

# Sheirdrim 132kV Wind Farm Connection

## Consultation Document

December 2021



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## GLOSSARY

<b>Term</b>	<b>Definition</b>
Alignment	A centre line of an overhead line route, along with location of key angle structures.
Amenity	The natural environment, cultural heritage, landscape, and visual quality. Also includes the impact of SHE Transmission's works on communities, such as the effects of noise and disturbance from construction activities.
Ancient Woodland	Woodland which has been in continuous existence since before 1750 in Scotland and is important for biodiversity and cultural identity. Ancient semi-natural woodland is Ancient Woodland composed of mainly locally native trees and shrubs that derive from natural seed fall or coppice rather than from planting.
Angle Tower	Support structure (tower or pole) which allows a change in direction of the overhead line.
Barrier and Collision Effects	Barrier effect is where the development creates an obstacle to regular movements of birds to and from breeding colonies or migration. Collision effects are where the proposed development poses a risk of harm to birds through direct contact.
BNG	Biodiversity Net Gain
Centre Line	The linear connection between the central point of each support structure along the length of the overhead line.
Circuit	Overhead line or underground cable consisting of multiple conductors, to carry electric current.
Commercial Forestry	Planting, maintaining and growing trees for commercial production of timber.
Conductor	A metallic wire strung from structure to structure, to carry electric current.
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.
Desk-based Assessment	A desktop appraisal using existing information available.
European Protected Species	Species of plants and animals protected by law throughout the European Union.
Environmental Impact Assessment (EIA)	A formal process set down in The Electricity Works (EIA) (Scotland) Regulations 2000 (as amended in 2008) used to systematically identify, predict, and assess the likely significant environmental impacts of a proposed project or development.
Gardens and Designed Landscape (GDL)	The Inventory of Gardens and Designed Landscapes lists those gardens or designed landscapes which are considered by a panel of experts to be of national importance.
Geographical Information Systems (GIS)	A spatial system that creates, manages, analyses, and maps all types of data.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities.
Indicative Proposed Alignment	An alignment for the overhead line identified following public consultation that is taken forward to EIA and detailed design.
Kilovolt (kV)	One thousand volts.

<b>Term</b>	<b>Definition</b>
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).
Local Nature Conservation Site (LNCS)	LNCSs identify locally important natural heritage that could be damaged by development.
Major Crossing	Major crossings include other electric lines of 132kV and above, railways, rivers/loch (200m+), navigable watercourses, motorways and other major roads, and major pipelines.
Minor Crossing	Minor crossings include all road crossing and minor watercourses not considered major. Private tracks and driveways may also be considered where the need for access to be maintained is present, or where relatively high traffic volumes are anticipated.
Mitigation	Term used to indicate avoidance, remediation, or alleviation of adverse impacts.
National Scenic Area (NSA)	A national level designation applied to those landscapes considered to be of exceptional scenic value.
Operational Corridor	The area needed for operational maintenance.
Ordnance Survey (OS)	Ordnance Survey is the national mapping agency for Great Britain.
Overhead line (OHL)	An electric line installed above ground, usually supported by lattice steel towers or trident wood poles.
Preferred Alignment	An alignment for the overhead line taken forward to stakeholder consultation following a comparative appraisal of route options.
Proposed Alignment	An alignment taken forward to consent application. It comprises a defined centre line for the overhead line and includes an indicative support structure (tower or pole) schedule, also specifying access arrangements and any associated construction facilities.
Proposed Development	The construction and operation of the 132 kV overhead line and underground cable to connect the proposed Sheirdrim Wind Farm to Crossaig Substation.
RAG	Red/Amber/Green, rating applied for the comparative appraisal.
Report on Consultation Document	A report that documents the result of a consultation process.
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 under Section 37 of the Electricity Act 1989.
Royal Society for the Protection of Birds (RSPB)	The RSPB is a charitable organisation founded in 1889. It works to promote conservation and protection of birds and the wider environment.
Scheduled Monument	A monument which has been scheduled by the Scottish Ministers as being of national importance under the terms of the 'Ancient Monuments and Archaeological Areas Act 1979'.
Scottish Environment Protection Agency (SEPA)	Scottish Environmental Protection Agency is Scotland's environmental regulator and national flood forecasting, flood warning and strategic flood risk management authority.
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



<b>Term</b>	<b>Definition</b>
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.
Sky-lining	The process of positioning an overhead line along the top of an elevated area.
Special Area of Conservation (SAC)	An area designated under the 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 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.
SSEN Transmission	Scottish and Southern Energy Networks Transmission.
Stakeholders	Organisations and individuals who can affect or are affected by SHE Transmission works.
Study Area	The area within which the corridor, route and alignment study takes place.
Substation	Part of the electrical transmission and distribution system that transforms voltage from high to low, or the reverse, before switching to another electricity network.
Terminal Pole	A pole required where the line terminates either at a substation or at the beginning and end of an underground cable section.
The National Grid	The electricity transmission network in the Great Britain.
Underground Cable (UGC)	An electric line installed below ground.
Volts	The international unit of electric potential and electromotive force.
VP	Vantage Point
Wild Land Area (WLA)	Those areas comprising the greatest and most extensive areas of wild characteristics within Scotland.
Wirescape Impact	A landscape dominated by overhead wires.

## PREFACE

This Consultation Document has been prepared by ERM on behalf of Scottish and Southern Electricity Networks Transmission (SSEN Transmission), to seek comments from all interested parties on the Sheirdrim Wind Farm Connection project.

The Consultation Document is available online at: <https://www.ssen-transmission.co.uk/projects/sheirdrim-wind-farm-connection/>.

**Public consultation** events detailing the proposals described in this document will be held at the following times:

- Wednesday 8<sup>th</sup> December 2021: Virtual Event

You can also view our proposals online using our virtual consultation room. Live Instant Message (IM) chats with the project team will be held on the following dates and times:

Virtual Event	Website address to join consultation
Wednesday 8th December 2021 -10-12 Noon	<a href="https://www.ssen-transmission.co.uk/projects/sheirdrim-wind-farm-connection/">https://www.ssen-transmission.co.uk/projects/sheirdrim-wind-farm-connection/</a>
Thursday 9th December 2021 - 5-7pm	

Comments on this document should be sent to:

Caitlin Quinn  
Scottish & Southern Electricity Networks (SSEN) Transmission  
Inveralmond House  
200 Dunkeld Road  
Perth, PH1 3AQ  
Email: [Caitlin.Quinn@sse.com](mailto:Caitlin.Quinn@sse.com)  
Mobile: 07901 135758

All comments are requested by **Monday 10<sup>th</sup> January 2022**

## EXECUTIVE SUMMARY

SSEN Transmission is proposing to construct and operate a 132 kV overhead line and underground cable to connect the proposed Sheirdrim Wind Farm to Crossaig Substation (the 'proposed development'). Scottish Power (UK) Ltd is the developer for the proposed Sheirdrim Wind Farm. The 84MW windfarm requires a single circuit 132kV connection from the windfarm substation compound and terminating at the existing Crossaig 132kV substation, with an approximate length of 8-11 km.

The optioneering process for selection of a route initially considered three overhead line routes. Following this, an underground cable section within all routes was identified to avoid the proposed wind turbines. This Consultation Document invites comments from all interested parties on the three Route Options under consideration. The routes consist of both Underground Cable (UGC) and Overhead Line (OHL) and are appraised against environmental, engineering and cost criteria.

The key environmental considerations for the routes considered in this report are impact on peatland habitats, collision and barrier effects on protected bird species, impacts on semi-natural ancient woodland and visual impacts. The key technical considerations are clearance distances from existing and proposed turbines, peat disturbance, access for construction and maintenance, and elevation of the route options.

From an environmental perspective Route A is preferred. This is because it offers the potential to avoid direct impacts on ancient woodland and of the three options it passes through the smallest area of sensitive habitat, including class 1 and 2 peat. From an engineering perspective Route A is preferred. This is because it is the route that provides the least technical challenges, particularly in regards to peat, access, and proximity to windfarms, and provides a more technically viable route. From a cost perspective Route B is preferred, because it has the lowest cost.

