SP Energy Networks

Harestanes West Wind Farm 132kV Overhead Line Grid Connection

Routeing and Consultation Report

Final report
Prepared by LUC
July 2023

SP Energy Networks

Harestanes West Wind Farm 132kV Overhead Line Grid Connection

Routeing and Consultation Report

Project Number
11306

Version	Status	Prepared	Checked	Approved	Date
1.	Draft for Client Issue	Z. Whitley	L. McGowan	J. Wright	04.11.2021
2.	Update with SPEN technical assessment dated 03.03.23. Update to NPF4 text.	L. McGowan			13.03.2023
3.	Updated draft for client review.	D. McArthur	SPEN		21.06.2023
4.	Final for public consultation	LUC	SPEN	LUC	20 07.2023

Bristol
Edinburgh
Glasgow
London
Manchester

landuse.co.uk

Land Use Consultants Ltd
Registered in England
Registered number 2549296
Registered office:
250 Waterloo Road
London SE1 8RD

100% recycled paper

Landscape Design
Strategic Planning & Assessment
Development Planning
Urban Design & Masterplanning
Environmental Impact Assessment
Landscape Planning & Assessment
Landscape Management
Ecology
Historic Environment
GIS & Visualisation

Contents

Chapter 1
Introduction

Purpose of this Report

1.1 This document has been prepared by LUC on behalf of SP Energy Networks (SPEN). It relates to the identification and appraisal of route options for a new 132 kilovolt (kV) overhead line (OHL) supported on trident wood poles from the Harestanes West Wind Farm substation to a suitable point on the existing 132kV 'BR Route', located within the administrative boundary of Dumfries and Galloway Council. The construction and operation of the new 132kV OHL is hereafter referred to as the 'Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project. The location of the Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project is shown on **Figure 1.1**.

1.2 This report presents the methodology adopted for routeing the new OHL, culminating with the description of the 'preferred route'. This report also sets out the process for the consultation which will be undertaken. This process is designed to gather feedback from stakeholders, including the public, to inform the subsequent stages of the Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project.

The Need for the Harestanes West Wind Farm 132kV Overhead Line Grid Connection

1.3 There is ongoing substantial interest for renewable energy generation development (primarily wind and hydro) and SPEN continues to receive associated grid connection requests from developers wishing to develop such renewable energy schemes.

1.4 An application has been received from the Developer of Harestanes West Wind Farm requiring a 78 megawatt (MW) connection from the wind farm substation to a suitable point on the existing 132kV 'BR Route', via a 132kV OHL.

SPEN's Statutory and Licence Duties

1.5 As transmission licence holder for southern Scotland, SPEN[1] is required under Section 9(2) of the Electricity Act 1989 to:

- Develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and
- Facilitate competition in the supply and generation of electricity.

1.6 SPEN is required in terms of its statutory and licence obligations to provide for new electricity generators wishing to connect to the transmission system in its licence area. SPEN is also obliged to make its transmission system available for these purposes and to ensure that the system is fit for purpose through appropriate reinforcements to accommodate the contracted capacity.

1.7 Schedule 9 of the Electricity Act 1989 imposes a further statutory duty on SPEN to take account of the following factors in formulating proposals for the installation of overhead transmission lines.

- *"(a) to have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features or special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and*
- *(b) to do what it reasonably can to mitigate any effects which the proposals would have on the natural beauty of the countryside or any such flora, fauna, features, sites, buildings or objects."*

1.8 SPEN's 'Schedule 9 Statement' sets out how it will meet the duty placed upon it under Schedule 9. The Statement also refers to the application of best practice methods to assess the environmental impacts of proposals and to identify appropriate mitigation measures.

1.9 As a result of the above, SPEN is required to identify electrical connections that meet the technical requirements of the electricity system, which are economically viable, and cause on balance, the least disturbance to both the environment and the people who live, work and enjoy recreation within it.

The Development and Consenting Process

1.10 The Project comprises three key phases:

- Phase One: Routeing and Consultation.
- Phase Two: Environmental Impact Assessment (EIA)/Environmental Appraisal.
- Phase Three: Application for Consent.

Phase One: Routeing and Consultation

1.11 This report relates to Phase One, which comprises a review of environmental, technical and economic considerations and the application of established step-by-step routeing principles to identify and appraise potential route options to establish a 'preferred' route for the OHL.

1.12 SPEN is committed to ongoing consultation with interested parties, including statutory and non-statutory consultees and local communities. Whilst there is no statutory requirement to consult during the early routeing stages, SPEN nonetheless considers it good practice to introduce consultation at this stage.

1.13 Responses to the consultation process will be evaluated and the 'proposed' route confirmed for progression to the next stage.

Phase Two: Environmental Impact Assessment (EIA)/Environmental Appraisal

1.14 As the project comprises an '*electric line installed above ground with a voltage of 132 kilovolts or more'*, the Harestanes West Wind Farm Overhead Line Grid Connection Project may be considered an 'EIA development' under Schedule 2 of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 ('the EIA Regulations').

1.15 Following confirmation of the Proposed Route, SPEN will submit a request for an EIA Screening Opinion to the Scottish Ministers in accordance with Regulation 8(1) of the EIA Regulations. The request will be accompanied by the relevant information in accordance with Regulation 8(2) and 8(3) and will take into account the selection criteria in Schedule 3 and the findings of the work undertaken as part of the routeing process.

1.16 Should the Scottish Ministers determine that the Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project is EIA development and that subsequent provisions of the EIA Regulations apply, SPEN will follow the

[1] SPEN owns and operates the electricity transmission and distribution networks in central and southern Scotland through its wholly-owned subsidiaries SP Transmission plc (SPT) and SP Distribution plc (SPD). SP Transmission plc is the holder of a transmission licence. The references below to SPEN in the context of statutory and licence duties and the application for section 37 consent below should be read as applying to SP Transmission plc

EIA process, with the topics requiring further consideration to be agreed with consultees through the EIA Scoping process. SPEN will then prepare an 'EIA Report'.

1.17 Should the Scottish Ministers determine that EIA is not required, then an 'Environmental Appraisal' will be undertaken.

Phase Three: Application for Consent

1.18 SPEN will apply to the Scottish Ministers for consent under Section 37 of the Act, as amended, to install and keep installed, the proposed OHL identified above. In conjunction with the Section 37 application, SPEN will apply for deemed planning permission for the OHL under Section 57(2) of the Town and Country Planning (Scotland) Act 1997, as amended, for any ancillary development such as access tracks or substation facilitation works. The EIA Report/Environmental Appraisal will accompany the application as relevant.

Stakeholder Engagement

1.19 Stakeholder engagement, including public involvement, is an important component of the Scottish planning and consenting system. Legislation and government guidance aim to ensure that the public, local communities, statutory and other consultees and interested parties have an opportunity to have their views taken into account throughout the planning process.

1.20 Striking the right balance can be challenging, and in seeking to achieve this, SPEN recognises the importance of consulting effectively on proposals and of being transparent about the decisions reached. SPEN is keen to engage with key stakeholders including local communities and others who may have an interest in the Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project. This engagement process begins at the early stages of development of a project and continues into construction once consent has been granted.

1.21 SPEN's approach to stakeholder engagement for major electrical infrastructure projects is outlined in Chapter 2 of the SPEN document 'Approach to Routeing and Environmental Impact Assessment'[2]. SPEN aims to ensure effective, inclusive and meaningful engagement with the public, local communities statutory and other consultees and interested parties through four key engagement steps:

- **Pre-project notification and engagement:** Discussions are undertaken with consenting bodies, planning authorities, and statutory consultees such as NatureScot and Scottish Forestry. Early and proactive engagement enables the views of these consultees to inform project design, assessment methodologies and further engagement. It also provides consultees with an early understanding of the likely programme to submission of the application for consent.
- **Information gathering:** To inform the routeing stage, information on relevant environmental and planning considerations and proposed data gathering techniques (e.g. for seasonal ecological surveys) is requested from statutory consultees and other relevant organisations.
- **Obtaining feedback on emerging route options:** This Routeing and Consultation document has been prepared to gather feedback on the emerging project details. It will be issued to statutory consultees, and made available on SPEN's website, with its availability advertised in the press. Local exhibitions and/or public meetings will be arranged. SPEN will also look to virtual methods of informing consultation and gathering feedback from stakeholders such as project specific websites to host virtual consultations to share relevant information. Further details in relation to the consultation process are provided in **Chapter 7**.
- **The EIA stage**: The results of stakeholder engagement are taken into consideration and used to confirm the 'proposed route' and 'proposed substation site' for progression to EIA. The main purpose of the EIA is to identify the significant effects arising from a project. Further consultation is carried out during the EIA stage, including additional information gathering, and the preparation of a publicly available Scoping Report which accompanies a 'Request for a Scoping Opinion' to the consenting authority as to the information to be provided in the EIA Report.

1.22 In addition, and as noted above, SPEN as a holder of a transmission licence, has a duty under section 38 and Schedule 9 of the Electricity Act 1989, when formulating proposals for the new electricity lines and other transmission development, to have regard to the effect of work on communities, in addition to the desirability of the preservation of amenity, the natural environment, cultural heritage, landscape and visual quality.

The Structure of the Report

1.23 This report comprises the following chapters:

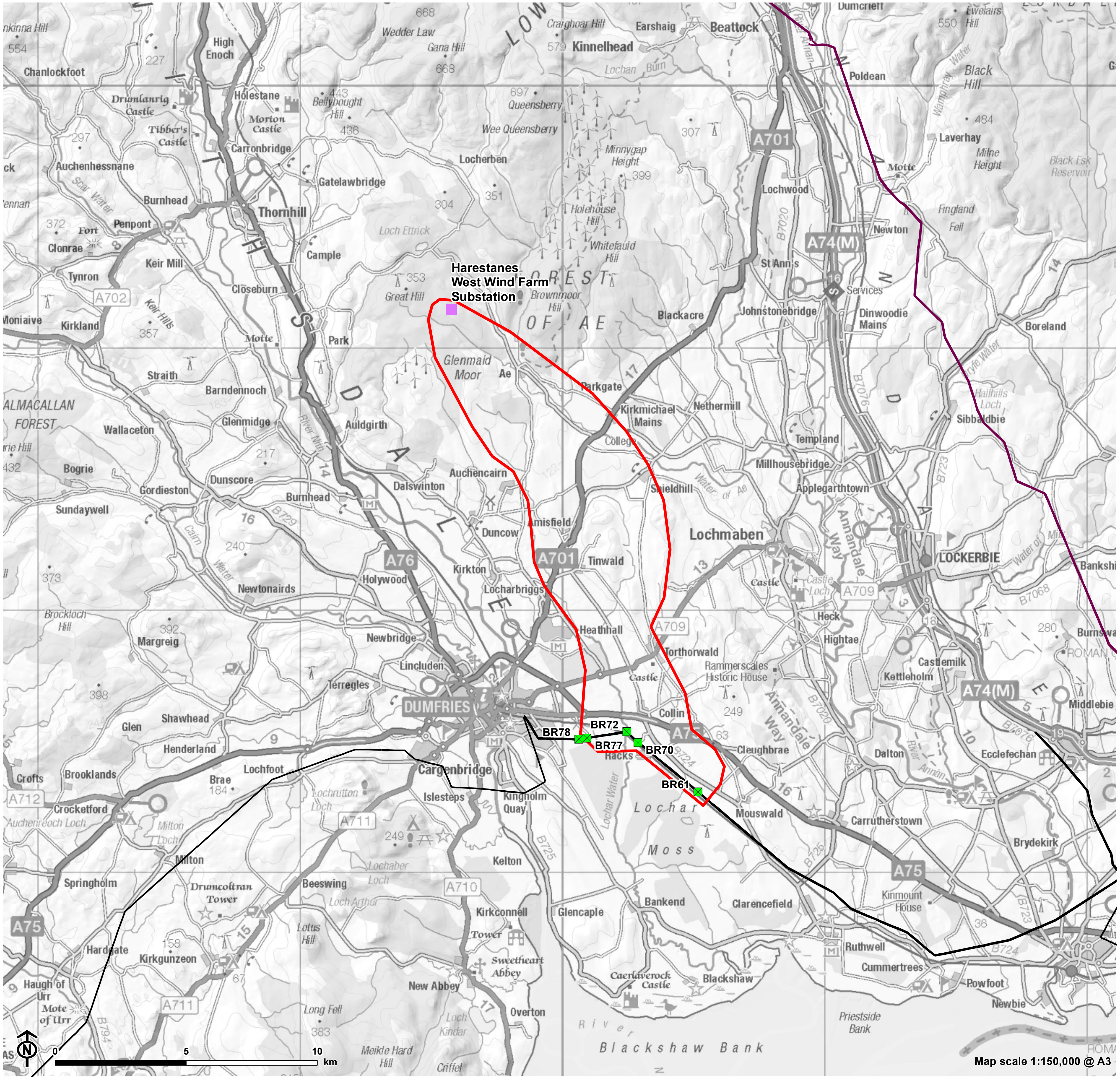
- **Chapter 1:** Introduction;

[2] https://www.spenergynetworks.co.uk/userfiles/file/SPEN_Approach_to_Routeing_Document_2nd_version.pdf

- **Chapter 2:** Project Description;
- **Chapter 3:** Approach to Routeing;
- **Chapter 4:** Identification of Route Options;
- **Chapter 5:** Appraisal of Route Options;
- **Chapter 6:** Appraisal Findings; and
- **Chapter 7:** The Consultation Process and Next Steps.

1.24 This report is also supported by figures and appendices which are referenced throughout.

Figure 1.1: Existing Network and Points of Connection



- Study Area
- Point of Connection
- Tension Towers for Connection
- Existing 132kV overhead line (OHL)
- Existing 400kV overhead line (OHL)

Chapter 2
Project Description

Connection Requirements

2.1 A new 132kV OHL is required to connect the Harestanes West Wind Farm into a suitable point on the existing 'BR Route'. The proposed connection is approximately 23km in length and will be supported on wood poles. One 33kV circuit breaker and one transformer will also be required at the Harestanes West Wind Farm as well as a circuit breaker at the tee-in point on the 'BR Route'.

2.2 As part of the wider approach, a land right will be sought with each landowner for a corridor, typically 60m wide (30m either side of the centre of the OHL), to protect the resilience of the line from future development and from falling trees.

Overhead Line Infrastructure

2.3 With an OHL of this nature, conductors (or wires) will be suspended at a specified height above ground and supported by wooden poles, spaced at intervals.

2.4 Conductors will be made either of aluminium or steel strands. This connection will include one three-phase circuit with no earth wire, with one of the phase conductors incorporating a fibre optic cable for communication purposes. The fibre optic cable will be contained within the conductor.

2.5 Conductors are strung from insulators attached to the steelwork at the top of the poles and prevent the electric current from crossing to the relevant support.

Wood Pole Structure

2.6 The proposed OHL will be constructed using the Trident wood pole (double H pole) design with galvanised steelwork cross-arms supporting aluminium conductors on insulators.

2.7 The proposed design is described below, and examples of the pole design including a photograph is shown on **Figure 2.1**.

2.8 Wood poles can be used for single circuit lines operating at 132kV. Wood poles are fabricated from high pressure impregnated softwood, treated with a preservation to prevent damage to structural integrity.

2.9 There are three types of wood pole structure, in terms of appearance:

- *Intermediate*: where the pole structure is part of a straight-line section;
- *Angle*: where there is a horizontal or vertical deviation in line direction of a specified number of degrees; and
- *Terminal*: where the overhead line terminates into a substation or on to an underground cable section via a separate cable sealing end compound or platform.

Wood Pole Heights and Span Lengths

2.10 The 132kV OHL will be supported on trident wood poles. The standard height of trident poles (including steel work and insulators) varies from 11m to 16m.

2.11 The section of OHL between wood poles is known as the 'span', with the distance between them known as the 'span length'. Span lengths between wood poles average between 80m to 100m but can be increased if there is a requirement to span a larger distance due to the presence of a feature in the landscape such as a river or loch.

2.12 Wood poles are used to regulate the statutory clearances required for conductor height, which is determined the voltage of the OHLs (the higher the voltage, the greater the safety clearance that will be required) and the span length between wood poles.

Wood Pole Colouring

2.13 Wood poles are dark brown in colour when first erected and weather to a silver/grey after a period of about five years.

2.14 The wood pole top cross-arms are galvanised steel and support the aluminium conductors on stacks of grey insulator discs. Both the steelwork and aluminium will weather and darken after a few years.

Circuit Breaker Compound

2.15 The circuit from Harestanes West wind farm substation shall connect to the existing Dumfries to Chapelcross(2) overhead line circuit as a 'T' connection through a circuit breaker arrangement. The purpose of this circuit breaker compound is to allow for an outage (planned or unplanned) to be taken on the wind farm feeder whilst not affecting the existing Chapelcross to Dumfries supply. The attributes of this Circuit Breaker compound are as below:

- Compound size: the current estimated SPEN compound size is 41m x 50m. However, upon the completion of detailed survey and studies, the compound size may be increased up to 44m x 59m, including the 2m wide footpath along the perimeter of the compound and excluding any embankment/external drainage/SUDS pond/ soakaways that might require to be constructed outside the compound.
- Fencing: a 3m high-security palisade fence will be required around the compound.
- Access: the access road from the main road into the compound will have a bound surface (tarmac), with the rest of the compound finished with stone chippings.
- The gantries at the Circuit Breaker compound will be 9m tall.
- There will be down leads from the Dumfries to Chapelcross(2) overhead line circuit to an interim wooden pole before connecting to the circuit breaker compound gantry. This interim wooden pole height is estimated to be 18m.

Construction Process

2.16 The construction of OHLs requires additional temporary infrastructure such as temporary accesses to pole locations. All have limited maintenance requirements, and all are subject to well-established procedures for dismantling/ decommissioning.

