CNP, but Route Option 3 would cross the open valley of Glen Shirra where potential effects on SLQs would be greater.

4.2.24 Route Options 1 and 2 would follow the length of the Loch Earba valley which is considered to be a notable contributary part of the Ben Alder, Laggan and Glen Banchor SLA. This would result in notable loss of woodland which contributes to the distinctive character as well as compromising mitigation planting proposed for the

pumped storage scheme within this area. Route Option 4 would have similar effects to Route Option 1 but would also cross very steep crags over the valley-side, likely to be difficult to achieve without notable effects on the SLA.

4.2.25 Route Option 3 would lead to a less notable effect on Loch Earba but both Route Options 2 and 3 would potentially compromise proposed mitigation planting for the Earba PSH scheme, around the proposed powerhouse and Shuas dam. Route Option 3 would also lead to potential effects on areas around Loch Laggan.

4.2.26 All of the numbered Route Options would also pass through a wild land area (WLA 14), with potential to influence qualities of wildness within the Loch Earba valley.

4.2.27 Taking account of these likely constraints, a **Red** RAG rating has been applied to Route Option 4 due to the likely impacts on the crag, Creag a' Chuir. An **Amber** RAG rating allocated for Route Options 1-3.

4.2.28 All of the lettered route options fall partly or fully within the CNP. The majority of the lettered route options also fall within the Ben Alder, Laggan and Glen Banchor SLA, with the exception of the three B Route Options which are mostly outwith this area.

4.2.29 Route Options C, E and B3 affect parts of the CNP which are strongly characterised by coniferous forest plantation, and therefore would be less likely to affect the CNP SLQs. A **Green** RAG rating has therefore been applied to Route Options C, E and B3.

4.2.30 Route Options A, B1 and B2 would also have potential to achieve an alignment which may not affect the SLQs although have more localised sensitivities: for Route Option A, in areas close to Loch Laggan and Kinloch Laggan which are more sensitive; and for Route Option B1 and B2, affecting some elevated open moorland where more remote or undeveloped characteristics exist. An **Amber** RAG rating has been allocated for Route Options A, B1 and B2.

4.2.31 Route Options D, F and G would be more difficult to implement without affecting some SLQs, with Route Option D liable to lead to potential loss of features on the valley floor area of Strath Mashie, and Route Options F and G affecting the more remote Glen Shirra. Route Option D is considered to be the most constrained due to the small scale and intricate character of the area it passes through. A **Red** RAG rating is allocated for Route Option D, while an **Amber** RAG rating is allocated for Route Options F and G.

Landscape Character

4.2.32 The Corridor comprises a generally sensitive landscape to new development. In some areas, landscape character could be noticeably changed by the loss of features such as distinctive woodland or landform patterns, particularly within the smaller scale and more diverse character areas of LCT 87 (Small Craggy Knolls and Hills) and localised parts of LCT 126 (Upland Glen – Cairngorms). The areas of greatest potential to accommodate the UGC, are those characterised by an established pattern of coniferous forest plantation, where felling and restocking is already taking place, mostly located on the southern more elevated slopes of Strath Mashie within LCT 126 (Upland Glen – Cairngorms).

4.2.33 The RAG rating allocated is **Amber** for numbered Route Options 1-3 where there would be risk of tree loss for the construction corridor around Loch Earba in LCT 87 and within LCT 126, particularly around the Creag Meagaidh NNR car park. The RAG rating is **Red** for Route Option 4 due to the likely effects of this route option on the distinctive crag, Creag a' Chuir.

4.2.34 A **Red** RAG rating has been allocated for Route Option D, due to the constraints in achieving an alignment through this route without loss of features including glacial landforms and trees which contribute to the small scale diversity of character and distinct 'Highland Estate' feel within Strath Mashie in LCT 126. Route Option F would also pass through this part of LCT 126 but is considered slightly easier to accommodate without notable loss of features and therefore has an **Amber** RAG rating allocated. An **Amber** RAG rating has also been

allocated to Route Option A due to the sensitivities of areas closer to the loch shore including notable trees which contribute to the same 'Highland Estate' character to a construction corridor and wayleave, and to Route Option B2, due the potential effects on the setting of the Falls of Pattack.

4.2.35 The RAG rating for landscape character is **Green** for remaining lettered Route Options B1, B3, C, E and G, where it is considered that a UGC would be likely to be possible without any notable longer term effects.

Visual

4.2.36 Visual sensitivities of route options are generally limited to OHL developments, as longer term visible evidence of UGC cables is generally more limited. On this basis, all route options have been allocated a **Green** RAG rating for visual considerations as visual effects would be relatively limited and likely to be possible to mitigate.

Land Use

Forestry

4.2.37 For all route options located through forestry, felling would be required to establish an operational corridor to construct, and safely operate the connection. Furthermore, the potential need for management felling is relevant to commercial forestry areas and should be considered. Management felling involves felling to a certain point in a woodland compartment (a 'green edge') to reduce the risk of windthrow, which is the potential uprooting of trees by wind. Route Options 1, 2, 3 and 4 have been allocated an **Amber** RAG rating due to the presence of commercial forestry within the route options, and the potential felling requirements of this commercial plantation for construction.