Route A is selected as the preferred route for the connection between the proposed Sheirdrim wind farm and Crossaig substation.

Consultation events will be held in December 2021 and meetings will be arranged with statutory and other stakeholders. The responses received, and those sought from statutory consultees and other key stakeholders will inform further consideration and design of the preferred route leading to the identification of a proposed route to take forward to the alignment and consenting stages.

Please submit your comments to Caitlin Quinn, Community Liaison Manager, Scottish Hydro Electric Transmission, Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ (caitlin.quinn@sse.com). All comments are requested by 10 January 2022.

# 1. INTRODUCTION

## 1.1 Purpose of this Document

SSEN Transmission is proposing to construct and operate a 132 kV overhead line and underground cable to connect the proposed Sheirdrim Wind Farm to Crossaig Substation (the 'proposed development'). This Consultation Document invites comments from all interested parties on the three Route Options under consideration (see Figure 1).

This document presents the findings of an environmental, engineering and cost appraisal of the three route options identified by SSEN Transmission, and describes the process by which a preferred route for the overhead line and underground cable has been selected. The preferred route is considered to provide the optimal opportunity to achieve an economically viable, technically feasible and environmentally sound alignment within it.

## 1.2 Document Structure

This Consultation Document comprises the following sections:

- Section 1: Introduction;
- Section 2: The need for the proposals – describes the project need, the project overview, and consultation history;
- Section 3: Route selection process – describes the process for selecting the route, based on environmental, engineering, and cost considerations;
- Section 4: Description of routes – describes the identification of Route Options and provides a summary of each Route Option (A-C);
- Section 5: Comparative appraisal – a summary of the environmental, engineering and cost topics, followed by a comparative analysis summary and a description of the Preferred Route; and,
- Section 6: Consultation on the proposals – invites comments on the preferred option process, the identification of preferred route and next steps.

## 1.3 Next Steps

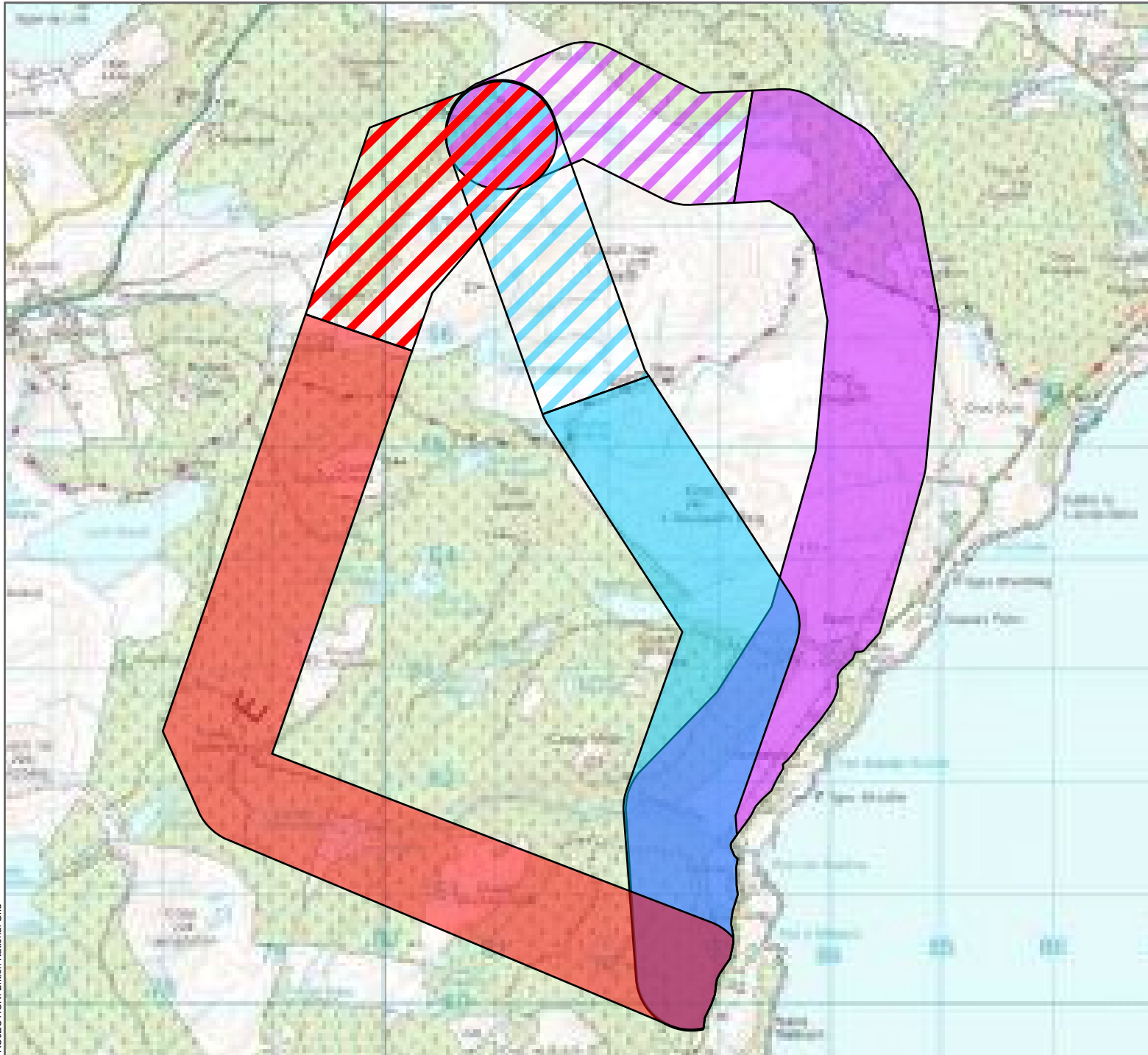
As part of the consultation exercise, comments are sought from members of the public, statutory consultees, and other stakeholders on the preferred route option put forward in this report.

A Report on Consultation will be published after the consultation period has ended, which will document the consultation responses received, and the decisions made considering these responses to select a Proposed Route. The Proposed Route will go forward to Alignment Selection, Stage 3 (see Section 4.1).

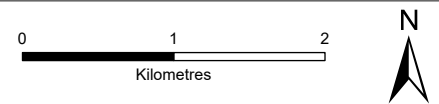
Further engineering and environmental studies will be undertaken to identify a Preferred Alignment within the Proposed Route. Consultation on a Preferred Alignment will be undertaken early 2022.

Upon completion of the alignment selection process, an Indicative Proposed Alignment will be selected and further technical and environmental assessment will be undertaken. This will culminate with an application to Scottish Ministers for consent for the construction and operation of overhead line under section 37 of the Electricity Act 1989. It is currently assumed that the underground cable will be progressed as permitted development and this will be confirmed in later stages of the project.

The intention is to submit the application for consent in 2022.



- Route A - Overhead Line
- Route A - Underground Cable
- Route B - Overhead Line
- Route B - Underground Cable
- Route C - Overhead Line
- Route C - Underground Cable



SCALE: See Scale Bar	VERSION: A03
SIZE: A4	DRAWN: DN
PROJECT: 0612294	CHECKED: OW
DATE: 30/11/2021	APPROVED: KG

**Figure 1: Sheirdrim Windfarm Connection**

UGC sections are indicative at this stage and the actual lengths of cable will be determined at the alignment stage.



PROJECTION: British National Grid

## 2. THE PROPOSALS

### 2.1 Need for the Project

SSEN Transmission is a wholly owned subsidiary of the SSE plc group of companies. SSEN Transmission owns and maintains the electricity transmission network across the north of Scotland and holds a licence under the Electricity Act 1989 to develop and maintain an efficient, co-ordinated and economical system of electricity transmission.

The developer of Sheirdrim Wind Farm is seeking consent under Section 36 of the Electricity Act 1989 for an 84 MW Wind Farm, which has a contracted connection date of April 2025. SSEN Transmission has a statutory duty under Schedule 9 of the Electricity Act 1989 to connect the new development to the transmission network by the contracted connection date.