Wood Pole Construction

2.17 The construction of the OHL will follow a well-established sequence of activities as outlined below:

- preparation of accesses;
- excavation of foundations;
- delivery of poles;
- erection of poles;
- delivery of conductor drums and stringing equipment;
- insulators and conductor erection and tensioning; and
- clearance and reinstatement.

2.18 Prior to constructing the OHL, temporary working areas around each pole location will be required for foundation excavation and pole erection. Any vegetation that requires removal will be removed or lopped.

2.19 The erection of the wood poles will require a small excavation to allow the pole brace block and/or steel foundation braces to be positioned in place. A typical pole excavation will be $3m^2$ by 2m deep. The excavated material will be sorted and stored and used for backfilling purposes. No concrete is required.

2.20 Poles are erected in sections, i.e. between angle support poles and/or terminal support pole. The insulator fittings, and wood poles forming the pole support, will be assembled local to the pole site and lifted into position utilising the tracked excavator which excavated the foundations. The pole foundation holes will then be backfilled, and the pole stay wire

supports attached to the ground in preparation for conductor stringing, erection and tensioning.

Access

2.21 Temporary accesses to all pole locations will be taken from the existing main road network wherever feasible, with the use of selected unclassified roads also likely to be required. The use of existing tracks and watercourse crossings will be maximised, with the upgrading of these where necessary.

2.22 The initial preference when taking temporary access is to use low ground pressure vehicles and plant. Where access is required to be taken through any sensitive areas, other less intrusive methods such as temporary steel matting, or timber roadways may be employed.

2.23 The use of temporary stone tracks is normally minimal for wood pole connections. All temporary tracks will be removed after commissioning with land being restored to its former condition.

Temporary Working

2.24 Temporary working areas will be required for the duration of the construction works. Temporary vehicular access is required to every pole location. Wood pole locations will have a working area of approximately 30m x 15m and could also extend to accommodate conductor pulling if required.

2.25 In some cases, the shape or size of the working area will be determined by nearby environmental or land use constraints, identified prior to construction. Each working area will be taped off to delineate the area for environmental protection reasons.

2.26 Following the completion of the construction works, the temporary working areas will be reinstated and restored to former conditions.

Construction Timescales

2.27 Construction and erection of a standard single pole generally takes approximately half a day depending on ground conditions and location, i.e. it may take more hours if the ground is softer. Angle poles can also take longer due to the need for ‘stay wires’ to stabilise the pole in the ground.

Operation and Maintenance

2.28 Whilst most OHL components are maintenance free, exposed elements which suffer from corrosion, wear, deterioration and fatigue may require inspection and periodic maintenance. OHL cables generally require refurbishment after approximately 40 years. Wooden pole damage could lead to potential bird nesting and bat roosting sites within the operational period of the OHL. Inspections of the poles would be carried out prior to any refurbishment works to identify any nesting/roosting potential.

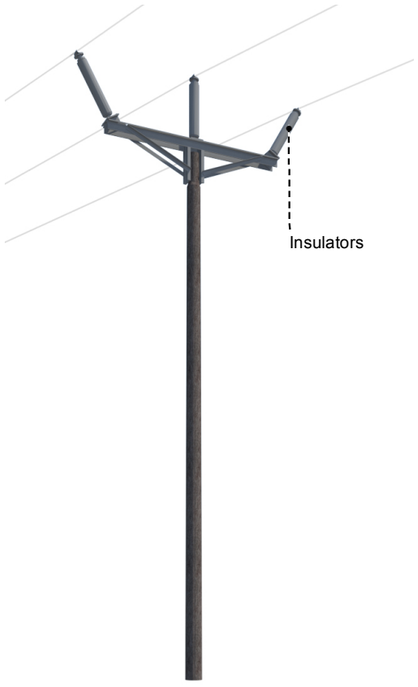
2.29 Any felled wayleave areas will also have to be managed to maintain the required clearances whilst the connection remains in service. Walkover surveys or flyovers will identify where there is a requirement to clear wayleaves of new growth. Line marking should be considered to avoid avian collisions in sensitive areas (as identified during appropriate vantage point surveys).

Decommissioning

2.30 When the operational life of the proposed Harestanes West Wind Farm 132kV Overhead Line Grid Connection comes to an end, it is possible that the line may be re-equipped with new conductors and insulators and refurbished. Alternatively, the OHL may be decommissioned fully.

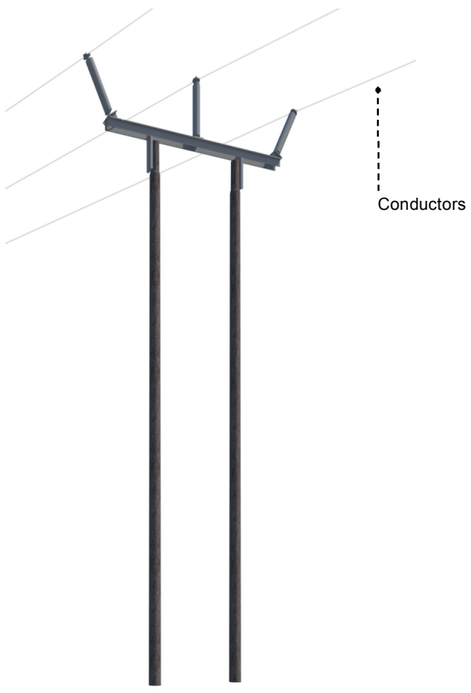
2.31 Upon decommissioning of Harestanes West Wind Farm 132kV Overhead Line Grid Connection, the wood poles will be removed in their entirety, with components re-used where possible. All ground disturbance will be fully reinstated.

Figure 2.1: Typical Wood Pole (Component Parts of 132kV 'Trident' Design Wood Pole)

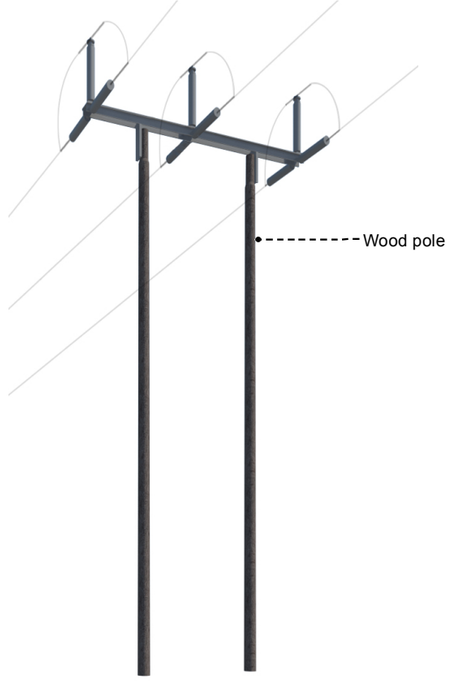


Component parts of 132kV 'Trident' design wood pole: Intermediate

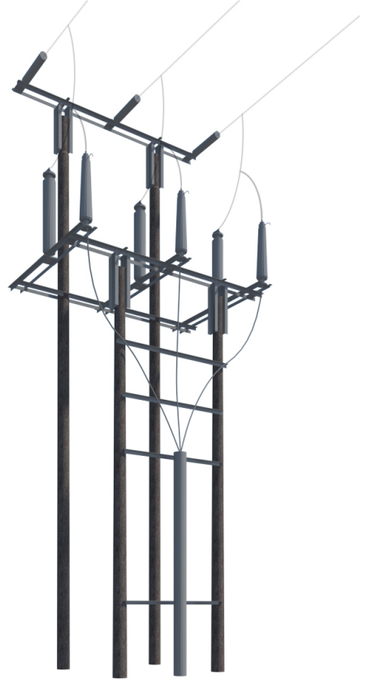
Component parts of 132kV 'Trident' design wood pole: Angle



Component parts of 132kV 'Trident' design wood pole: Intermediate (H pole)



Component parts of 132kV 'Trident' design wood pole: Angle (H pole)



Component parts of 132kV 'Trident' design wood pole: Terminal (H pole)

Chapter 3
Approach to Routeing

SPEN's Overall Approach to Routeing an Overhead Line

3.1 In June 2021 SPEN published the second version of its Approach to Routeing and Environmental Impact Assessment document outlining the approach taken to routeing transmission infrastructure[3]. The Approach to Routeing guidance has formed the basis for the methodology used for the Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project as summarised in **Figure 3.1** below.

3.2 The routeing process is iterative, and the steps outlined below may be re-visited several times. The outcome of each step is subject to a technical and, where relevant, consultation, 'check' with key stakeholders including the public, prior to commencing the next step. Professional judgement is used to establish explicitly the balance between technical, economic viability and environmental factors.

3.3 As such, a well-routed line takes into account other environmental and technical considerations and will avoid, wherever possible, areas of high amenity value.

The Harestanes West Wind Farm 132kV Overhead Line Grid Connection Routeing Objective

3.4 In accordance with SPEN's approach to routeing, the Routeing Objective for the project is:

> "*To identify a technically feasible and economically viable route for an overhead line, supported on wood poles, from the Harestanes West Wind Farm to the existing 132kV 'BR Route'. The route should, on balance, cause the least disturbance to the environment and the people, who live, work and enjoy recreation within it.*"

[3]https://www.spenergynetworks.co.uk/userfiles/file/SPEN_Approach_to_Routeing_Document_2nd_version.pdf

Established Practice for Overhead Line Routeing

The Holford Rules

3.5 It is generally accepted across the electricity industry that the guidelines developed by the late Lord Holford in 1959 for routeing OHLs, 'The Holford Rules', should continue to be employed as the basis for routeing high voltage OHLs. The Holford Rules were reviewed circa 1992 by the National Grid Company (NGC) Plc. (now National Grid Electricity Transmission Plc (NGT)) as owner and operator of the electricity transmission network in England and Wales, with notes of clarification added to update the Rules. A subsequent review of the Holford Rules (and NGC clarification notes) was undertaken by ScottishHydro Electric Transmission Limited (SHETL) in 2003 to reflect Scottish circumstances.

3.6 The Holford Rules and the NGC and SHETL clarification notes are included in **Appendix A**. These guidelines for the routeing of new high voltage overhead transmission lines form the basis for routeing the Harestanes West Wind Farm 132kV Overhead Line Grid Connection. Key principles of the Holford Rules include avoiding prominent ridges and skylines, following broad wooded valleys, avoiding settlements and residential properties and maximising opportunities for 'backclothing' infrastructure.

Overview of Routeing Process

Study Area

3.7 A study area is first defined, which is large enough to accommodate all likely route options, taking account of the technical requirements (i.e. connection points) and factors such as topography. Baseline mapping of the routeing considerations outlined below then enables routeing constraints and opportunities to be identified.

Environmental Considerations

3.8 Statutory duties imposed by Section 38 and Schedule 9 of the Electricity Act 1989 require licence holders to seek to preserve features of natural and cultural heritage interest, and to mitigate where possible, any effects which their proposals may have on such features. The construction and operation of an overhead transmission line will have potential effects on people and the environment, including potential effects on (in no hierarchical order):

- Visual amenity;
- Landscape character;
- Ecology and ornithology;
- Forestry and woodland (including areas of ancient woodland and native woodland);
- Hydrology, hydrogeology, geology (such as carbon rich soils and deep peat) and water resources;
- Cultural heritage including archaeology;
- Land uses including mineral operations and agriculture; and
- Recreation and tourism.

3.9 In addition to effects on visual amenity, a number of other effects can best be avoided or limited through careful routeing. Other effects are best mitigated through local deviations of the route, the refining of wood pole locations and/or specific construction practices. These are reviewed as part of the environmental appraisal process.

Forestry Guidelines

3.10 SPEN recognises the vital role which trees and forestry play in terms of our response to climate change, climate adaptation, biodiversity, landscape and habitat enhancement.

3.11 Wherever possible, OHLs should be routed to follow open space and to run alongside, not through, woodland areas. This is particularly important for areas of ancient and native broadleaf woodland. Routes should seek to avoid coupes where felling would lead to potential wind-throw of the coupe. Where there is no alternative route; an overhead line through a woodland/ forested area should:

- minimise landscape impacts;
- avoid the line of sight of important views;
- be kept in valleys and depressions;
- not divide a hill into two similar parts where it crosses over a summit;
- cross skyline or ridges where they drop to a low point;
- follow alignments diagonal to the contour as far as possible; and
- vary in the alignment to reflect the landform by rising in hollows and descending on ridges.

3.12 SPEN acknowledges the requirements of Scottish Forestry guidance on Design Techniques for Forest Management Planning: Practice Guide[4]. Within forested areas, the OHL should seem to pass through a series of

[4] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/689922/Design_techniques_for_forest_management_planning.pdf

irregular spaces. The forest should appear to meet across the open space in some places so that the corridor does not split the forest completely. Where appropriate, and in line with relevant electrical and forest management safety guidance, consideration should also be given to the management of woodland edges for biodiversity and wildlife, e.g. wildlife bridges.

3.13 Consideration is also given to the Scottish Government's Control of Woodland Removal Policy[5] which requires that woodland removal should be kept to a minimum and that it should be replanted if felled. The policy only supports woodland removal where it would achieve significant and clearly defined public benefits. In most cases, compensatory planting may form part of this balance.

Biodiversity Net Gain

3.14 SPEN is committed to achieving Biodiversity Net Gain (BNG) across all of their projects. During routeing, high level assessments of habitat types, including condition and strategic significance are undertaken and designated sites and their proximity to the proposed routes are identified.

Technical Considerations

3.15 Technical considerations which can influence routeing include the existing and proposed electricity transmission network, access requirements, slope gradient, altitude, waterbodies, peat and the existence of wind farms.

Economic Considerations

3.16 In compliance with the duties imposed on SPEN in terms of Section 9 of the Electricity Act 1989, the proposed route must be 'economically viable'. This is interpreted by SPEN as meaning that as far as is reasonably practicable, and all other concerns being equal, the line should be as direct as possible and the route should avoid areas where technical difficulty or compensatory requirements would render the scheme unviable on economic grounds.

Routeing Strategy

3.17 A Routeing Strategy is developed to provide clarity on how the overall Routeing Objective will be achieved for the specific project in question. This is based on established practice for routeing and careful consideration of the specific technical and environmental constraints and opportunities relating to routeing an OHL through the identified study area. Further information on the detailed routeing strategy is provided in **Chapter 4** of this report.

Development of Route Options

3.18 A number of possible 'route options' are identified within the study area, informed by the available constraints data. This process involves the avoidance wherever possible of designated areas of high amenity value and irreplaceable habitat. These areas generally include areas of natural and cultural heritage value designated at a national, European or international level. These high amenity value areas are balanced with the technical constraints to inform the landscape led identification of route options.

Appraisal of Route Options

3.19 Each route option is appraised against the agreed environmental and technical routeing considerations, which have supporting objectives. For example, in relation to visual amenity, one objective may be to avoid/reduce, as far as is practicable, potential effects on views from residential receptors. In relation to technical considerations, and the existing electricity network, the objective may be to avoid technical conflicts with existing or planned infrastructure.

3.20 In conjunction with the collection of relevant data and the appraisal of route options, the routeing considerations and related objectives may be re-appraised and updated as more information becomes available. Route options may then be rejected or modified, or new route options developed. The options which perform poorly in this initial appraisal are not considered further and the remaining route options are then further refined and re-appraised if necessary. The objective of this process is to identify the 'preferred route' which is technically feasible and economically viable whilst causing the least disturbance to the environment and to people.

Selection of a Preferred Route

3.21 After the appraisal of route options, an emerging preferred option is subjected to a further technical check prior to SPEN confirming the preferred option. This is then taken forward for consultation. The routeing and consultation report (i.e. this document) provides details on route options considered and provides a clear and transparent justification for the selection of the preferred route option.

Modification of the Preferred Route

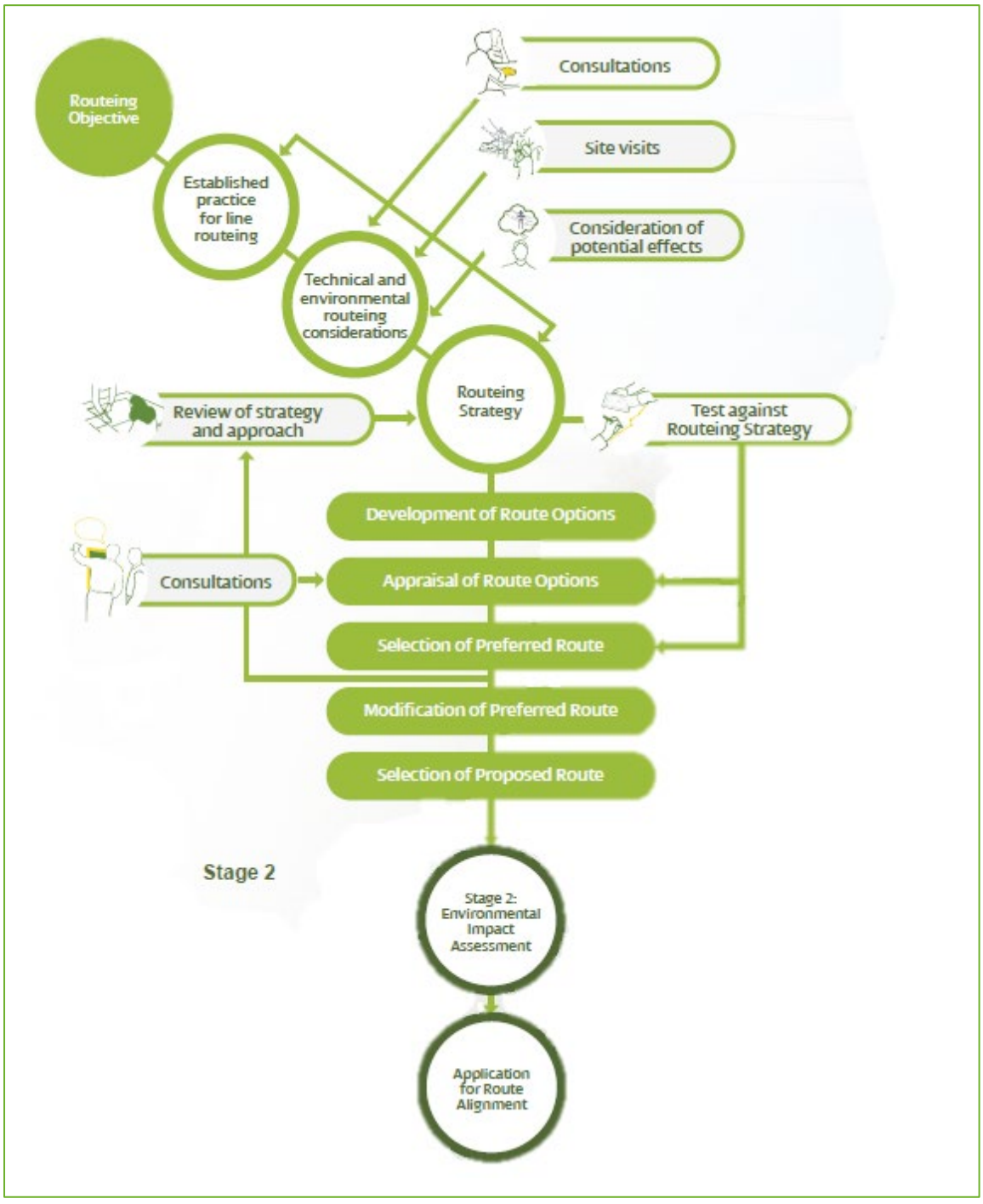
3.22 If required, following consideration of the consultation feedback the preferred route may be modified to reflect the feedback. Modifications may result in further consultation if necessary.