4.2.38 Route Options A, B1, B2, B3, C, D, E and G have been given an **Amber** RAG rating owing to the likely felling requirements of some dense areas of conifer plantation, particularly given any additional management felling requirements. Route Option F has been allocated a RAG rating of **Green** as the route is largely absent of woodland areas.

4.2.39 There are areas consented for forestry planting schemes discussed in the planning context (proposals) section below.

Agriculture

4.2.40 The agricultural land within the route options is identified as being of Class 4.1 or lower. As this is not a particularly sensitive or fertile category any impacts on agriculture as a result of any of the route options is considered to be low. As such, a RAG rating of **Green** has been allocated to all route options.

Recreation

4.2.41 It is anticipated that the construction of a new UGC through all route options may have an impact on recreational interests however, given the nature of UGC, no long-term impacts on recreational activities are anticipated and a **Green** RAG rating has been applied to all route options.

Planning Context

Policy

4.2.42 Adherence to National, Regional and Local planning policy will in large part depend on avoiding or minimising potential constraints noted above, particularly in relation to potential impacts on the natural environment given presence of designated sites and areas of landscape importance.

4.2.43 As such, given the potential constraints noted above, due mostly to the natural heritage constraints associated with designations, protected species and habitats a **Red** RAG rating has been allocated to most of the route options. This is with the exception of Route Options 1, 2, A, and B1 for which an **Amber** RAG rating has been applied as no Red RAG ratings were scored for any natural heritage constraints that relate to National, Regional and Local planning policy.

4.2.44 It is acknowledged that opportunities exist to reduce impacts, and associated constraints, through careful design choices through the alignment selection stage (Stage 3), and that these high constraint ratings at this stage of the appraisal do not necessarily preclude any development through the routes in planning terms.

Proposals

4.2.45 In relation to the consented Earba PSH Scheme (for which this project is providing a grid connection for), Route Option 1 and Route Option 4, would commence and travel north-east, thus not interacting with the PSH Scheme buildings themselves which will lie to the south-west. They would however potentially interact with the raised level of Loch Earba, access tracks and planting that would occur as a result of the PSH Scheme. These would have the potential to constrain Route Option 1 and Route Option 4, so an **Amber** RAG rating has been applied to these two route options. Route Option 2 and Route Option 3, would travel south-west, doubling back over the proposed PSH Scheme. It may be difficult to find an alignment around the PSH Scheme, so an **Amber** RAG rating has been applied to these two route options. However, as the proposed Earba PSH Scheme is so closely linked to this project, an open dialogue between SSEN Transmission and the developer will ensure resolutions to such constraints could be achievable.

4.2.46 Route Option F and Route Option G would have the potential to interact with a proposed telecoms tower and associated works (ref: 23/00818/FUL). If the project is granted consent, its access track would pass through Route Option F, and the footprint of the tower Itself would be within Route Option G. Due to this, both route options have been allocated an **Amber** RAG rating, as opportunities would exist to avoid the infrastructure at alignment selection stage.

4.2.47 In relation to the proposed / consented planning areas (see **Figure 1.2**), Route Options 3 and F would pass over the area of the consented Aberader planting scheme. Route Option A, D and F would pass over the Lower Pattack Wood for woodland planting under the FGS. Opportunities would exist to avoid the schemes at alignment selection stage, however Route Option A and D would receive an **Amber** RAG rating and Route Option 3 and Route Option F would maintain their **Amber** RAG ratings.

4.2.48 Although the proposed installation of a bridge to replace a collapsed culvert would be on the access track within Route Option B3 and E, the works are not expected to be a constraint to development and would likely be completed by the time of construction, therefore Route Option B3 and E would be allocated a **Green** RAG rating.

4.2.49 All remaining route options (B1, B2, C, D, E) received a **Green** RAG rating due to not interacting with other proposals.

4.3 Engineering Topic Areas

Infrastructure Crossings

Major Crossings

4.3.1 Major infrastructure crossings[5] for UGSs include OHLs and UGCs of 132kV and above, railways, bridges, rivers, canals, oil and gas pipelines or hydro pipelines and other significant infrastructure. These crossings require specific OHL solutions and can greatly constrain a design.

[5] Major infrastructure crossings include high voltage transmission lines, rail lines, wide rivers (greater than 200 m), navigable canals, gas pipelines, and hydro pipelines.

4.3.2 Route Options 1 and 2 would have no major crossings, hence are given a **Green** RAG rating and would be the preferred route options in relation to major crossings.

4.3.3 Route Options A, C and D all have one major crossing, giving them an **Amber** RAG rating. Route Option A crosses the River Pattack Hydro Pipeline and Route Options C and D include a river crossing.

4.3.4 Route Options 3, 4, B1, B2, B3, E, F and G are associated with several major infrastructure crossings and are therefore given a **Red** RAG rating. Route Option 3 would require a crossing of the River Spean, approximately 20 m in width. It has been considered a 'high' risk due to the highly constrained landing area to the north of the river, due to the proximity of the A86. Route Options 4, B1 and B2 are considered 'high' risk as they have two infrastructure crossings, the River Pattack Hydro Pipeline as well as the River Pattack itself. Route Options B3 and E also would have two infrastructure crossings, as they both cross the Beauly-Denny OHL as well as crossing the River Mashie. Route Option F crosses the Beauly-Denny OHL twice, as well as crossing the Loch Laggan Tunnel and River Pattack. Route Option G crosses the Beauly-Denny OHL as well as crossing the Loch Laggan Tunnel. Loch Crunachdan is also present within Route Option G.