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

### 2.2 Project Overview

Four types of technology solution have been proposed and appraised:

- Routes comprised of trident wood pole;
- routes comprised of trident wood pole lines with sections of underground cable;
- routes comprised of steel lattice structures; and,
- routes comprised of steel lattice with sections of underground cable.

The spacing between poles or towers would vary depending on topography, altitude, and land use but would likely be between 30 m to 250 m. If steel lattice towers are used, permanent access tracks are likely to be required to any angle and terminal tower locations, with temporary access tracks used to access all other towers. At this stage, it has been assumed that a typical average pole or tower height will be 30 m above ground level. Figure 1 shows the routes that are presented in this Consultation Document. Plate 1 shows an example of a trident wood pole and steel lattice tower.

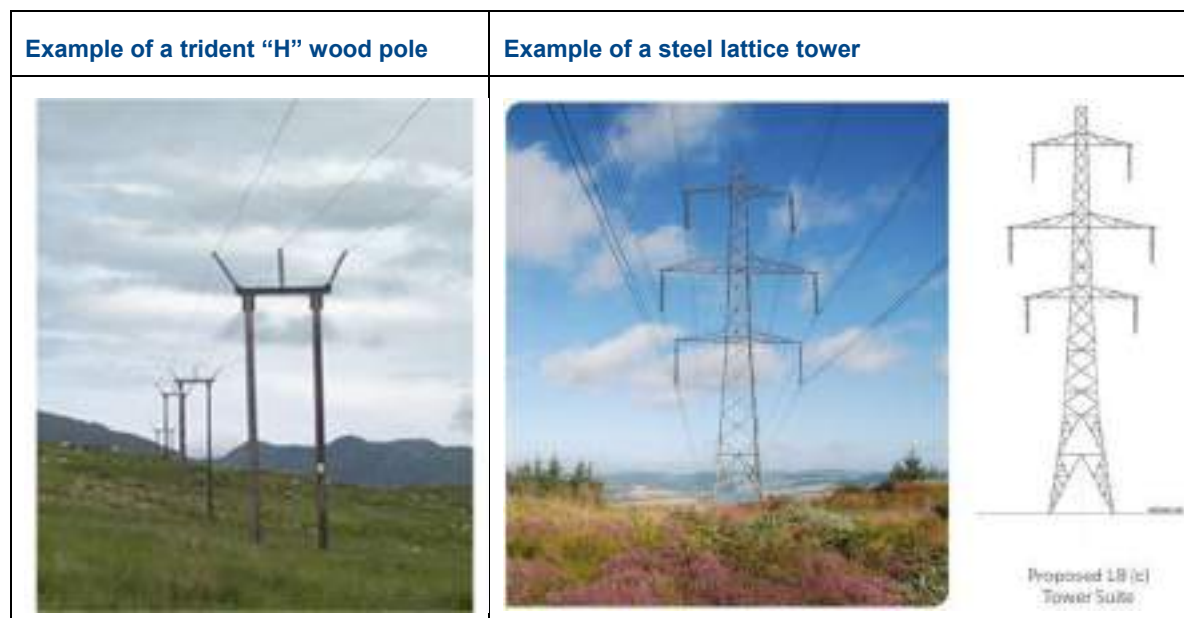


Plate 1: 'H' Wood Pole and Steel Lattice Tower examples

## 2.3 Construction Activities

Key tasks during construction are listed below. Alongside these activities, the construction would require the removal of sections of commercial forest, which would be undertaken in consultation with Scottish Forestry and affected landowners. After felling, any timber removed that is commercially viable would be sold and the remaining forest material would be dealt with in a way that delivers the best practicable environmental outcome and is compliant with waste regulations.

Key tasks during construction would involve:

- 1 Establish laydown areas for material and install temporary access tracks;
- 2 Upgrade existing access tracks and construct new tracks, where required;
- 3 Deliver structures and materials to site;
- 4 Assemble and erect steel lattice or wood pole structures and stays;
- 5 Excavate trench and install underground cable (UGC); and
- 6 String conductors using hauling ropes and winches.

Installation of the wood poles would involve:

1. Excavate a suitable area for the wood poles, and backfilling after installation of the pole;
2. In some pole locations, it may be necessary to add imported hard-core backfill around the pole foundations to provide stability in areas where the natural sub soils have poor compaction qualities;
3. In some pole locations where shallow bedrock is present, it may be necessary to break or remove rock to accommodate pole foundations;
4. Conductors would be installed on the wood poles using full tension stringing to prevent the conductor coming into contact with the ground; and,
5. Remedial works to reinstate the immediate vicinity of the structure, and any ground disturbed, to pre-existing use.

Installation of steel lattice towers would involve:

- Excavate a suitable area for the tower pad;
- Installation of foundation; either concrete pad and column, raft, piled or rock anchor;
- Conductors would be installed using full tension stringing to prevent the conductor coming into contact with the ground; and
- Remedial works to reinstate the immediate vicinity of the structure, and any ground disturbed, to pre-existing use.

Installation of an underground cable (UGC) would involve:

6. Establish laydown areas for materials and welfare;
7. Installation of temporary access tracks and drainage;
8. Delivery of structures and materials to site;
9. Excavate a trench in which to lay the cable;
10. Excavation and construction of joint bays; and
11. Remedial works to reinstate the immediate vicinity of the works and any ground disturbed, to pre-existing use.

## 3. ROUTE SELECTION PROCESS

### 3.1 Guidance Documents

The approach to route selection is informed by the following SHE Transmission guidance:

- Procedures for Routeing Overhead Lines and Underground Cables of 132kV or above, SHE Transmission, 2020 (PR-NET-ENV-501)
- Biodiversity Net Gain Flow Chart, Guidance and Project Toolkit (FC-NET-ENV-500)

The guidance develops a process which aims to balance environmental, technical and economic considerations throughout a staged route options process.

The principal routeing stages are:

- Stage 0: Routeing Strategy Development;
- Stage 1: Corridor Selection;
- Stage 2: Route Selection; and
- Stage 3: Alignment Selection.

For certain projects, such as Sheidrim Wind Farm Connection, Stage 1 is not required due to the small scale of the project. As a result, this consultation document presents the appraisal completed at Stage 2 – Route Selection.

In consideration of the above, the method of identifying a preferred route option in this study has involved the following four key tasks:

- Identification of the baseline;
- Identification of alternative route options;
- Environmental, technical and cost analysis of route options; and
- Identification of a preferred route option.

### 3.2 Main Considerations

Route options were identified following site appraisals, that considered the constraints identified during the desk-based baseline studies. The following has been taken into account during route selection (Stage 2) and will be considered in more detail at the next stage - alignment selection (Stage 3).

- Avoid if possible major areas of highest amenity value (including those covered by national and international designations and other sensitive landscapes);
- Avoid by deviation, smaller areas of high amenity value;
- Try to avoid sharp changes of direction and reduce the number of larger angle towers required;
- Avoid sky lining the route in key views and where necessary, cross ridges obliquely where a dip in the ridge provides an opportunity;
- Target the route towards open valleys and woods where the apparent height of towers will be reduced and views broken by trees (avoid slicing through landscape types and try to keep to edges and landscape transitions);
- Consider the appearance of other lines in the landscape to avoid a dominating or confusing wirescape impact; and
- Technical issues related to clearances, connectivity, outages, maintenance, and faults.

### 3.3 Baseline Conditions

The following information sources have informed the desk based baseline study to identify potential environmental constraints within and adjacent to the route. The study area applied for natural heritage features was 20 km, for landscape and visual 15 km, and cultural heritage 2 km.