[5] https://forestry.gov.scot/publications/285-the-scottish-government-s-policy-on-control-of-woodland-removal/viewdocument/285

Selection of the Proposed Route

3.23 The preferred route, with any post consultation modifications, is subsequently confirmed by SPEN as the proposed route. This is then subject to environmental survey, detailed design to establish a final alignment, including locations for towers/poles and for any ancillary development required such as temporary construction access tracks, laydown areas and construction compounds. The final design is then subject to the EIA/Environmental Appraisal.

Figure 3.1: Routeing Methodology



Chapter 4
Identification of Route Options

The Project Routeing Strategy

4.1 The Routeing Strategy, which has informed the identification and appraisal of the route options for the Harestanes West Wind Farm 132kV Overhead Line Grid Connection is as follows:

> *"Route options for a continuous 132kV OHL will seek to avoid high ground and ridgelines, responding to the grain of the landscape, subject to avoiding areas of highest amenity value as far as possible. In more densely populated areas and where there are other competing environmental and/or technical constraints, the weighting and balancing of these constraints will be given careful consideration."*

The Study Area

4.2 The first step in the routeing process involved identification of the study area, predominantly for the purposes of gathering data specific to the project area. In identifying the study area, it was important to ensure that this was large enough to accommodate all likely route options reflecting the Routeing Objective and Routeing Strategy.

4.3 On the basis of the Routeing Objective, the study area was required to be able to accommodate a continuous 132kV OHL from the Harestanes West Wind Farm's proposed substation to the existing 132kV 'BR Route'.

4.4 From a technical perspective, the OHL must connect into a tension tower on the existing 132kV BR Route. Suspension towers are typically unsuitable for a tie in connection as they are not designed for transversal loads (which would be introduced from the additional span joining the tower). Additionally, the suspension tower's freely swinging suspension insulators could present internal clearance issues to other attaching spans, while the tower itself would likely not offer any obvious attachment points to support the attachment of the tying in span. There are four tension towers on the BR route within the study area; tower BR77, BR72, BR70 and BR61 and these have been considered in the routeing appraisal. The connection point will also include the provision of a circuit breaker compound (as discussed in **Chapter 2**).

4.5 A preliminary check was also carried out to identify the presence of international, European or nationally designated

areas within or immediately adjacent to, the study area, to ensure that potential effects on these areas could be considered and avoided through amending the study area. Taking account of the above, and also informed by topography, the maximum area across which the route options were likely to be located, was identified. The study area is shown in **Figure 4.1**.

Study Area Description

4.6 The study area covers the area between the Forest of Ae to the north; Shieldhill to the east; the eastern extents and land to the south-east of Dumfries to the south; and Kirkton to the west. The study area covers an area of approximately 7,853 ha and is entirely contained within the Dumfries and Galloway Council area. Much of the study area is relatively rural in nature, comprising agricultural land, with hedgerows, and interspersed with areas of woodland and blocks of coniferous forest. There are a number of small settlements across the study area including the Village of Ae to the north; Amisfield, Tinwald and Torthorwald, on the western flank of the Torthorwald Ridge to the east of the study area; and Locharbriggs and Kirkton on the eastern side of Nithsdale to the west of the study area. The southern extents of the study area display a denser settlement pattern, being located on the eastern fringes of the town of Dumfries.

4.7 Topography across the study area varies. The highest ground is located to the north, in the more upland area within and south of the Forest of Ae. There is a high point of 307m Above Ordnance Datum (AOD) to the north of the study area at Glencorse Hill. The landform then generally falls in elevation to the south, with the south-western extents of the study area encompassing the lower reaches of Nithsdale. The ground rises to the east of the study area as it encompasses the hills and higher ground within Torthorwald Ridge. As such, the varied topography across the study area represents both potential opportunities for, and constraints to, the routeing of overhead transmission infrastructure.

4.8 The existing electricity transmission network within the study area currently includes the existing 132kV 'BR Route' OHL, which defines the southern extents of the study area. Other electricity infrastructure is generally limited to the distribution network.

4.9 There are a small number of operational and proposed wind farms to the north of the study area, including the operational Dalswinton (15 turbines at 121m to tip), Harestanes (68 turbines at 121.5m to tip) and Minnygap (10 turbine 125m to tip) and the proposed Harestanes South (7 turbines at 200m to tip). These schemes are located to the west and north-east of the proposed Harestanes West wind farm, for which the new OHL will provide a grid connection.

4.10 The main communication routes within the study area comprise the following:

- the A701, which crosses the study area from south-west to north-east and links Dumfries to the M74 near Moffat;
- the A75, which provides the main route along the southern edge of Dumfries and Galloway and passes round to the north of Dumfries;
- the A709, also to the south of the study area, which links Dumfries to Lockerbie, and the M74 to the west; and
- the railway line which links Dumfries to Glasgow and passes through Nithsdale to the south and south-west of the study area.

4.11 Communication routes are a key consideration during the routeing process as crossing certain A roads is unavoidable.

Planning Policy Context

National Planning Policy

4.12 National Planning Framework 4 (NPF4) was adopted on 13th February 2023 and supersedes NPF3 and Scottish Planning Policy (SPP). The Planning (Scotland) Act 2019 elevates the status of the National Planning Framework from material consideration to being part of the development plan. The Act also includes a planning purpose for the preparation of the NPF, being *"to manage the development and use of land in the long-term public interest"*.

4.13 Part 1 of NPF4 sets out an overarching spatial strategy for Scotland to 2045. Page 3 states that *"the global climate emergency means that we need to reduce greenhouse gas emissions and adapt to the future impacts of climate change"*. The NPF4 Policy on Energy (Policy 11) emphasises the Scottish Government's commitment *"to encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure…." (page 53)*.

4.14 Policy 11(a)(ii) further notes that grid transmission and distribution infrastructure will be supported.

4.15 Policy 11(e) provides details of which impacts are expected to be considered through project design and mitigation, including impacts on residential amenity, landscape and visual impacts, public access, historic environment, etc. Furthermore, Policy 11(e) notes that *"in the case of proposals for grid infrastructure, consideration should be given to underground connections where possible"*.

4.16 NPF4 identifies transmission infrastructure as a national development where there is support for *"electricity generation and associated grid infrastructure throughout*

Scotland…helping to reduce emissions and improve security of supply" (page 7). National Development 3: Strategic Renewable Electricity Generation and Transmission Infrastructure *"supports renewable electricity generation, repowering and expansion of the electricity grid"* (page 103). NPF4 acknowledges that "*the electricity transmission grid will need substantial reinforcement including the addition of new infrastructure to connect and transmit the output from new on and offshore capacity to customers in Scotland, the rest of the UK and beyond*" (page 103).

4.17 There is further acknowledgement at page 103 that *"additional electricity generation from renewables and electricity transmission capacity of scale is fundamental to achieving a net zero economy…"*

4.18 Developments for new and/or replacement upgraded on and offshore high voltage electricity transmission lines, cables and interconnectors of 132kv or more are now classified as national developments. As the Harestanes West Wind Farm 132kV Overhead Line Grid Connection comprises a new 132kv OHL, the proposals will be classed as a national development.

Local and Strategic Planning Policy

4.19 The Local Development Plan (LDP) covering the study area is the Dumfries and Galloway Local Development Plan 2 (LDP2) (adopted October 2019)[6].

4.20 The LDP2 is a strategic land use plan that sets out the strategic spatial priorities and policies for Dumfries and Galloway and identifies land for specified uses (e.g. housing/industry etc.) to provide certainty for development. The LDP2 and accompanying supplementary guidance replaces the Dumfries and Galloway LDP (2014).

4.21 Para 4.103 of LDP2 refers to the Scottish Government 's commitment to increasing the amount of electricity generated from renewable sources. Para. 4.102 states that *"the provision of infrastructure is fundamental to the deliverability of a development proposal"*.

Identification and Mapping of Routeing Considerations

4.22 The Holford Rules are broadly hierarchical with Rule 1 deemed the first rule to be considered in routeing. Rule 1 relates to the avoidance, where possible, of *"major areas of highest amenity value"*. Holford Rule 2 makes the following recommendation: *"avoid smaller areas of high amenity value or scientific interest by means of deviation"*.

4.23 As the Holford Rules do not define what constitutes a major area (Rule 1), and the importance of the areas is irrespective of size, smaller areas of highest amenity value e.g. Scheduled Ancient Monuments (Rule 2) were also mapped at this stage alongside the larger areas.

4.24 The Holford Rules do not identify which designated areas constitute areas of *highest amenity value*. However, SHETL clarification note b) (see **Appendix A**) states that areas of highest amenity value *"require to be established on a project-by-project basis considering Schedule 9 of the Electricity Act, 1989"*, and provides examples to be considered.

4.25 In this routeing study, the term 'environmental' has also been used in place of 'amenity' (with the exception of residential amenity) to reflect more recent thinking which also seeks to recognise the intrinsic values of such areas.

4.26 On this basis, 'areas of highest environmental value' (Holford Rule 1) located within the study area and therefore considered within this stage of the routeing process, include the national level designations listed below, and shown on **Figure 4.2:**

- Sites of Special Scientific Interest (SSSIs), as defined in the Wildlife and Countryside Act 1981 (as amended) as areas of land or water which are of special interest by reason of their flora, fauna or geographical or physiographical features;
- Areas of Ancient Woodland (AW), as defined by the Ancient Woodland Inventory (AWI) and Areas of Native Woodland of Scotland (NWS), as defined by the National Woodland Survey of Scotland.
- Listed Buildings (LBs) which are protected under the Listed Buildings and Conservation Areas (Scotland) Act 1997 and Scheduled Monuments (SMs) which are monuments of national importance, given legal protection under the Ancient Monuments and Archaeological Areas Act 1997.

4.27 These have been mapped where present and treated as 'avoid where possible', or where not possible, 'balance with other considerations'.

4.28 The presence of NatureScot (formally SNH) Priority Peatland Habitats (Class 1 and 2 peatlands) have been mapped. Class 1 areas are present within the study area and form an 'avoid where possible' constraint in the identification of route options. Watercourses, Native Woodland and Regional Scenic Areas have also been identified on **Figure 4.2**.

[6] The Dumfries and Galloway LDP2 (2019), Available [online]: https://www.dumgal.gov.uk/article/16130/ldp2

4.29 The Castle Loch Ramsar Site and Special Protection Area (SPA) was considered but later discounted due to this location some 4.3km east of the study area.

4.30 Supplementary Note a) of the Rules relates to residential areas, stating *"avoid routeing close to residential areas as far as possible on grounds of general amenity"*. There are several settlements, defined as towns and villages identified within the LDP, within the study area. These include Locharbirggs, Torthorwald, Heathall and Ae Village.

4.31 There are also a number of residential properties located throughout the study area. Therefore, whilst it is recognised that proximity to properties is not an absolute constraint to routeing, a 150m 'trigger for consideration' has been mapped around each residential property to allow this proximity to be balanced with other considerations, whilst also helping to identify possible 'pinch points'.

4.32 At this stage, all operational wind farms, wind farms with consent and those with valid planning applications were also mapped as these form an environmental constraint to routeing as committed development and also as a technical constraint due to the requirement for a separation distance between turbines and the OHL. A 3x rotor diameter buffer was also applied to reflect potential technical constraints associated with 'wake effects' from the turbines on the OHL. This buffer is a 'trigger for consideration' for routeing.

4.33 There are several 11kV OHLs running throughout the study area. There is also a 33kV OHL, the A701, A709, and A75 roads, and a railway line (located in the south of the study area) which have all been included as technical constraints. The routeing process will seek to avoid the railway line by connecting in the north as opposed to crossing it.

4.34 There are also several waterbodies within the study area, including the Water of Ae and tributaries, Lochar Water Side Burn and Amisfield Burn (tributaries of the River Nith and have been included as both an environmental and technical constraints.

4.35 The Torthorwald Ridge Regional Scenic Area (RSA) covers a large area to the east and south-east of the study area. The DGC Regional Scenic Areas Technical Paper, 2018[7] provides a description of this area. This local level landscape designation has been considered during the route option appraisal stage.

Identification of Route Options

4.36 Given the nature of overhead transmission lines, the primary environmental effects are likely to be landscape and visual effects. The best way to limit adverse effects on landscape and visual amenity is by careful line routeing, led by landscape architects, based on professional judgement and informed by fieldwork.

4.37 Holford Rules 1 and 2, as described above, formed the basis for the landscape led identification of route options. In addition, Rules 4 and 5 of the Holford Rules identify that OHL infrastructure is judged to be more widely visible from surrounding areas when located on higher ground, for example ridges and skylines. Holford Rule 3 which states that, other things being equal, the most direct line should be chosen, with no sharp changes in direction, is also taken account of in identifying route options. The presence of residential properties within the study area and the 150m 'trigger for consideration' also played a key role in identifying route options.

4.38 Following a desk-based mapping exercise to define potential route options based on the environmental and technical constraints, a site visit was undertaken by LUC's landscape architects to further refine the potential route options for taking forward to the appraisal stage.

Identification of Tie-in/Connection Points

4.39 As noted previously, suspension towers are typically unsuitable for the tie in connection as they are not designed for permanent transversal loads. There are four tension towers within the study area which, from a technical perspective, could, prior to further technical considerations, be capable of accommodating the connection of the proposed OHL route. Of the four tension towers available within the study area, towers BR77 and BR70 are located within the 150m trigger for consideration zone which is mapped around residential properties and were considered at the outset as unfavourable locations for the OHL to terminate due to the proximity to the residential properties. This also takes account of the need to provide space to accommodate the circuit break compound. In this regard, the tie-in/connections points considered in the route options were BR72 and BR61. **Figure 4.2** illustrates the positioning of the tension towers amongst the environmental considerations (with further detail provided in **Figures 4.4a-d**).

Description of Route Options

4.40 **Figure 4.3** provides an overview of route options across the study area. The route options have been split into five sections (Sections A, B, C, D and E – see **Figures 4.4 a-d**). Each section has a different number of route options within, as described below. The routeing appraisal presented in **Chapter**

[7] https://www.dumgal.gov.uk/media/19851/Regional-Scenic-Areas-technical-paper/pdf/Regional_Scenic_Areas_Technical_Paper.pdf?m=637064038441030000

5 identifies the route option preference for each section, to come to an overall preferred continuous route option.

Section A

- Route Option A1: starting from the proposed substation to the north of the study area, this route option travels south-east, passing to the immediate south of the Village of Ae and continuing to the south-east towards Johnfield Moss, to the west of the A701.
- Route Option A2: this route option travels in a more southerly direction from the proposed substation, passing to the west of Glendenholm Moor and then turning to the south-east travelling towards Johnfield Moss.
- Route Option A3: this route option follows a similar alignment to Route Option A2 but deviates slightly further south over the higher ground to the west of Johnfield Moss.

Section B

- Route Option B1: this route option crosses the A701 either side of Johnfield, continues south, crossing Amisfield Burn and routes through the Torthorwald Ridge in the valley between Hightown Hill/ Hempland Hill and Black Hill (routeing to the east of Bruntshields) continuing south towards the property cluster around Tinwald House.
- Route Option B2: this route option follows a similar alignment to Route Option B1 but passes through the Torthorwald Ridge in the valley between Hightown Hill/ Hempland Hill and Black Hill to the west of Bruntshield.
- Route Option B3: this route option crosses the A701 to the north of Amisfield, passing over the western flank of the Torthorwald Ridge to the east (and above) Amisfield and Tinwald continuing south towards Tinwald House.
- Route Option B4: this route option follows a similar alignment to Route Option B3; however, it deviates to the south of Tinwald Shaws on the approach to Tinwald House.
- Route Option B5: this route options travels south-west from Johnfield Moss, passing on lower ground to the west of Amisfield and crossing the A701 to the west of Tinwald before continuing south to the area to the south-west of Tinwald House, at the end of Section B.

Section C

- Route Option C1: this route option passes to the north-east of Tinwald House (and the small cluster of properties around it) crossing the western flank of Hempland Hill before continuing south-west towards the A709.
- Route Option C2: this route option passes to the south-west of Tinwald House continuing south towards the A709.
- Route Option C3: this route option passes along lower ground to the north-east of Heathhall and west of the Low Road, continuing south-east towards the A709.