4.3.5 It should also be noted that within the route options are 11 kV and 33 kV OHLs. Whilst this does not affect any RAG scores and does not constrain the route options, it would require consideration moving forward throughout the future project stages and would need to be considered during the construction phase.

Road Crossings

4.3.6 Road crossings, including private tracks and driveways, can collectively constrain UCG design, although they typically have less impact than major crossings.

4.3.7 Route Options 1, B3, E and G have been considered 'low' in terms of risk of road crossings and have therefore been assigned a **Green** RAG rating. These route options contain 1 to 2 minor unclassified roads and only include one minor road crossing each.

4.3.8 Route Options C and D are considered 'intermediate' in terms of constraint risk of road crossings and have therefore been assigned an **Amber** RAG rating. Both route options have unavoidable minor roads required to be crossed twice.

4.3.9 Route Options 2, 3, 4, A, B1, B2 and F are considered as 'high' potential risk of constraint from road crossings and have therefore been assigned a **Red** RAG rating. These route options would require crossing roads at least 4 times. As well as this, Route Options 3 and F would require a crossing of a major road (A86).

Environmental Design

Elevation

4.3.10 High elevations have the potential to constrain an UGC as it increases the difficulty for access for construction and maintenance as the risk of more severe weather is greater. The RAG ratings are based on the percentage of the route option over 200 m AOD, measured at its centreline.

4.3.11 The elevation for all route options measured over 200 m AOD, therefore all route options have been considered 'high' risk and given a **Red** RAG rating. Although all route options are considered 'high' risk, elevation is not considered to be a major constraint in this case, therefore no route options should be discarded due to this topic.

Contaminated Land

4.3.12 All route options have been considered 'intermediate' risk and have been assigned an **Amber** RAG rating as each option contains at least one area of contaminated land. Desk based studies have also confirmed that there are no know unexploded ordnance (UXO) within the route options.

Flooding

4.3.13 There are three types of flooding which must be considered: Coastal, Surface and River. Potential for flood risk has been based on SEPA publicly available data to determine if less than 80% of the width for less than 2% of the length of any route options was found to be within the 1:200-year flood zone.[6]

4.3.14 Areas vulnerable to flooding have the potential to greatly constrain an UGC. Flooding poses a potential risk during the construction of the UGC alongside maintenance in the future. Route options with large areas vulnerable to flooding would be considered 'high' risk to constraining the UGC.

4.3.15 Route Options 1, 2, 4, A, B1, B2, B3, C, D, E and G have been given a **Green** RAG score as they are considered 'low' risk given they have <2 % of the route length within a 1 in 200-year flood zone. However, there are areas of localised flooding within each route option that will still need to be considered in further alignment studies.

4.3.16 Route Option 3 is considered 'intermediate' risk as approximately 2.6 % of the length falls within the 1 in 200-year flood zone, with the main areas of concern within Route Option 3 located south of Loch Earba and west of A86 in Aberarder. It has thus been allocated an **Amber** RAG rating for flooding.

4.3.17 Route Option F is considered 'high' risk as 10.8 % of the route length falls within the 1 in 200-year flood zone with the main area of concern being south of A86. It has thus been allocated a **Red** RAG rating for flooding.

Ground Conditions

4.3.18 Ground topography and condition can directly impact the ease of routeing, access, construction and maintenance. Route options with large areas of difficult ground conditions are more likely to be significantly constrained.

Terrain

4.3.19 Steep or mountainous terrain present a significant difficulty for routeing, installation and access for operations and maintenance for UGC. Options with a large proportion of steep or mountainous terrain are more likely to be constrained and thus more difficult and costly to build and maintain.

4.3.20 At this early stage, all route options were considered 'high' risk as each one has multiple areas with a gradient greater than 20 %, therefore all route options have been assigned a **Red** RAG rating. With Route Options 1 and 2 having the most areas considered 'Extremely Sloping' (>50% gradient).

4.3.21 It should be noted however that although each route option is considered 'high' risk due to the terrain, as the route option width is so large, and the terrain was measured at a mid-point, it may be possible that steeper sections will be able to be avoided in further alignment stages.

Rock

4.3.22 Areas of rocky terrain present challenges with UGC system design, routeing and installation. These areas can present unfavourable thermal ratings leading to increased conductor sizing being necessary. As well as this,

[6] Scottish Environmental Protection Agency. *SEPA Flood Maps* [online] Available at: http://map.sepa.org.uk/floodmap/map.htm [Accessed: February 2025]

these areas can present areas difficult for cable installations. Route options with a large proportion of rock areas are more likely to be constrained and thus more difficult and costly to build and maintain.

4.3.23 At this stage detailed information regarding rock depths is not available therefore rock percentages have been mapped using British Geological Survey superficial mapping.