- Identification of environmental designated sites and other constraints, utilising GIS datasets available via SNHi Site Link and other sources. These include:



- > Special Areas of Conservation (SAC);
- > Special Protection Areas (SPA);
- > Proposed Special Protection Areas (pSPA);
- > Sites of Special Scientific Interest (SSSI);
- > National Scenic Area (NSA);
- > Wild Land Areas (WLA);
- > Royal Society for the Protection of Birds (RSPB) reserves;
- > Land capability for agriculture;
- > Geological Conservation Review Sites;
- > Carbon-rich soil, deep peat and priority peatland habitats; and
- > Areas at risk of flooding (SEPA flood map <sup>(1)</sup>).
- Identification of archaeological designations and other recorded sites, utilising GIS datasets available via Historic Environment Scotland Data Services and Local Historic Environment Teams. These include:
  - > World Heritage Sites (WHS) and buffers;
  - > Scheduled Monuments;
  - > Category A, B and C listed buildings; and
  - > Gardens and Designed Landscapes.
- Review of the Argyll and Bute Council Local Development Plan 2015 to identify local policies and further environmental constraints and opportunities, such as Local Nature Conservation Sites (LNCS), core paths or other locations important to the public;
- Review of landscape character assessments of relevance to the Study Area;
- Review of Ordnance Survey (OS) mapping (1:50,000 and 1:25,000) and online GIS data sources from OS Open Data) and aerial photography (where available) to identify other potential constraints such as settlement, properties, walking routes, cycling routes etc.;
- Extrapolation of OS Vectormap GIS data to identify further environmental constraint including locations of watercourses and waterbodies, roads classifications and degree of slope; and
- Review of other local information through online and published media such as tourism sites.

Vantage point surveys are being undertaken in 2021/22 to understand the interaction between birds and potential overhead lines along the three route options.

### 3.4 Appraisal Method

Appraisal of route options has involved systematic consideration against the following environmental, technical and cost topic areas:

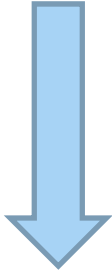
#### 3.4.1 Environmental:

- Natural Heritage (Designations, Protected Species, Habitats, Ornithology and Geology, Hydrology and Hydrogeology);
- Cultural Heritage (Designations and Cultural Heritage Assets);
- People (Proximity to dwellings);
- Landscape (Designations and Character); and
- Land Use (Agriculture, Forestry and Recreation).

Environmental sensitivity has been considered qualitatively, based on professional judgement and utilising the red, amber, green (RAG) rating. It has been applied to each topic area indicating potential impacts. This rating is based on a three-point scale as described in Figure 2 below. SSE guidance “Procedures for Routeing Overhead Lines of 132 kV or above” has been followed.

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(1) <http://map.sepa.org.uk/floodmap/map.htm>

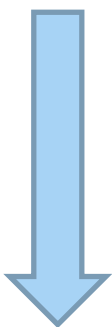
<b>Most Preferred</b>  <b>Least Preferred</b>	<b>Lower Impact</b>	Low potential for the development to be constrained
	<b>Moderate Impact</b>	Intermediate potential for the development to be constrained
	<b>Higher Impact</b>	High potential for the development to be constrained

**Figure 2 Environmental RAG Rating for Comparative Analysis**

3.4.2 Engineering:

- Infrastructure crossings – major crossings, road crossings;
- Environmental design – elevation, atmospheric pollution, contaminated land, flooding;
- Ground conditions – terrain, peat;
- Construction/Maintenance – access;
- Proximity – clearance distance, communication masts, metallic pipelines.

Engineering sensitivity has been considered qualitatively, based on professional judgement and utilising the red, amber, green (RAG) rating. It has been applied to each topic area indicating potential impacts. This rating is based on a four-point scale as described in Figure 3 below. SSE guidance “Procedures for Routeing Overhead Lines of 132 kV or above” has been followed.

<b>Most Preferred</b>  <b>Least Preferred</b>	<b>No Impact</b>	
	<b>Lower Impact</b>	High potential to accommodate the required infrastructure within the context of the consideration appraised.
	<b>Moderate Impact</b>	Moderate potential to accommodate the required infrastructure within the context of the consideration appraised.
	<b>Higher Impact</b>	Low potential to accommodate the required infrastructure within the context of the consideration appraised.

**Figure 3 Engineering RAG Rating for comparative analysis**

### 3.4.3 Cost:

Appraisal of route options has involved systematic consideration against capital cost including construction, diversions, public road improvements, tree felling and land assembly.

To allow comparative appraisal a Red, Amber, Green (RAG) rating has been applied using the criteria described in Figure 4.

Red	Amber	Green
>140% of least cost option	120-140% of least cost option	< 120% of least cost option

**Figure 4 Cost RAG Rating for Comparative Analysis**

## **4. DESCRIPTION OF ROUTES**

### **4.1 Identification of Route Options**

#### **4.1.1 Route A**

Start and end points will be determined through suitable connections from the proposed Sheirdrim Wind Farm and the existing Crossaig Substation. Due to proximity to the proposed turbines at Sheirdrim Wind Farm, Route A comprises OHL and UGC. Route A begins with UGC and travels south-east through the proposed turbines, and after approximately 2.5 km, the route switches to OHL and continues in the same direction towards Creag Eanaiche. Here the route turns to the south east, and continues until it terminates at Crossaig Substation. The OHL section is approximately 9 km long.

#### **4.1.2 Route B**

Start and end points will be determined through suitable connection points with the proposed Sheirdrim Wind Farm and the existing Crossaig Substation. Due to proximity to the proposed turbines at Sheirdrim Wind Farm, Route B comprises OHL and UGC. Route B begins with UGC and travels south through the proposed turbines at Sheirdrim Wind Farm for approximately 2.5 km. As the UGC approaches the Kintyre Way, it changes to OHL and continues for 6 km south east, until Crossaig substation. The southern section of the route runs alongside the B842 to the north, and overall Route B is the most direct route to Crossaig Substation.

#### **4.1.3 Route C**

Start and end points will be determined through suitable connections from the proposed Sheirdrim Wind Farm and Crossaig Substation. Due to proximity to the proposed turbines at Sheirdrim Wind Farm, Route C comprises OHL and UGC. Route C begins with UGC and travels east through the proposed turbines at Sheirdrim Wind Farm for approximately 2.5 km. After passing Loch Cruinn, Route C switches to OHL and joins with Route B at Crossaig Glen. Both follow south to Crossaig substation, alongside the B842.

## 5. ENVIRONMENTAL, ENGINEERING AND COST APPRAISAL

### 5.1 Introduction

This section presents a summary of the environmental, engineering and cost and appraisal of the route options.

### 5.2 Route A

#### 5.2.1 Environmental Baseline and Appraisal

Route A begins within the proposed Sheirdrim Wind Farm, within the Plateau Moorland Landscape Character Type (LCT), which is a medium-large scale landscape. As Route A transitions to OHL, it enters an extensive area of commercial forestry. In the south of the route corridor, near Crossaig substation, there is a transition into the smaller scale Rocky Coastline LCT. There are no landscape designations within Route A. The nearest designated landscape is located 3.1 km at its closest point to Route A (refer to Figure 5) Route A is distant from visual receptors for the majority of the route. The landscape contains few scattered residential and farm properties, concentrated on the lower slopes, and close to the A83 and B842 to the north west and south east of the route, respectively. The closest settlement is Crossaig at the most southern point of the route. Route A would intersect with the Kintyre Way, with potential for close range visual effects for a short section of the route, and would be partially viewed in the context of the consented and existing wind turbines.

Route A does not pass through internationally, nationally, or locally designated sites for nature conservation. However, proximity to Kintyre Goose Roosts SPA (1.5 km to the west at the closest point) and Sound of Gigha SPA (2 km to the north at the closest point), mean there is potential for barrier and collision impacts to Schedule 1 species, as they may pass through the route corridor to access these designated sites. Further potential risks to natural heritage that have been identified in a desk-based assessment of the route corridor are:

- Direct impacts on blanket bog and peat <sup>2</sup> due to being intersected by the route;
- Impact on an area of semi natural ancient woodland south of Cnoc Breacam Wind Farm; and
- Impact to European and nationally protected species considered likely to be present.

There are no designated cultural heritage assets within proposed route A. There are assets within close proximity that may be sensitive to settings impacts, or impacted by development within the route, such as Talatoll Shielings (SM3817) Scheduled Monument (0.3 km from the route at the closest point).

