

Route Selection Consultation Document

Project: LT313 Earraghail Wind Farm OHL
Connection

Date: August 2022



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CONTENTS

GLOSSARY	5
PREFACE	7
EXECUTIVE SUMMARY	8
1. INTRODUCTION	9
1.1 Purpose of the Document	9
1.2 Document Structure	9
1.3 Next Steps	9
2. THE PROPOSALS	10
2.1 The Need for the Project	10
2.2 Alternative Options and Preferred Technology Solution	10
2.3 Proposals Overview	10
3. ROUTE SELECTION PROCESS	12
3.1 Guidance Document	12
3.2 Area of Search	12
3.3 Baseline Conditions	12
3.4 Route Identification and Selection Methods	14
3.5 Appraisal Method	14
4. DESCRIPTION OF THE ROUTE OPTIONS	17
4.1 Introduction	17
4.2 Identification of Route Options	17
5. BASELINE CONDITIONS	19
5.1 Introduction	19
5.2 Environmental Constraints	19
5.3 Engineering Constraints	26
5.4 Economic Constraints	28
6. COMPARATIVE APPRAISAL	29
6.1 Environmental Appraisal	29
6.2 Engineering Appraisal	38
6.3 Economic Appraisal	40
6.4 Comparative Appraisal Summary	41
6.5 Preferred Route	41
7. CONSULTATION ON THE PROPOSALS	42
7.1 Questions for Consideration by Consultees	42
7.2 Next Steps	42

Appendices

Appendix 1 – Figures

Appendix 2 – OHL Route Options and Summary RAG Tables

Figures

Figure 1.1 – Location

Figure 3.1 – Study Area

Figure 4.1 – Route Options

Figure 5.1 – Key Constraints

Figure 6.1 – Preferred Route

GLOSSARY

Term	Definition
Alignment	A centre line of an overhead line (OHL), along with location of key angle structures.
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.
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.
Environmental Impact Assessment (EIA)	Environmental Impact Assessment. A formal process codified by EU directive 2011/92/EU, and subsequently amended by Directive 2014/52/EU. The national regulations are set out in The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. The EIA process is set out in Regulation 4(1) of the regulations and includes the preparation of an EIA Report by the developer to systematically identify, predict, assess and report on the likely significant environmental impacts of a proposed project or development.
Gardens and Designed Landscapes (GDLs)	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.
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.
Micro-siting	The process of positioning individual structures to avoid localised environmental or technical constraints.
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.
Overhead line (OHL)	An electric line installed above ground, usually supported by lattice steel towers or poles.
Plantation Woodland	Woodland of any age that obviously originated from planting.
Riparian Woodland	Natural home for plants and animals occurring in a thin strip of land bordering a stream or river.
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.
Route (preferred)	A route for the OHL taken forward to stakeholder consultation following a comparative appraisal of Route Options.
Route (proposed)	A route taken forward following stakeholder consultation to the alignment selection stage of the overhead line routeing process.

Term	Definition
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.
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'.
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
Site 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.
Span	The section of OHL between two structures.
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 Landscape Area (SLA)	Landscapes designated by Argyll and Bute Council which are considered to be of regional/local importance for their scenic qualities.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive 79/409/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.
Study Area	The area within which the corridor, route and alignment study takes place.
Volts	The international unit of electric potential and electromotive force.
Wild Land Area (WLA)	Those areas comprising the greatest and most extensive areas of high wildness. It is not a statutory designation, but WLAs are considered nationally important.

PREFACE

This Consultation Document has been prepared by WSP UK Ltd. on behalf of Scottish and Southern Electricity Networks Transmission (SSEN Transmission) to seek comments from all interested parties on the Preferred Route identified for the proposed Earraghail Wind Farm Connection between the Earraghail Wind Farm Substation and a T-point into one side of the consented Craig Murrail to Crossaig 275 kV OHL.

The Consultation Document is available online at the project website:

<https://www.ssen-transmission.co.uk/projects/earraghail-wind-farm-connection-project/>

A face to face public consultation event will be held between 2pm to 7pm on 24th August 2022 at White House Village Hall, Tarbert, PA29 6XR.

To continue engagement on the project SSEN Transmission has developed an online consultation tool, to enable the local community to experience the full exhibition from home on a computer, tablet or mobile device. The online exhibition has been designed to look and feel like a real consultation in a community hall, with exhibition boards, maps, interactive videos and the opportunity to share views on the proposals.

Visitors will be able to engage directly with the project team, via a live chat function, where they can ask any questions they might have about the project and share their feedback on the current proposals.

A virtual consultation event will be taking place week commencing 29th August 2022 via the project website.

Comments on this Consultation Document should be sent to:

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All comments are requested by 23rd September 2022.

EXECUTIVE SUMMARY

Scottish and Southern Electricity Network Transmission is proposing to construct a new 275 kilovolt double circuit overhead line supported on steel lattice towers between the Earraghail Wind Farm Substation and a T-point into one side of the consented Craig Murrail to Crossaig 275 kilovolt overhead line.

The developer of Earraghail Wind Farm has submitted an application to the Scottish Government under Section 36 of the Electricity Act 1989 for a 114 megawatt Wind Farm and has a contracted connection date of April 2027. Under the terms of their license, Scottish and Southern Electricity Network Transmission is therefore obliged to connect the developer to the transmission network by the contracted connection date.

Route Options were identified, which provided feasible areas for the overhead line to be developed, and from a which a Preferred Route has been selected that provides an optimum balance of environmental, engineering and economic factors. This Consultation Document invites comments from all interested parties on the Preferred Route.

Moving forward, confirmation of the Preferred Route will be informed by this consultation exercise and through detailed surveys, which may identify any as yet unknown engineering, environmental or land use constraints. Subject to the outcome of the consultation, the Preferred Route will then be referred to as the Proposed Route. We will seek potential alignments within it, which will then be subject to further appraisal and consultation. On identification of a Proposed Alignment (after further consultation), Section 37 consent under the Electricity Act 1989 will be sought from the Energy Consents Unit of the Scottish Government for proposed new overhead line infrastructure.

Further public consultation on a Preferred Alignment will take place by Spring 2023. It is anticipated that an application for consent for a Proposed Alignment will be submitted in Winter 2023.

When providing comments and feedback on this Consultation Document, SHE Transmission would be grateful for your consideration of the questions below:

- Has the need for the Project been adequately explained?
- Has the approach taken to select the Preferred Route been adequately explained?
- Are there any factors, or environmental features, that you consider may have been overlooked during the Preferred Route selection process?
- Do you feel, on balance, that the Preferred Route selected is the most appropriate for further consideration at the alignment selection stage? Please provide an explanation of your answer.
- If you don't agree to our Preferred Route which of the options would you consider the best option for SSEN Transmission to develop? Please provide an explanation of your answer.

1. INTRODUCTION

1.1 Purpose of the Document

The Consultation Document invited comments from all interested parties on the Preferred Route identified for the new 275 kilovolt (kV) double circuit overhead line (OHL) between the Earraghail Wind Farm Substation and a T-point into one side of the consented Craig Murrail to Crossaig 275 kV OHL (see **Figure 1.1**), a distance of approximately 5 kilometres (km) (hereafter referred to as the 'Proposed Development').

This Consultation Document describes the findings of an environmental, engineering and economic appraisal of six Route Options identified by SSEN Transmission, and present the process by which a Preferred Route for the OHL 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. Comments are now sought from statutory authorities, key stakeholders, elected representatives and the public on the route selection process and the Preferred Route identified.

All comments received will inform further consideration of the Preferred Route, and subsequent alignment options therein.

1.2 Document Structure

This report is comprised of 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 solution and the typical construction methods;
- 3) Route Selection Process – sets out the route selection process and methodology that has been applied to date to derive a Preferred Route;
- 4) Description of the Route Options – describes the Route Options that have been identified;
- 5) Baseline Conditions – describes the local context and baseline environmental and engineering conditions;
- 6) Comparative Appraisal – analyses each Route Option against a series of environmental, technical and economic considerations to arrive at a recommendation for the Preferred Route; and
- 7) Consultation on the Proposals – invites comments on the route assessment process and identification of Preferred Route.

The main body of this document is supported by a series of figures (see **Appendix 1**).

1.3 Next Steps

As part of the consultation exercise, comments are sought from members of the public, statutory consultees and other key stakeholders on the Preferred Route recommended.

A Report on Consultation will be produced which will document the consultation responses received, and the decisions made in light of these responses.

Following the identification of a Proposed Route, further technical and environmental surveys will be undertaken to identify a Preferred Alignment within the route. Consultation on a Preferred Alignment will be undertaken during Spring 2023.

2. THE PROPOSALS

2.1 The Need for the Project

SSEN Transmission is a wholly owned subsidiary of the SSE plc Group of companies. SSEN Transmission holds a license under the Electricity Act 1989 for the transmission of electricity in the north of Scotland and has a statutory duty under Schedule 9 of the Electricity Act 1989 to '*develop and maintain an efficient, co-ordinated and economical electricity transmission system in its licensed areas*'.

The developer of Earraghail Wind Farm has submitted an application to the Scottish Government under Section 36 of the Electricity Act 1989 for a 114 megawatt (MW) Wind Farm and has a contracted connection date of April 2027. Under the terms of their license, SSEN Transmission is therefore obliged to connect the developer to the transmission network by the contracted connection date.

2.2 Alternative Options and Preferred Technology Solution

Two system options were assessed to facilitate this connection, a Loop In and Out T-in option directly into the consented Craig Murrail to Crossaig 275 kV OHL and a direct connection into the existing Crossaig 132 kV Substation.

Option 2 (connection to the existing Crossaig 132 kV Substation) was discounted due to the high cost associated with the works in comparison to option 1, considering the preferred technologies and route lengths needed to facilitate each option. As such, option 1 was progressed to detailed analysis.

2.3 Proposals Overview

SSEN Transmission is proposing to construct a new double circuit 275 kV OHL supported on steel lattice towers between the Earraghail Wind Farm Substation and a T-point into one side of the consented Craig Murrail to Crossaig 275 kV OHL.

For the purposes of this report, it is assumed that the Proposed Development would comprise steel lattice towers from the L8 tower suite. Generally, the height, including extensions, for the L8 tower suite is approximately 46 m. The selection of the supports suitable for the OHL are being considered separately to the OHL routeing process.

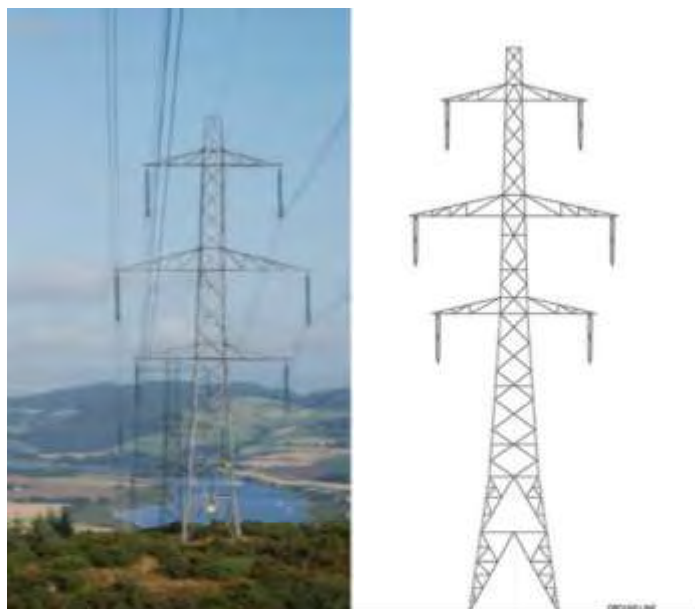


Plate 2.1 – Typical L8 steel lattice tower design

The final designation of support type is generally dependent on three main factors: altitude, weather and the topography of the route. The size of supports and span lengths will also vary depending on these factors, with supports being closer together at high altitudes to withstand the effects of greater exposure to high winds, ice and other weather events. The support configuration, height and the distance between supports will therefore only be fully determined after a detailed alignment survey.

The proposed steel lattice towers will support six conductors (wires) on six cross-arms (three on each side) and an earth wire between the peaks, typical designs can be seen in **Plate 2.1**.

2.3.1 *Construction Activities*

Construction activities are anticipated to consist of six phases, as follows:

- Alterations to the existing transmission and distribution networks;
- Enabling work (forestry clearance and establishment of temporary construction compound(s));
- Erection of towers;
- Conductor stringing (including construction of temporary scaffolding);
- Inspections and OHL commissioning; and
- Removal of temporary works and site reinstatement.

An indicative programme can be found in **Section 2.3.3** below.

All construction activities will be undertaken in accordance with a Construction Environmental Management Plan (CEMP) which will define specific methods for environmental survey, monitoring and management throughout construction. A CEMP will be produced by the Principal Contractor and agreed with statutory stakeholders prior to the commencement of construction.

2.3.2 *Access during Construction*

Vehicle access is required to each support structure location during construction to allow excavation and creation of foundations and erection of the support structure. Existing tracks would be used where possible and upgraded as required. Preference will be given to lower impact access solutions including the use of low pressure tracked personnel vehicles and temporary track solutions in boggy / soft ground areas to reduce any damage to, and compaction of, the ground. These journeys would be kept to a minimum to minimise disruption to habitats along the route. Temporary access panel solutions may also be used to protect the ground, however, temporary stone tracks are likely to be necessary in some areas depending on existing access conditions, terrain and altitude. Helicopters may also be used to reduce access track requirements.