4.3.24 All route options are classified 'high' risk, and therefore have been assigned a **Red** RAG rating, as each route option has superficial soil absent for more than 10% of the route option. Route Option G has the lowest percentage at approximately 15% coverage, whilst Route Option C has the highest percentage at approximately 45% coverage.

Peat

4.3.25 Peat, particularly deep peat, represents significant difficulties for an UGC system design, installation and access for operations and maintenance. Areas of deep peat can negatively affect the ratings achieved from an UGC system, causing larger conductors to be necessary. As well as this, peat causes significant challenges with regards to installation and maintenance of an UGC.

4.3.26 The British Geological website has been used to determine peat areas along each route option.

4.3.27 Route Options A, B3, C, D and E are classified as 'intermediate' risk and have therefore been assigned an **Amber** RAG rating, with all other options classified as 'high' risk and assigned **Red** RAG ratings. The reason the majority of the options are classified as 'high' risk are due to the areas of continuous peat. Excluding these areas of continuous peat, Route Options 1 and F would not be considered 'high' risk as they all have <10% of the route covered by >50% of peat.

Construction / Maintenance

Access

4.3.28 Construction of temporary access tracks for construction and installation of an UGC is a significant project cost and a route option that is remote from existing tracks and the public road network has the potential to incur large access costs. Furthermore, access for inspection and maintenance is necessary throughout the life of the asset. A route option remote from existing access routes represents a significant risk and has a high potential to be constrained.

4.3.29 All route options are within 1 km from existing road networks hence all options have been assigned a **Green** RAG rating.

4.3.30 Access would likely be from the A86 as it is the major road located within the surrounding area. From this, access to the south of the cable route would be taken from the access used for construction of the Earba PSH scheme. Access to the centre of the cable route would use existing estate tracks located within Ardverikie Estate and access to the north of the cable route would be taken from existing forestry access tracks alongside new tracks that will be developed for the Corrie Mashie substation construction.

Angles of Deviation

4.3.31 Angles of Deviation present a risk for the routeing of UGC. Angles that are too large will lead to stresses during installation that will cause a significant risk and have a high potential to constrain a route option.

4.3.32 Route Options 1, A, B2, B3, D and E are all generally straight with very few areas of deviation, therefore they have been assigned a **Green** RAG rating.

4.3.33 Route Options 2, 4, B1, C, F and G all have sections of their respective routes with areas of deviation that may cause maximum pulling tensions to be compromised, therefore they have been assigned an **Amber** RAG rating.

4.3.34 Route Option 3 has significant deviations throughout the route length and has therefore been assigned a **Red** RAG rating.

4.3.35 It should be noted that although a route is deemed 'low', 'intermediate' or 'high' risk at this stage, further studies may show an alignment to not correspond with this current scoring, therefore careful consideration would need to be carried forwards.

Cable Haul Road

4.3.36 Cable haul roads are necessary for the construction and installation of a UGC. Route options that are remote or have unsuitable terrain to install cable haul roads present a significant risk and have the potential to be constrained.

4.3.37 Route Options A, B3 and E have been assigned a **Green** RAG rating as they have the best ground conditions of the selected routes, due to the lack of peat, flooding and most favourable terrain conditions.

4.3.38 Route Option 1 is considered as an 'intermediate' risk as unfavourable terrain will present challenges through the construction phase, however a track road has been confirmed to run through this route to the Earba PSH Scheme, therefore it is possible to use this as cable haul road. Route Option B2 is also considered as 'intermediate' risk due to the levels of peat found within a section of the route option, leading to unfavourable ground conditions in that section requiring enhanced haul road design. Therefore, Route Options 1 and B2 have been assigned an **Amber** RAG rating.

4.3.39 All other route options are considered 'high' risk for cable haul road construction and have been assigned a **Red** RAG rating. Unfavourable ground conditions, such as steep side slopes as seen in Route Options 2, 3, 4, B1 and G or areas of extreme flood risk as seen in Route Options C, D, and F have led to this **Red** RAG rating being assigned.

Proximity

4.3.40 Existing features can constrain a route option often requiring the features to be avoided to reduce or avoid impact. These include properties, windfarms, telecommunications masts, urban area, and metallic pipes.

Proximity to Wind Farms

4.3.41 Windfarms pose a risk to UGC due to the potential proximity to array cables, potentially impacting the ratings of the UGC. No route options are located in areas of close proximity to windfarms or turbines therefore all route options have been assigned a **Green** RAG rating.

Communication Masts

4.3.42 No route options are located in areas of close proximity to communication masts hence all routes have been assigned a **Green** RAG rating.

Urban Environments

4.3.43 As with dispersed buildings and properties, urban areas represent a significant constraint that will often need to be routed around.

4.3.44 The Corridor is largely rural and not densely populated. Only Route Option D is considered 'intermediate' risk as over 10% of the route option is within 50 m of an urban environment, therefore it has been assigned an **Amber** RAG rating whereas all other options have been assigned **Green** RAG ratings.

Metallic pipes

4.3.45 Metallic pipes present challenges to UGC routeing as if they need to be passed under, greater cable depths are required.