Route A passes through large areas of commercial forestry that would need to be felled to create an operational corridor and access tracks for the proposed OHL. The extent of tree-felling would depend on the final alignment and commercial returns may be compromised within a limited area surrounding the proposed development.

The environmental appraisal is provided in Table 1.

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<sup>2</sup> Blanket bog and peat are an Annex 1 Habitat. Annex 1 lists the specific habitats which have been designated as a Special Area of Conservation, to which common EU-wide legislation applies.

Route	RAG Impact Rating - Environmental														
	Natural Heritage					Cultural Heritage		People	Landscape			Land Use			Planning
	Designations	Protected Species	Habitats	Hydrology/geology	Ornithology	Designated	Assets		Designations	Character	Visual	Agriculture	Forestry	Recreation	
Route A	M	L	M	L	M	M	L	L	M	M	M	L	M	M	M

**Table 1 Route A Environmental RAG Impact Rating**

### 5.2.2 Engineering Baseline and Appraisal

Route A is the longest of the route options from Sheirdrim Windfarm to Crossaig substation, with approximately 2.5 km of UGC, and 9 km of OHL. There are no major crossings such as railways, major roads, rivers, major pipelines, or other significant infrastructure. There are a number of minor crossings that will need to be considered. Route A has the most minor crossings of the three proposed routes, which includes six road crossings and three watercourse crossings. Route A is not within an area of high elevation, contaminated land, or have large areas significantly prone to flooding.

There is a significant amount of Class 1 and Class 2<sup>3</sup> peat in Route A (approx. 33% of the route centreline), which will be difficult to avoid during construction and maintenance. Despite this, route A has the smallest overall area of peatland (1.61 km<sup>2</sup>) of the three route options. Route A also has good access as there are numerous existing tracks and minor roads within 1 km, which may help limit peat disturbance and damage.

Route A has good clearance from any properties and communication masts. The route passes close to the proposed wind turbines (see Figure 5). To maintain SSEN Transmission's recommended distance from OHL to turbines, UGC will be required for the section passing through the wind farm and the OHL will need to be located on the southern extremity of Route A, away from the proposed turbines.

The engineering appraisal is provided in Table 2.

Route	RAG Impact Rating - Environmental											
	Infrastructure Crossings		Environmental Design			Ground Conditions		Construction and Maintenance	Proximity			Other Considerations
	Major Crossings	Minor Crossings	Elevation	Contaminated Land	Flooding	Terrain	Peatland	Access	Clearance	Windfarms	Communication Masts	Route Length
Route A	L	H	L	L	M	L	H	L	L	M	L	H

**Table 2 Route A Engineering RAG Impact Rating**

<sup>3</sup> Class 1: Nationally important carbon-rich soils, deep peat and priority peatland habitat. These are areas likely to be of high conservation value. Class 2: Nationally important carbon-rich soils, deep peat and priority peatland habitat. These are areas of potentially high conservation value and restoration potential. Available at: <https://soils.environment.gov.scot/>

### 5.2.3 Cost Appraisal

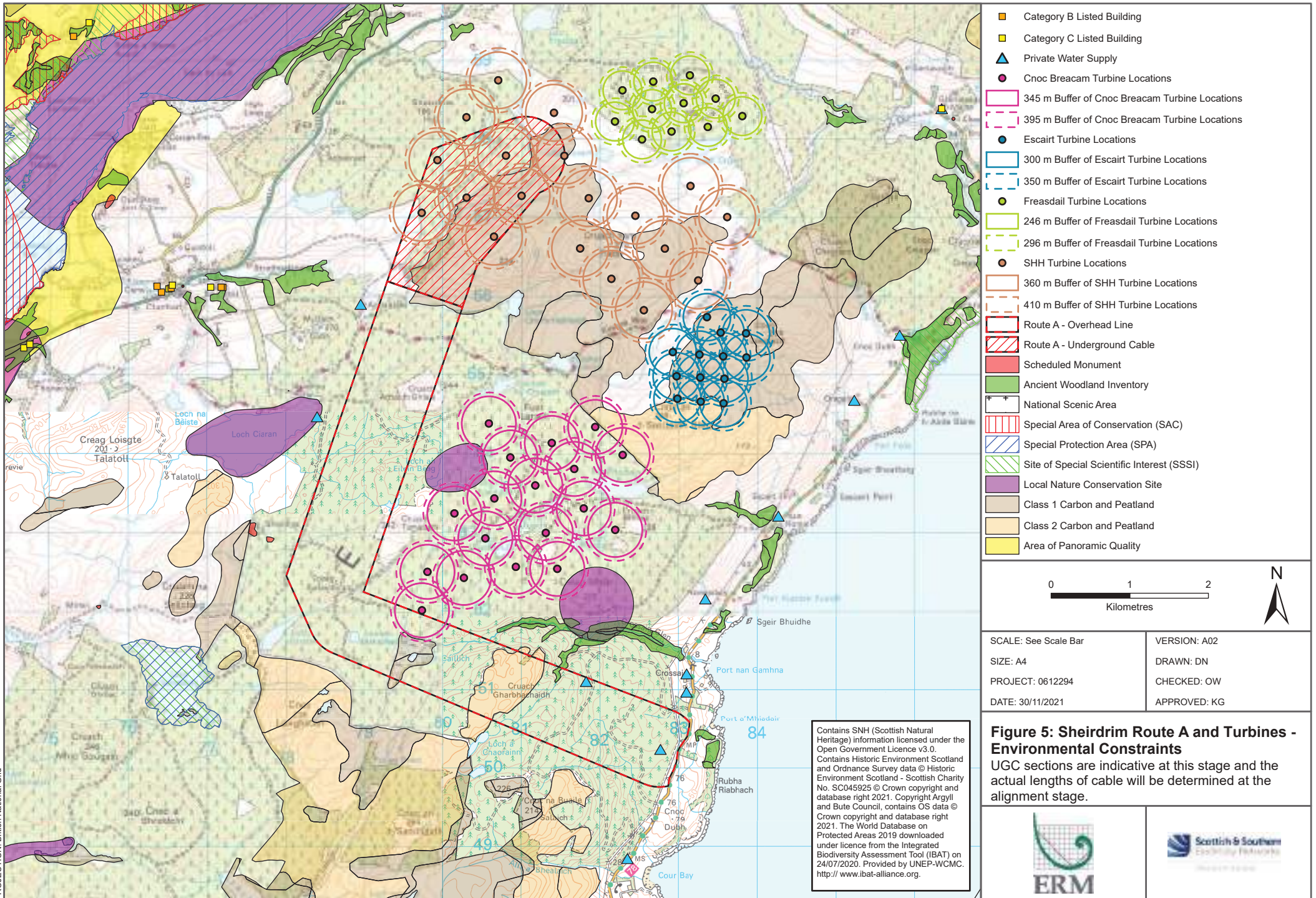
The approximate construction cost of the route has been calculated based on a standard per km rate derived from SSEN Transmission's experience of similar projects. Route Option A has the highest capital cost of the three Route Options, however it is still rated as Green as the cost differences between the different route options is low, i.e. it is 16% higher than the lowest cost option. Operations (inspection and maintenance) have been allocated an amber rating due to the difference in length of the Route Options i.e. based on differences between 8.5 km and 11.5 km. Route Option A has the highest tree felling costs of the three Route options, the only Route with a red RAG rating for tree felling.

The cost appraisal is provided in Table 3.

Route	RAG Impact Rating – Cost								
	Capital	Diversions	Public Road Improvement	Tree Felling	Land Assembly	Consent Mitigations	Inspections	Maintenance	Total Cost
Route A	G	G	G	R	G	G	A	A	G (116%)

**Table 3 Cost RAG Rating Table for Route A**





PROJECTION: British National Grid



### 5.3 Route B

#### 5.3.1 Environmental Baseline and Appraisal

Route B begins within the proposed Sheirdrim Wind Farm, within an area of open Plateau Moorland LCT, which is a medium-large scale landscape. Where Route B meets Loch Romain and re-directs towards Crossaig substation, the landscape becomes dominated by commercial forestry. In the very south of the route corridor, by Crossaig substation, Route B enters the smaller scale Rocky Coastline LCT. There are no landscape designations within Route B, and the nearest designated landscape is located 3.9km at its closest point (refer to Figure 6). The landscape contains few scattered residential and farm properties, concentrated on the lower slope, and close to the A83 and B842 to the north west and south east of the route, respectively. The closest settlement is Crossaig, which lies within the route corridor. Route B would also intersect with the Kintyre Way, with potential for close range visual effects for a short section of the route, and would be viewed in the context of the consented and existing wind turbines.