Access requirements for the Proposed Development will be dependent upon the type of OHL supports chosen. Consideration of impacts will be undertaken at the alignment stage once the support type has been confirmed. A more detailed plan for access during construction will be prepared once a Proposed Alignment has been identified and the type of support structure has been selected.

2.3.3 *Indicative Programme*

It is anticipated that construction of the Proposed Development would take place over an 18 – 22 month period, following the granting of consents, although a detailed programming of works would be the responsibility of the Principal Contractor in agreement with SSEN Transmission.

Construction is estimated to start in July 2025 with completion in January 2027.

3. ROUTE SELECTION PROCESS

3.1 Guidance Document

The approach to route selection, in identifying and assessing alternative OHL routes, is informed by SSEN Transmission's Routeing Guidance¹. The guidance develops a process which aims to balance environmental, engineering and economic considerations throughout the Route Options process.

This report summarises the process of Stage 2: Route Selection from the guidance², which seeks to find a proposed route which, where possible, avoids physical, environmental and amenity constraints, is likely to be acceptable to stakeholders, and is economically viable, taking into account factors such as altitude, slope, ground conditions and access.

In consideration of these principles, the method of identifying a Preferred Route in this study has involved the following four key tasks:

- Identification of the baseline situation;
- Identification of alternative Route Options;
- Environmental analysis of Route Options; and
- Identification of a Preferred Route.

On finalisation of the Route Selection (Stage 2) process, SSEN Transmission's Routeing guidance¹ will be followed as the project progresses through Alignment Selection (Stage 3) and onto the Consenting Process (Stage 4).

3.2 Area of Search

A preliminary environmental Study Area was identified within which the identification and assessment of Route Options could be completed (see **Figure 3.1**). This Study Area encompassed a range of feasible Route Options between Earraghail Wind Farm Substation in the east and the consented Craig Murrail to Crossaig 275 kV OHL in the west of the Study Area.

The Study Area is largely defined by the geography of the area between the two connection points. It is constrained by areas of steep slopes and local high points. At the northern end, the Study Area extends north from the Earraghail Wind Farm Substation at Meall Donn to traverse steep slopes and areas of forestry, east of Corranbuie. At the southern end, the Study Area extends to just north of the B8001 road, and extends west approximately 6 km between Kennacraig and Caol – Bheinn.

Baseline studies have been focussed within the Study Area, although consideration of potential receptors outside of this area (e.g. environmental designations, visual receptors or cultural heritage sites) has been undertaken and these are referenced where relevant in this report.

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 routes.

- Identification of environmental designated sites and other constraints, utilising GIS datasets available via NatureScot Site Link² and other sources. These include:
 - Special Areas of Conservation (SAC);
 - Special Protection Areas (SPA);
 - Sites of Special Scientific Interest (SSSI);

¹ Scottish & Southern Electricity Networks, 2020. PR-NET-ENV-501: Procedures for Routeing Overhead Lines and Underground Cables of 132 kV and above

² NatureScot. Site Link. [online] Available at: <https://sitelink.nature.scot/home> (Accessed 16 June 2022).

- National Scenic Area (NSA);
- Wild Land Areas (WLA);
- Important Bird Areas (IBA);
- Royal Society for the Protection of Birds (RSPB) reserves;
- Land capability of agriculture;
- Geological Conservation Review Sites;
- Carbon-rich soil, deep peat and priority peatlands; and
- Areas at risk of flooding (SEPA flood map).
- Identification of archaeological designations and other recorded sites, utilising GIS datasets available via Historic Environment Scotland Data Services and Local Historic Environment Teams^{3,4}. These include:
 - World Heritage Sites;
 - Scheduled Monuments;
 - Category A, B and C listed buildings; and
 - Inventory of Gardens and Designated Landscapes.
- Review of the Argyll and Bute Local Development Plan (2015)⁵ and Argyll and Bute Local Development Plan 2 (2020)⁶ to identify further environmental constraints and opportunities, such as regional level designations or other locations important to the public;
- Review of Landscape Character Assessments of relevance to the Study Area⁷;
- Review of Ordnance Survey (OS) mapping (1:50,000 and 1:25,000 online mapping and terrain data from OS OpenData) and aerial photography (where available) to identify other potential constraints such as settlements, properties, walking routes, cycling routes etc.;
- Extrapolation of OS OpenData to identify further environmental constraints including locations of watercourses and waterbodies and to undertake a preliminary slope analysis;
- Identification of watercourse and waterbody quality and areas prone to flooding, utilising online GIS data sources from Scottish Environment Protection Agency (SEPA)⁸;
- Review of other local information through online and published media such as tourism sites and walking routes; and
- Review of ornithological data available for wind farms within a 2 km buffer of the Study Area from the Argyll and Bute planning portal⁹.

3.3.1 Site Visits

Following the identification of potential Route Options (see **Section 3.4** below), a site walkover was undertaken by landscape specialists in February and March 2022 to ground truth the key constraints identified by the desk studies and where appropriate to refine the Route Options.

³ Historic Environment Scotland Data Services. Portal. [online]. Available at: <http://portal.historicenvironment.scot/> (Accessed 8 February 2022).

⁴ Royal Commission on Ancient and Historical Monuments of Scotland. Canmore. [online]. Available at: <http://canmore.rcahms.gov.uk/> (Accessed 8 February 2022).

⁵ Argyll and Bute Council (2015). Local Development Plan. [online]. Available at: <https://www.argyll-bute.gov.uk/ldp> (Accessed 8 February 2022).

⁶ Argyll and Bute Council (2020). Local Development Plan 2. [online]. Available at: <https://www.argyll-bute.gov.uk/ldp2> (Accessed 8 February 2022).

⁷ NatureScot (N/A). Scottish Landscape Character Type Map and Descriptions. [online]. Available at: <https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions> (Accessed 8 February 2022).

⁸ Scottish Environment Protection Agency (N/A). SEPA Data publication. [online]. Available at: <https://www.sepa.org.uk/environment/environmental-data/> (Accessed 8 February 2022).

⁹ Argyll and Bute Council (N/A). Planning Portal. [online]. Available online at: <https://www.argyll-bute.gov.uk/planning-and-environment/find-and-comment-planning-applications> (Accessed 24 March 2022).

The landscape site walkover was undertaken on 15th and 16th February 2022, working from public roads and publicly accessible locations. The site visit covered the area of Kintyre Way within the east of the Study Area and local roads were driven where possible. Due to poor weather conditions and visibility, the site visit was aborted on the 16th February and a second landscape site walkover was undertaken on the 14th March 2022. This site visit sought to walkover the remainder of the Study Area and consider the Route Options proposed in more detail.

3.4 Route Identification and Selection Methods

Route Options were identified following site appraisals, considering the most notable constraints identified during the baseline studies. Considerations have included a review of the steps outlined in the Holford Rules and the SSEN Transmission approach to routeing.

In summary, the following has been considered as far as is practicable at this routeing stage and will be considered in more detail during alignment selection.

- Avoid if possible major areas of highest amenity value (including those covered by national and international designations and other sensitive landscapes). Areas considered included extensive areas of native and semi-natural woodland and Ancient Woodland;
- 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.

Route options were identified to allow for subsequent identification of alignments during the next stage of the process (Alignment Selection). Routes are approximately 1 km in width to allow for site specific constraints and may be narrower or wider in places. Route Options are described in detail in **Section 4**, below.

3.5 Appraisal Method

Appraisal of the Route Options has followed the process defined by SSEN Transmission's Routeing Guidance¹, including the environmental topics considered within. The environmental characteristics of each Route Option are then considered in turn. Below is a list of the topic areas considered as part of the Route Options appraisal.

3.5.1 *Environmental Criteria*

Appraisal of Route Options has involved systematic consideration against the following environmental topic areas:

- Natural Heritage - designations; protected species; habitats; biodiversity; ornithology; geology, hydrogeology and hydrology;
- Cultural Heritage - designations; cultural heritage assets;
- People – proximity to dwellings;
- Landscape – designations; landscape character; visual;

- Land Use – agriculture; forestry; recreation; and
- Planning – policy, proposals.

3.5.2 Engineering Criteria

Appraisal of Route Options has involved systematic consideration against the following engineering topic areas:

- Infrastructure Crossings – major crossings (132 kV, 275 kV, Rail, 200+m wide river, navigable canal, gas or hydro pipeline); road crossings;
- Environmental Design – elevation; atmospheric pollution; contaminated land; flooding;
- Ground Conditions – terrain; peat;
- Construction / Maintenance – access; angle towers; and
- Proximity – clearance distance; wind farms, communication masts, urban environments; metallic pipelines.

3.5.3 Economic Criteria

Appraisal of Route Options has involved systematic consideration against the following economic topic areas:

- Capital – construction; diversions; public road improvements; tree felling; land assembly; consent mitigations; and
- Operational – inspections; maintenance.

3.5.4 Comparative Appraisal


Each Route Option has been considered in terms of its potential interaction with the environmental, engineering and economic characteristics, features and sensitivities. The Route Options have then been compared to determine which has the greatest and least capacity or potential to accommodate the Proposed Development.

3.5.5 RAG Rating

Each Route Option has been considered in terms of its potential interaction with the environmental, engineering and economic characteristics, features and sensitivities. The Route Options have then been compared to determine which has the greatest and least capacity or potential to accommodate the Proposed Development.

In line with the RAG assessment criteria defined within the SSEN Transmission Guidance, a RAG rating has been applied to each topic area within each Route Option. This rating is based on a three-point scale as indicated in **Table 3.1** below.

Table 3-1: 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.

3.5.6 *Identification of a Preferred Route*

Following rating of applicable environmental, engineering and economic criteria for the Route Options, these have been considered in combination to arrive at a Preferred Route. The overall objective throughout the appraisal of Route Options has been to take a balanced consideration of all criteria. Following a review and consideration of the potential Route Options, a Preferred Route Options was arrived at.

4. DESCRIPTION OF THE ROUTE OPTIONS

4.1 Introduction

This section provides a description of the Route Options considered; these are also presented in **Figure 4.1**.

4.2 Identification of Route Options

4.2.1 OHL Route Options

The Study Area has been divided into five sections for the definition of Route Options as described below. These Route Options have been defined to allow for subsequent identification of alignments during the next stage of the process. The Route Options are as follows:

Route Option 1

Route Option 1 has been divided into two sub-options, Route Option 1A and 1B. All Route Options would utilise Route Option 1 for the initial section of the Proposed Route, as such Route Option 1 has not been appraised in isolation but has been included within the appraisal for each sub-options within **Section 6**. The Route Options are described as follows:

Route Option 1A

Route Option 1A would leave the Earraghail Wind Farm Substation in a south west direction through a small valley between Cruach Tarsumn and Cruach na Caol-bheinn. The route would then head in a north west direction against the slope, in parallel to the east of the B8001 before joining into the consented Craig Murrail to Crossaig 275 kV OHL. Route Option 1A is approximately 6.8 km in length.

Route Option 1B

Route Option 1B would leave the Earraghail Wind Farm Substation in a south west direction through a small valley between Cruach Tarsumn and Cruach na Caol-bheinn. The route would then continue south west before crossing the B8001 and joining into the consented Craig Murrail to Crossaig 275 kV OHL. Route Option 1B is approximately 5.9 km in length.

Route Option 2

Route Option 2 would run east to west between Earraghail Wind Farm Substation and the consented Craig Murrail to Crossaig 275 kV OHL. The route would utilise a valley between high points at Cnoc a'Bhaite-shios, Cnoc an Fhionn and Cnoc an Tobair to the north and Crunach Tarsuinn and Coire nan Capull to the south. The western section of route would have to traverse a steep slope. Route Option 2 is approximately 5.2 km in length.

Route Option 3

Route Option 3 has been divided into three sub-options, Route Option 3A, 3B and 3C, in order to assess the three potential Route Options that could be preferred within the north west of the Study Area. All sub-options would utilise Route Option 3 for the initial section of the proposed route, as such Route Option 3 has not been appraised in isolation but has been included within the appraisal of each sub-options Route Options 3A, 3B and 3C within **Section 6**. The Route Options are described as follows:

Route Option 3 would leave Earraghail Wind Farm Substation to the north west, traveling north and roughly following the route of the Kintryre Way. The route avoids areas of higher ground to the east, Cruach Doire Leithe, and west, Cnoc Breac. Approximately 1.8 km north west of Earraghail Wind Farm Substation, the route would then split into three sub-options. Up to this point Route Option 3 is approximately 3 km in length.

Route Option 3A

Route Option 3A is approximately 4.5 km in length and would bare west from Route Option 3, traversing the steep slopes. The route then travels south west along the route of the consented Craig Murrail to Crossaig 275 kV OHL enabling flexibility on where the Proposed Development connects into it.

Route Option 3B

Route Option 3B is approximately 2.3 km in length and follows a more direct route, continuing from Route Option 3 in a north west direction and would connect into the consented Craig Murrail to Crossaig 275 kV OHL north before bearing west around the Cnoc an Freacadain high point.

Route Option 3C

Route Option 3C is approximately 2.5 km in length and is proposed between Route Options 3A and 3B to avoid the Cnoc an Freacadain high point by heading west from Route Option 3 before connecting into the consented Craig Murrail to Crossaig 275 kV OHL within the north west of the Study Area.

4.2.2 *Nodes*

Nodes have been included within the figures to illustrate where Route Option 1 and 3 would join each sub-option to develop a full end to end route. This has been used to determine the preferred sub-option for Route Option 1 and 3.

5. BASELINE CONDITIONS

5.1 Introduction

This section summarises the baseline information for the key environmental, engineering and economic constraint types and their associated topics relevant to the Proposed Development, as listed in **Section 3.5** (above).