4.3.46 No known metallic pipes have been identified within the route options. Route Options 4, A, B1 and B2 include a crossing of the River Pattack Hydro Pipeline, however the materials within this pipeline are Glass Fibre Reinforced Plastic, therefore are not considered a constraint. Routes Options 3, F and G all include a crossing of the Loch Laggan Tunnel, material lists for this tunnel are unknown, therefore it is possible that metals were used in the construction. Route Options 3, F and G have been assigned an **Amber** RAG rating, with all other route options being assigned a **Green** RAG rating.

Design

Reactive Compensation

4.3.47 UGCs that have a significant length and operate at high voltages require reactive compensation to cover the required high voltage cables reactive power demand. Cable system charging power is proportional to the length of an UGC, so the route options with the longest length will require larger shunt reactors than shorter route options.

4.3.48 The route option combinations of Route Option 1 + Route Option B2 and Route Option 1 + Route Option A + Route Option D to substation Site Option 2, gives a total length of approximately 13 km. Any other combination of route options increases the route length which in effect increases the required reactive power demand, required current rating and total cost of the cable system. As such, Route Options 1, A, B2 and D have been assigned a **Green** RAG rating, with Route Options 2, 4, B1, B3, C, E and F being assigned an **Amber** RAG rating due to the increase in route length. Route Options 3 and G have been assigned a **Red** RAG rating as they lead to the highest overall route length and therefore would require the highest reactive power demand.

Joint Bays and Link Box Chambers

4.3.49 The placement of Joint Bays would require careful routeing and planning of access tracks/roads. As the route options have varying lengths, each route may need a separate number of joint bays to support a cable system design. Unfavourable ground conditions restrict the placement of joint bays within an UGC and therefore can create a large constraint.

4.3.50 Route Options A, B3 and E have been considered to have 'low' risk for as they have the most favourable ground conditions for joint bay installation, therefore have been assigned a **Green** RAG rating.

4.3.51 Route Options 1, B1, B2 and C have been considered as 'intermediate' risk and have been assigned an **Amber** RAG rating, as they have constraints associated with ground conditions such as peat coverage and flood risk.

4.3.52 Route Options 2, 3, 4, D, F and G are considered 'high' risk as they have multiple constraints associated with the ground conditions, therefore they have been assigned a **Red** RAG rating.

Other Considerations

4.3.53 The topic areas listed in this section are not engineering considerations in SSEN Transmission's guidance for routeing as described in **Section 3.1**, however, they are deemed to be significant enough for consideration in this route option selection process.

DNO Crossings

4.3.54 Existing distribution (DNO) crossings are generally undergrounded or diverted to avoid creating a construction and maintenance hazard. There is a cost and programme requirement associated with this activity though, and route options with many DNO crossings could find minimising such crossing a significant routeing constraint.

4.3.55 Route Option C has no DNO crossings, therefore it is considered 'low' risk and has been assigned a **Green** RAG rating. All other route options include at least one DNO crossing, with Route Option B1 and Route Option F having the highest number of crossings at three each. The majority of DNO crossings are OHL crossings, other than the Pattack Export Cable running in parallel with the Pattack Hydro Pipeline as well as a small section of UGC located at the east of Route Option F. There are no significant issues that are caused by the potential DNO crossings, with mitigations available for all options, therefore Route Options 1, 2, 3, 4, A, B1, B2, B3, D, E, F and G have been assigned an **Amber** RAG rating.

4.4 Cost Topic Areas

4.4.1 Costs were not assessed in detail as part of this route selection process. These will be considered in more detail at the alignment stage when the technical and engineering specifications required become clearer.

4.4.2 Some preliminary cost ratings based on combined route lengths, tree felling, and anticipated compensatory planting have been assessed. This has been conducted in relation to full route combinations between the PSH Scheme and each of the substation site options. The most and least preferred in relation to cost per substation site option connection point is summarised in **Table 5.1**.

Table 5.1: Most and Least Preferred Route Combinations in relation to Cost

Site Option	Most Preferred Route Combination in relation to Cost	Least Preferred Route Combination in relation to Cost
Site Option 1	Route Option 4 & Route Option E.	Route Option 2, Route Option A, Route Option C & Route Option B3.
Site Option 2	Route Option 4.	Route Option 2, Route Option A & Route Option C.
Site Option 3	Route Option 1, Route Option A & Route Option F.	Route Option 3.
Site Option 4	Route Option 1, Route Option A & Route Option F.	Route Option 3.
Site Option 5	Route Option 1, Route Option A, Route Option F & Route Option G.	Route Option 3 & Route Option G.

4.5 Comparative Analysis Summary

4.5.1 The environmental and engineering appraisal RAG ratings are summarised in the following paragraphs and the RAG scores for all topic areas can be seen below in **Table 5.2** for the numbered route options and in **Table 5.3** for the lettered route options. As can be seen in **Section 4.4**, costs were not assessed in detail as part of this route selection process.

Environmental

4.5.2 In relation to environmental considerations the RAG ratings for Route Options 1 and 2 are largely comparable across all environmental topic areas. However, there is a slight preference for Route Option 1 in terms of habitats, landscape and visual constraints as this option would keep to the side of the Loch Earba which already features more human interventions and avoids potential conflict with the mitigation measures proposed for the PSH Scheme, although some interaction with proposed planting as part of the PSH may exist. Route Option 3 and Route Option 4 are more highly constrained due to proximity to key natural heritage designations and Annex 1 habitats.