Section D

- Route Option D1: this route option crosses the A709 to the west of Torthorwold and continues south-east stopping to the north of the A75.
- Route Option D2: this route option follows a similar alignment to Route Option D1 however, in the central section of the route option is deviates west of Trabeattie and Drumbreg and stops to the north of the A75.
- Route Option D3: this route option crosses the A709 to the east of Barton House and stops to the north of the A75. continues south and then crosses the A75 to the east of Nether Dargavel, before joining the 132kV 'BR Route' OHL.
- Route Option D4: this route option follows a similar alignment to Route Option D3 however, in the central section of the route option is deviates west of Mid Dargavel.

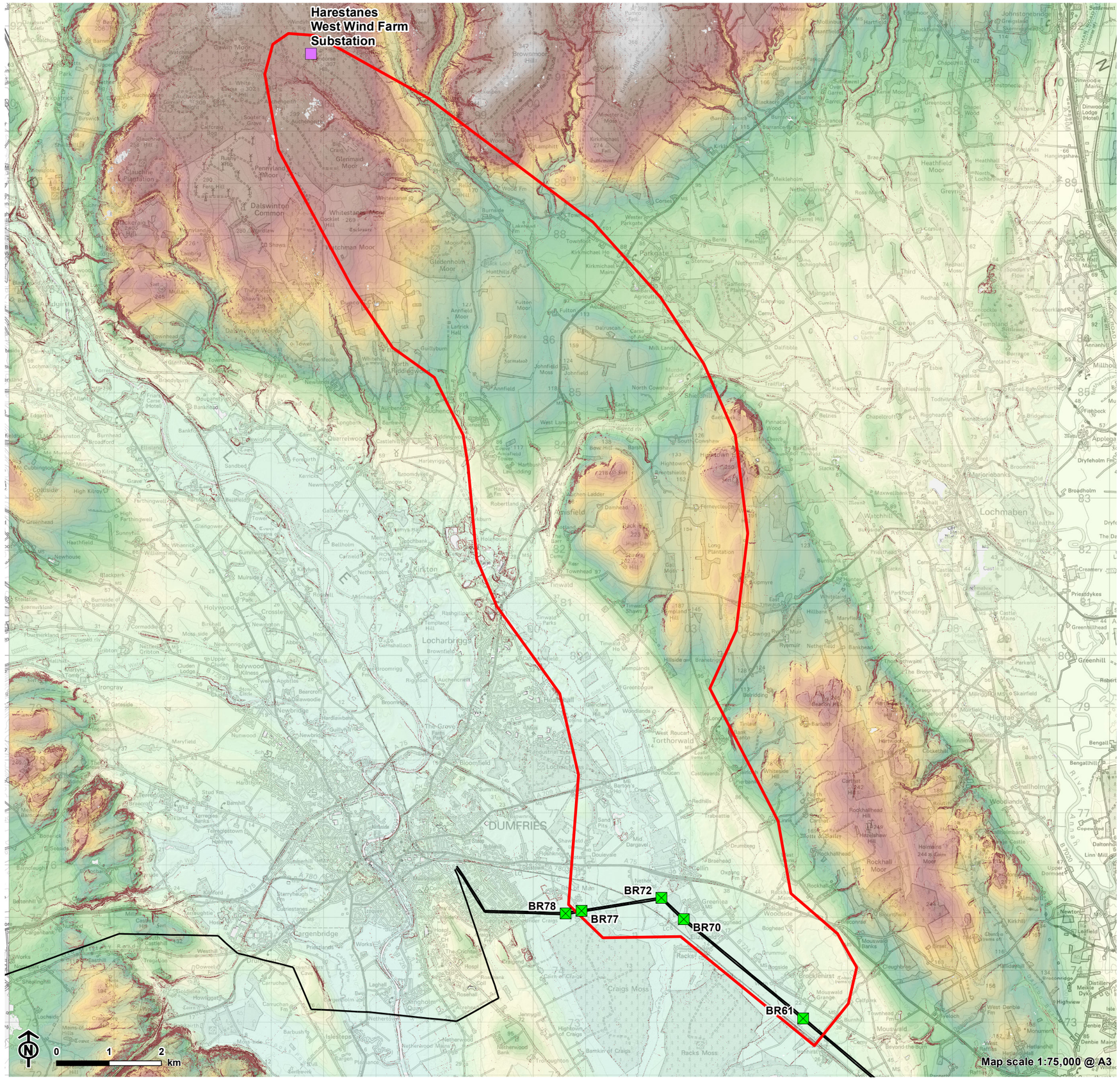
Section E

- Route Option E1 (to tower BR61): this route continues from the north side of the A75 west of Woodside and east of Rigghead. The route option then passes to the north-east of Broklehirst, joining the 132kV 'BR Route' OHL near Mouswald Grange at tower BR61.
- Route Option E2 (to tower BR61): this route continues from the north side of the A75 west of Woodside and east of Rigghead. The route option then travels west to cross the B724 to then run parallel with the existing 132kV ‘BR Route’ OHL to join at tower BR61.
- Route Option E3 (to tower BR72): this route option also continues from the north side of the A75 and travels west to the north of Rigghead, running parallel to the A75 in a westerly direction crossing the B724 to the north of Greenlea, joining the 132kV 'BR Route' OHL near the Lochar Water at tower BR72.
- Route Option E4 (to tower BR72): this route continues south from the A75 to the east of Nether Dargavel, before joining the 132kV 'BR Route' OHL at tower BR72.

Harestanes West Wind Farm 132kV
Overhead Line Grid Connection
Routeing and Consultation Report
for SP Energy Networks

LUC

Figure 4.1: Study Area



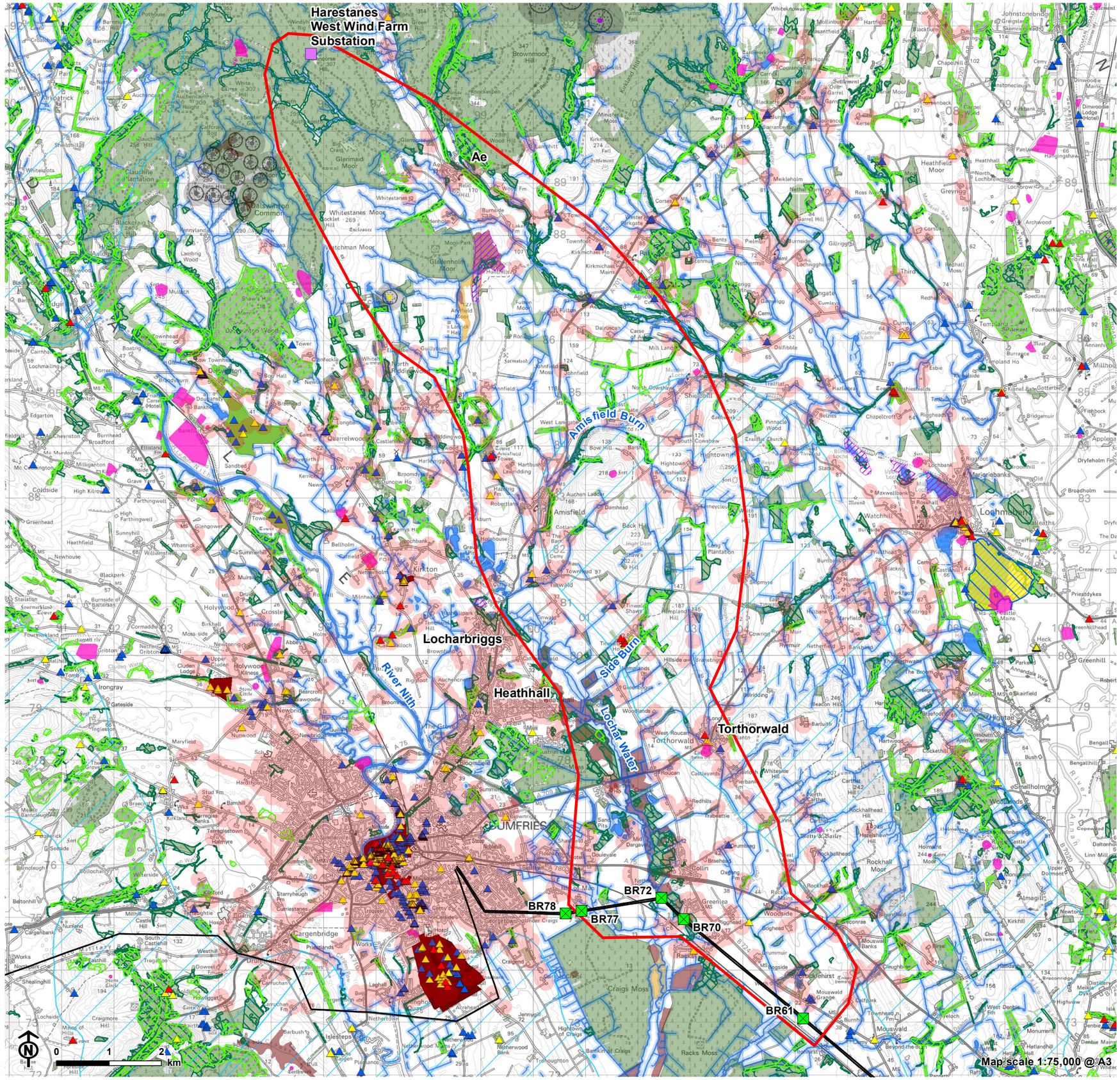
CB:JN EB:nunn_j LUC FIG04-01_11306_Ae_Study_Area_A3L 29/06/2023
Source: Scottish Remote Sensing Portal

SP ENERGY NETWORKS

Harestanes West Wind Farm 132kV
Overhead Line Grid Connection
Routeing and Consultation Report
for SP Energy Networks

LUC

Figure 4.2: Routeing Considerations



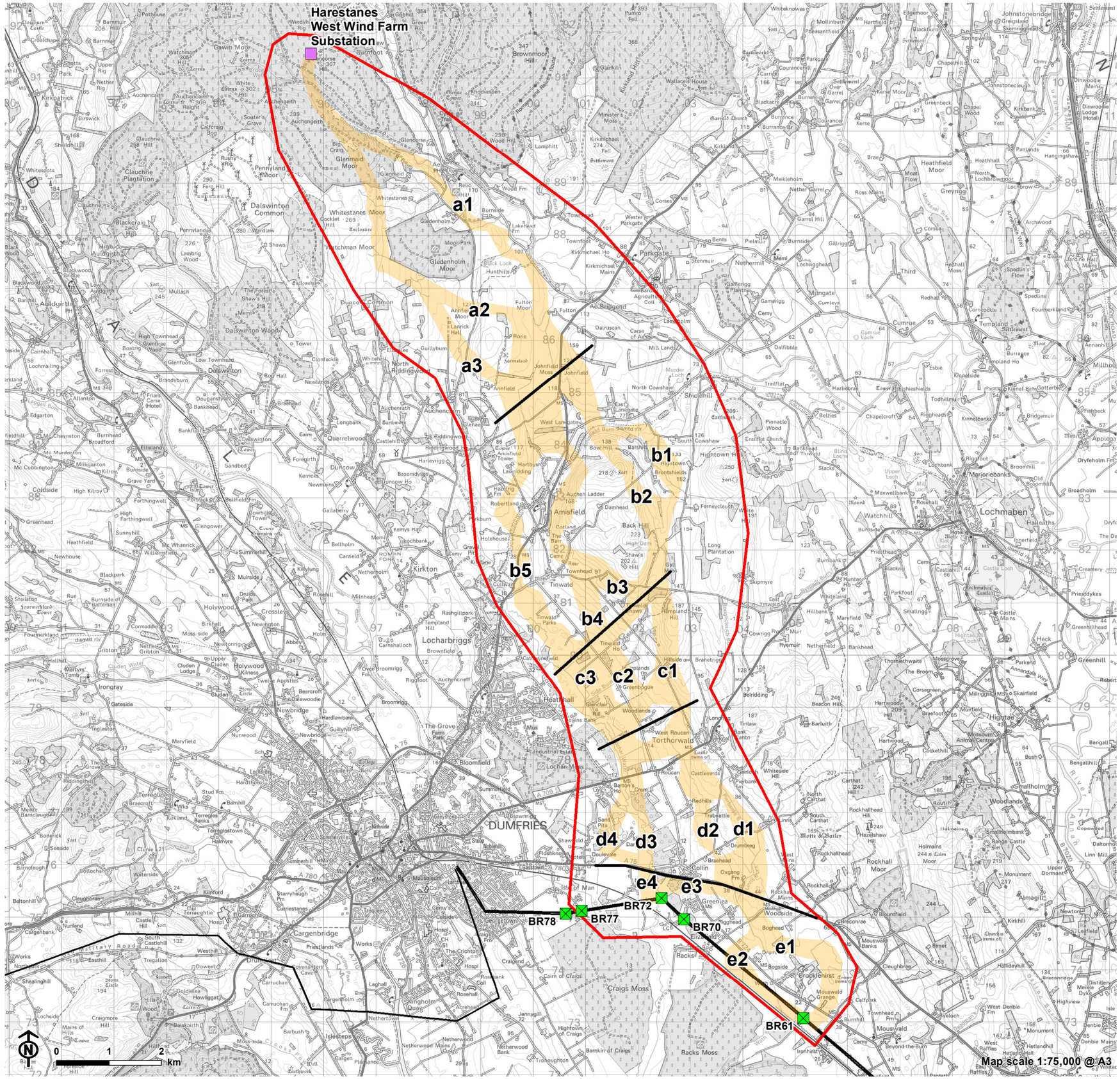
- Study Area
- Point of Connection
- Tension Towers for Connection
- Existing 132kV overhead line (OHL)
- Wind Turbine - Operational
- Wind Turbine - Application Submitted
- Wind Turbine - Design/Scoping
- Wind Turbine - Rotor Diameter x 3
- Wind Turbine - Tip Height + 10%
- 150m from residential address
- Conservation Area
- Scheduled Monument
- Listed Building - Category A
- Listed Building - Category B
- Listed Building - Category C
- Gardens and Designed Landscape
- DGC - Regional Scenic Area
- Special Protection Area (SPA)
- Ramsar site
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland 2014
- National Forest Inventory
- SNH Carbon Peatland - Category 1
- SNH Carbon Peatland - Category 2
- Watercourse
- Watercourse - 50m buffer

Map scale 1:75,000 @ A3

CB:JN EB:nunn_j LUC FIG04-02_11306_Ae_RouteingConsiderations_A3L 29/06/2023
Source:

SP ENERGY NETWORKS

Figure 4.3: Route Options



CB:JN EB:nunn_j LUC FIG04-03_11306_Ae_RouteOptions_A3L 29/06/2023
Source:

Harestanes West Wind Farm 132kV
Overhead Line Grid Connection
Routeing and Consultation Report
for SP Energy Networks

LUC

Figure 4.4a: Route Options Section a

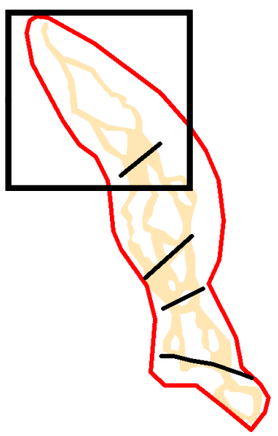
Harestanes West Wind Farm Substation

a1

a2

a3

- Study Area
- Point of Connection
- Route Options
- Wind Turbine - Operational
- Wind Turbine - Design/Scoping
- Wind Turbine - Tip Height + 10%
- Wind Turbine - Rotor Diameter x 3
- 150m from residential address
- Scheduled Monument
- Listed Building - Category B
- Listed Building - Category C
- Gardens and Designed Landscape
- DGC - Regional Scenic Area
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland 2014
- National Forest Inventory
- SNH Carbon Peatland - Category 1
- SNH Carbon Peatland - Category 2
- Watercourse
- Watercourse - 50m buffer



SP ENERGY NETWORKS

Map scale 1:30,000 @ A3

CB:JN EB:nunn_j LUC FIG04-04_11306_Ae_RouteOption_Sections_A3L 29/06/2023
Source:

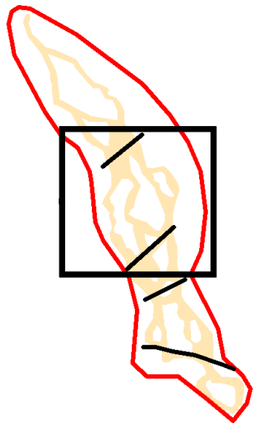
Harestanes West Wind Farm 132kV
Overhead Line Grid Connection
Routeing and Consultation Report
for SP Energy Networks

LUC

Figure 4.4b: Route Options Section b

a3
b1
b2
b3
b4
b5
c1
c2
c3

- Study Area
- Route Options
- 150m from residential address
- Scheduled Monument
- Listed Building - Category A
- Listed Building - Category B
- Listed Building - Category C
- Conservation Area
- DGC - Regional Scenic Area
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland 2014
- National Forest Inventory
- SNH Carbon Peatland - Category 1
- SNH Carbon Peatland - Category 2
- Watercourse
- Watercourse - 50m buffer



SP ENERGY NETWORKS

0 1 2 km

Map scale 1:25,000 @ A3

CB:JN EB:nunn_j LUC FIG04-04_11306_Ae_RouteOption_Sections_A3L 29/06/2023
Source:

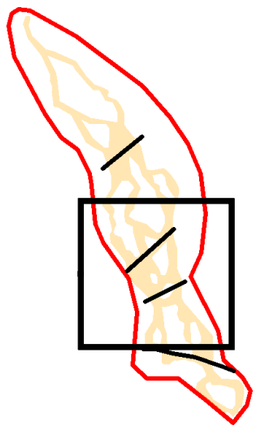
Harestanes West Wind Farm 132kV
Overhead Line Grid Connection
Routeing and Consultation Report
for SP Energy Networks

LUC

Figure 4.4c: Route Options Section c

b5
b3
b4
c3
c2
c1
d4
d3
d2
d1

Study Area
Route Options
150m from residential address
Scheduled Monument
Listed Building - Category A
Listed Building - Category B
Listed Building - Category C
DGC - Regional Scenic Area
Site of Special Scientific Interest (SSSI)
Ancient Woodland Inventory (AWI)
Native Woodland Survey of Scotland 2014
National Forest Inventory
SNH Carbon Peatland - Category 1
SNH Carbon Peatland - Category 2
Watercourse
Watercourse - 50m buffer



SP ENERGY NETWORKS

Map scale 1:25,000 @ A3

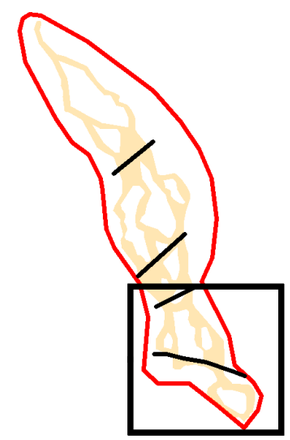
CB:JN EB:nunn_j LUC FIG04-04_11306_Ae_RouteOption_Sections_A3L 29/06/2023
Source:

Harestanes West Wind Farm 132kV
Overhead Line Grid Connection
Routeing and Consultation Report
for SP Energy Networks

LUC

Figure 4.4d: Route Options Section d and e

- Study Area
- Tension Towers for Connection
- Route Options
- Existing 132kV overhead line (OHL)
- 150m from residential address
- Scheduled Monument
- Listed Building - Category A
- Listed Building - Category B
- Listed Building - Category C
- DGC - Regional Scenic Area
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland 2014
- National Forest Inventory
- SNH Carbon Peatland - Category 1
- SNH Carbon Peatland - Category 2
- Watercourse
- Watercourse - 50m buffer



SP ENERGY NETWORKS

Map scale 1:25,000 @ A3

CB:JN EB:nunn_j LUC FIG04-04_11306_Ae_RouteOption_Sections_A3L 29/06/2023
Source:

Chapter 5
Appraisal of Route Options

Approach to the Appraisal of Route Options

5.1 The objective of the appraisal of the route options was to identify a preferred route for the Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project, in a comparable, documented and transparent way to identify an overall preferred route option.