5.2 Environmental Constraints

This section summarises the baseline information and key constraints for each of the environmental topics relevant to the Proposed Development. **Figure 5.1** shows the key constraints within the Study Area.

5.2.1 *Natural Heritage*

Designations

A summary of statutory designated sites which occur within 2 km of the Route Options and non-statutory designations which occur within 1 km of the Route Options are outlined in **Table 5-1**. Additionally, there are a further 16 International / European statutorily designated-sites between 1 km and 20 km of the Route Options which are outlined in **Appendix 2 – Environmental Route Options Appraisal Report (Appendix 3)**.

Table 5-1 Statutory Designated Sites within 2 km and Non-Statutory Designated Sites within 1 km

Designation / Type	Statutory / Non-Statutory	Name of Designation
SSSI (biological)	Statutory	Tarbert to Skipness Coast
SSSI (biological)	Statutory	Glen Ralloch to Baravalla Woods
SAC (biological)	Statutory	Tarbert Woods
SPA (biological)	Statutory	The Sound of Gigha
Local Nature Conservation Site (LNCS)	Non-statutory	West Loch Tarbert
Ancient Woodland	Non-statutory	Various
Native Woodland	Non-statutory	Various

Protected Species

An ecological desk study identified records of several European Protected Species (EPS), protected under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended)¹⁰, those identified as priority species on the Scottish Biodiversity List¹¹ (SBL) and / or protected under national legislation such as the Wildlife and Countryside Act 1981¹² as amended (WCA) or Protection of Badger Act 1992¹³ (PBA). The identified species / species groups include:

¹⁰ The Conservation (Natural Habitats, &c.) Regulations 1994. [online] Available at: <https://www.legislation.gov.uk/uksi/1994/2716/contents/made> (Accessed 11 March 2022).

¹¹ The Scottish Biodiversity List is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland, as required by the Nature Conservation (Scotland) Act 2004.

¹² Wildlife and Countryside Act 1981. [online]. Available at: <https://www.legislation.gov.uk/ukpga/1981/69> (Accessed 11 March 2022).

¹³ Protection of Badger Act 1992. [online]. Available at: <https://www.legislation.gov.uk/ukpga/1992/51/contents> (Accessed 11 March 2022).

- Bats (EPS and SBL);
- Badger (PBA);
- Red squirrel (WCA and SBL);
- Pine marten (WCA and SBL);
- Otter (EPS and SBL);
- Water vole (WCA and SBL);
- Reptiles (WCA and SBL); and
- Amphibians (EPS and SBL).

Habitats

The Study Area contains large areas of plantation coniferous woodland in various stages of management, over valleys and hillsides and areas of pasture grazed by sheep. Between the plantations and on the slopes of hills are open habitats. On review of the Habitat Map of Scotland data¹⁴ set these habitats likely comprise wet / dry heath, blanket bog and grassland habitats (particularly acid grassland). Some of these habitats, particularly wet / dry heath and blanket bog will likely constitute Annex 1 habitats designated under the Habitats Directive. Habitats within the Study Area have the potential to comprise Ground Water Dependent Terrestrial Ecosystems (GWDTE) with SEPA guidance identifying acid grassland and wet heath as having moderate potential to support GWDTE¹⁵. In the flatter higher areas peat, raised and blanket bogs are likely to be prevalent. Towards the west of the Study Area, woodland fringe and grassland will be more common. Numerous burns and rivers flow through some of the valleys, with the larger water courses of Skipness River and Claonaig Water to the south and south west of the Study Area, respectively. Loch na Machrach Moire falls within the Study Area to the east. Some open areas are likely to be subject to sheep grazing and deer browsing. There could potentially be Invasive and Non-Native plant species (INNS), including rhododendron, in varying in abundance throughout the Study Area: in particular towards the north west of the Study Area where a Rhododendron Control Target Area has been identified¹⁶.

A high-level Biodiversity Net Gain (BNG) assessment of the identified Route Options within the Study Area has been undertaken following the guidance outlined within SSEN Transmission's Biodiversity Net Gain Toolkit User Guide and the SSEN Transmission Assessment Methodology & Associated Guidance. The BNG assessment included a calculation of baseline Biodiversity Units (BU) for each Route Option and provides recommendations for Stage 3 with regards to BNG. The outputs of the BNG assessment relevant for each Route Option is included within **Appendix 2 – Environmental Route Options Appraisal Report (Appendix 5)**.

Ornithology

The ornithology baseline was determined based on knowledge of the geographical area encompassed by the Study Area, habitats present and a review of the ornithology consenting documents produced for Inveraray to Crossaig 275 kV OHL project (confidential data was not available to review) (hereafter the 'Inveraray Surveys'). Schedule 1 raptors with the potential to utilise the Study Area for nesting and / or foraging include golden eagle *Aquila chrysaetos*, merlin *Falco columbarius* and hen harrier *Circus cyaneus*. Flights for all these species were recorded within or adjacent to the Study Area. These species will typically occupy the higher altitude areas of the Study

¹⁴ NatureScot (2020). Habitat Map of Scotland. [online]. Available at: <https://www.nature.scot/landscapes-and-habitats/habitat-map-scotland> (Accessed 11 March 2022).

¹⁵ SEPA (2017). SEPA Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. [online]. Available at: [lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf](https://www.sepa.gov.uk/guidance/guidance-note-31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf) (Accessed 11 March 2022).

¹⁶ Scotland's environment (N/A). Scotland's environment map. [online]. Available at: <https://map.environment.gov.scot/sewebmap/> (Accessed 11 March 2022).

Area (typically greater than 200 m above sea level (a.s.l) (300 m a.s.l for golden eagle) with woodland areas generally avoided by all species. Black grouse *Lyrurus tetrix* were also recorded during the Inveraray Surveys and this species is a red listed Bird of Conservation Concern (BoCC)¹⁷. Black grouse favour upland moorland and woodland mosaic habitats. Other Schedule 1 or red listed BoCC species recorded during the Inveraray Surveys included barn owl *Tyto alba*, curlew *Numenius arquata* and skylarks *Alauda arvensis*. Barn owl will typically utilise the lower lying areas (below 150 m a.s.l) and upland grassland, bog and heath habitats will be suitable to support moorland breeding birds including curlew and skylark. Lochs and lochans in the Corridor provide potentially suitable breeding habitat for the Schedule 1 species red-throated diver.

Hydrology, Geology and Hydrogeology

There are no designations of relevance to hydrology, geology or hydrogeology within the Study Area.

Geological information pertaining to the Study Area was gathered from the British Geological Survey GeoIndex Onshore online mapping¹⁸, including bedrock and superficial geology 1:50,000 scale, NatureScot's Carbon and Peatland Mapping¹⁹ and James Hutton Institute Soils mapping²⁰.

The majority of underlying bedrock geology within the Study Area consists of the Beinn Bheula Schist Formation (gritty psammite and pelite). Towards the north and north western reaches of the Study Area, lies the Southern Highland Group (metavolcaniclastic sedimentary rock). Numerous igneous intrusions are also present within the Study Area; these largely consist of Central Scotland Late Carboniferous Tholeiitic Dyke Swarm (quartz-microgabbro) and Mull Dyke-Swarm (olivine-microgabbro).

Superficial deposits within the Study Area are limited and are predominantly situated to the west, comprising Devensian till (diamicton). Smaller areas of alluvium are situated in the northern extent of the Study Area. The James Hutton Institute National Soils Map of Scotland indicates the majority of the Study Area is underlain by peaty gleys, with small areas of blanket peat, and mineral gleys at the western boundary.

The Study Area is entirely within the Southern Highland Group low productivity aquifer (small amounts of groundwater in the near surface weathered zone and secondary fractures)¹⁸. The Study Area is underlain by the Oban and Kintyre SEPA Water Framework Directive (WFD) groundwater body (ID: 150698)²¹ which was classified as having an overall 'Good' status in 2020.

There are numerous named and unnamed watercourses throughout the Study Area, with notable larger watercourses, including the Bardaravine River in the north, Skipness River in the east, Claonaig Water in the south, and Whitehouse Burn in the west of the Study Area. The Skipness River and Claonaig Water have been classified by SEPA under the WFD as having a 'Good' overall status in 2020²¹. Loch na Machrach Moire falls within the eastern extent of the Study Area.

Private Water Supplies (PWS) are expected to be present throughout the Study Area. PWS data has been requested from Argyll and Bute Council Environmental Health Department; however, have not been received at the time of this appraisal. Scottish Water has not yet been consulted with regards to public water supply assets.

¹⁷ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747

¹⁸ British Geological Survey GeoIndex [online]. Available at: <https://www.bgs.ac.uk/map-viewers/geoindex-onshore/> (Accessed 11 March 2022).

¹⁹ NatureScot Carbon and Peatland Mapping. [online]. Available at: https://map.environment.gov.scot/Soil_maps/?layer=10 (Accessed 11 March 2022).

²⁰ The James Hutton Institute, National Soil Map of Scotland [online]. Available at: https://map.environment.gov.scot/Soil_maps/?layer=1 (Accessed 11 March 2022)

²¹ SEPA Water Classification Hub [online]. Available at: <https://www.sepa.org.uk/data-visualisation/water-classification-hub/> (Accessed 11 March 2022).

The Study Area is located entirely within a Scottish Government Drinking Water Protected Area (DWPA) for groundwater. There is no DWPA for surface water within any part of the Study Area²².

Habitat survey information was not available at the time of this appraisal in order to establish potential GWDTE. However, potential GWDTE are anticipated to be present in the vicinity of each of the OHL Route Options and will be assessed when data becomes available.

5.2.2 Cultural Heritage

Designations

There are no World Heritage Sites, Inventory Battlefields or Inventory Gardens and Designated Landscapes (GDLs) within 3 km of the Route Options.

There are 10 Scheduled Monuments within 3 km of the Route Options, none of which fall within the Route Options.

There are 16 undesignated assets within the Route Options.

Cultural Heritage Assets

There is one Conservation Area within 3 km of the Route Options, Tarbert Conservation Area, approximately 1.6 km north of the Study Area.

There is a single Listed Building within the Route Options; the Category C Listed Spion Kop Kennels, Lonlia, Glenreasdell Estate (LB12028). An additional 10 listed buildings are present within 3 km of the Route Options, comprising of four Category B and six Category C.

5.2.3 People

Proximity to Dwellings

Due to the nature of the area, residential properties are extremely sparse within the Study Area and isolated to the B8001.

5.2.4 Landscape and Visual

Designations

National Designations

The Study Area does not fall within 10 km of a National Park.

The nearest NSA is the North Arran NSA, which lies approximately 9.4 km south east of the Study Area.

Other Nationally Important Landscapes

There are no Forest Parks within 10 km of the Study Area.

The nearest WLA is the North Arran WLA, which lies some 11.2 km south east of the Study Area.

There are no Inventory GDLs within the Study Area, the closest being Stonefield Castle Hotel (GDL00350) which lies approximately 3.4 km north of the Study Area.

Regional Designations

Argyll and Bute Council have designated regionally important landscapes as Areas of Panoramic Quality (APQ). There are no APQ's within the Study Area, although the Bute & South Cowal APQ lies 4.5 km to the east and the Knapdale / Melfort APQ lies 4.4 km to the west at their closest point.

²² Scottish Government Drinking Water Protected Areas [online]. Available at: <https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/> (Accessed 11 March 2022).

Landscape Character

Landscape Context

The Study Area broadly comprises the north central Kintyre Peninsula moorland plateau, the high point known as Cnoc a' Bhaile-shios Cnoc and part of the surrounding western coastal edge. The Study Area encompasses scattered residential properties, mainly along the B8001 which is the main road running through the south western part of the Study Area. The long distance path Kintyre Way runs through the Study Area and the National Cycle Route (NCR) 78 runs along the B8001, through the south western part of the Study Area. More details on the landscape and visual aspects of the site are presented below.

Landscape features

The Study Area is predominantly characterised by an inland area of moorland plateau and hills, with the far western part of the Study Area characterised by coastal areas of rocky outcrops, narrow glens and steep wooded cliffs and hummocky, gorse-covered slopes.

The central part of the Study Area comprises of smooth rounded hills rising up to 422 m Above Ordnance Datum (AOD) at Cnoc a' Bhaile-shios, with surrounding hill summits ranging between 303 m and 346 m. To the north east, peaks rise up to 351 m at Cruach Bhrec. There are several burns and streams within the central part of the Study Area, with the majority of them heading westward towards the western Kintyre coast. Bardaravine River is located within the north western part of the Study Area and Claonaig Water passes through the far south western part of the Study Area in a south easterly direction.

The coastal area is incised by steep western facing slopes and gullies, heading out to sea. Overall, the landform falls towards the coast, descending to approximately 20 m AOD at Bardavine River along the western edge of the Study Area.

Landcover is influenced by topography and drainage. Most of the hill summits comprises of a mosaic of open moorland, rocky out crops and forestry. The central hill summits in the centre of the Study Area, such as Cnoc a' Bhaile-SHIOS, Cnoc an Tobair, Coire nan Capull and Cruach Doire Leithe form a large area of open moorland, with forestry dominating their lower slopes in all directions. In the northern area of the Study Area, forestry broadly dominates the network of hills, with the exception of the summits of Cruach an t-Sorchain, which forms a small island of open moorland. The lower, more accessible slopes near the coastal edge to the west comprise improved grassland, woodland and some rocky outcrops.

There are no settlements within the Study Area. The town of Tarbert is the closest settlements 600 m north, with properties along the A83 to the south of Tarbert. There are a few isolated farms / cottages, sited along the B8001.