Route C does not pass through any internationally or nationally designated sites for nature conservation. However, proximity to Kintyre Goose Roosts SPA (5km to the west at the closest point) and Sound of Gigha SPA (2.4km north at the closest point), mean there is potential for barrier and collision impacts to Schedule 1 species, as they may pass through the route corridor to access these designated sites. Further potential risks to natural heritage that have been identified in a desk-based assessment are:

- Direct impacts on large areas of blanket bog and peat due to being intersected by the route;
- Direct impact on areas of semi natural ancient woodland;
- Direct impact on Crossaig Glen Local Nature Conservation Site (LNCS); and
- Impact to European and nationally protected species considered likely to be present.

There are no designated cultural heritage assets within proposed route B. There are assets within close proximity that may be sensitive to settings impacts, or impacted by development within the route corridor, such as Cour House, Category A Listed Building (1.6 km from the route at the closest point).

Route B passes through areas of commercial forestry that would need to be felled to create an operational corridor and access tracks for the proposed OHL. The extent of tree-felling would depend on the final alignment and commercial returns may be compromised within a limited area surrounding the proposed development.

The environmental appraisal is provided in Table 4.

Route	RAG Impact Rating - Environmental														
	Natural Heritage					Cultural Heritage		People	Landscape			Land Use			Planning
	Designations	Protected Species	Habitats	Hydrology/geology	Ornithology	Designated	Non designated		Designations	Character	Visual	Agriculture	Forestry	Recreation	
Route B	H	L	H	L	M	L	L	L	M	M	M	L	M	M	M

**Table 4 Route B Environmental RAG Impact Rating**

### 5.3.2 Engineering Baseline and Appraisal

Route B is the shortest of the route options from Sheirdrim Windfarm to Crossaig substation, with approximately 2.5km of UGC and 6km of OHL. There are no major crossings, however a number of minor crossings will need to be considered. Route B has the least minor crossings of the three proposed routes, which includes one road crossing and three watercourse crossings. Route B has 25% of the OHL above an elevation of 200 m, which increases the risk of wind and ice loading on the lines, which can result in the need for stronger structures. Route B does not appear to be within an area of contaminated land, or have large areas significantly prone to flooding.

There is a significant amount of Class 1 and Class 2 peat in Route B (approx. 53% of the route centreline), which will be very difficult to avoid disturbing during construction and maintenance. Route B has the largest overall area of peatland (4.6 km<sup>2</sup>) of the three route options. In addition, Route B has poor access with no access tracks within 1 km of the route, which may increase peat disturbance if numerous access tracks must be constructed.

Route B has good clearance from any properties and communication masts. The route passes close to the proposed wind turbines (see Figure 6), with over half the route impacted by windfarms. In order to maintain SSEN's recommended distance from OHL to turbines (of 149.9 m height), UGC will be required for the section passing through the wind farm and the OHL will need to be located on the southern extremity of Route B, away from the proposed turbines.

The engineering appraisal is provided in Table 5.

Route	RAG Impact Rating - Environmental											
	Infrastructure Crossings		Environmental Design			Ground Conditions		Construction and Maintenance	Proximity			Other Considerations
	Major Crossings	Minor Crossings	Elevation	Contaminated Land	Flooding	Terrain	Peatland	Access	Clearance from Buildings	Windfarms	Communication Masts	Route Length
Route B	L	L	M	L	L	L	H	H	L	H	L	L

**Table 5 Route B Engineering RAG Impact Rating**

### 5.3.3 Cost Appraisal

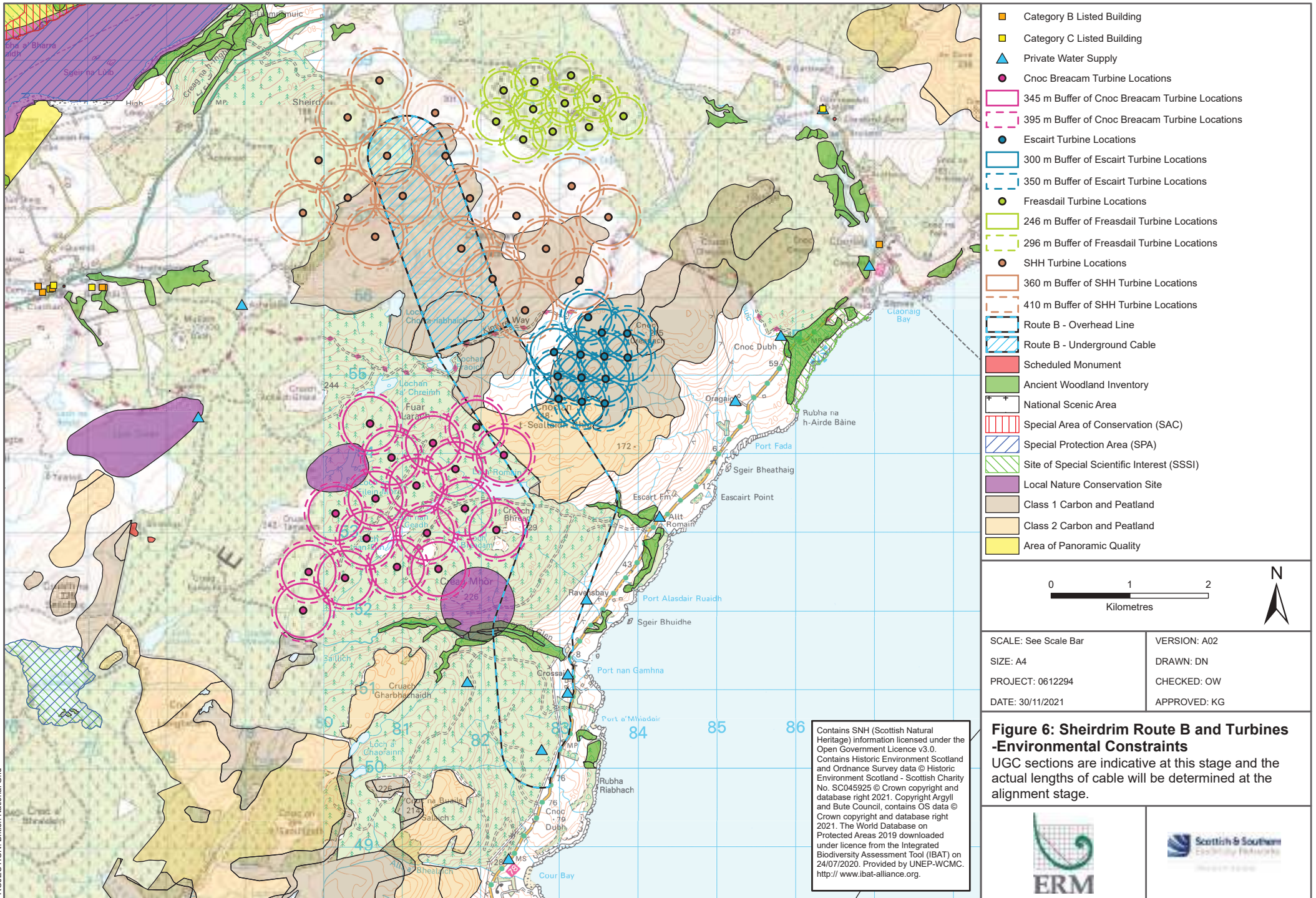
The approximate construction cost of the route has been calculated based on a standard per km rate derived from SSEN Transmission's experience of similar projects.