5.2 As outlined in the Routeing Strategy, where the characteristics of the study area were such that they required to be balanced to enable the overarching Routeing Objective to be met, professional judgement, informed by both desk studies and field work, and reflecting the Holford Rules, was employed to identify the preferred route. This professional judgement was made on a case-by-case basis.

5.3 The process also sought to:

- Continue to reflect the overall Routeing Objective and Routeing Strategy;
- Continue to reflect SPEN's 'Approach to Routeing and EIA document';
- Continue to reflect the Holford Rules for Routeing Overhead Transmission Lines; and
- Consider Biodiversity Net Gain (BNG) priorities; and
- Draw out distinctions between the routes to enable the relative strengths and weaknesses of each to be identified.

5.4 The comparative appraisal of route options was undertaken in stages as set out below:

- Identification of appraisal criteria, together with their reasoning for inclusion;
- The application of appraisal criteria to each route option, following the appraisal methodology.
- A comparative appraisal of route options to identify a preferred route;
- A SPEN technical review, reflecting system design requirements (**Chapter 6**); and
- A cumulative appraisal with other OHL connections within the study area.

Technical Appraisal Criteria

5.5 All route options were reviewed by SPEN in relation to the system/network design requirements to assess the technical constraints of each route option. This review was undertaken to ensure that, based on the level of detail available, the preferred route is within the technical parameters required to construct the OHL. This included consideration of the following parameters:

- **Length of route**;
- **Altitude**;
- **Topography** (particularly slopes greater than 22 degrees however, slopes that were not greater than 22 degrees but steep in nature were also considered as these could be less favourable for routeing);
- **Buildability access constraints** (including restrictive roads and forestry access tracks);
- **Crossings of existing OHL transmission and distribution infrastructure**;
- **Proximity to existing OHL transmission and distribution infrastructure**;
- **Mineworking areas** (opencast etc);
- **Ground conditions** (including peat and alluvium);
- **Public service utilities** (crossings/ proximity) (including major pipelines);
- **Watercourse / Catchment areas crossings** (i.e. river, loch, reservoir);
- **Road / railway crossings along corridor**;
- **Wind farms** (existing and future developments);
- **Residential / Industrial areas**; and
- **Pollution** (consideration of corrosion rates).

5.6 During the technical review, a specific risk rating (high, medium or low) was allocated to each parameter for each Route Option. Parameters with low-risk ratings for all Route Options were not considered in the appraisal. The appraisal (**Appendix C**) therefore considers the following technical criteria:

- Altitude and Topography (including slopes);
- Crossings to existing OHL transmission and distribution infrastructure;
- Proximity to existing OHL transmission and distribution infrastructure;
- Road/Railway Crossings;
- Ground Conditions; and
- Watercourses/Catchment Areas Crossings.

5.7 The technical appraisal also considers proximity to wind farm developments. The technical appraisal of Route Option A (A2 and A3) identified a red/high risk relating to Duncow Common Wind Farm. This has since been discounted following the technical review as no further application has been submitted since the request for an EIA Scoping Opinion was submitted in 2013.

Environmental Appraisal Criteria

5.8 Based on the established practice for OHL routeing and the routeing considerations for the project; the route options were appraised using criteria, which continue to reflect the key considerations of the routeing methodology:

- Length of route;
- Landscape and visual amenity;
- Hydrology;
- Forestry;
- Biodiversity and geological conservation;
- Cultural heritage; and
- Land use.

5.9 The reasoning for the use of these criteria and an outline of the methodology for appraising each route option is set out below.

Length of Route Options

5.10 Holford Rule 3 states that *"other things being equal choose the most direct line"*. Although this rule primarily relates to avoiding sharp changes in direction, and therefore the need for more visually intrusive angle poles, choosing the most direct route may result in fewer adverse effects, than a longer, less direct route (taking due consideration of other constraints).

Landscape and Visual Amenity

5.11 Consideration of landscape sensitivity is determined with reference to both the susceptibility of the landscape to the type and scale of OHL development proposed, and the value attributed to the landscape through formal designation or otherwise, using published baseline landscape character information.

5.12 The NatureScot (formally known as SNH) digital map-based national Landscape Character Assessment (published in 2019) has been used as the basis for determining the susceptibility of Landscape Character Types (LCTs) across the study area. This was supplemented by information contained within published landscape capacity studies and

observations made during fieldwork to appraise the relative landscape 'fit' of each route option.

5.13 The LCTs found across the study area are shown on **Figure 5.1.** The study area is contained within three LCTs.

- Foothills with Forest – Dumfries and Galloway. This LCT is characterised by predominantly forest land cover. These foothills are generally found at heights of between 170 and 250m and are often undulating with gently rounded summits.
- Upland Fringe - Dumfries and Galloway. This LCT is characterised by high, gently rolling pastures. Topography is locally uneven, with numerous minor valleys, ridges and hallows.
- Lower Dale – Dumfries and Galloway. This LCT is characterised by post-improvement (19th and 20th Century) fields and farming, with a few small, designed landscapes and a scatter of relict land-uses. This LCT is a settled landscape which contains the region's most developed area including Dumfries.

5.14 A local level landscape character assessment was also undertaken. The Local LCTs found across the study area are shown on **Figure 5.2**, and the findings of the landscape susceptibility appraisal are presented in **Appendix B**.

5.15 There are no landscape designations comprising area of highest environmental value (Holford Rule 1) within the study area. However, landscape areas of 'high environmental value' (Holford Rule 2), including local level landscape designations (i.e. Torthorwald Regional Scenic Area), cover eastern parts of the study area, as shown on **Figure 5.1**.

5.16 Non-residential visual amenity as experienced by those in the wider landscape e.g., travelling along roads/tracks and working in the landscape, was also a factor in the appraisal of route options. This allowed topography, potential backclothing and visual prominence to be considered (similar to Holford Rule 4).

5.17 In relation to residential visual amenity, there are numerous inhabited properties across the study area, with a higher density of population focused to the south-west around the edges of Dumfries. For all properties, a 150m radius 'trigger for consideration' zone has been applied.

5.18 Consideration was also given to tourism receptors such as promoted/ key recreational viewpoints and promoted routes such as core paths. No Ordnance Survey viewpoints or long distance trails are within the study area.

Hydrology

5.19 In relation to potential conflicts with policy relating to flooding and to avoid potential increase to flood risk, SEPA flood zones were mapped using GIS with a 50m buffer being applied to all watercourses and bodies. When appraising the route options, the ability to span the flood zone (assuming an average span of 100m for wood poles) was considered. The appraisal considered the potential to cross the flood zone at the narrowest point, all other environmental/ technical considerations being equal.

5.20 The waterbodies/watercourses, which the route options cross, or are in proximity to were also considered during the appraisal process.

Forestry

5.21 Forest areas within each of the route options were identified through the use of aerial photography, combined with digital data available from NatureScot and Scottish Forestry (SF) sources:

5.22 These forests were then divided into three groupings:

- National Forest Inventory (NFI);
- Ancient and Semi Natural Woodland sites (ASNW); and
- Native Woodlands from the Native Woodland Survey of Scotland (NWSS).

5.23 The appraisal has considered all three forest types which are found throughout the study area.

5.24 Appraisal against the forestry criterion comprised analysis of the extent and location of the forests within the route options to identify net areas.

5.25 In general terms, a key objective in identifying a preferred route is based on identifying the lowest impact for forest.

5.26 Further consideration is also given to minimising impacts on forestry at the detailed route alignment stage, taking account of the need to create long term stable forest edges and to minimise impacts on any forestry management practices.

Biodiversity and Geological Conservation

Biodiversity Net Gain

5.27 NS habitat map data and aerial photography was reviewed to inform the appraisal of BNG opportunities.

5.28 A BNG optioneering tool which will use habitat mapping (Scotland's Environment Map / GIS aerial imagery) and the Defra scoring system to assign a RAG (red, amber, green) coding system, that relates to biodiversity value is being prepared for the use in the later detailed design stages of the project. The tool will also use policy and designated sites data, and habitat condition will be assumed as 'high', 'moderate' or

'Poor'/'N/A' (where automatically assigned such as for arable), prior to surveys taking place. It then details habitat type, size, condition, strategic value[8] and a unit value for each habitat area.

5.29 Linear habitats are difficult to analyse at a high level, with publicly available data regarding hedgerows and lines of trees unavailable and large numbers of watercourses being picked up by aerial mapping. Watercourses should be avoided where possible, however calculations of biodiversity units are not made due to the number of watercourses and the complexity of the crossings within each option. This will be calculated and refined as the project progresses. The preference is for a route that follows green coded routes where possible, minimising interaction with high value (amber/red) habitat.

5.30 Detailed BNG information will be provided at the later detailed design phases, with the initial routeing stage taking account of high level constraints and opportunities through the appraisal process.

5.31 There are no international designations (Ramsar, SPA and SAC) within the study area. There is only one national designation (SSSI) in the north of the study area which has been avoided by the route options.

5.32 The presence of NatureScot (formally SNH) Priority Peatland Habitats (Class 1 and 2 peatlands) was also taken into account during the appraisal. Peatland habitat was mainly distributed in the southern sections of the study area with an area of peatland habitat also found in the north within the SSSI designation.

Cultural Heritage

5.33 There are scheduled monuments, listed buildings, and non-designated heritage assets (recorded on Canmore / Dumfries and Galloway Historic Environment Record) within the study area.

5.34 Potential effects of the OHL proposal on the cultural significance of heritage assets, as a consequence of setting change, have been assessed by initially identifying assets within 500m of the route option, and 'screening' the assets using professional judgement to identify and appraise assets with the potential to experience an effect on their setting.

Land Use

5.35 When appraising the route options, where a route was located within proximity to committed development, the implications of this for the alignment and/or subsequent environmental appraisal stage were highlighted.

5.36 Committed development included consideration of existing and consented wind farms at this stage, with a 'trigger for consideration' zone of three times the rotor diameter placed around all turbines to account for the wake effect from the wind generated by the turbines as this can impact the OHL conductors. A 'trigger for consideration' zone of the tip height plus 10% buffer (topple distance) was also placed around all turbines.

5.37 Committed development data has been obtained from Dumfries and Galloway Council using the online planning portal to review live applications and consents. This was accessed on 19th May 2023. Notable consented developments include those consented within the last 5 years, new residential properties and new agricultural buildings).

5.38 The following notable consented applications have been identified within the route option areas:

- 18/1332/DPA – Erection of an agricultural building;;
- 18/0420/FUL – Erection of agricultural building;
- 19/0402/PIP – Erection of replacement dwellinghouse;
- 19/1390/FUL – Erection of dwellinghouse and installation of septic tank and soakaway and ground source heat pump; and
- 18/1565/PIP – Erection of two dwellinghouses.

5.39 The above noted committed developments are located within areas which have already been mapped as 'Residential Visual Amenity with '150m trigger for consideration zone' which have been considered in the routeing appraisal. Detailed design can consider any route alignments to avoid committed developments where required.

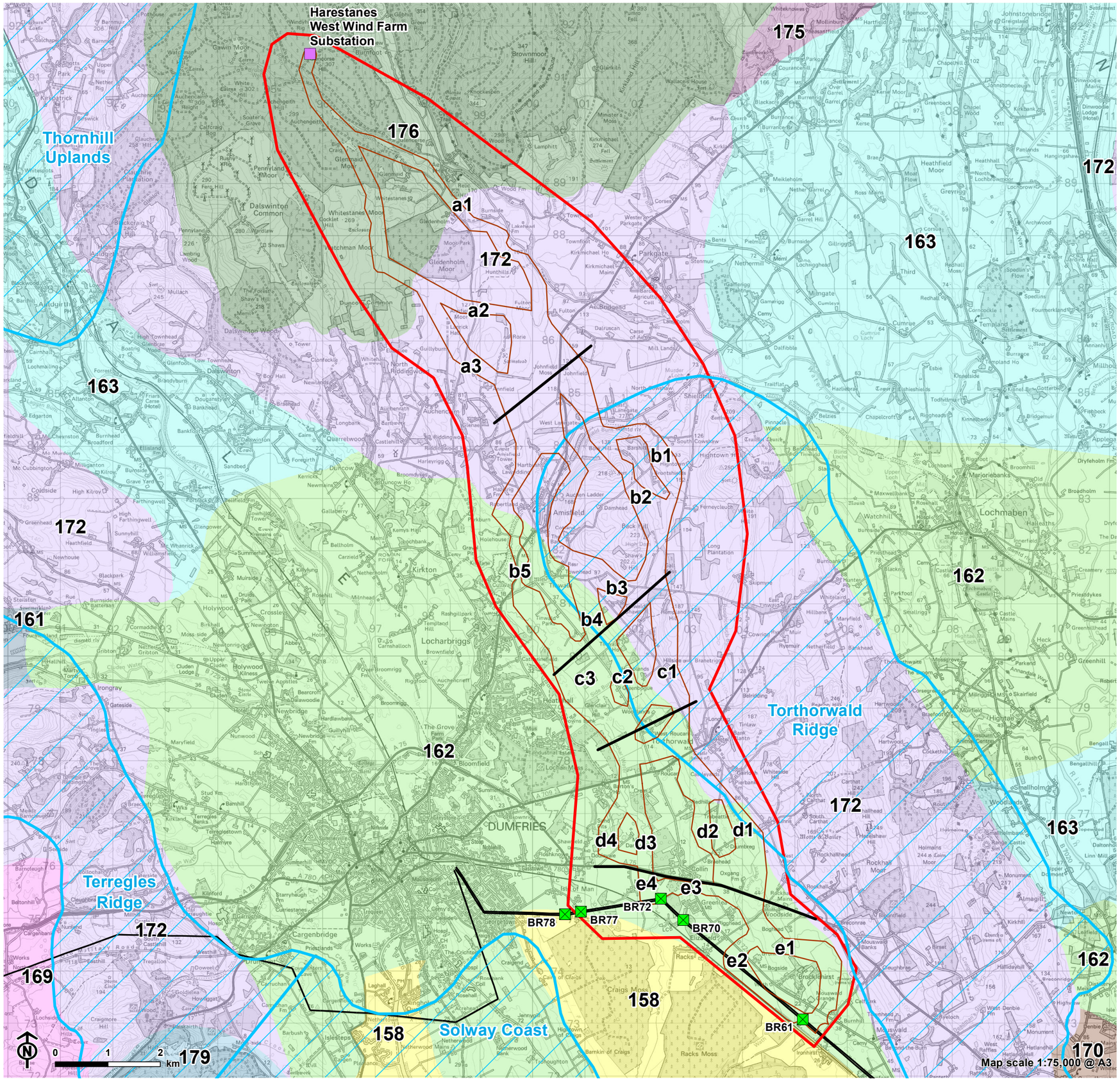
5.40 The Dumfries and Galloway Local Development Plan (LDP2) identifies areas of land designated for future use. The following notable sites have been identified to the west of the study area (outwith any route option corridors):

- DFS.H4 Heathhall College for housing development (176 units);
- DFS.H8 Catherinefield Farm for housing development (374 units); and
- DFS.B&I4 Heathhall Airfield for business and industry development (7.12 hectares) including a consented application (20/1203/FUL) for '*erection of industrial building, formation of car parking area and landscaping and associated works.*

[8] All habitats have been assumed as being in a location that's ecologically desirable.