Roads and infrastructure are typically located along the lower slopes in the south west of the Study Area. There is an existing OHL running along the eastern edge of the Study Area with the consented in-construction Craig Murrail to Crossaig 275 kV OHL running broadly parallel with the existing OHL. The proposed Earraghail Wind Farm would be located in the east of the Study Area, in a forestry area around the summit of Meall Donn.

The majority of the Study Area falls within the Plateau Moor and Forest (Landscape Character Type (LCT) 39) character area as NatureScot's Scottish Landscape Character Types Map and Descriptions, with the western extents falling within Rocky Coastland (LCT 53) character area. The Study Area is composed of three Landscape Character Types as defined by NatureScot's 'The Landscape of Scotland'. The LCTs within the Study Area are:

- LCT 39 – Plateau Moor and Forest; and

- LCT 53 – Rocky Coastland.

Visual

The potential visual receptors within the Study Area or in close proximity with a potential to have views of the Study Area, have been identified as shown in **Table 5-2** below. The nature of the views available in the Route Option area is generally determined by a combination of topography and forestry cover.

Views of the sea and nearby islands to the west and east of the Kintyre peninsula are available across the Study Area and the descending topography allows for scenic framings of these views. Consideration of the views from these locations back to Kintyre is also important, as is the visual amenity of properties within Tarbert and locations outside the Study Area, where the Proposed Development has potential to be seen in close proximity.

Table 5-2: Potential Visual Receptors within the Study Area

Type of Receptor	Identified Receptor
Residential (Settlements and residences)	Individual properties along the B8001 Residents in Tarbert and along the A83
Recreational and tourist	B8001
	NCR 78
	The Kintyre Way, Section 1: Tarbert to Claonaig
	Users of Core Paths throughout the Study Area (<i>the effects on local users of the Core Paths network are discussed under 'Recreation' under the heading of Land Use although the effect on users is primarily on their visual amenity. To avoid 'double counting' the Landscape and Visual section only considers effects on users of footpaths that are promoted visitor attractions</i>)
Transport	Main roads within and adjacent to the Study Area including the B8001 and A83

5.2.5 Land Use

Agriculture

Agricultural land is predominantly a mix of Class 5.3, 6.1 and 6.3 agricultural land, classified by the Macaulay Land Use Research Institute²³. The majority of the Study Area has been identified as Class 6.3, land capable of use as rough grazing with low quality plants with the remaining agricultural land classifications occupy a small area in the south and west of the Study Area.

Forestry

Forestry is a key land use within the Study Area. Many discrete areas of native woodland are identified within the Study Area and Native Woodlands are present in each Route Option. Many of the Native Woodlands are typically contiguous with larger areas of woodland, including plantations on Ancient Woodland sites. This is advantageous in terms of habitat connectivity but is also a mechanism for the introduction of invasive species. Within the Study Area, Native Woodlands fall principally into three categories: wet woodland, upland birch woodlands and upland oak woodlands.

There are substantial areas of Plantations on Ancient Woodland Sites (PAWS), typically contiguous with commercial forestry but alternatively adjoining Native Woodlands. The concentration of forestry

²³ The James Hutton Institute: Land Capability for Agriculture in Scotland, N/A. Land Capability for Agriculture in Scotland. [online]. Available at: <https://www.hutton.ac.uk/learning/exploringscotland/land-capability-agriculture-scotland> (Accessed 27 April 2022).

interests in the Study Area, reduces pressure for PAWS restoration, from non-native crops, that is exerted where woodlands are more limited.

Commercial forestry is present throughout the Study Area and climatic conditions in the Study Area are favourable toward fast-growing conifer crops. The advantage of this is a skilled and established forestry industry for forestry activity, including timber harvesting and transport. Disruption to established forest design and management will be inevitable. The separation of ownership between Forestry and Land Scotland and private interests has not yet been established and, whilst multiple Route Options are being considered, forest plans have not been sought.

Recreation

The Study Area lies within an area which is of high recreational interest for walkers, hikers and cyclists. The Caledonia Way long distance cycle route (NCR 78) runs from Campbeltown to Inverness and passes through the southern extent of the Study Area along the B8001. Section 1: Tarbert to Claonaig of the Kintyre Way is also located within the Study Area, running north to south along the eastern extents of the Study Area. Moreover, there are a series of Core Paths within the Study Area, notably:

- o C104(b) – Kennacraig to Skipness, which follows the same route as NCR 78 along the B8001;
- o C521 – Glenreadell to Kintyre Way, runs along the south eastern extent of the Study Area between C104(b) – Kennacraig to Skipness and the Kintyre Way; and
- o C099(f) – Tarbert to Skipness. follows the Kintyre Way north to south along the eastern extent of the Study Area.

5.2.6 Planning

Policy and Policy

The relevant Local Development Plans (LDPs) to the appraisal include the Argyll and Bute LDP, adopted in 2015, and the Argyll and Bute LDP2 which is currently being prepared and will replace the current LDP. There are numerous policies within the current and proposed LDPs on the protection of the natural and built environments that are relevant in the consideration of the development of electricity infrastructure.

A search for other developments was undertaken on 27th May 2022 using the Argyll and Bute planning portal. This considered developments recorded within the Study Area which have been submitted or approved within the last five years. Eight submitted or approved planning applications have been identified within the Study Area; these have been summarised in **Table 5-3** below.

Table 5-3: Developments identified within the Study Area

Planning application reference	Description	Location	Status
22/00324/FELLI C	Felling licence	Cnoc An Devora Forest, east of Whitehouse	Unknown
21/01154/MIN	Formation of borrow pit for the extraction of hard rock and siting of ancillary infrastructure for the purposes of the Port Ann-Crossaig overhead line project	Corranbuie South Of Tarbert Argyll And Bute	Approved
21/00614/PP	Erection of meteorological mast (up to 90 metres in height)	Land At Earraghail Meall Don	Approved

Planning application reference	Description	Location	Status
20/00949/S36	S36 Scoping opinion consultation for erection of 13 wind turbines with tip heights of up to 200m	Earraghail Windfarm	Unknown
20/00344/PNF OR	Formation of ATV track (9110m in length)	Land Between Claonaig and Skipness Argyll And Bute	Prior notification – no objections
20/00311/FDP	Forest Design Plan	Cnoc An Devora Forest, east of Whitehouse	Prior notification – no objections
18/01700/S37	Construction of approximately 81 km of 275 kV OHL from the existing Inveraray Switching Station to the existing Crossaig Substation and ancillary development including an additional section of Overhead Line as a tie in to Port Ann Substation	Land Between Inveraray and Crossaig (route Via Environs Of Lochgilphead And Tarbert) Argyll	Approved

5.3 Engineering Constraints

5.3.1 Infrastructure Crossings

Major Crossings and Metallic Pipes

The consented in-construction Craig Murrail to Crossaig 275 kV OHL is currently in construction and runs along the eastern edge of the Study Area, broadly running in parallel with an existing 33 kV OHL and 132 kV OHL. There are no metallic pipelines that run through the Study Area.

Road Crossings

Road crossings include the following road classifications types, of which there are numerous located throughout the Study Area:

- B Roads i.e. B8001;
- Minor Roads;
- Local Access Roads;
- Tracks (access and forestry); and
- Minor waterways.

5.3.2 Environmental Design

Elevation

Elevations within the Study Area range from 84 m AOD in the east to 340 m AOD in the north and south west. All Route Options exceed elevations of 200 m AOD, the average elevation for all Route Options ranges between 192m AOD and 282 m AOD.

Atmospheric Pollution

The atmospheric pollution has been checked based on the data gathered from National Atmospheric Emissions Inventory (NAEI)²⁴. The NAEI provides information on the following pollutants that are deemed to affect the performance of OHLs:

²⁴ National Atmospheric Emissions Inventory (N/A). UK Emissions Interactive Map. [online]. Available at: <https://naei.beis.gov.uk/emissionsapp/> (Accessed 27 June 2022).

- Carbon Dioxide;
- Nitrogen Oxide;
- Sulphur Dioxide; and
- Particulate Matter (10 um, 2.5 um, 1um and 0.1um).

Based upon the pollution maps, none of the routes are significantly impacted by atmospheric pollution.

Contaminated Land

There are no known areas of contaminated land or evidence of a risk of contaminated land identified within the Route Options. Unexploded Ordnance (UXO) and Unexploded Bomb (UXB) studies have been conducted within the area of the identified Route Options due to the high risk of UXOs present within the Argyll and Bute area. These studies have identified UXOs were present within Route Option 3A, however it was confirmed that these detonated, therefore the risk is no longer present.

Flooding

As outlined on the SEPA flood map, areas of flooding have been identified within the Study Area, most notably associated with Skipness River in the east, Claonaig Water in the south of the Study Area and Bardaravine River in the north west of the Study Area. Other areas of flooding include Loch na Machrach Mòire in the east.

5.3.3 *Ground Conditions*

Terrain

The terrain has been assessed by reviewing the average gradient and maximum gradients of the terrain along the centre line of each Route Option using Google Earth elevation profiles. The terrain within the Study Area is generally hilly, with scattered valleys and areas of steep slopes. The maximum gradient within the Route Options is 34.7%, with an average gradient ranging between 5.5% and 7.9%.

Peat

The British Geological website has been used to determine peat areas within the Study Area. The majority of the Study Area contains Class 5 (carbon-rich and deep peat) peat with large areas of Class 2 (nationally important carbon-rich soils and deep peat) and Class 3 (carbon-rich soils with some areas of deep peat) peat scattered throughout the Study Area. Areas of Class 1 and Class 4 peat are also located within the southern half of the Study Area.

5.3.4 *Construction and Maintenance*

Access

Steep terrain and limited existing track accesses have been identified within the Study Area, however some existing forestry tracks are present within the area. Existing highway infrastructure predominantly within the south and west of the Study Area also provides suitable accesses for corresponding Route Options. Existing access tracks are present and some tracks will likely be upgraded to accommodate new infrastructure within the Study Area.

Angle Towers

OHLs with a high number of angle supports tend to be more difficult to construct, due to the number of angle pull throughs, and often require more extensive access. As such, a route with a large number of angle supports is at a greater risk of being constrained.

5.3.5 Proximity

Clearance Distance

As noted in **Section 5.2.3**, settlement is very scarce within the Study Area due to the nature of the area, therefore residential properties are confined to the A83 and B8001.

Wind Farms

Excluding the Earraghail Wind Farm, there are no other wind farms identified within the Study Area. However, a number of turbines located at Earraghail Wind Farm are likely to impact the alignment stage in particular where it is not possible to maintain the required 3 x rotor diameter between the turbine and OHL.

Communication Masts

The OS map and cell mapper website²⁵ have been assessed to check if any communication masts are present within the Study Area. No communication masts were found within the Study Area.

Urban Environments

As identified within **Section 5.2.3**, settlement is very scarce within the Study Area due to the nature of the area, therefore residential properties are confined to the A83 and B8001.

5.4 Economic Constraints

5.4.1 Regulated Company

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 electricity transmission system in its licensed area'. SSEN Transmission are regulated by Ofgem, who determine how much revenue SSEN Transmission can earn from customers to cover the cost of maintaining and reinforcing the electricity network.

Ultimately the costs associated with development, operation and maintenance of the Transmission systems for part of the energy user's bill. Further information on how SSEN transmission are Regulated be found here: <https://www.ssen-transmission.co.uk/information-centre/industry-and-regulation/>

5.4.2 Maintenance of Supply

SSEN Transmission are required to maintain a reliable network. It is highlighted that Route Options which require crossing of the existing line will incur increased costs and risk elements associated with the required temporary OHL diversions which would be needed to maintain a Transmission connection (275 kV) to Earraghail during the construction phase.

5.4.3 Assumptions and Limitations

Due to the early stage of the project limited information was available to make a cost comparison appraisal, resulting in the requirement to make very high-level assumptions for each of the cost comparison elements considered. More detailed cost estimates of the investment required to build the replacement OHL will be derived as the project progresses.

²⁵ Cell Mapper (N/A). Cellular Tower and Signal Map. [online]. Available at: <https://www.cellmapper.net/> (Accessed 16 June 2022).

6. COMPARATIVE APPRAISAL

This section provides a summary of the environmental, engineering and economic characteristics relevant to each Route Option and an appraisal of the performance of each Route Option with reference to each characteristic. Only those factors which inform the comparative appraisal are assessed.

6.1 Environmental Appraisal

6.1.1 Environmental Appraisal

Natural Heritage

Designations

No Route Options overlap with any statutory designated sites and there is limited connectivity between any Route Option and designated sites in the wider area. Small areas of woodland listed on the Ancient Woodland Directory are present within Route Options 3A, 3B and 3C. As a result, Route Options 3A, 3B and 3C have been assigned an **Amber** RAG rating.

No statutory or non-statutory designated sites (including Ancient Woodland) are located within Route Options 1A, 1B or 2. As a result these Route Options have been assigned a **Green** RAG rating. Of these Route Options there is a marginal preference for Route Option 2 as Route Options 1A and 1B are closer to areas of Ancient Woodland.

Protected Species

All Route Options have been assigned an **Amber** RAG rating. Route Option 2 is the preferred option as it is the shortest most direct route and therefore will potentially support a lower number / diversity of protected species. Route Options 3A, 3B and 3C are the least preferred options as they all pass-through woodland listed on the Ancient Woodland Inventory. Such woodland will potentially comprise older mature trees with a high potential to support protected species resting / breeding sites e.g., bat roost or pine marten dens.