Route Option B has the lowest capital cost of the three Route Options, it is the only Route Option with all green RAG ratings apart from Tree Felling. Route Option B has an amber RAG rating for Tree Felling due to having the second highest volume of trees of the three routes.

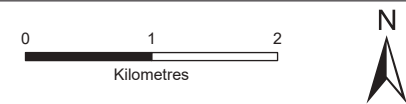
The cost appraisal is provided in Table 6.

Route	RAG Impact Rating – Cost								
	Capital	Diversions	Public Road Improvement	Tree Felling	Land Assembly	Consent Mitigations	Inspections	Maintenance	Total Cost
Route B	G	G	G	A	G	G	G	G	G

**Table 6 Cost RAG Rating Table for Route B**



- Category B Listed Building
- Category C Listed Building
- Private Water Supply
- Cnoc Breacam Turbine Locations
- 345 m Buffer of Cnoc Breacam Turbine Locations
- 395 m Buffer of Cnoc Breacam Turbine Locations
- Escairt Turbine Locations
- 300 m Buffer of Escairt Turbine Locations
- 350 m Buffer of Escairt Turbine Locations
- Freasdail Turbine Locations
- 246 m Buffer of Freasdail Turbine Locations
- 296 m Buffer of Freasdail Turbine Locations
- SHH Turbine Locations
- 360 m Buffer of SHH Turbine Locations
- 410 m Buffer of SHH Turbine Locations
- Route B - Overhead Line
- Route B - Underground Cable
- Scheduled Monument
- Ancient Woodland Inventory
- National Scenic Area
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Local Nature Conservation Site
- Class 1 Carbon and Peatland
- Class 2 Carbon and Peatland
- Area of Panoramic Quality



SCALE: See Scale Bar	VERSION: A02
SIZE: A4	DRAWN: DN
PROJECT: 0612294	CHECKED: OW
DATE: 30/11/2021	APPROVED: KG

**Figure 6: Sheirdrim Route B and Turbines - Environmental Constraints**  
 UGC sections are indicative at this stage and the actual lengths of cable will be determined at the alignment stage.

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PROJECTION: British National Grid



## 5.4 Route C

### 5.4.1 Environmental Baseline and Appraisal

Route C is located between the proposed Sheirdrim Wind Farm and Freasdail wind farm, and follows a route east of Escairt Wind Farm, which is within an area of open Plateau Moorland LCT, a medium-large scale landscape. The south section of Route C, is adjacent to an existing overhead line route in parallel with the B842 and is within the smaller scale Rocky Coastland LCT. Route C has a number of areas covered by commercial forestry, both in the north, to the west of Loch Cruinn, and towards the south, where the route joins with the B842. There are no landscape designations within Route C, and the nearest designated landscape is located 3.9 km at its closest point (refer to Figure 7). The landscape contains few scattered residential and farm properties, concentrated on the lower slopes, and close to the A83 and B842 to the north west and south east of the route, respectively. The closest settlement is Crossaig, which lies within the route corridor. Route C would also intersect with the Kintyre Way, with potential for close range visual effects for a short section of the route and would be viewed in the context of the proposed, consented and existing wind turbines.

Route C does not pass through any internationally or nationally designated sites for nature conservation. However, proximity to Kintyre Goose Roosts SPA (5 km to the west at the closest point) and Sound of Gigha SPA (2.4km north at the closest point), mean there is potential for barrier and collision impacts to Schedule 1 species, as they may pass through the route corridor to access these designated sites. Further potential risks to natural heritage that have been identified in a desk-based assessment are:

- Direct impacts on large areas of blanket bog and peat due to being intersected by the route;
- Direct impact on areas of semi natural ancient woodland;
- Direct impact to Crossaig Glen LNCS; and
- Impact to European and nationally protected species considered likely to be present.

There are no designated cultural heritage assets within proposed Route C. There are assets within close proximity that may be sensitive to settings impacts, or impacted by development within the route corridor, such as Cour House, Category A Listed Building (1.6 km from the route at the closest point).

Route C passes through areas of commercial forestry that would need to be felled to create an operational corridor and access tracks for the proposed OHL. The extent of tree-felling would depend on the final alignment and commercial returns may be compromised within a limited area surrounding the proposed development.

The environmental appraisal is provided in Table 7.

Route	RAG Impact Rating - Environmental														
	Natural Heritage					Cultural Heritage		People	Landscape			Land Use			Planning
	Designations	Protected Species	Habitats	Hydrology/geology	Ornithology	Designated	Non designated		Designations	Character	Visual	Agriculture	Forestry	Recreation	
Route C	H	L	H	L	M	L	L	L	M	M	M	L	M	M	M

**Table 7 Route C Environmental RAG Impact Rating**

#### 5.4.2 Engineering Baseline and Appraisal

Route C consists of approximately 2.5 km UGC, and 9 km OHL. In Route C, there are no major infrastructure crossings, however five minor crossings will need to be considered. Route C has the lowest elevation of the three options, not exceeding 200m at any point. Route C does not appear to be within an area of contaminated land. It does have the highest flood risk of the three Route Options, with 9% of the route within a 1 in 200-year flood zone.

There is a significant amount of Class 1 and Class 2 peat in Route C (approx. 29% of the route centreline), which will be difficult to avoid disturbing during construction and maintenance. Within the 1 km corridor, there is an area of approximately 2.95 km<sup>2</sup> of peat present. Route C has good access with numerous tracks present within 1 km of the route, including the B842, which may mitigate disturbance to peatland.

Route C has good clearance from any properties and communication masts. The route passes close to the proposed wind turbines (see Figure 7), with over half the route impacted by windfarms. In order to maintain SSEN's recommended distance from OHL to turbines (of 149.9 m), UGC will be required for the section passing through the wind farm and the OHL will need to be located on the southern extremity of Route A, away from the proposed turbines.

The engineering appraisal is provided in Table 8.

Route	RAG Impact Rating - Environmental											
	Infrastructure Crossings		Environmental Design			Ground Conditions		Construction and Maintenance	Proximity			Other Considerations
	Major Crossings	Minor Crossings	Elevation	Contaminated Land	Flooding	Terrain	Peatland	Access	Clearance from Buildings	Windfarms	Communication Masts	Route Length
Route C	L	M	L	L	H	L	H	L	L	H	L	H