LUC

Figure 5.1: Landscape Character Types (NatureScot, 2019) and Regional Scenic Areas



Study Area
Point of Connection
Tension Towers for Connection
Route Options
Existing 132kV overhead line (OHL)

Landscape Character Types (NatureScot, 2019)

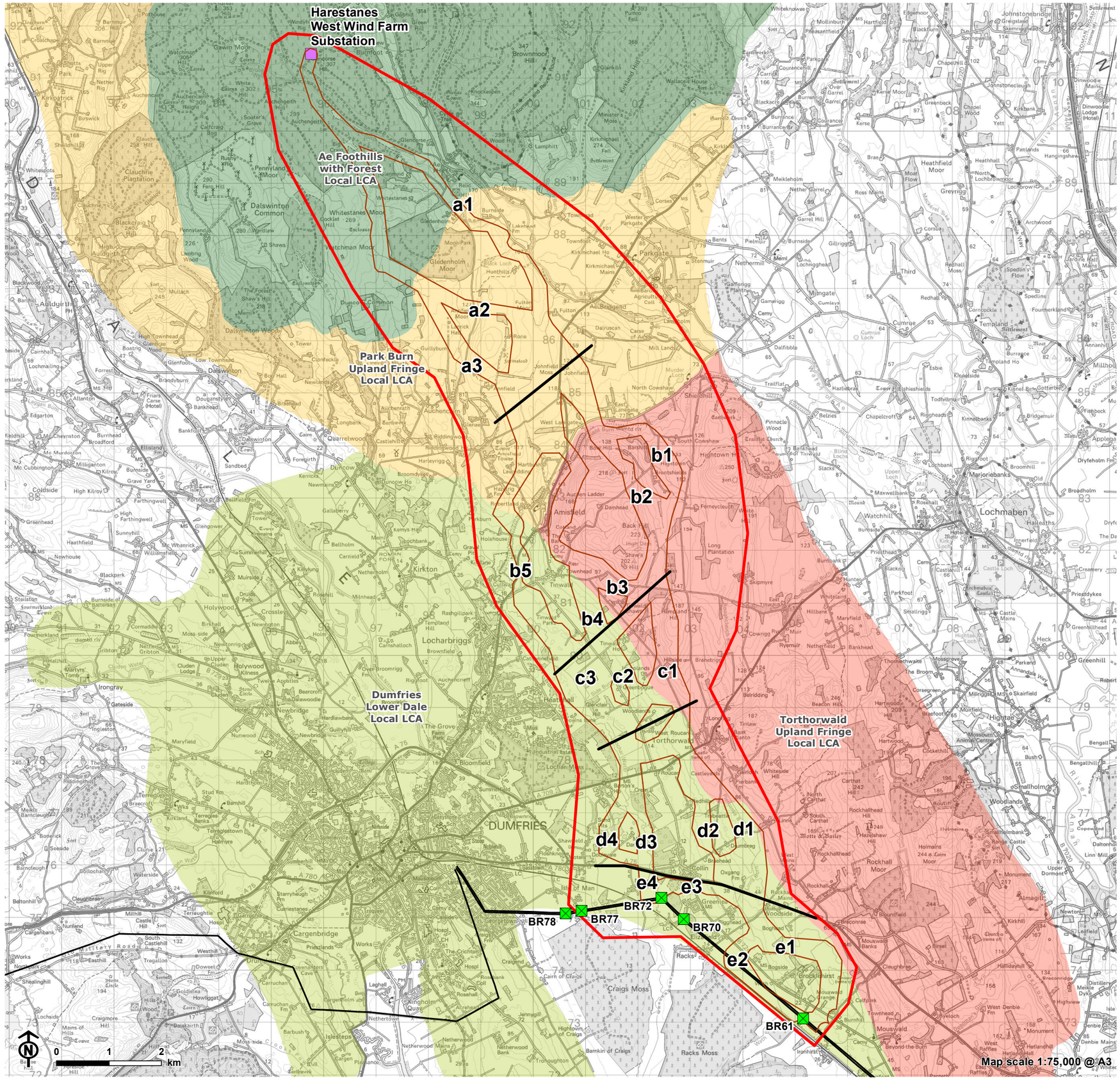
158: Coastal Flats - Dumfries & Galloway
161: Pastoral Valley - Dumfries & Galloway
162: Lower Dale - Dumfries & Galloway
163: Middle Dale - Dumfries & Galloway
169: Drumlin Pastures
170: Coastal Plateau - Dumfries & Galloway
172: Upland Fringe - Dumfries & Galloway
175: Foothills - Dumfries & Galloway
176: Foothills with Forest - Dumfries & Galloway
179: Coastal Uplands
Dumfries and Galloway - Regional Scenic Area

CB:JN EB:nunn_j LUC FIG05-01_11306_Ae_NatureScot_LCT_A3L 29/06/2023
Source:

SP ENERGY NETWORKS

LUC

Figure 5.2: Local Landscape Character Areas and Susceptibility to Overhead Line Development



CB:JN EB:nunn_j LUC FIG05-02_11306_Ae_Local_LCT_A3L 29/06/2023
Source:

SP ENERGY NETWORKS

Chapter 6
Appraisal Findings

6.1 The overall emerging preferred route for the 132kV overhead line (OHL), i.e. the preference, on balance, taking account of environmental and technical considerations is **Route Option A3-B5-C3-D2-E1.** This considers hydrology as both a technical and environmental constraint.

Environmental Considerations

6.2 The findings of the Environmental Route Option Appraisal are shown in **Appendix C.**

Section A

6.3 On balance, **Route Option A3** is the shortest in length and avoids routeing in proximity to the village of Ae minimising visual impacts. The route is also furthest from the SSSI, avoids AWI and has the fewest watercourse crossings. Through detailed design, the route can avoid Priority Class 2 Peatland habitat and the non-designated heritage assets.

Section B

6.4 There are no overall emerging preferences but through careful consideration of the environmental constraints, on balance, **Route Option B5** is preferred. Route Option B5 avoids the locally designated Torthorwald RSA and the Torthorwald Upland Fringe LLCA (medium-high susceptibility to OHL) and minimises potential views of the OHL from sensitive receptors including Barrs Hill fort Scheduled Monument.

6.5 The visual and setting effects of the OHL on the Grade A Listed Building, Amisfield Tower, and the non-designated heritage assets in particular, Tinwald cairn and Tinwald Place, Tower House will be considered through detailed design of the route alignment.

6.6 The SEPA Flood maps show a wide 200-year floodplain associated with Lochar Water, Amisfield Burn and Jerico Loch. This is close to the southern end of Route Option B5 and would be difficult to span but could be avoided by routing along the eastern side of Route Option B5.

6.7 Based on mapped watercourse on 1:25k Ordnance Survey, there are also a number of smaller watercourses along the route that would need to be considered through detailed route design and likely spanned.

Section C

6.8 On balance, **Route Option C3** is preferred. The route is the shortest in length; avoids the locally designated Torthorwald RSA and the Torthorwald Upland Fringe LLCA; and views of the route from the horizon are also minimised. The route also results in the least impacts to woodland and through detailed design, it is expected that impacts would be minimised further.

6.9 Option C3 is wide and although it parallels the Lochar Water, the 200-year floodplain of the watercourse and its tributaries can be avoided by detailed routeing in the eastern part of the option.

6.10 However, at the southern end of Route Option C3 (where it merges into Route Option D3/D4) there is a wide floodplain associated with the confluence of the Mill Cleugh watercourse and the Lochar Water, which would be problematic to avoid and span to get to Route D to the south.

Section D

6.11 On balance, the emerging preferred route is **Route Option D2**. The route avoids Priority Peatland Habitat, Ancient Woodland and a relatively wide 200-year floodplain associated with Lochar water which both Route Option D3 and D4 would affect.

6.12 Woodlands impacted by this route are limited to narrow farm hedgerow trees. Through detailed route design, the area of woodland affected could be minimised further.

6.13 The Route also passes through the locally designated Torthorwald RSA, at the northern extents of this section. However, there is greater scope to avoid routeing in the RSA in comparison to Route Option D1.

Section E

6.14 On balance, the emerging preferred route is **Route Option E4**. Route Option E4 is the shortest of the four route options in this section and therefore will have the fewest impacts on the environmental considerations in terms of least potential impact on forestry, fewer impacts to the historic environment and would be visible from the lowest number of properties.

6.15 However, as Route Option D2 is the preferred adjoining section and there is no physical way to link Route Option D2 to Route Option E4; Route Option E4 must therefore be discounted for consideration.

6.16 Environmentally the next preferred option would be Route Option E3 as it is the shortest of the remaining route options, however neither Route Option E1 or E2 have any major environmental constraints which would prevent these being progressed through detailed design, Route Option 2 however would bring new electricity infrastructure closer to the property at Wath on its western gable end. **Route Option E1** is preferred in terms of hydrology impacts as it would avoid the flood risks which are associated with the tie in to tower BR72 associated with Route Option E3, and flood risks associated with Route Option E2. Route Option E1 is also preferred in relation to biodiversity impacts as it avoids areas of peat and it would keep new electricity infrastructure to the north of the existing OHL, to the north of Fieldside Cottage.

6.17 The detailed appraisal findings are included in **Appendix C**.

Consideration of Cumulative Effects of Emerging Route Option Preference

6.18 As set out in **Chapter 3**, the routeing process takes cognisance of other OHL connections which share the project study area. This consideration of cumulative effects is undertaken in addition to the technical consideration of the OHLs in the area. When considering more than one project, combined or cumulative environmental effects can arise from the concentration of environmental effects in one area or the distribution of effects across a wider area. It is therefore necessary to find an appropriate balance using professional judgement and experience.

6.19 The other existing OHL connections considered from an environmental perspective in the cumulative environmental appraisal comprise the 11kV OHLs which are located throughout the study area and a 33kV line located along the southern extent of the study area.

6.20 Overall, there are no likely geographically widespread significant environmental cumulative effects which will prevent **A3-B5-C3-D2-E1** from being progressed further. Cumulative effects will, however, continue to be considered, and assessed where appropriate, throughout the alignment and EIA/Environmental Appraisal stages.

Technical Considerations

6.21 A technical appraisal was undertaken of all route option corridors.

6.22 Below is a summary of the technical risks associated with the preferred Route Options.

Section A

6.23 Overall, the SPEN technical appraisal identifies Route Options A2 or A3 as the preferred route taking account of the technical considerations. As noted above, on balance with the environmental appraisal, Route Option A3 is identified as being the preferred Route Option.

6.24 Potential technical risks identified for Route Option A3 include:

- Wind farms: Proximity to the proposed Duncow Wind Farm. This has since been discounted following the technical review as no further application has been submitted since the request for an EIA Scoping Opinion was submitted in 2013. The proposed wind farm is not currently being considered as a technical constraint to Route Option A3.
- Altitude: ≥ 200m ≤ 500m Above Ordnance Datum (AOD).
- Ground Conditions: No immediate signs of peat or poor ground, although part of the Route Option crosses open moorland where ground conditions could also prove poor.

Section B

6.25 Overall, all routes contain similar technical risks. On balance, Route Option B1 is the technical preferred route over the other Route Options due to its location on less steep ground and with only one potential technical risk identified in relation to the crossing of four 11kV OHLs.

6.26 As noted above, Route Option B5 was the overall selected route taking into consideration both the environmental and technical constraints.

6.27 Potential technical risks identified for Route Option B5 include:

- OHL: Three 11kV OHL crossings.
- Ground Conditions: Small section of Alluvium Ground. Route crosses the Amisfield Burn with SEPA flood maps showing flooding potential north-east of Locharbriggs.

6.28 In conjunction with the consideration of hydrology features through the environmental appraisal, it is considered that further technical flood modelling may be required to fully understand the technical constraints associated with the flood risk potential in this area. This will be further reviewed through the detailed design stage, however it is anticipated that a technical solution could be progressed.

Section C

6.29 Overall, Route Option C1 has only two medium risk ratings where Route Options C2 has one medium and one high risk and Route Option C3 has one high risk. All routes contain similar technical risks. As noted above, Route Option C3 was the overall selected route taking into consideration both the environmental and technical constraints.

6.30 Potential technical risks for Route Option C3 include:

- Ground Conditions: Full corridor is within poor alluvium ground, while majority of the corridor is shown to be in a high flood risk area.

6.31 In conjunction with the consideration of hydrology features through the environmental appraisal, it is considered that further technical flood modelling may be required to fully understand the technical constraints associated with the flood risk potential in this area. This will be further reviewed through the detailed design stage, however it is anticipated that a technical solution could be progressed.

Section D

6.32 Overall, on balance Route Options D1 or D2 are the preferred route taking account of technical considerations only. The technical review identified that Route Options D3 and D4 were of higher technical risk as both crossed an area of poor Alluvium ground and are shown to be in a high flood risk area. It was determined that these areas of higher risk could not be avoided and as such, were least preferred.

6.33 Potential technical risks identified within the SPEN technical reviews for Route Option D2 (the overall preferred Route Option taking into consideration both technical and environmental constraints) include:

- OHL: Two 11kV OHL crossings.
- Ground Conditions: No immediate signs of peat or poor ground. Short section with flood risk crossed just south of A75.
- Roads Crossings: Route crosses two major roads (A709 & A75). One major road is also a high load route (A75).

6.34 In conjunction with the consideration of hydrology features through the environmental appraisal, it is considered that further technical flood modelling may be required to fully understand the technical constraints associated with the flood risk potential in this area. This will be further reviewed through the detailed design stage, however it is anticipated that a technical solution could be progressed.

Section E

6.35 Overall, from a technical perspective, Route Options E1 and E2 are preferred as they contain only medium risks. Route Options E3 and E4 cross areas of peat and alluvium ground, with large portions of Route Option E4 within a high flood risk area. The termination point for Route Options E3 and E4 at BR72 also lies within a high risk flood area which will result in the construction of the circuit break compound within the high risk area.

6.36 When considered alongside the environmental considerations, Route Option E1 would be preferred as it has the fewest technical risks.

6.37 Potential technical risks associated with the Route Option E1 include:

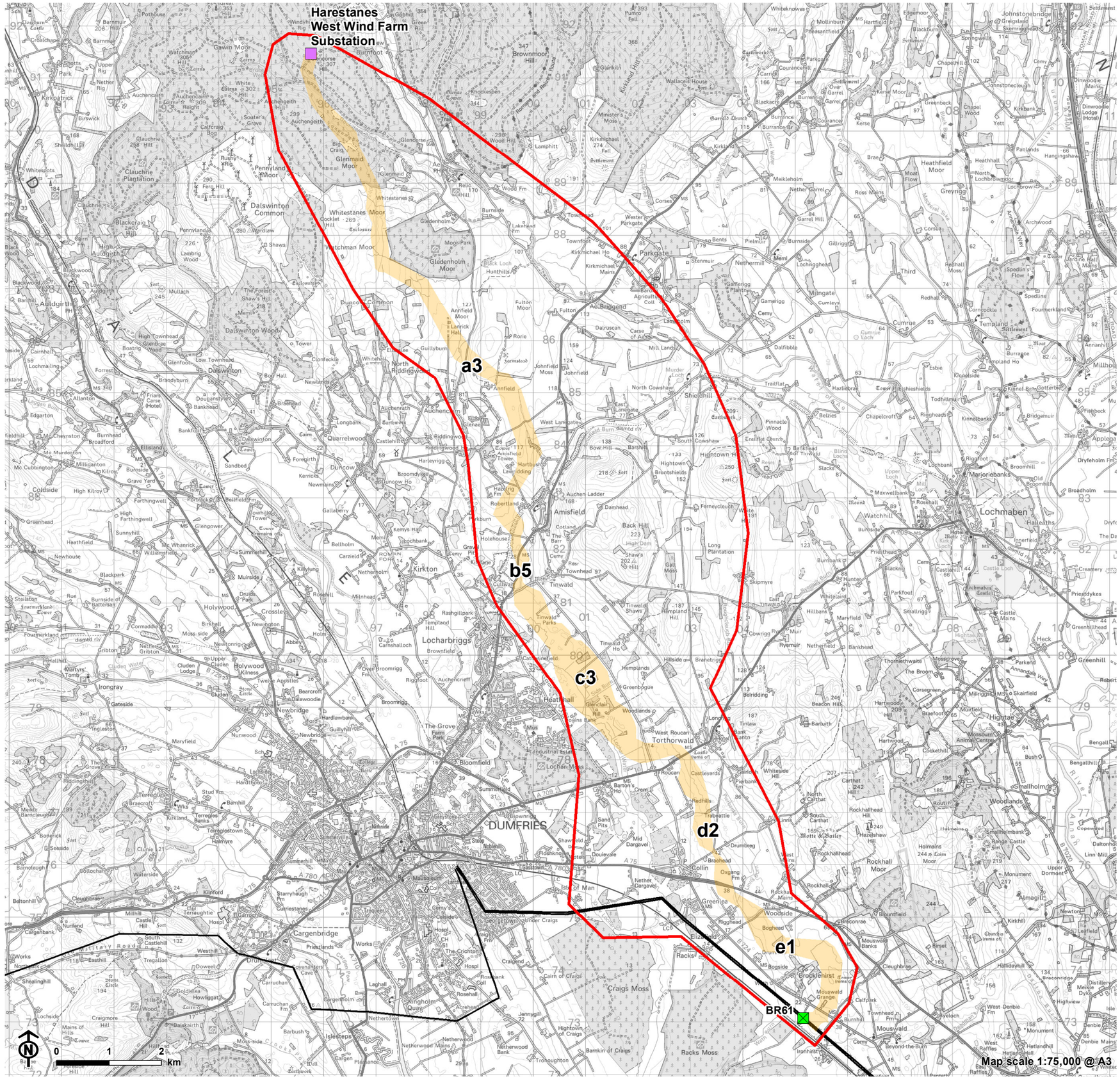
- OHL: One LV OHL crossing, two 11kV OHL crossings and three 33kV OHL crossings.
- Ground Conditions: No immediate signs of peat or poor ground. Short section with flooding risk crossed.