Habitats

All Route Options have been assigned a **Red** RAG rating as they all pass-through potential Annex 1 habitats (namely heath and blanket bog). Route Option 2 is the least preferred as it passes through the most extensive area of Annex 1 habitat. Of the remaining options, Route Option 1A and 1B are preferred as they do not pass through any areas of Ancient Woodland.

Irreplaceable Habitat

Irreplaceable habitat was calculated for each Route Option using HabMoS data and the Ancient Woodland Inventory. There is Ancient Woodland and / or blanket bog assumed to be of moderate condition within each Route Option as shown in **Table 6-1** below and therefore each Route Option contains irreplaceable habitat to some extent.

As shown in **Table 6-1**, all Route Options contain Ancient Woodland and / or blanket bog. If blanket bog is in 'moderate' or 'good' condition this would constitute irreplaceable habitat as assumed within this assessment along with all Ancient Woodland (with the exception of Ancient Woodland Inventory classified as Long Established of Plantation Origin).

Route Option 2 contains the largest area of irreplaceable habitat (265 ha) compared to Route Option 1A which contains the lowest (55.78 ha) with the other Route Options as follows lowest to highest: Route Option 3B (86.40 ha), Route Option 3A (96.06 ha), Route Option 3C (101.06 ha) and Route Option 1B (124.71 ha).

Table 6-1: Irreplaceable Habitat within each Route Option In Hectares

Irreplaceable Habitat	Route Option					
	Route Option 1A	Route Option 1B	Route Option 2	Route Option 3A	Route Option 3B	Route Option 3C
Ancient Woodland Inventory Habitats	0.15	0.00	0.00	16.21	14.20	22.35
Blanket bog (Moderate condition)	55.63	124.71	265	79.85	72.20	78.71
Total	55.78	124.71	265	96.06	86.40	101.06

It is possible that there will be areas of blanket bog that could be in 'poor' condition, within which an alignment could be developed and therefore, the presence of blanket bog does not necessarily preclude a Route Option from achieving BNG at this stage. Irreplaceable habitats within Route Option 3A, 3B and 3C are largely located at one side of the option which could allow for irreplaceable habitats to be avoided at alignment stage and therefore it is more likely that No Net Loss (NNL) or a Net Gain (NG) could be achieved.

The distribution of irreplaceable habitat within Route Option 1A forms a patchy corridor across the full width of the route and it is possible that these habitats could also be avoided at alignment stage therefore offers an opportunity to achieve BNG.

Route Options 1B, 2, 3B and 3C contain continuous sections of irreplaceable habitat which span the full width of the option. Thus irreplaceable habitat is unavoidable for these options and NNL would not be achievable.

Non-irreplaceable habitat

All Route Options contain upland acid grassland and upland heathland which result in higher BU values due to the contribution of these high distinctiveness habitats. The majority of each Route Option is classified as woodland and forest of various types ranging from low to medium distinctiveness. **Table 6-2** shows a summary of the total BU, area and percentage of irreplaceable habitat.

Table 6-2: Summary of total BU, area and percentage of irreplaceable habitat.

Option	Irreplaceable Habitat Area (ha)	Irreplaceable Habitat (% of Site)	Biodiversity Units (BU) for non-irreplaceable habitats
Route Option 1A	55.79	7.31	3317.54
Route Option 1B	124.71	19.58	2282.99
Route Option 2	265	43.75	1989.33
Route Option 3A	96.06	11.49	3974.15
Route Option 3B	86.40	14.13	3583.57
Route Option 3C	101.06	16.13	3491.95

Upland heathland and acid grassland high distinctiveness habitats are present within all Route Options along with medium and low distinctiveness woodland types. As shown in **Table 6-2** Route Option 2 accounts for the least BU (1989.33) among all options, with the greatest contributor being upland acid

grassland high distinctiveness habitat. This number is lower than recorded for the other Route Options primarily due to the extent of irreplaceable habitat present within this Route Option, which is not counted for within the overall BU value. As such, overall Route Option 2 is not considered to accurately represent the Route Option with the lowest biodiversity value. Route Option 3A has the highest overall BU (3974.15) with the greatest contributor being upland heathland high distinctiveness habitat.

Upland heathland and acid grassland high distinctiveness habitats are present within all Route Options along with medium and low distinctiveness woodland types.

Biodiversity summary:

All Route Options cross Ancient Woodland and/ or potential irreplaceable blanket bog. Overall, Route Options 1B and 2, 3B and 3C not be Preferred Routes from a BNG perspective due to the unavoidable irreplaceable habitat which span the width of the Route Options thus NNL or NG is unlikely to be achievable. These Route Options have been assigned a **Red** RAG rating.

It may be feasible to achieve NNL or NG for Route Option 3A through careful alignment to avoid irreplaceable habitats. Option 3A has been assigned an **Amber** RAG rating.

Route Option 3A is the preferred option from a BNG perspective in terms of achieving NNL due to the irreplaceable habitat located at the north west edge of the Route Option being potentially avoidable.

Ornithology

All Route Options have been assigned an **Amber** RAG rating as all options pass-through upland moorland and woodland edge habitats with the potential to support Schedule 1 and red listed BoCC species including hen harrier, black-grouse and golden eagle. Route Options 1A and 1B are the Preferred Options as they pass through the smallest areas of upland moorland habitat. These Route Options are also the greatest distance from the high peaks and crags in the centre of the Study Area that could support nesting golden eagle.

Hydrology, Geology and Hydrogeology

All Route Options have been assigned an **Amber** RAG rating as each of the options present the potential to compromise quality or quantity of surface waters or groundwaters, in relation to public or private water supplies, or GWDTE. However, subsequent surveys will establish specific receptors considered to be at risk.

Notwithstanding, due to the nature of the Proposed Development, refinement of alignment, assumed construction good practice and compliance with relevant guidance, it is likely that risks associated with each of the options will be minimised.

Conclusion

There is no distinguishable factor between the Route Options when considering hydrology, geology and hydrogeology. Route Option 2 is considered the Preferred Option when considering designations and protected species due to it being the most direct route and being a greater distance away from Ancient Woodland than Route Options 1A and 1B. However, this is only marginal preference based on proximity to Ancient Woodlands. Route Option 1A and 1B is considered the Preferred Route from a habitats and ornithological perspective, as it is considered a greater distance from ornithological constraints (for example, potential presence of nesting golden eagle) and does not pass through any areas of Ancient Woodland. From a BNG perspective, whilst Route Option 3A is considered the Preferred Route as it presents the most opportunity to avoid irreplaceable habitats, it is considered that Route Option 1A has the lowest amount of irreplaceable habitat which could also be avoided during the OHL alignment stage.

Overall, Route 1A is considered the Preferred Route from a natural heritage perspective.

6.1.2 Cultural Heritage

The Route Options have been assessed to identify key constraints for each. The assessment has taken account of the opportunities for mitigation, such as avoidance through design and the adoption of other standard working practices which, if implemented, could overcome the identified constraint.

Designations

No Route Options have the potential for direct impacts on any World Heritage Sites, Scheduled Monuments, Inventory GDLs or Inventory Battlefields.

Route Option 1A encroaches circa 970 m to the north of the Scheduled Monument of Glenreasdel Mains, chambered cairn (SM3281). In addition, Route Option 1A has six undesigned assets within it. Due to the presence of and proximity of assets Route Option 1A has been allocated an **Amber** RAG rating.

Route Option 1B encroaches circa 975 m to the north-west of Scheduled Monument of Glenreasdel Mains, chambered cairn (SM3281). In addition, Route Option 1B has 11 undesigned assets within it. Due to the presence of and proximity of assets Route Option 1B has been allocated an **Amber** RAG rating.

Route Option 2 has one undesigned asset within it but is not in proximity to designated assets and therefore indirect impacts are not likely. As such, a **Green** RAG rating has been allocated.

Route Option 3A has three undesigned assets within it but is not in proximity to designated assets and therefore indirect impacts are not likely. As such, a **Green** RAG rating has been allocated.

Route Options 3B and 3C encroaches within circa 900 m to the south east of the Scheduled Monument of Escart, standing stones (SM3656). There is the potential for indirect impacts on the setting of this asset. Route Option 3B also has two undesigned assets within it and Route Option 3C has a single undesigned asset within it. Due to the presence and proximity of assets, Route Options 3B and 3C have been allocated an **Amber** RAG rating.

Cultural Heritage Assets

No Route Options have the potential for direct or indirect impacts on any non-inventory GDLs or Conservation Areas.

Route Option 1A has a single Category C Listed Building within it, Spion Kop Kennels, Lonlia, Glenreasdel Estate (LB12028). The potential exists for indirect impacts on the setting of this asset, as such Route Option 1A has been allocated an **Amber** RAG rating.

Route Options 1B, 2, 3A, 3B and 3C have no Listed Buildings within them and have therefore been allocated a **Green** RAG rating.

Conclusion

In conclusion, taking into consideration the direct and indirect impacts on both Designations and Cultural Heritage Assets, Route Options 2 and 3A are preferred from a Cultural Heritage perspective and have been allocated a **Green** RAG rating. Route Options 1A, 1B, 3B and 3C have the potential for adverse impacts on the setting on Scheduled Monuments, so have been allocated an **Amber** RAG rating. Additionally, Route Option 1A and 1B have an increased potential for encountering undesigned heritage assets, so are the least preferred from a Cultural Heritage perspective.

6.1.3 People

Proximity to Dwellings

There are few residential dwellings within the Study Area. Route Options 1B, 2, 3A, 3B and 3C contain no residential dwellings and Route Option 1A contains two dwellings, however it is considered that there are some opportunities to avoid encroaching on dwellings within the Route Option at the alignment stage. All Route Options have been assigned a **Green** RAG rating, however, Route Options 1B, 2, 3A, 3B and 3C is preferred as they contain no dwellings and offers the greater opportunity for minimising potential effects at the alignment stage.

6.1.4 Landscape and Visual

Designations

As identified in **Section 5.2.4** above, there are no National, Regional or Local Designations within the Study Area, although there are some which would have intervisibility with the Study Area. These are discussed below.

The North Arran WLA and North Arran NSA lie circa 11.2 km and 9.4 km, respectively to the south east of the Study Area at their closest point. The steel lattices towers and lines are unlikely to be perceptible beyond circa 10 km, although this will be dependent on if they are back clothed by landform or skylined.

All the Route Options have the potential to be skylined on the open moorland for a small section of their routes and would potentially be perceptible in distant views from both the North Arran WLA and North Arran NSA. They would however be seen in the context of the proposed Earraghail Wind Farm turbines which would be much more prominent. The distance between the Route Options (circa 10 km at closest) and both the WLA and NSA, wind farm context, and intervening vegetation on Kintyre and Arran has resulted a **Green** RAG rating being given for all Route Options.

There are no APQ within the Study Area, although the Bute & South Cowal APQ lies circa 4.5 km to the east and the Knapdale / Melfort APQ lies circa 4.4 km to the west at their closest point.

Route Options 3A, 3B and 3C are the closest of the Route Options to the Bute & South Cowal APQ and would be perceptible in distant views given its more elevated location and exposed nature, particularly as it passes alongside the Kintyre Way west of the summit of Cruach Doure Leithe. The surrounding vegetation and the western direction of Route Options 3A, 3B and 3C allows them to travel away from the Bute & South Cowal APQ, along topography that falls in the opposite direction, allowing the majority of Route Options 3A, 3B and 3C to be screened.

Although Route Options 3A, 3B and 3C are the more exposed Route Options when it comes to views from the east, the distance between these Route Options from the APQ intervening vegetation on Kintyre and Cowal, and topography has resulted in a **Green** RAG rating being given for these Route Options.

All Route Options would potentially be seen in views from the Knapdale / Melfort APQ to the west, although all Route Options would be viewed at a distance, in the context of existing OHL infrastructure and consented Craig Murrail to Crossaig 275 kV OHL and partially screened by intervening vegetation on Kintyre and Knapdale. A RAG rating of **Green** has been given to all Route Options.

Landscape Character

The entirety of Route Options 1A, 1B and 3B and for the most part Route Options 2, 3A, and 3C fall within LCT 39: Plateau Moor and Forest – Argyll. This LCT is a relatively remote, large-scale landscape which extends across the central spine of the Kintyre peninsula. This LCT also includes existing OHL

infrastructure and several wind farms in the southern extents of the LCT. The proposed Earraghail Wind Farm, to which the Proposed Development is connecting to will extend the presence of wind farm development into the northern parts of the LCT.

Route Option 1 heads south to south west along the edge of forestry, crossing a relatively narrow area of open moorland into forestry slopes to the south of Coire nan Capull, where it splits into two sub-options. Route Option 1A runs to the north west parallel with the B8001 and other energy infrastructure. As it approaches its junction with the consented Craig Murrail to Crossaig 275 kV OHL in the west, this Route Option passes through another area of open moorland adjacent to the B8001. Route Option 1B runs to the south west and crosses the B8001, joining the consented Craig Murrail to Crossaig 275 kV OHL at a right angle. This option is shorter than Route Option 1A, however it would be more prominent in the landscape as it crosses the broad Claonaig Water valley along which the B8001 lies. Energy infrastructure is already present in the area and it is a characteristic of the LCT, but the addition of a Proposed Development across the valley could considerably increase the perception of infrastructure as a defining characteristic of the local area. Route Option 1A for the most part, have the potential to be partially screened out of sight in the less sensitive forested areas of the LCT, along the foot of the hills.