4.5.3 Of the lettered route options, Route Options A and B3 are largely comparable across all environmental topic areas and these are the two preferred route options. Route Option B3 comes out marginally preferable with more Green RAG ratings overall. The next preferred route options would be Route Option B2 and C, which again are similar to each other. Route Option F also only has two Red RAG ratings, but these could be more difficult to mitigate as they are linked to habitats. The remaining lettered route options (Route Option B1, D, E and G) are all less preferable and have three to four Red RAG ratings each. Route Option B1 is particularly unfavourable in relation to habitats and ornithology, while Route Option D scored poorly for landscape considerations. Route Options E is not preferable due to interaction with habitats and also would not be able to avoid the cultural heritage asset of Druim an Aird. Route Option G would not be favourable due to interaction with natural heritage designations and sensitive habitats.

4.5.4 Thus, environmentally, it is considered that either the combination of **Route Option 1, Route Option A, Route Option C and Route Option B3** or the combination of **Route Option 1, Route Option B2 and Route Option B3** offer the route with the least constraints. Both combinations lead to Coire Mashie substation Site Option 2 if they do not continue along Route Option B3, but the use of Route Option B3 would reach Site Option 1. The key difference in the two combinations, is that the second option would lead to an overall combination score of Amber rather than Green for both ornithology and visual. It would however be slightly shorter at approximately 8 km which is 1.5 km less than the first option[7] and would not affect Druim an Aird.

Engineering

4.5.5 From a technical perspective, all Route Options 1, 2, 3 and 4 are all considered extremely 'high' risk and in normal scenarios all options would be disregarded. However, with these four route options being the only possible connections out of the Earba PSH, one needs to be chosen. Route Option 1 is the shortest and most direct of the route options and provides the most potential for a feasible cable installation, although the presence of extreme side slopes will need careful consideration as the project progresses.

4.5.6 Of the lettered route options, Route Option B2 is the most direct route and presents the most favourable terrain for cable installation. The crossing of the River Pattack would likely be completed using trenchless techniques. Although Route Option A scores better than Route Option B2 in the RAG ratings, it would need to be combined with Route Option C or Route Option D. Route Option C and D are not considered preferred on an engineering basis due to unfavourable terrain and flood risk; therefore, the northern section of Route Option A is also considered not technically preferable. The more northern route options (Route Option F and Route Option G)

[7] The reduced length would reduce the risk for environmental constraint somewhat.

which would serve Coire Mashie substation Site Option 3, 4, or 5 have constraints associated with terrain, rock, peat, and access. The uncertainty surrounding the Loch Laggan Tunnel also poses technical constraints.

4.5.7 Route Option B1 would require significant tree felling near Coire Mashie substation Site Option 2. Sections of Route Option B1 also include areas of peat found to be up to 4 m in depth. Route Option B3 as a potential addition to reach Coire Mashie substation Site Option 1 is considered technically preferred to Route Option E due to the potential risks and costs associated with tree felling within the surrounding area of Coire Mashie substation Site Option 2. The crossing of the River Mashie would likely be completed within Route Option B3 using trenchless techniques.

4.5.8 Thus, from an engineering standpoint, the potential route option combination would be **Route Option 1 and Route Option B2** (this would serve Coire Mashie Substation Site Option 2), or **Route Option 1, Route Option B2 and Route Option B3** (this would serve Coire Mashie Substation Site Option 1).

Potential Route Option

4.5.9 The potential route option combination on the basis of environmental and engineering considerations would therefore be **Route Option 1 and Route Option B2** should Coire Mashie Substation Site Option 2 be taken forwards to detailed design stage, or **Route Option 1, Route Option B2, Route Option B3** should Coire Mashie Substation Site Option 1 be taken forwards to detailed design stage. This potential route option combination can be seen highlighted in **Figure 1.4**.

4.5.10 From a cost perspective, as can be seen in **Table 5.1**, these route option combinations to reach Site Option 1 or Site Option 2 would be within the midpoint in terms of preference.

Table 5.2: Numbered Route Options: Environmental and Engineering RAG ratings

	Category	Sub-Topic	Route Option 1	Route Option 2	Route Option 3	Route Option 4
Environmental	Natural Heritage	Natural Heritage Designations	A	A	R	A
		Protected Species	A	A	R	A
		Habitats	A	A	R	R
		Ornithology	A	A	R	R
		Geology, Hydrology & Hydrogeology	A	A	A	A
	Cultural Heritage	Cultura Heritage Designations	G	G	G	G
		Cultural Heritage Assets	G	G	A	R *
	Landscape and Visual	L & V Designations	A	A	A	R
		Landscape Character	A	A	A	R
		Visual	G	G	G	G
	Land Use	Agriculture	G	G	G	G
		Forestry	A	A	R	A
		Recreation	G	G	G	G
	Planning	Policy	A	A	R	R
		Proposals	A	A	A	A
Engineering	Infrastructure Crossings	Major Crossings	G	G	R	R
		Road Crossings	G	R	R	R
	Environmental Design	Elevation	R	R	R	R
		Contaminated Land	A	A	A	A
		Flooding	G	G	A	G
	Ground Conditions	Terrain	R	R	R	R
		Rock	R	R	R	R
		Peat	R	R	R	R
	Construction / Maintenance	Access	G	G	G	G
		Angles of Deviation	G	A	R	A
		Cable Haul Road	A	R	R	R
	Proximity	Proximity to Windfarms	G	G	G	G
		Communication Masts	G	G	G	G
		Urban Environments	G	G	G	G
		Metallic pipes	G	G	A	G
	Design	Reactive Compensation	G	A	R	A
		Joint Bays	A	R	R	R
	Other	DNO Crossings	A	A	A	A