Conclusion

6.38 In accordance with the overarching project routeing strategy, the selection of the preferred route has primarily reflected the findings of the landscape and visual appraisal, subject to avoiding areas of highest amenity value. However, due to the nature of the other key environmental and technical constraints including the avoidance of areas of flood-risk, deep peat, woodland and consideration of the setting of cultural heritage features, these considerations have also influenced the preferred route choices. This is on the basis that the routeing stage comprised the most effective way of avoiding and/or minimising these potential effects.

6.39 On this basis, the environmental and technical appraisal undertaken as part of the routeing process has identified a continuous 132kV OHL route which meets the project routeing objective. The preferred route is confirmed as **Route Option A3-B5-C3-D2-E1** and is shown in **Figure 6.1**. The preferred route, along with the alternative route options considered, form the basis of this round of consultation with stakeholders and the public. Further details in relation to the consultation process are provided in **Chapter 7**.

Figure 6.1: Preferred Route



Study Area
Point of Connection
Tension Towers for Connection
Preferred Route
Existing 132kV overhead line (OHL)

CB:JN EB:nunn_j LUC FIG06-01_11306_Ae_Preferred_Route_A3L 29/06/2023
Source:

Chapter 7
Consultation Process and Next Steps

The Consultation Process

7.1 As set out in **Chapter 1**, SPEN will apply to the Scottish Ministers for consent to install and keep installed the Harestanes West Wind Farm 132kV Overhead Line Grid Connection under Section 37 of the Electricity Act 1989. SPEN will also apply for deemed planning permission for the line and associated works under Section 57(2) of the Town and Country Planning (Scotland) Act 1997. Whilst there are no formal pre-application requirements for consultation in seeking section 37 consent/deemed planning permission, SPEN is embracing best practice as outlined in the Scottish Government Energy Consents Unit's (ECU) Best Practice Guidance (July 2022). This guidance encourages applicants to engage with stakeholders and the public in order to develop their proposals in advance of such applications being made.

7.2 Therefore, prior to the submission, SPEN is carrying out consultation with stakeholders and the public.

7.3 Following the submission of application for Section 37 consent and deemed planning permission, the Scottish Government ECU will, on behalf of Scottish Ministers, carry out further consultation with the public and stakeholders, including Dumfries & Galloway Council.

Consultation Strategy

7.4 SPEN attaches great importance to the effect that its works may have on the environment and local communities and is very keen to hear the views of local people to help it develop the project in the most appropriate way.

7.5 The overall objective of the consultation process is to ensure that all parties with an interest in the Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project continue to have access to up to date information and are given clear and easy ways in which to shape and inform SPEN's proposals at the pre-application stage.

7.6 In addition, it is envisaged that the key issues identified through this process can be recorded and presented to decision makers to assist the consents process.

7.7 As part of the consultation strategy, SPEN will be holding two rounds of public consultation events for the public, stakeholders and consultees to provide comments on the proposals. Details of the consultation process are set out below.

Consultation Launch and Duration

7.8 The consultation will run from **Tuesday 1st August to Friday 1st September 2023**.

7.9 Prior to the consultation events, an advert will appear in the Dumfries Courier (a local newspaper) for two consecutive weeks in w/c 14th August 2023 and w/c 21st August 2023. The advert will provide information on the project, where and when consultation will take place and confirm that comments received at this stage are informal comments to SP Energy Networks, with the opportunity to comment formally to the Energy Consents Unit available once an application has been submitted to them. A copy of the advertisement text to be publicised in the local newspaper is provided in **Appendix D**.

7.10 Leaflets have also been distributed to local properties within the study area and the properties at Locharbriggs and Heathhall (w/c 24th July 2023). The leaflet distributed is contained in **Appendix E**.

7.11 The closing date for sending responses to SPEN will be midnight on **Friday 1st September 2023**. Following this date, the information will remain accessible online (on the project website) and available to download.

Consultees

7.12 SPEN wishes to consult with relevant stakeholders and gain their views on the identified proposed route as well as the alternatives considered. The consultation will seek to gain views from the following broad groups:

- Statutory and non-statutory consultees, including community councils;
- Known local interest and community groups operating in Dumfries & Galloway Council area;
- Elected members of Dumfries & Galloway Council area, the Member of Parliament (MP) and Members of the Scottish Parliament (MSPs) whose constituencies are within in the Dumfries & Galloway Council area; and
- Local residents, businesses and the public in general.

7.13 As noted above, leaflets have been distributed to local residents. Email correspondence has been sent to relevant stakeholders advising them of the consultation and seeking their views on the proposals. The list of stakeholders consulted can be found in **Appendix F.**

The Focus of the Consultation

7.14 This report presents the findings of Phase One of the Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project; the routeing process, resulting in identification of a preferred route.

7.15 The focus of the consultation process will be to ask for people's views on:

- The preferred route;
- The alternative route options considered during the routeing process;
- Any other issues, suggestions or feedback; particularly knowledge of the local area, for example areas used for recreation, local environmental features, and any plans to build along the preferred route.

Sources of Information about the Consultation

7.16 The principal source of information regarding the consultation will comprise the project leaflet, website and the in-person public events.

Project Leaflet

7.17 The leaflet includes details of the project, the consultation process, how to find out more and how to submit comments by feedback form, website, post or email, and by when. The leaflet will be emailed to community councils and known local interest and community groups operating in the Dumfries and Galloway Council area.

Project Website

7.18 The website will go live on Tuesday 1st August 2023: **www.spenergynetworks.co.uk/pages/overhead_line_for_harestanes_west_wf.aspx** and will contain publicly available consultation documents for viewing or download**.**

Consultation Documents

7.19 Hard copies of consultation documents will be lodged at publicly-accessible information points from **Tuesday 1st August 2023** until **Friday 1st September 2023** (during normal opening hours) for those who do not have access to the internet, cannot attend an exhibition or would prefer to see them in person. Details of these information points are listed below and in other consultation materials.

Public viewing locations

- Georgetown Library, Gillbrae Road, Georgetown Drive, Dumfries, DG1 4EJ; and
- Lochthorn Library, Edinburgh Road, Lochthorn, Dumfries, DG1 1UF.

Public Consultation Events

7.20 As part of the first round of public consultation events for the project, SPEN will hold two public exhibitions on **24th and 25th August 2023** where people can look at maps, talk to members of the project team and pick up a feedback form.

Locations have been chosen so that people within the consultation zone are only a short distance from their nearest exhibition by car or public transport. The dates and venues are listed in full in the project leaflet and on the website. The format will be an afternoon/evening drop-in.

7.21 The exhibitions will be held at the following locations from 12pm to 6pm on the days stated:

- **24th August 2023** at the Hetland Hall Hotel, Near Carrutherstown, A75, Carrutherstown, Dumfries, DG1 4JX; and
- **25th August 2023** at Heathall Community Centre, Barnett Rd, Heathhall, Dumfries, DG1 3RU.

How People can make Comments

7.22 People will be able to submit comments:

- In person at an exhibition (see above);
- In writing; or
- By email.

In Writing

7.23 SPEN will also accept comments relating to the specific focus of this round of consultation in writing. Letters are to be posted to the following address no later than midnight on **Friday 1st September 2023**:

Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project
Land and Planning Team
SP Energy Networks
55 Fullarton Drive
Glasgow
G32 8FA

7.24 If contacting SPEN by post, people are advised to allow up to 7 days for these to be received. It may not be possible to consider comments received after this date.

Email

7.25 SPEN will also accept comments relating to the specific focus of this round of consultation by e-mail to harestaneswestohl@spenergynetworks.co.uk no later than midnight on **Friday 1st September 2023**.

Next Steps

7.26 The responses received from the consultation process will be considered in combination with the findings of this report to enable SPEN to decide on the 'proposed' route to be progressed to the next stage. Following the consultation period, SPEN will consider all responses carefully and will subsequently prepare a Consultation Feedback Report setting out how consultation responses have been considered and how they have informed the selection of the proposed route. The feedback report will be published to the project website. In parallel, SPEN will submit a request for an EIA Screening Opinion to the Scottish Ministers to determine if EIA is required. It is proposed that a second round of public consultation will be undertaken following EIA Screening and this will be publicised in due course.

7.27 The proposed route will then progress to identify an OHL alignment, including individual pole positioning which will be informed by the Environmental Appraisal[9], detailed engineering ground surveys and discussions with landowners. This alignment, including all ancillary development, will be included in the application for Section 37 Consent and deemed planning permission.

7.28 SPEN will consult fully with affected landowners and occupiers on all aspects of the project and will give them an opportunity to comment on proposals as they progress.

[9] Subject to the Scottish Ministers confirming the Project does not require an EIA.

Appendix A

The Holford Rules and NGC and SHETL Clarification

The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines (with NGC 1992 and SHETL 2003 Notes)

Rule 1

Avoid altogether, if possible, the major areas of highest amenity, by so planning the general route of the line in the first place, even if the total mileage is somewhat increased in consequence.

Note on Rule 1

a. Investigate the possibility of alternative routes, avoiding altogether, if possible major areas of highest amenity value. The consideration of alternative routes must be an integral feature of environmental statements. If there is an existing transmission line through a major area of highest amenity value and the surrounding land use has to some extent adjusted to its presence, particularly in the case of commercial forestry, then effect of remaining on this route must be considered in terms of the effect of a new route avoiding the area.

b. Areas of highest amenity value require to be established on a project-by-project basis considering Schedule 9 to The Electricity Act 1989, Scottish Planning Policies, National Planning Policy Guidelines[10], Circulars and Planning Advice Notes and the spatial extent of areas identified.

Examples of areas of highest amenity value which should be considered are:
Special Area of Conservation (NPPG 14)[11]
Special Protection Area (NPPG 14)[12]
Ramsar Site (NPPG 14)[13]
National Scenic Areas (NPPG 14)[14]
National Parks (NPPG 14)[15]
National Nature Reserves (NPPG 14)[16]
Protected Coastal Zone Designations (NPPG 13)[17]
Sites of Special Scientific Interest (SSSI) (NPPG 14)[18]
Schedule of Ancient Monuments (NPPG 5)[19]
Listed Buildings (NPPG 18)[20]
Conservation Areas (NPPG 18)[21]
World Heritage Sites (a non-statutory designation) (NPPG 18)[22]

---

[10] The National Planning Policy Guidelines ("NPPG") have been superseded by the Scottish Planning Policy ("SPP") published on 23 June 2014. The references to the relevant equivalent paragraphs of the SPP are noted.
[11] Now noted in SPP paragraph 207.
[12] Now noted in SPP paragraph 207.
[13] Now noted in SPP paragraph 211.
[14] Now noted in SPP paragraph 212.
[15] Now noted in SPP paragraph 212.
[16] Now noted in SPP paragraph 212.
[17] Now noted in SPP paragraph 87.
[18] Now noted in SPP paragraphs 211-212.
[19] Now noted in SPP paragraph 145.
[20] Now noted in SPP paragraph 141.
[21] Now noted in SPP paragraph 143.
[22] Now noted in SPP paragraph 147.

Historic Gardens and Designed Landscapes (a non-statutory designation) (NPPG 18)[23]

Rule 2

Avoid smaller areas of high amenity value, or scientific interest by deviation; provided that this can be done without using too many angle towers, i.e. the more massive structures which are used when lines change direction.

Note on Rule 2

a. *Small areas of highest amenity value not included in Rule 1 as a result of their spatial extent should be identified along with other areas of regional or local high amenity value identified from development plans.*

b. *Impacts on the setting of historic buildings and other cultural heritage features should be minimised.*

c. *If there is an existing transmission line through an area of high amenity value and the surrounding landuses have to some extent adjusted to its presence, particularly in the case of commercial forestry, then the effect of remaining on this line must be considered in terms of the effect of a new route deviating around the area.*

Rule 3

Other things being equal, choose the most direct line, with no sharp changes of direction and thus with few angle towers.

Note on Rule 3

a. Where possible choose inconspicuous locations for angle towers, terminal towers and sealing end compounds.

b. Too few angles on flat landscape can also lead to visual intrusion through very long straight lines of towers, particularly when seen nearly along the line.

Rule 4

Choose tree and hill backgrounds in preference to sky backgrounds, wherever possible; and when the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees.

Rule 5

Prefer moderately open valleys with woods where the apparent height of towers will be reduced, and views of the line will be broken by trees.

Notes on Rules 4 and 5

a. Utilise background and foreground features to reduce the apparent height and domination of towers from main viewpoints.

b. Minimise the exposure of numbers of towers on prominent ridges and skylines.

[23] Now noted in SPP paragraph 148.

c. *Where possible follow open space and run alongside, not through woodland or commercial forestry, and consider opportunities for skirting edges of copses and woods. Where there is no reasonable alternative to cutting through woodland or commercial forestry, the Forestry Commission Guidelines should be followed (Forest Landscape Design Guidelines, second edition, The Forestry Commission 1994 and Forest Design Planning – A Guide to Good Practice, Simon Bell/The Forest Authority 1998).*

d. Protect existing vegetation, including woodland and hedgerows, and safeguard visual and ecological links with the surrounding landscape.

Rule 6

In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concatenation or 'wirescape'.

Note on Rule 6

a. In all locations minimise confusing appearance.

b. Arrange wherever practicable that parallel or closely related routes are planned with tower types, spans and conductors forming a coherent appearance. Where routes need to diverge allow, where practicable, sufficient separation to limit the impacts on properties and features between lines.

Rule 7

Approach urban areas through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, go carefully into the comparative costs of undergrounding, for lines other than those of the highest voltage.

Note on Rule 7

a. When a line needs to pass through a development area, route it so as to minimise as far as possible the effect on development.

b. Alignments should be chosen after consideration of impacts on the amenity of existing development and on proposals for new development.

c. When siting substations take account of the impacts of the terminal towers and line connections that will need to be made and take advantage of screening features such as ground form and vegetation.

Explanatory Note on Rule 7

The assumption made in Rule 7 is that the highest voltage line is overhead.

Supplementary Notes

a. **Residential Areas**

Avoid routeing close to residential areas as far as possible on grounds of general amenity.

b. **Designations of Regional and Local Importance**

Where possible choose routes which cause the least disturbance to Areas of Great Landscape Value and other similar designations of Regional or Local Importance.

c. **Alternative Lattice Steel Tower Designs**

In addition to adopting appropriate routeing, evaluate where appropriate the use of alternative lattice steel tower designs available where these would be advantageous visually, and where the extra cost can be justified. [*Note: SHETL have reviewed the visual and landscape arguments for the use of lattice steel towers in Scotland and summarised these in a document entitled Overhead Transmission Line Tower Study 2004*].

FURTHER NOTES ON CLARIFICATION TO THE HOLFORD RULES

Line Routeing and People

The Holford Rules focused on landscape amenity issues for the most part. However, line routeing practice has given greater importance to people, residential areas etc.

The following notes are intended to reflect this.

a. Avoid routeing close to residential areas as far as possible on grounds of general amenity.

b. In rural areas avoid as far as possible dominating isolated house, farms or other small-scale settlements.

c. Minimise the visual effect perceived by users of roads, and public rights of way, paying particular attention to the effects of recreational, tourist and other well used routes.

Supplementary Notes on the Siting of Substations

a. Respect areas of high amenity value (see Rule 1) and take advantage of the containment of natural features such as woodland, fitting in with the landscape character of the area.

b. Take advantage of ground form with the appropriate use of site layout and levels to avoid intrusion into surrounding areas.

c. Use space effectively to limit the area required for development, minimizing the impacts on existing land use and rights of way.

d. Alternative designs of substation may also be considered, e.g. ‘enclosed’, rather than ‘open’, where additional cost can be justified.

e. Consider the relationship of tower and substation structures with background and foreground features, to reduce the prominence of structures from main viewpoints.

f. When siting substations take account of the impacts of line connections that will need to be made.

INTERPRETATION OF THE HOLFORD RULES 1 AND 2 AND THE NOTES TO RULE 2 REGARDING THE SETTING OF A SCHEDULED ANCIENT MONUMENT OR A LISTED BUILDING

1. Interpretation of The Holford Rules 1 and 2

1.1. Introduction

Rules 1 refers to avoiding major areas of highest amenity value, Rule 2 refers to avoiding smaller areas of high amenity value. These rules therefore require identification of areas of amenity value in terms of highest and high, implying a hierarchy, and the extent of their size(s) or area(s) in terms of major and smaller areas.

The NGC Notes to these Rules identify at Rule 1(b) areas of highest amenity value and at Rule 2(a) and (b) of high amenity value that existed in England circa 1992.

1.2. Designations

Since 1949 a framework of statutory measures has been developed to safeguard areas of high landscape value and nature conservation interest. In addition to national designations, European Community Directives on nature conservation, most notably through Special Areas of Conservation under the Habitats and Species Directive (92/43/EC) and Special

Protection Areas under the Conservation of Wild Birds Directive (79/409/EEC) have been implemented. Governments have also designated a number of Ramsar sites under the Ramsar Convention on wetlands of International Importance (CM6464). Scottish Office circulars 13/1991 and 6/1995 are relevant sources of information and guidance. In addition, a wide range of non-statutory landscape and nature conservation designations affect Scotland.

1.3. Amenity

The term 'Amenity' is not defined in The Holford Rules but has generally been interpreted as designated areas of scenic, landscape, nature conservation, scientific, architectural or historical interest.

This interpretation is supported by paragraph 3 of the Schedule 9 to the electricity Act 1989 (The Act). Paragraph 3 (1)(a) requires that in formulating any relevant proposals the licence holder must have regard to the desirability of preserving natural beauty, or conserving flora, fauna and geological or physiological features of special interest and of protecting sites, buildings, including structures and objects of architectural, historic or archaeological interest. Paragraph 3 (1)(b) requires the license holder to do what he reasonably can do to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any flora, fauna, features, sites, buildings or objects.