Route Option 2 is the more direct route, passing through a relatively large area of exposed open moorland south of the high points of Cnoc a' Bhaile-shios and Cnoc an Tobair, where it will become a notable feature in the landscape, separate to the proposed wind farm. It would then pass through a less sensitive area of forestry and finally another area of open, lower, moorland as it approaches its junction with the consented Craig Murrail to Crossaig 275 kV OHL in the west. There are some small areas of steep slope, but the Route Option includes the potential to develop alignments to avoid these.

Route Option 3 heads north through an area of forestry before crossing an open, exposed visually sensitive area of moorland, adjacent to the Kintyre Way. As it reaches the edge of an area of forestry, Route Option 3 splits into three sub-options. Route Option 3A is the longest of the three sub-options and broadly heads west before heading south-west through forestry, south of the summit of Cnoc an Fhreachadain. This Route Option does encounter some steep slopes and Ancient Woodland. Although Route Option 3A includes the potential to develop alignments to avoid these, these areas are narrow and very restrictive. Route Option 3B continues in a broadly north west direction, again through an area of forestry. This option does encounter some steep slopes. Although the option includes the potential to develop alignments to avoid these, these areas are also narrow and very restrictive. As the Preferred Route Option, 3C branches off in a westerly direction through forestry, south of the summit of Cnoc an Fhreachadain, before heading north and terminating in the same location as Route Option 3B. As with Route Option 3A and 3B, this Route Option 3C encounters some steep slopes and Ancient Woodland. Although the sub-option includes the potential to develop alignments to avoid these, these areas are narrow and restrictive.

Parts of the far western extents of Route Option 3A and 3C fall within LCT 53: Rocky Coastland – Argyll. All other Route Options would join the consented Craig Murrail to Crossaig 275 kV OHL before entering the LCT.

Route Option 3A run broadly north south along the eastern edge of LCT 53 between Bardaravine and the summit of Cnoc na Caorach. Due to areas of steep slopes and Ancient Woodland, viable areas of this Route Option are located within forestry and near existing energy infrastructure, in turn reducing any potential landscape impacts. Route Option 3C, encounters areas of steep slopes in the section within LCT 53, therefore these areas would most likely be avoided during the development of alignments.

Route Options 3A, 3B and 3C encounter areas of steep slopes and several areas of Ancient Woodland, and although the Route Options includes the potential to develop alignments to avoid these, these areas are in places narrow and very restrictive in places.

Route Option 2 has the largest stretch of isolated moorland to cross, although Route Options 3A, 3B and 3C cross a high, exposed and sensitive point of the Study Area, adjacent to the Kintyre Way. These Route Options would be within an exposed location and as such, would be more intrusive in the relative wildness of this LCT.

Overall, Route Option 1A is the Preferred Route for least effects on landscape character and is given a RAG rating of **Green** due to its potential to develop alignments that pass through a limited area of exposed landscape and is largely located within an area of landscape that provides some screening, and combined with existing energy infrastructure, lessen the sensitivity to the type of development proposed. Route Option 1B would increase the presence of infrastructure in the valley, with limited opportunities for screening or backdropping as it crosses the valley and the B8001, therefore it would be given a RAG rating of **Amber**.

Route Options 2, 3A, 3B and 3C have been given a RAG rating of **Amber** largely due to their extended intrusion into the more sensitive exposed and elevated moorland landscapes.

Visual

Potential visual effects from the western extents of Route Option 1A, 1B and 2 from the west and south of the Study Area would be limited to users of the B8001, local residents along the B8001 and people involved in other outdoor pursuits, such as cyclists using the NCR 78. In these areas, the Route Options would be partially screened by forestry along the foothills of Coire nan Capull and in the context of existing and consented Craig Murrail to Crossaig 275 kV OHL, also running parallel with the B8001. There would be a slightly higher potential for significant visual effects from the B8001, NCR 78 and nearby residential properties as Route Options 1A and 2 exit the forestry and run parallel with the B8001 through open moorland near its connection with the consented Craig Murrail to Crossaig 275 kV OHL near Cruach Bhiorach. Route Option 1B exits the forestry and crosses the B8001 to the north west of Gartavaich, and it would have the potential to affect the visual amenity of residents at Gartavaich as well as users of the B8001 and NCR 78 and people involved in outdoor pursuits. There would be very limited opportunities for screening or backdropping Route Option 1B where it crosses the valley.

Views from travellers on the A83 going north towards Tarbert, have views towards the upland areas of the Study Area would have potential to see Route Option 2 where it lies on the higher open moorland before descending into the forestry.

Views of Route Options 1A and 1B from the Kintyre Way would be limited to distant or potentially glimpsed views through forestry and / or the intervening undulating landform. Route Option 2 would be seen from the Kintyre Way where it crosses the exposed moorland but would be partially screened by landform and forestry.

Potential effects from Route Options 3A, 3B and 3C from east would be limited to the Kintyre Way, however from the west this would include users of the B8001, A83, local residents along the B8001 and A83 and people involved in other outdoor pursuits, such as cyclists using the NCR 78. Due to the elevated topography in the area, there is potential for Route Options 3B and 3C to be visible in the skyline from Tarbert and West Tarbert, especially as it enters the north facing down slopes of Cnoc and Fhreachadain to join the existing OHL west of Corranbuie. In the eastern areas, the Route Options would be clearly visible from the open stretch of the Kintyre Way as Route Option 3A, 3B and 3C runs parallel with it to the west. In the western areas, Route Options 3A, 3B and 3C would be screened by forestry and woodland to the east of the A83. Route Option 3B and Preferred Route Option 3C would connect to the consented Craig Murrail to Crossaig 275 kV OHL within forestry, screened from view.

There would be a slightly higher potential of significant visual effects from the B8001, NCR 78 and nearby residential properties as the least Preferred Route Option 3A exits the forestry and runs through open moorland near its connection with the consented Craig Murrail to Crossaig 275 kV OHL. Although, Route Option 3A would only be viewed from a short section of road near Redhouse, set back into the foothills and in the context of the consented Craig Murrail to Crossaig 275 kV OHL.

Conclusions

Overall, Route Option 1A is the Preferred Option for visual receptors due to its potential to be sited away from the more exposed moorland areas and use of forestry for screening and backdropping. It has been given a **Green** RAG rating. Route Option 1B has been given an **Amber** RAG rating due to its potential to be visually intrusive for sensitive receptors along the B8001. Route Option 2 has been given an **Amber** RAG rating due to its potential to be visible in the open exposed extents from the A83 and Kintyre Way. Route Options 3A, 3B and 3C have been given an **Amber** RAG rating due to the potential effects on users of the Kintyre Way and potential to be in the backdrop in views of Tarbert.

6.1.5 Land Use

Agriculture

The majority of the agricultural land within the Study Area is identified as Class 6.3, land capable of uses as rough grazings with low quality plants. There are small areas of land identified as Class 5.3, land capable of use as improved grassland with pasture that deteriorates quickly, and Class 6.1, land capable of use as rough grazings with a high proportion of palatable plants, at the western extent of the Study Area. However, as the majority of the land is not a particularly sensitive or fertile category any impacts on agriculture as a result of the Route Options is considered to be low, therefore a **Green** RAG rating has been allocated.

Forestry

As per the RAG criteria within SSEN's guidance document¹, this forestry section only considers and appraises the RAG commercial conifer element of the Route Options 1A, 1B, 2, 3A, 3B and 3C,

Route Option 1A is host to approximately 511 ha of commercial coniferous woodland. Specific locations within the Route Option have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would be minimal opportunity during the Alignment Selection Stage to avoid specific areas of commercial conifer woodland and therefore it is assumed that the commercial and / or financial viability of the forestry operations within this Route Option may be compromised as a result. Route Option 1A has therefore been allocated a RAG rating of **Red**.

Route Option 1B is host to approximately 409 ha of commercial coniferous woodland. Specific locations within the Route Option have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would be the opportunity during the OHL Alignment Selection Stage to avoid specific areas of commercial conifer woodland. Route Option 1B has been allocated a RAG rating of **Amber**.

Route Option 2 is host to approximately 276 ha of commercial coniferous woodland. There would be the opportunity during the Alignment Selection Stage to avoid areas of commercial conifer woodland. Route Option 2 has been allocated a RAG rating of **Amber**.

Route Option 3A is host to 594 ha of commercial coniferous woodland. Specific locations of the Route Option have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would also be an opportunity during the Alignment Selection Stage to avoid specific areas of commercial conifer woodland however given the extent of cover it is assumed that the commercial and / or financial viability of the forestry

operations within this Route Option may be compromised as a result. Route Option 3A has therefore been allocated a RAG rating of **Red**.

Route Option 3B is host to approximately 654 ha of commercial coniferous woodland. Specific locations of the Route Option have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would be minimal opportunity during the Alignment Selection Stage to avoid specific areas of commercial conifer woodland and therefore it is assumed that the commercial and / or financial viability of the forestry operations within this Route Option may be compromised as a result. Route Option 3B has therefore been allocated a RAG rating of **Red**.

Route Option 3C is host to approximately 517 ha of commercial coniferous woodland. Specific locations of the Route Option have the potential to impact a wider woodland area through increased windthrow risk from woodland removal of an OHL operational corridor. There would also be an opportunity during the Alignment Selection Stage to avoid specific areas of commercial conifer woodland however given the extent of cover it is assumed that the commercial and / or financial viability of the forestry operations within this Route Option may be compromised as a result. Route Option 3C has therefore been allocated a RAG rating of **Red**.

Recreation

There are very few recreational receptors within the Study Area, only a short section of the NCR 78, C104(b) – Kennacraig to Skipness Core Path and C521 – Glenreasdell to Kintyre Way Core Path falls within Route Option 1A. Route Option 1B contains the same recreational receptors as Route Option 1A, however Route Option 1B will intersect NCR 78 and the C104(b) – Kennacraig to Skipness Core Path. In addition, a short section of the Kintyre Way and C099(f) – Tarbert to Skipness Core Path falls within Route Option 3A, 3B and 3C. There are no recreational receptors within Route Option 2, therefore would be the Preferred Option, however the Kintyre Way and C099(f) – Tarbert to Skipness Core Path falls in close proximity. Given that there are points of recreational interest within Route Options 1A, 1B, 3A, 3B and 3C and in close proximity to Route Option 2, users may experience a reduction in visual amenity. Therefore, Route Option 1B has been allocated a **Red** RAG rating and an **Amber** RAG rating has been allocated for remaining Route Options.

Conclusion

There is no distinguishable factor between the Route Options when considering agriculture. Due to the absence of recreational facilities within Route Option 2 this is considered the Preferred Route from a recreational use perspective, however it is considered that all Route Options would allow for impacts to recreational use to be avoided during the alignment stage with the exception of Route Option 1B. From a forestry perspective, Route Option 2 would be the Preferred Route given this route holds the least amount of commercial conifer woodland and there would be opportunities to avoid this during Alignment Selection Stage.

Overall, Route Option 2 is considered the Preferred Route from a land use perspective.

6.1.6 *Planning*

Policy and Proposals

Adherence to National, Regional and Local planning policy will in large part depend on avoiding or minimising potential constraints noted, particularly in relation to potential impacts on the natural environment given presence of Annex 1 habitats and cultural heritage designations and assets.

There are three planning applications within Route Option 1A and Route Option 2, therefore they are considered to have the highest risk for adverse effects. Of these planning applications, two are likely avoidable through alignment development. However, planning application 20/00311/FDP intersects

the entire width of Route Option 1A and Route Option 2, therefore is unlikely to be avoided. As such, both Route Option 1A and 2 have been allocated an **Amber** RAG rating. There is only one planning application of relevance for Route Options 1B, 3A, 3B and 3C, 21/00614/PP, however it is thought that this planning application could be avoided through alignment development therefore a **Green** RAG rating has been allocated. Planning applications 18/01700/S37 and 20/00949/S36 (applicable to all Route Options) have not been assessed as they refer to the development of the Craig Murrail to Crossaig 275 kV OHL and Earraghail Wind Farm Substation which are intrinsic to the Proposed Development.

Route Options 1B, 3A, 3B and 3C are therefore preferable as it is considered that they have the greatest potential to accommodate the required infrastructure and opportunities to minimise potential impacts.

6.2 Engineering Appraisal

6.2.1 Infrastructure Crossings

Major Crossings and Metallic Pipes

There are no major crossings or metallic pipes within any of the Route Options, therefore they have all been allocated a **Green** RAG rating.

Road Crossings

Where Route Options have one crossing or less, they have been classified with a **Green** RAG rating. Where Route Options have two crossings or less they have been classified with an **Amber** RAG rating. Where Route Options have three or more crossings they have been classified as a **Red** RAG rating.

Route Options 2 and 3B have been allocated a **Green** RAG rating in terms of risk of road crossings as only one crossing has been identified within each Route Option. Route Options 1B, 3A and 3C cross three minor crossings and Route Option 1A comprises four minor crossings, therefore they have all been allocated a **Red** RAG rating in terms of constraint risk of road crossings.

6.2.2 Environmental Design

Elevation

Rudimentary elevation scoring in terms of potential for the route to be constrained in each of the Route Options could be misleading. The Route Options are 1 km wide and can include within that extent an area of high elevation that may not be practical for the OHL to be routed over or near. However, there could be sufficient route remaining to enable detailed routeing (avoiding the areas of potential constraint). RAG key scoring indicates a percentage of elevation captured of a whole Route Option at maximum height of 200 m AOD.

All Route Options have been allocated a **Red** RAG rating as they all have at least 33.5% of the Route Option exceeding elevations of 200 m AOD. 91% of Route Option 3B is above 200m. Route Option 1A has the lowest percentage above 200m AOD at 33.5%.