Table 5.3: Lettered Route Options: Environmental and Engineering RAG ratings

	Category	Sub-topic	A	B1	B2	B3	C	D	E	F	G
Environmental	Natural Heritage	Natural Heritage Designations	A	A	A	A	G	G	G	A	R
		Protected Species	A	A	A	A	A	A	A	A	A
		Habitats	A	R	A	A	A	A	R	R	R
		Ornithology	G	R	A	G	G	G	G	A	A
		Geology, Hydrology & Hydrogeology	A	A	A	A	A	A	A	A	A
	Cultural Heritage	Cultura Heritage Designations	G	G	G	G	G	G	G	G	G
		Cultural Heritage Assets	G	R *	R *	A	R *	G	R	G	G
	Landscape and Visual	Proximity to Dwellings	A	A	A	G	G	R	G	A	A
		L & V Designations	A	G	A	G	G	R	G	A	G
		Landscape Character	G	G	A	G	G	A	G	G	G
	Land Use	Visual	G	G	G	G	G	G	G	G	G
		Agriculture	A	A	A	A	A	A	A	G	A
		Forestry	G	G	G	G	G	G	G	G	G
	Planning	Recreation	A	R	R *	A	R *	R	R	R	R
		Policy	A	G	G	G	G	G	G	A	A
Engineering	Infrastructure Crossings	Major Crossings	A	R	R	R	A	A	R	R	R
		Road Crossings	R	R	R	G	A	A	G	R	G
	Environmental Design	Elevation	R	R	R	R	R	R	R	R	R
		Contaminated Land	A	A	A	A	A	A	A	A	A
		Flooding	G	G	G	G	G	G	G	R	G
	Ground Conditions	Terrain	R	R	R	R	R	R	R	R	R
		Rock	R	R	R	R	R	R	R	R	R
		Peat	A	R	R	A	A	A	A	R	R
	Construction / Maintenance	Access	G	G	G	G	G	G	G	G	G
		Angles of Deviation	G	A	G	G	A	G	G	A	A
		Cable Haul Road	G	R	A	G	R	R	G	R	R
	Proximity	Proximity to Windfarms	G	G	G	G	G	G	G	G	G
		Communication Masts	G	G	G	G	G	G	G	G	G
		Urban Environments	G	G	G	G	G	A	G	G	G
		Metallic pipes	G	G	G	G	G	G	G	A	A
	Design	Reactive Compensation	G	A	G	A	A	G	A	A	R
		Joint Bays	G	A	A	G	A	R	G	R	R
	Other	DNO Crossings	A	A	A	A	G	A	A	A	A

** If these route options were to connect into Route Option B3 to go to substation Site Option 1, rather than turn north into substation Site Option 2, they would not interact with Druim an Aird and would have a reduced RAG rating to Amber for Cultural Heritage Assets and therefore Policy as well.*

4.6 Next steps

4.6.1 As described in the Consultation Document, a consultation event will be held on 28th May 2025: 14:00 to 19:30 at Laggan Village Hall, Newtonmore, PH20 1AN. The responses received from this consultation event, and responses sought from statutory consultees and other key stakeholders, will inform further consideration of Coire Mahie site options and Earba PSH Grid Connection route options.

4.6.2 All comments are requested by **28th June 2025**. Following consultation events and a review of consultation responses, a Report on Consultation will be produced which will document the consultations received, and the decisions made in light of these responses to inform the selection of a proposed substation site and UGC proposed route.

Scottish & Southern Electricity Networks

TRANSMISSION

Route Option G

Route Option F

Route Option D

Route Option E

Route Option C

Route Option B3

Route Option A

Route Option B2

Route Option B1

Route Option 4

Route Option 1

Route Option 2

Route Option 3

Legend

Study Corridor

Indicative Earba Pumped Storage Substation

Earba PSH Grid Connection Route Options

- Route Option 1
- Route Option 2
- Route Option 3
- Route Option 4
- Route Option A
- Route Option B1
- Route Option B2
- Route Option B3
- Route Option C
- Route Option D
- Route Option E
- Route Option F
- Route Option G

Coire Mashie Substation Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

N

0 0.75 1.5 3 km

Scale - 1:60,000 @ A3

Project: Appendix 1 - Earba PSH Grid Connection

Title: Figure 1.1 - Route Options

Drawn by: MT/UM/HL Date: 11/05/2025

Drawing: 123015-D1.1-CD-0.0.1

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TRANSMISSION

Creag Meagaidh (SAC)
Creag Meagaidh (SPA)
Creag Meagaidh (NNR)
Creag Meagaidh (SSSI)

River Spey (SSSI)
River Spey (SAC)