**Table 8 Route C Engineering RAG Impact Rating**

#### 5.4.3 Cost Appraisal

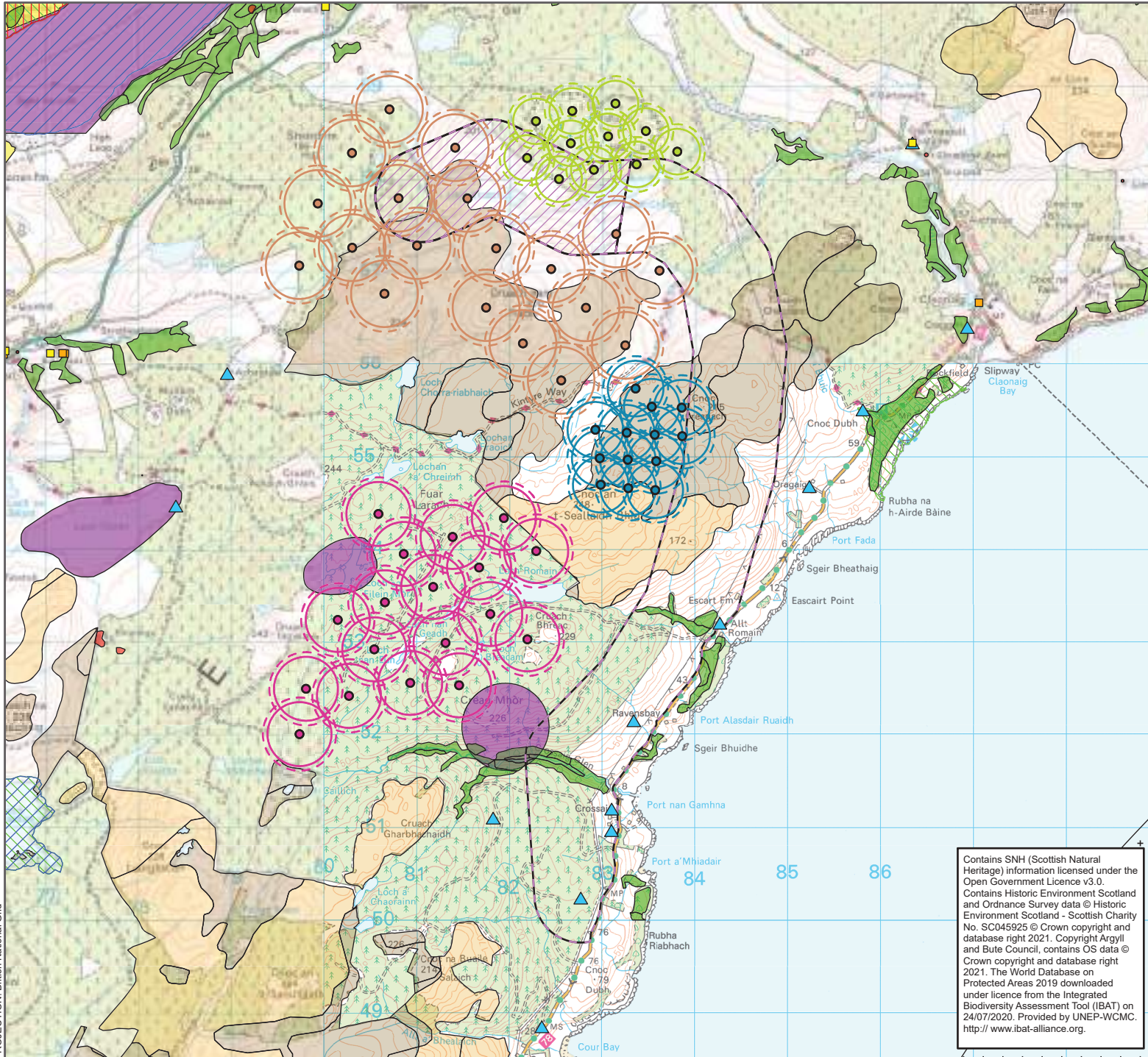
The approximate construction cost of the route has been calculated based on a standard per km rate derived from SHE Transmission's experience of similar projects.

Route Option C has the second highest capital cost of the three Route Options and has an overall green RAG rating, because it is only 11% higher than the lowest cost option. Operations (inspection and maintenance) have been allocated an amber RAG rating due to the difference in length of the Route Options i.e. based on differences between 8.5 km and 11.5 km. In comparison with the other Route Options, Route Option C has a green RAG rating for tree felling as it has the fewest volume of trees to be felled of the Route Options.

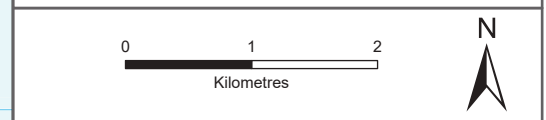
The cost appraisal is provided in Table 9.

Route	RAG Impact Rating – Cost								
	Capital	Diversions	Public Road Improvement	Tree Felling	Land Assembly	Consent Mitigations	Inspections	Maintenance	Total Cost
Route C	G	G	G	G	G	G	A	A	G (111%)

**Table 9 Cost RAG Rating Table for Route C**



- Category B Listed Building
- Category C Listed Building
- Private Water Supply
- Cnoc Breacam Turbine Locations
- 345 m Buffer of Cnoc Breacam Turbine Locations
- 395 m Buffer of Cnoc Breacam Turbine Locations
- Escairt Turbine Locations
- 300 m Buffer of Escairt Turbine Locations
- 350 m Buffer of Escairt Turbine Locations
- Freasdail Turbine Locations
- 246 m Buffer of Freasdail Turbine Locations
- 296 m Buffer of Freasdail Turbine Locations
- SHH Turbine Locations
- 360 m Buffer of SHH Turbine Locations
- 410 m Buffer of SHH Turbine Locations
- Route C - Overhead Line
- Route C - Underground Cable
- Scheduled Monument
- Ancient Woodland Inventory
- National Scenic Area
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Local Nature Conservation Site
- Class 1 Carbon and Peatland
- Class 2 Carbon and Peatland
- Area of Panoramic Quality



SCALE: See Scale Bar	VERSION: A02
SIZE: A4	DRAWN: DN
PROJECT: 0612294	CHECKED: OW
DATE: 30/11/2021	APPROVED: KG

**Figure 7: Sheirdrim Route C and Turbines - Environmental Constraints**  
 UGC sections are indicative at this stage and the actual lengths of cable will be determined at the alignment stage.



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PROJECTION: British National Grid



## 5.5 Comparison of Routes and Preferred Option

### 5.5.1 Comparison of Route Options A, B and C

There are environmental and engineering challenges for all routes. From an environmental perspective, all route options have the potential to result in barrier and collision effects on Schedule 1 bird species, some of which are associated with nearby Special Protection Areas. All route options have potential to impact semi-natural ancient woodland, however Route B and C corridors intersect a larger area of ancient woodland, which could not be avoided at routeing stage. Routes B and C also pass through a larger area of Class 1 and Class 2 peat in comparison to Route A, with Route B having the larger area of peat within the route corridor of all the options. All route options have cultural heritage features within 2 km, that may experience effects to settings, however Route A has the greatest potential due to nearby Scheduled Monuments. Route C has the greatest potential for visual impacts due to its position parallel to the B842.

From a technical perspective, Route B is most challenging due to its high elevation and increased risk of ice load. In addition to having the greatest area of peat, Route B also has the poorest access of the three routes, which may mean further disturbance to peatland habitats in order to construct access roads. Routes A and C both have good access, with Route A being the most connected.

From a cost perspective, Routes A and C are more expensive than Route B, most likely due to their longer length, and for Route A, the larger area of commercial forestry that would need to be felled to create an operational corridor.

### 5.5.2 Selection of Preferred Route

The optioneering process initially considered three overhead line routes. Following this, an underground cable section within all routes was identified to avoid proposed wind turbines.

From an environmental perspective Route A is preferred. This is because it offers the potential to avoid direct impacts on ancient woodland and of the three options it passes through the smallest area of sensitive habitat, including Class 1 and 2 peat.

From an engineering perspective Route A is preferred. This because it is the route that provides the least challenges, particularly in regards to peat, access, and proximity to windfarms, and provides a more technically viable route.

From a cost perspective Route B is preferred, as it has the lowest cost.

Despite Route B having the lowest cost of the three options, the preferred route for the connection between the proposed Sheirdrim Wind Farm and Crossaig substation is Route A. This is because the environmental and technical considerations of Route A outweigh the additional cost considerations.

## 6. CONSULTATION ON THE PROPOSAL

### 6.1 Introduction

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

6.1.2 The proposals detailed in this report have been developed through environmental and technical analysis of various route options. The potential for environmental effects remains and further assessment and design will be important in giving detailed consideration to the development and integration of mitigation measures to address significant environmental effects identified.

When providing comment and feedback, SSEN Transmission would be grateful for your consideration of the questions below. We are keen to receive your views and comments in regards to the following:

- Do you feel sufficient information has been provided to enable you to understand what is being proposed and why? If no, please tell us how we could provide further explanation.
- Which of the three Options would you consider the best option for SSEN Transmission to develop? Please provide an explanation of your answer.
- Which of the three Options would you consider the least preferable option for SSEN Transmission to develop? Please provide an explanation of your answer.
- Are there any potential risks or benefits associated with this project, that you believe have not been included in the Consultation Document?
- Do you have any other comments on the Proposed Development?

### 6.2 Next steps

6.2.1 A series of events will be held in December and meetings will be arranged with statutory and other stakeholders. The responses received, and those sought from statutory consultees and other key stakeholders will inform further consideration and design of the preferred route leading to the identification of a proposed route to take forward to the alignment and consenting stages.

Please submit your comments to Caitlin Quinn, Community Liaison Manager, Scottish Hydro Electric Transmission, Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ (caitlin.quinn@sse.com). All comments are requested by 10 January 2022.