Atmospheric Pollution

No Route Options are located in areas of high pollution and therefore they have all been allocated a **Green** RAG rating.

Contaminated Land

There are no known areas of contaminated land or evidence of a risk of contaminated land identified within the Route Options. In addition, UXO and UXB studies have been conducted within the area, these studies have identified UXOs were present within Route Option 3A, however it was confirmed

that these detonated, therefore the risk is no longer present. Therefore, all Route Options have been allocated a **Green** RAG rating.

Flooding

Flooding does not present an immediate risk to the majority of Route Options, with Route Options 2 and 3B being allocated a **Green** RAG rating due to <1% of the Route Option length with >80% of width within a 1 in 200-year flood zone. Route Options 1A, 1B, 3A and 3C were allocated an **Amber** RAG rating due to 5% of the Route Option length with >80% of width within a 1 in 200-year flood zone. However, it is likely that these areas can be avoided during the alignment development stage.

6.2.3 *Ground Conditions*

Terrain

The terrain has been assessed by reviewing the average gradient and maximum gradients of the terrain along the centre line of each Route Option using Google Earth elevation profiles. The terrain within the Study Area is generally hilly, with scattered valleys and areas of steep slopes.

All Route Options have been allocated a **Green** RAG rating as the terrain for these routes is considered as open terrain, nearly flat or gently undulating with no cliffs or narrow pinch points. Route Option 3B has the steepest slope gradient at a maximum of 34.7%, however the average gradient is 7.1% across the entire Route Option. Route Options 1A, 1B, 2, 3A and 3C have an average gradient of 5.5%, 5.7%, 7.9%, 6.3% and 6.8% respectively.

At this stage it is thought that steep slopes could be avoided during the route development / alignment stage by traversing the alignment through flatter

Peat

All Route Options have an element of peat ranging from moderate to high. Within Route Options 1A and 1B there is 1 km² of peatland present. Approximately 11.5% of both Route Options pass through Class 1 and 2 peatland, therefore an **Amber** RAG rating has been allocated. There is 2.95 km² of peatland present within Route Option 2, approximately 53.5% of the Route Option passes through Class 1 and 2 peatland therefore a **Red** RAG rating has been allocated. Route Option 3A comprises 3.6 km² of peatland, approximately 40% of the Route Option passes through Class 1 and 2 peatland therefore a **Red** RAG rating has been allocated. Within Route Options 3B and 3C there is 2.4 km² of peatland present. Approximately 38.6% of Route Option 3B and 36.3% of Route Option 3C pass through Class 1 and 2 peatland, therefore a **Red** RAG rating has been allocated

6.2.4 *Construction and Maintenance*

Access

With regards to accessibility, Route Options 1A, 1B, 3A, 3B and 3C have limited exiting track access and have therefore been allocated an **Amber** RAG rating. There are no access tracks within 1 km of Route Option 2, therefore a **Red** RAG rating has been allocated.

Angle Towers

Where Route Options have five angle supports, they have been classified with a **Green** RAG rating. Where Route Options have six angle supports they have been classified with an **Amber** RAG rating. Where Route Options have seven or more supports they have been classified as a **Red** RAG rating.

Route Options 1B and 2 requires the least about of angle supports, with five being required for each Route Option. Therefore, a **Green** RAG rating has been allocated. Route Option 1A will required six angle supports, therefore an **Amber** RAG rating has been allocated. Route Options 3A, 3B and 3C

require 10, seven and seven support angle towers respectively, therefore, a **Red** RAG rating has been allocated.

6.2.5 Proximity

Clearance Distance

There are no buildings or residential properties within 250 m of the centre line of any Route Options, therefore they have all been allocated a **Green** RAG rating.

Wind farms

Excluding Earraghail Wind Farm, there are no wind farms within 1 km of any Route Options. However, a number of turbines located at Earraghail Wind Farm are likely to be impacted by the Proposed Development, particularly at the alignment stage where it is not possible to maintain the required 3 x rotor diameter clearance from the OHL. Therefore, all Route Options have been allocated an **Amber** RAG rating.

Communication Masts

There are no communication masts within 1 km of any Route Options, therefore all Route Options have been allocated a **Green** RAG rating.

Urban Environments

The overall site area is largely rural and is not densely populated with <10% of the Route Options considered to be within an urban environment. Although there are sporadic farms and individual dwellings, these are located mostly within the south and south east of the Study Area, following the B801 road. All Route Options have therefore been allocated a **Green RAG** Rating.

6.3 Economic 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 1B has the lowest capital cost of all Route Options and has therefore been allocated a **Green** RAG rating. Route Option 1A has a higher capital cost, it is 123% more expensive than Route Option 1B due to a number of factors, including but not limited to: peat land areas, tree felling requirements and a main road crossing. As a result, Route Option 1A has been allocated an **Amber** RAG rating. Operations (inspection and maintenance) have been allocated an **Amber** RAG rating due to the access difficulties and high altitudes when comparing Route Options 1A and 1B.

Route Option 2 has the second lowest capital cost of all Route Options, it is 101% above Route Option 1B due to a number of factors, including but not limited to: peat land areas as well as a significant visual and consent impact. Therefore, has been allocated a **Green RAG rating**. Operations (inspections) have been allocated a **Red** RAG rating due to the significant access difficulties and high altitudes associated with Route Option 2.

Route Options 3B and 3C are only marginally more expensive than Route Option 1B, they are 104% and 109% above Route Option 1B, therefore both Route Options have been allocated a **Green** RAG rating. Route Option 3A has the highest capital cost of all the Route Options, it is 130% above Route Option 1B due to a number of factors, including but not limited to: peat land areas, tree felling requirements as well as a requirement for additional angle towers. Operations (inspection and maintenance) have been allocated an **Amber** RAG rating due to the access difficulties and high altitudes of all three Route Options.

6.4 Comparative Appraisal Summary

Summary RAG tables presenting the comparative appraisals undertaken for environment, engineering and economic considerations are included in **Appendix 2**.

From an environmental perspective, Route Option 1A was the Preferred Option from a habitats, ornithology, landscape designations, landscape character and visual perspective. Route Options 1B and 2 both scored very similar to Route Option 1A, however Route Option 1B was not preferred from a recreation perspective as it would intersect NCR 78 and the C104(b) – Kennacraig to Skipness Core Path, it was also considered more visually intrusive as there were limited screening opportunities. However, Route Option 1B was preferred from a cultural heritage asset, proximity to dwellings and forestry perspective. Route Option 2 was also preferred from a designated sites, protected species, cultural heritage designations, proximity to dwellings and recreation perspective. It is considered that the differences between Route Options 1A, 1B and 2 is relatively small, such that no one Route Option, stands out as considerably better able to accommodate an OHL alignment. Although Route Options 3A, 3B and 3C were not significantly worse than the other Route Options, they were all the least Preferred Option from a designated sites, protected species, ornithology, landscape character, visual and forestry perspective.

From an engineering perspective, all Route Options were constrained however Route Options 1B, 3B and 3C were preferred. With all parameters considered, Route Option 1B was determined to be the overall Preferred Option. Route Option 1B required less underground cabling in order to maintain the required 3 x turbine rotor diameter clearance and required fewer road crossings and angle supports. Route Options 2, 3A, 3B and 3C scored particularly worse from an elevation, terrain, peat and angle support perspective.

Route Option 1B is preferred from an economic perspective as it has the lowest construction cost, it was also preferred from a tree felling, land assembly and consent mitigations perspective. Route Options 1A, 2, 3A, 3B and 3C were all most expensive to construct, this due to a number of factors, but not limited to: peat land areas, tree felling requirements, main road crossings, visual impacts, consent impacts and the requirement for additional angle towers.

6.5 Preferred Route

Taking all the Route Options preferences into account, and balancing the environmental, engineering and economic perspectives, Route Option 1B is considered to be the Overall Preferred Route (see **Figure 6.1**).

Whilst there are engineering and environmental challenges associated with Route Option 1B it presents the most favourable Route Option overall to progress to Stage 3: Alignment Selection, based on a balance of environmental, engineering and economic aspects.

The Preferred Route would require careful consideration during the alignment selection stage of the project to achieve an acceptable alignment with minimal environmental effects.

Should further site and desk-based analysis at the alignment selection stage identify a particular constraint, a further review of route or alignment options may be required prior to the identification of a Preferred Alignment.

7. CONSULTATION ON THE PROPOSALS

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 Questions for Consideration by Consultees

When providing your comments and feedback, SSEN Transmission would be grateful for your consideration of the questions below:

- Has the need for the Project been adequately explained?
- Has the approach taken to select the Preferred Route been adequately explained?
- Are there any factors, or environmental features, that you consider may have been overlooked during the Preferred Route selection process?
- Do you feel, on balance, that the Preferred Route selected is the most appropriate for further consideration at the alignment selection stage? Please provide an explanation of your answer.
- If you don't agree to our Preferred Route which of the options would you consider the best option for SSEN Transmission to develop? Please provide an explanation of your answer.

7.2 Next Steps

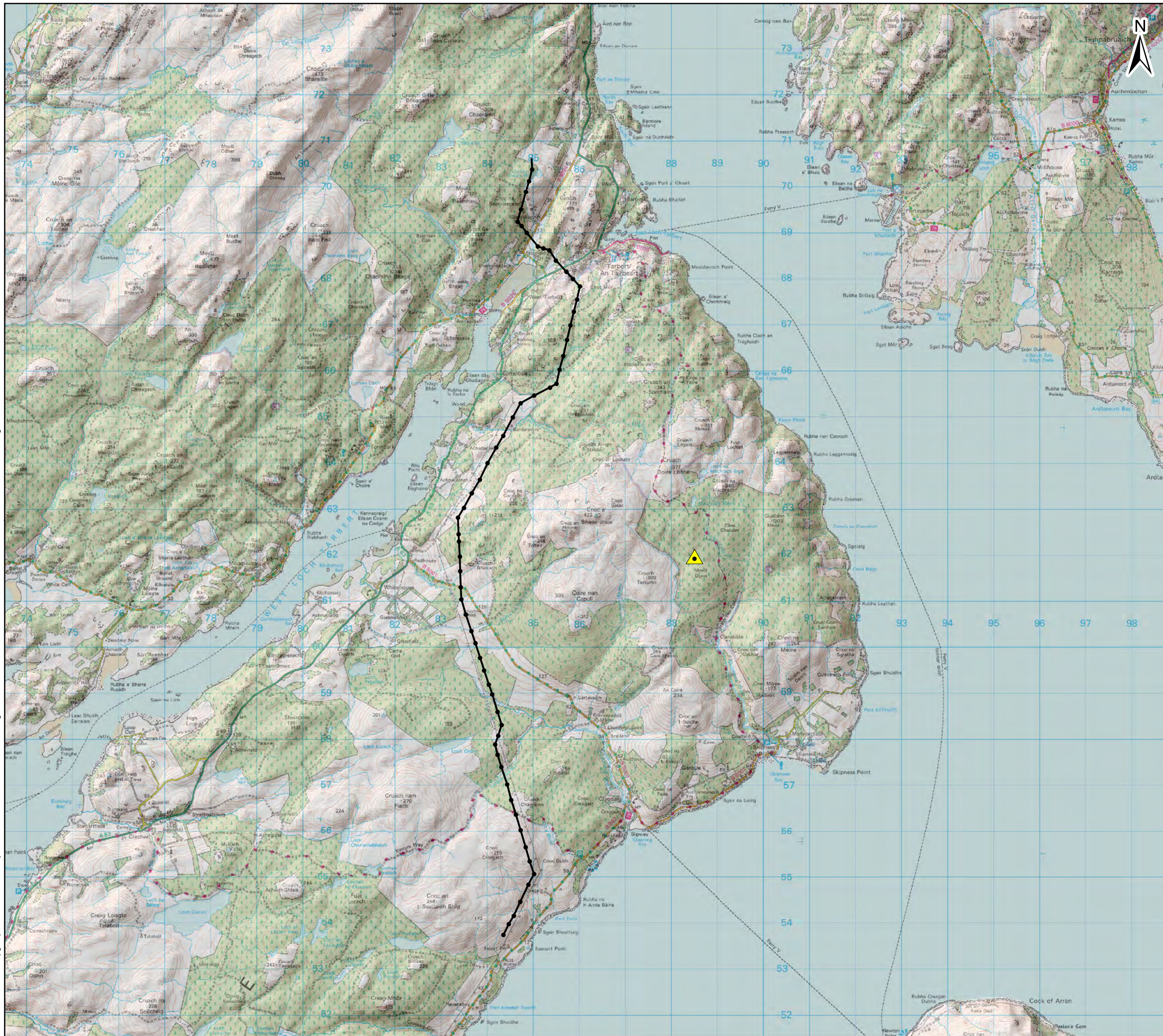
A face to face public consultation event will be held on 24th August 2022 and a virtual online consultation event will take place week commencing 29th August 2022. The responses received from these consultation events, and those sought from statutory consultees and other key stakeholders, will inform further consideration of the Route Options put forward, and the confirmation of the Preferred Route to take forward to the next stage in the routeing process (alignment selection).

All comments are requested by 23rd September 2022. A Report on Consultation will be produced which will document the consultations received, and the decisions made in light of these responses.

Following the identification and confirmation of a proposed route, further technical and environmental surveys (e.g. Phase 1 Habitat / National Vegetation Classification surveys, Protected Species Surveys and further input by landscape, ecology, cultural heritage) would be undertaken to identify a Preferred Alignment.

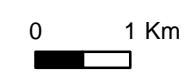
Consultation on a Preferred Alignment will be undertaken in a similar manner to the identification of a Preferred Route in Spring 2023.