Druim an Aird Township & Associated Features

Ben Alder and Aonach Beag (SSSI)
Ben Alder and Aonach Beag (SAC)

Legend

- Study Corridor
- Indicative Earba Pumped Storage Substation

Earba PSH Grid Connection Route Options

- Route Options

Coire Mashie Substation Site Options

- Site Options

Key Constraints

Natural Heritage Designations

- Special Protection Area (SPA)
- Special Areas of Conservation (SAC)
- Sites of Special Scientific Interest (SSSI)
- Cairngorms National Park
- National Nature Reserve (NNR)

Ancient Woodland Inventory (AWI)

- Ancient (of semi-natural origin)
- Long-Established (of plantation origin)
- Other (on Roy map)

Planting Schemes

- Aberarder Planting Scheme (consented)
- Lower Pattack Wood Forestry Grant Scheme (FGS) (proposed)

Carbon and Peatland Classification

- Class 1 - Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value
- Class 2 - Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential

Cultural Heritage Assets

- Druim an Aird Township and associated features

N

0 0.25 0.5 1 1.5 2 2.5 km

Scale - 1:60,000 @ A3

Project: Appendix 1 - Earba PSH Grid Connection

Title: Figure 1.2 - Earba PSH Grid Connection Key Constraints

Drawn by: M.T. Date: 11/05/2025

Drawing: 123015-CD-1.2-0.0.1

Scottish & Southern Electricity Networks
TRANSMISSION

Military Road - Undesignated Section
Glenshero Lodge, LB 6901
Dun da Lamh Fort, SM 4361
St Kenneth's Kirk, Church and Cross Slab, SM 5703
Kinloch Laggan Lime Kiln, LB 6908
Ardverikie Gatelodge, Gate Piers, Bridge, LB 6911
Ardverikie House, LB 6910
SHIELING HUT
GLENSHIRRA FOREST
ABERARDER FOREST
MOY FOREST
LOCH LAGGAN
BEN ALDER FOREST

1. MHG17572
2. MHG27122
3. MHG27123
4. MHG 46349
5. MHG30718
6. MHG27121
7. MHG27132
8. MHG27128
9. MHG27135
10. MHG49206
11. MHG32735/ MHG 49125
12. MHG49131
13. MHG27133
14. MHG49130
15. MHG49130
16. MHG49129
17. MHG49138
18. MHG49139
19. MHG4482
20. MHG32744
21. MHG27137

Cultural Heritage Assets
1 - Moy Lodge
2 - Allt Labhrach, Enclosure
3 - Ardverikie, Enclosure
4 - A'Choille Mhor
5 - Meall Damh, Enclosure
6 - Tullochroam, Township
7 - Creag nam Broc, Building; Field Boundary
8 - River Pattack, Enclosure
9 - Gallovie, Farmstead
10 - Cramlets West: A drystone cairn
11 - The Cramlets, Building; Cairn
12 - Dark Gully
13 - Sron a' Mhadaidh, Farmstead
14 - Strathmashie Forest (building), MHG 49130
15 - Strathmashie Forest (stone wall), MHG 49130
16 - Strathmashie, Willie's Bridge
17 - Leacainn Trackway
18 - Strathmashie Forest, River Mashie
19 - Druim am Aird
20 - Strathmashie Forest (Dyke)
21 - Aberarder House

Legend

- Indicative Earba Pumped Storage Substation
- Study Corridor

Earba PSH Grid Connection Route Options
- Route Option 1
- Route Option 2
- Route Option 3
- Route Option 4
- Route Option A
- Route Option B1
- Route Option B2
- Route Option B3
- Route Option C
- Route Option D
- Route Option E
- Route Option F
- Route Option G

Coire Mashie Substation Sites
- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

Cultural Heritage Constraints
- Scheduled Monuments
- Historic Environment Record (HER): Monument Point Features
- Historic Environment Record (HER): Monument Polygon Features
- Druim an Aird Township and associated features
- Military Roads - Undesignated

Listed Buildings
- Category A
- Category B
- Category C

N
0 0.75 1.5 3 km
Scale - 1:59,501 @ A3

Project: Appendix 1 - Earba PSH Grid Connection

Title: Figure 1.3 - Cultural Heritage

Drawn by: MT/UM Date: 11/05/2025

Drawing: 123015-CD-1.3-0.0.1

Scottish & Southern Electricity Networks

TRANSMISSION

Legend

- Study Corridor
- Indicative Earba Pumped Storage Substation
- Potential Route Options

Earba PSH Grid Connection Route Options

- Route Option 1
- Route Option 2
- Route Option 3
- Route Option 4
- Route Option A
- Route Option B1
- Route Option B2
- Route Option B3
- Route Option C
- Route Option D
- Route Option E
- Route Option F
- Route Option G

Coire Mashie Substation Site Options

- Site Option 1
- Site Option 2
- Site Option 3
- Site Option 4
- Site Option 5

N

0 0.75 1.5 3 km

Scale - 1:60,000 @ A3

Project: Appendix 1 - Earba PSH Grid Connection

Title: Figure 1.4 - Potential Route Options

Drawn by: M.T. Date: 14/05/2025

Drawing: 123015-CD-1.4-1.0.0