APPENDIX 1 – FIGURES



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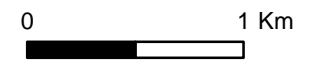
- Legend**
- Earraghail Wind Farm Substation
 - Proposed Craig Murrail-Crossaig 275 kV OHL Towers
 - Proposed Craig Murrail-Crossaig 275 kV OHL



Client:		
Project:	Earraghail Wind Farm OHL Connection	
Title:	Figure 1.1: Location	
Date:	07 April 2022	Scale: 80,000 @ A3
Drawn:	MAL	Checked: IM Approved: RD
Drawing Number:	EARRAGHAILWF-WSP-GIS-004	



- Legend**
- Study Area
 - ▲ Earraghail Wind Farm Substation
 - Proposed Craig Murrail-Crossaig 275 kV OHL Towers
 - Proposed Craig Murrail-Crossaig 275 kV OHL

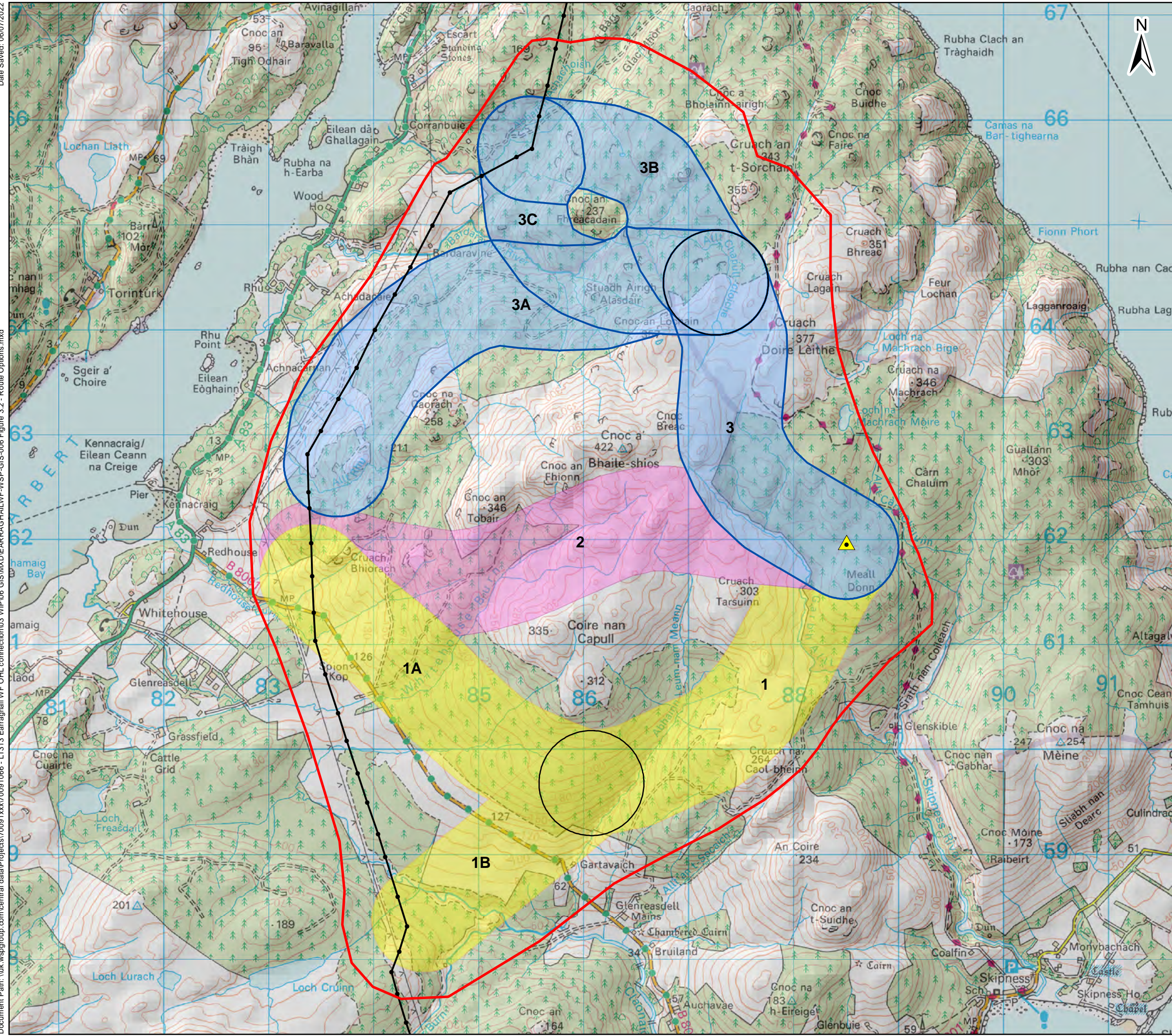


Client: Scottish & Southern Electricity Networks

Project: Earraghail Wind Farm OHL Connection

Title: **Figure 3.1: Study Area**

Date: 07 July 2022 Scale: 35,000 @ A3
 Drawn: MAL Checked: IM Approved: RD
 Drawing Number: EARRAGHAILWF-WSP-GIS-005



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Legend

- Study Area
- ▲ Earraghail Wind Farm Substation
- Proposed Craig Murrail-Crossaig 275 kV OHL Towers
- Proposed Craig Murrail-Crossaig 275 kV OHL

Route Option

- 1
- 2
- 3
- Node

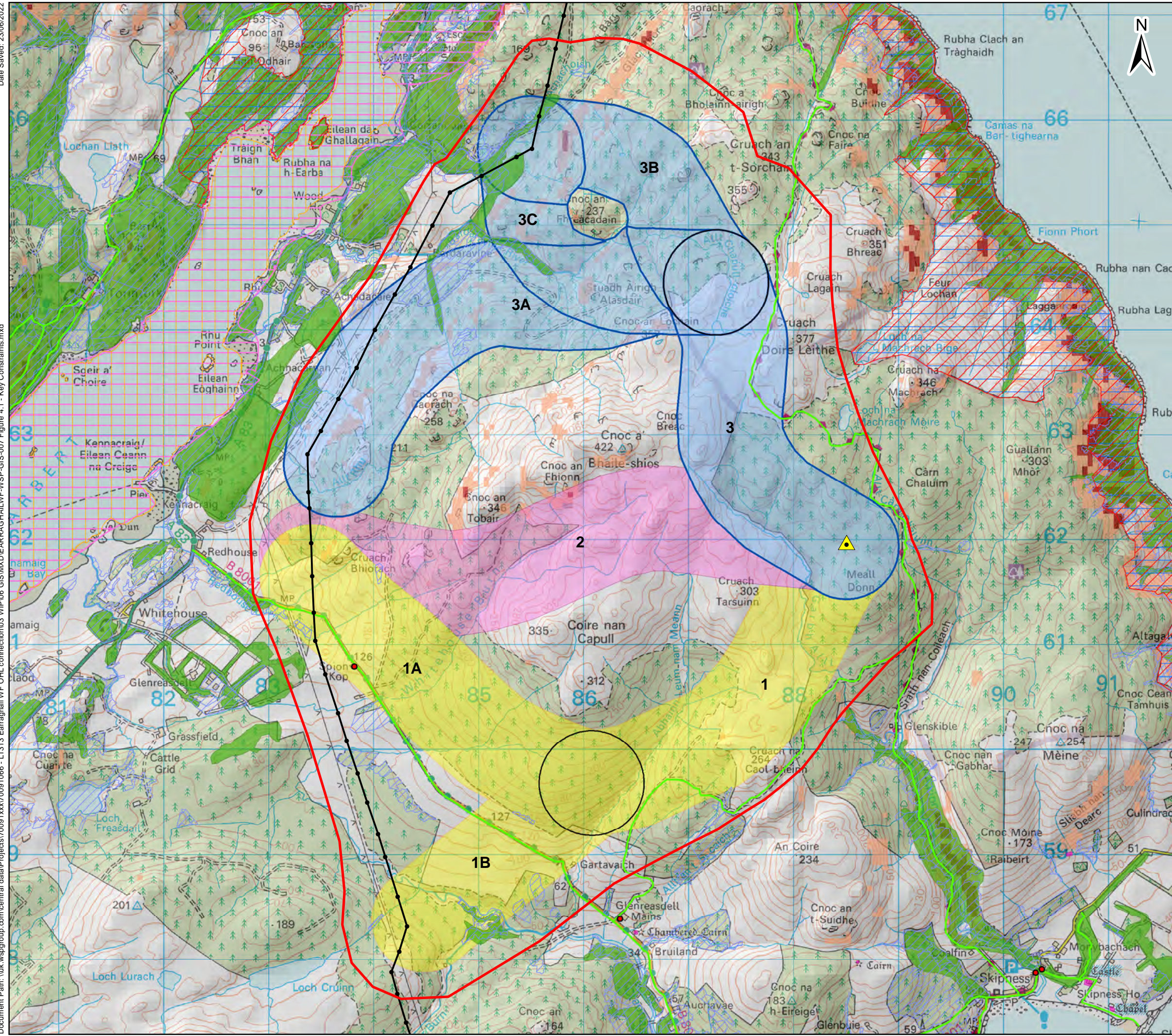


Client: Scottish & Southern Electricity Networks

Project: Earraghail Wind Farm OHL Connection

Title: **Figure 4.1: Route Options**

Date: 06 July 2022 Scale: 35,000 @ A3
 Drawn: MAL Checked: IM Approved: RD
 Drawing Number: EARRAGHAILWF-WSP-GIS-006



Legend

- Study Area
- Earraghail Wind Farm Substation
- Proposed Craig Murrail-Crossaig 275 kV OHL Towers
- Proposed Craig Murrail-Crossaig 275 kV OHL

Route Options

- 1
- 2
- 3
- Node
- Adopted Core Path
- Special Protection Area
- Special Area of Conservation
- Site of Special Scientific Interest
- Local Nature Conservation Site
- Ancient Woodland Inventory
- Native Woodland Survey of Scotland
- Scheduled Monument

Listed Building Category

- A
- B
- C

Slope Angle

- 15° - 22°
- > 22°

0 1 Km

Client: Scottish & Southern Electricity Networks

Project: Earraghail Wind Farm OHL Connection

Title: **Figure 5.1: Key Constraints**

Date: 07 July 2022 Scale: 35,000 @ A3
 Drawn: MAL Checked: IM Approved: RD
 Drawing Number: EARRAGHAILWF-WSP-GIS-007



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Legend

- Study Area
- ▲ Earraghail Wind Farm Substation
- Proposed Craig Murrail-Crossaig 275 kV OHL Towers
- Proposed Craig Murrail-Crossaig 275 kV OHL
- Preferred Route



Client: Scottish & Southern Electricity Networks

Project: Earraghail Wind Farm OHL Connection

Title: **Figure 6.1: Overall Preferred Route**

Date: 18 July 2022 Scale: 35,000 @ A3
 Drawn: LG Checked: MAL Approved: RD
 Drawing Number: EARRAGHAILWF-WSP-GIS-015

APPENDIX 2 – OHL ROUTE OPTIONS AND SUMMARY RAG TABLES

Summary RAG Rating Table

Table A.1: Environmental, Engineering and Economic Summary RAG Ratings

Environmental Parameter		Route Options					
Main Parameter	Sub-Parameter	1A	1B	2	3A	3B	3C
Natural Heritage	Designations	L	L	L	M	M	M
	Protected Species	M	M	M	M	M	M
	Habitats	H	H	H	H	H	H
	Ornithology	M	M	M	M	M	M
	Hydrology, Geology and Hydrogeology	M	M	M	M	M	M
Cultural Heritage	Designations	M	M	L	L	M	M
	Cultural Heritage Assets	M	L	L	L	L	L
People	Proximity to Dwellings	L	L	L	L	L	L
Landscape and Visual	Designations	L	L	L	L	L	L
	Landscape Character	L	M	M	M	M	M
	Visual	L	M	M	M	M	M
Land Use	Agriculture	L	L	L	L	L	L
	Forestry	H	M	M	H	H	H
	Recreation	M	H	M	M	M	M
Planning	Policy and Proposals	M	L	M	L	L	L
Engineering Parameter		Route Options					
Main Parameter	Sub-Parameter	1A	1B	2	3A	3B	3C
Infrastructure Crossings	Major Crossings and Metallic Pipelines	L	L	L	L	L	L
	Road Crossings	H	H	L	H	L	H
Environmental Design	Elevation	H	H	H	H	H	H
	Atmospheric Pollution	L	L	L	L	L	L
	Contaminated Land	L	L	L	L	L	L
	Flooding	M	M	L	M	L	M
Ground Conditions	Terrain	L	L	L	L	L	L
	Peat	M	M	H	H	H	H
Construction/maintenance	Access	M	M	H	M	M	M
	Angle towers	M	L	L	H	H	H
Proximity	Clearance distance	L	L	L	L	L	L
	Wind Farms	M	M	M	M	M	M
	Communication Masts	L	L	L	L	L	L
	Urban environments	L	L	L	L	L	L

Economic Parameter		Route Options					
Main Parameter	Sub-Parameter	1A	1B	2	3A	3B	3C
Capital	Construction	M	L	L	M	L	L
	Diversions	L	L	L	L	L	L
	Public Road Improvements	L	L	L	L	L	L
	Tree Felling	M	L	L	M	L	L
	Land Assembly	M	L	L	L	M	M
	Consent Mitigations	M	L	M	L	L	L
Operational	Inspections	M	M	H	M	M	M
	Maintenance	M	M	M	M	M	M