1.4. Hierarchy of Amenity Value

Rules 1 and 2 imply a hierarchy of amenity value from highest to high.

Schedule 9 to the Act gives no indication of hierarchy of value and there is no suggestion of a hierarchy of value in either NPPG5: Archaeology and Planning, NPPG 13: Coastal Planning, NPPG 14: Natural Heritage or NPPG 18: Planning and the Historic Environment. Nevertheless, designations give an indication of the level of importance of the interest to be safeguarded.

1.5. Major and Smaller Areas

Rules 1 and 2 imply consideration of the spatial extent of the area of amenity in the application of Rules 1 and 2.

1.6. Conclusion

Given that both the spatial extent in terms of major and smaller and the amenity value in terms of highest and high that must be considered in applying Rules 1 and 2, that no value in these terms is provided by either Schedule 9 to the Act, relevant Scottish Planning Policies or National Planning policy Guidelines, then these must be established on a project-by-project basis. Designations can be useful in giving an indication of the level of importance and thus value of the interest safeguarded. The note to The Holford Rules can thus only give examples of the designations which may be considered to be of the highest amenity value.

2. The setting of a Scheduled Ancient Monument or a Listed Building

The NGC note to Rule 2 refers to the setting of historic buildings and other cultural heritage features. NPPG 5: Archaeology and Planning refers to the setting of scheduled ancient monuments and NPPG 18: Planning and the Historic Environment refers to the setting Listed Buildings. None of these documents define setting.

ENVIRONMENTAL AND PLANNING DESIGNATIONS – EXAMPLES OF DESIGNATIONS TO BE TAKEN INTO ACCOUNT IN THE ROUTEING OF NEW HIGH VOLTAGE TRANSMISSION LINES

Major Areas of Highest Amenity Value

2. In Scotland relevant national or international designations for major areas of highest amenity value include the following identified from Scottish Planning Policies and National Policy Guidelines[24]:

Special Areas of Conservation	(NPPG 14)
Special Protection Areas	(NPPG 14)
Ramsar Sites	(NPPG 14)
National Scenic Areas	(NPPG 14)
National Parks	(NPPG 14)
National Nature Reserves	(NPPG 14)
Protected Coastal Zone Designations	(NPPG 13)
Sites of Special Scientific Interest	(NPPG 14)
Scheduled Ancient Monuments	(NPPG 5)
Listed Buildings	(NPPG 18)
Conservation Areas	(NPPG 18)
World Heritage Sites	(NPPG 18)
Historic Gardens and Designated Landscapes	(NPPG 18)

Other Smaller Areas of High Amenity Value

3. There are other designations identified in development plans of local planning authorities which include areas of high amenity value:

Areas of Great Landscape Value

Regional Scenic Areas

Regional Parks

Country Parks

The nature of the landscape in these areas is such that some parts may also be sensitive to intrusion by high voltage overhead transmission lines but it is likely that less weight would be given to these areas than to National Scenic Areas and National Parks.

Flora and Fauna

4. Legislation sets out the procedure for designation of areas relating to flora, fauna and to geographical and physiogeographical features. Designations relevant to the routeing of transmission lines will include Special Area of

[24] See footnotes under Holford Rule 1 (note on Rule 1) for references update.

Conservation, Special Protection Area, Sites of Special Scientific Interest, National Nature Reserves, Ramsar Sites and may also include local designations such as Local Nature Reserve.

Area of Historic, Archaeological or Architectural Value

5. Certain designations covering more limited areas are of relevance to the protection of views and the settings of towns, villages, buildings or historic, archaeological or architectural value. These designations include features which may be of exceptional interest. Of particular importance in this connection are:

   Schedule of Ancient Monuments

   Listed Buildings, especially Grade A and Grade B Conservation Areas

   Gardens and Designated Landscapes included in the Inventory of Gardens and Designated Landscapes of Scotland

Green Belts

6. Generally the purposes of Green Belts are not directly concerned with the quality of the landscape.

Appendix B

Landscape Susceptibility Appraisal

B.1 Landscape susceptibility is assessed with reference to the existing landscape characteristics and attributes of the landscape. Accordingly, the NatureScot (previously SNH) web based 2019 Landscape Character Assessment has been used as the basis for determining landscape susceptibility across the study area. The following regional Landscape Character Types (LCT) fall within the study area and are mapped on **Figure 5.1**:

- Foothills with Forest – Dumfries and Galloway
- Upland Fringe – Dumfries and Galloway; and
- Lower Dale – Dumfries and Galloway.

B.2 The regional landscape character assessments have been reviewed and refined to provide a finer grain landscape assessment of the study area, subdividing this into Local Landscape Character Areas (Local LCA - refer to **Figure 5.1**). This local landscape character assessment has been verified through fieldwork and provides a useful assessment tool for this routeing appraisal.

B.3 Each Local LCA which is potentially affected by a route option has been evaluated (on its susceptibility to being changed by OHL development of the type proposed) and categorised as having higher to lower susceptibility. The application of professional judgement in the use of the Local LCT also draws on the principles set out in the Holford Rules. Indicators of the relative levels of landscape susceptibility to accommodate OHL development are shown in the table below:

Figure B.1: Indicators of Landscape Susceptibility

Susceptibility	
Higher	Landscape character, existing land use, pattern, scale and attributes are vulnerable to being changed or lost resulting from the introduction of OHL development. Key perceptual and aesthetic characteristics are vulnerable to change or loss.
Medium	
Lower	Landscape character, existing land use, pattern, scale and attributes are robust and tolerant of the change resulting from OHL development. The change could be accommodated without geographically extensive and/ or significant adverse effects on (or loss of) key perceptual, physical or aesthetic characteristics.

B.4 For each Local LCA, the key characteristics are analysed to inform an overall judgement on the Local LCA's susceptibility to OHL development (refer to **Figure 5.2**). The following table outlines the rationale for determining landscape susceptibility in relation to key landscape characteristics:

Table B.1: Characteristics influencing Landscape Susceptibility

Criteria	Characteristics indicating a lower susceptibility to OHL development	Characteristics indicating a higher susceptibility to OHL development
Landform and Scale	Flatter or gently undulating landscapes Broad valley landscapes Larger scale landscapes	Steep, complex landscapes Complex topography Intimate scale landscapes
Landcover and Pattern	Arable, pasture, rough grassland Moorland Simple patterns Landcover which can recover quickly/ does not require complex engineering solutions	Continuous woodland Bog, peat, wetlands Complex patterns Landcover which recovers slowly/ requires complex engineering solutions
Human influence	Industry, arable farming, presence of large built structures, disturbed areas Landscapes which have experienced a higher level of human influence More developed/ managed landscapes	Remote landscapes Areas with natural characteristics Landscapes with little evidence of human influence
Visual experience	Interrupted horizons Simple skylines	Uninterrupted horizons Distinctive/ complex skylines
Settlements	Industrial Sparsely settled arable	Residential Dense patterns of isolated farmstead/ small scale settlements

B.5 The following table presents LUC's appraisal of landscape susceptibility to OHL development with reference to the Local LCA through which the route options pass.

Figure B.2: Landscape Susceptibility Appraisal

Local Landscape Character Area	Key landscape characteristics from LUC Finer Grain Landscape Character Assessment	LUC appraisal: Landscape susceptibility to OHL development of the type proposed
Ae Foothills with Forest	Landform and Scale – larger scale and simpler forested landscapes, which contrast with smaller areas of complex, locally distinctive and smaller scale landscapes. Landcover and pattern – coniferous forest covering undulating foothills which contrasts with smaller areas of rough pasture. Human influence – agriculture clustered in burn valleys, areas of relict landscape, wind farms and coniferous forestry. Visual experience – Views contained within areas of coniferous forest. Some longer distance and large scale views outwith the Local LCA, to the south towards the upland fringe and lower dale. The forest covered hills provide horizons in views north from these adjacent Local LCA. Settlements – outside the small village of Ae, the settlement pattern is low density and sparse, with occasional isolated farmsteads.	The key characteristics indicate a low susceptibility to OHL development. 

Park Burn Upland Fringe	Landform and Scale – contrast between wide open areas and more intimate landforms. The topography is less pronounced and of lower elevation when compared with the Torthorwald Upland Fringe. Landcover and pattern – elevated rolling pasture, improved and rough grassland in close proximity. Belts of deciduous trees and woodland and areas of squared forestry. Human influence – Dry stone walls, minor road network and small bridges over incised burns. Visual experience – varies depending on topography. Some longer distance views outwith the LLCA, to the south towards the lower dale. The forest covered hills in the Ae Foothills with Forest LLCA provide horizons in views north. Settlements – scattered properties and farmsteads and small hamlets. Many grand houses and period properties.	The key characteristics indicate a medium susceptibility to OHL development. 
Torthorwald Upland Fringe	Landform and Scale – contrast between wide open areas and more intimate landforms. The topography is more pronounced and of higher elevation when compared with the Park Burn Upland Fringe. Landcover and pattern – elevated rolling pasture, improved and rough grassland in close proximity. Belts of deciduous trees and woodland and areas of squared forestry. Human influence – Dry stone walls, minor road network, small bridges over incised burns and Iron Age fortifications. Visual experience – elevated landform offers long distance views, including over the lower dale to the south-west. This LLCA also provide a distinctive setting in views north-east form the lower dale. Settlements – scattered properties and farmsteads with occasional small hamlets. Many grand houses and period properties.	The key characteristics indicate a medium-high susceptibility to OHL development. 

Dumfries Lower Dale	Landform and Scale – wider, flatter lower section of major valley. Landcover and pattern – improved pasture, arable fields of medium to larger size, hedgerow field boundaries, broadleaf shelterbelts and areas of coniferous forest cover. Human influence – network of communication lines, minor and major roads and railway lines. Visual experience – open character with medium to longer distance views determined by tree lines/ woodland. Valley landform contains view east to west across the valley. Settlements – many settlements including main towns at river bridging points, isolated developments and suburban expansion.	The key characteristics indicate a medium-low susceptibility to OHL development. 

Appendix C

Environmental Route Option Appraisal Table

Figure C.1: Environmental Appraisal Table

Criterion	Sub-Criteria	Route Option A1	Route Option A2	Route Option A3	Preferred Route Option
Approximate Length of Line Route	N/A	8313m	8500m	8191m	**Route Option A3** would be preferred as the length of line is shortest.
Biodiversity	Designated Sites (e.g. SAC, SPA, SSSI, Ramsar, National and Local Nature Reserves)	All routes avoid the Black Loch SSSI. Route Option A1 is closest to Black Loch SSSI at its northern boundary. Site is designated for Basin fen and its condition has been assessed as unfavourable Declining.	All routes avoid the Black Loch SSSI. Route Option A2 runs close to the southern boundary of the Black Loch SSSI.	All routes avoid the Black Loch SSSI. Route Option A3 is furthest from Black Loch SSSI c.650m from the site.	On balance, **Route Option A3** would be preferred as it is furthest from the SSSI, avoids AWI and with detailed design, the route can avoid the Class 2 peat.
	NatureScot Priority Peatland Habitats (Class 1 and 2)	Route Option A1 avoids Class 1 and 2 Peatland Habitats. There are only small areas of Class 3 and 5 peatlands within this route.	Route Option A2 crosses two areas of Priority Peatland Habitat (Class 1 and 2). There are also several areas of Class 3 and Class 5 peatland in this route.	Route Option A3 crosses a small area of Priority Peatland Habitat (Class 2).	
	Ancient Woodland Inventory	All routes pass through approximately 620m of woodland within the NWSS register. Through consideration of the detailed alignment, the distance of woodland affected is expected to be reduced to approximately 250m.	All routes pass through approximately 620m of woodland within the NWSS register. Through consideration of the detailed alignments, the distance of woodland affected is expected to be reduced to approximately 250m.		

Criterion	Sub-Criteria	Route Option A1	Route Option A2	Route Option A3	Preferred Route Option
		Route Option A1 passes along the south-western edge of an NWSS registered woodland for an additional 280m in length. Micro-siting of the corridor in the south-west of this area would largely reduce this impact. In addition, a small section of Route Option A1 crosses through Glenmaid Plantation which is classed as Ancient Woodland Inventory.			
Landscape and Visual Amenity	Residential Visual Amenity with '150m trigger for consideration zone'	All route options incorporate the 150m 'trigger for consideration zone' for Johnfield. Route Option A1 skirts the fringes of a number of 150m 'trigger for consideration zones' as it routes to the west and south of the village of Ae. However, it will be possible to avoid these at detailed routeing stage.	All route options incorporate the 150m 'trigger for consideration zone' for Johnfield. However, it will be possible to avoid this at detailed routeing stage.		On balance, **Route Option A3** is the preference. This route options avoids routeing in proximity to the village of Ae, through the more complex valley terrain which is overlooked by properties to the west and south of the village. This route option also avoids routeing over higher ground across Rorie Hill, and through belts of woodland (with associated wayleaves) to the south of this section, to the north-east of Annfield.
	Visual Amenity	All route options would require wayleaves as they route through coniferous forest, within the north of this section. Route Option A1 also routes through more complex valley terrain between, and overlooked by, scattered farms and properties to the west and south of the village of Ae. This area includes	All route options would require wayleaves as they route through coniferous forest, within the north of this section. Sections of woodland belts towards the southern end of the route option may also require removal. Route Option A2 also crosses an	All route options would require wayleaves as they route through coniferous forest, within the north of this section. Route Option A3 provides detailed routeing options to cross the lower ground on the southern flank of Rorie Hill.	

Criterion	Sub-Criteria	Route Option A1	Route Option A2	Route Option A3	Preferred Route Option
		riverside trees and forest blocks, some of which may require removal to accommodate the OHL. Sections of woodland belts towards the southern end of the route option may also require removal.	area of higher ground on the ridge north of Rorie Hill.		
	Landscape Designations	All route options avoid the locally designated Torthorwald RSA.			
	Local Landscape Character (refer to Appendix B and Figure 5.2 for further information on location of Local LCA and landscape susceptibility appraisal)	All route options pass through the Ae Foothills with Forest LLCA (low susceptibility to OHL) in the northern extents of section A and the Park Burn Upland Fringe LLCA (medium susceptibility to OHL) in the southern extents of section A.			
	Tourism and Recreation: OS promoted viewpoints (visual amenity – Sustrans routes, core paths, long distance trails, tourist attractions and recreational areas such as golf courses)	There are no OS promoted viewpoints, long distance trails or tourist attractions of note within the study area. All route options cross a Core Path within the Forest of Ae, and National Cycle Network Route 10, as it passes along the minor road network between Ae, travelling south to Dumfries.			
Cultural Heritage	Listed Buildings	There are no listed buildings within any of the route options. Within the study area in the vicinity of the A-route options is the category B Kirkmichael Parish Church and Burial Ground (LB10369), Kirkmichael House (LB10368), Walled Garden Kirkmichael House (LB10419), Ae Bridge (LB17231) and Glenlae House (LB17237). It is not currently anticipated that the setting of these listed buildings would be affected in a way that will affect their heritage significance, either from setting not contributing to their significance, intervening topography, or their setting not interacting with the proposed OHL routes.			On the basis of the available information, **Route Option A2** is preferred due to the fewer numbers of non-designated heritage assets.
	Scheduled Monuments	There are no scheduled monuments within any of the route options or in the study area within close vicinity of the A-route options.			

Criterion	Sub-Criteria	Route Option A1	Route Option A2	Route Option A3	Preferred Route Option
	Non-designated heritage assets (Recorded on Canmore)	The following monument points are within all the route option corridors: Glencourse Hill, building (ID: 179192) Auchengeith, mound (ID: 85662)			
		There are five other non-designated heritage assets within Route Option A1. - These comprise post-medieval buildings and clearance cairns, likely of post-medieval in date. Whilst many of these assets will be of local importance, there are some that may be of regional or even equivalent to national importance. All will be sensitive to physical change but not all will have a setting that contribute to their significance or which interacts with the Route Option.	There is one other non-designated heritage asset within Route Option A2 Glenmaid Moor, clearance cairns (ID: 85640) Whilst many of these assets will be of local importance, there are some that may be of regional or even equivalent to national importance. All will be sensitive to physical change but not all will have a setting that contribute to their significance or which interacts with the Route Option.	There are two other non-designated heritage assets within Route Option A3. These are Glenmaid Moor, clearance cairns (ID: 85640) and Annfield, buildings (ID: 179233). Whilst many of these assets will be of local importance, there are some that may be of regional or even equivalent to national importance. All will be sensitive to physical change but not all will have a setting that contribute to their significance or which interacts with the Route Option.	
Land Use	Existing and Committed Development area allocated within the LDP including existing buildings/sites, residential use applications and valid planning applications for other non-residential uses of a size and geographic location to be considered major areas (including mineral and wind farm turbines	There is no other committed development within or in close proximity to these route options. Dalswinton operational wind farm (15 turbines at 121m to blade tip height) is located to the west of the study area, and circa 1,200m from the combined A1, A2 and A3 route from the northern connection point.			There is no preferred Route Option as there is no notable difference between the three routes in relation to land use.

Criterion	Sub-Criteria	Route Option A1	Route Option A2	Route Option A3	Preferred Route Option
Forestry	Forestry (NFI and NWSS)	Route Option A1 passes through approximately 2900m of predominantly commercial conifer forestry at the northern extent of the route. The remainder of Route Option A1 passes over predominantly agricultural land with occasional farm shelterbelts and hedgerows trees. None of these features are recorded within the NWSS register.	Route Options A2 and A3 pass through approximately 3000m of predominately commercial conifer forestry at their northern extents. The remainder of Route Option A2 and A3 passes over predominately agricultural land with occasional farm shelterbelts and hedgerow trees. None of these features are recorded within the NWSS register		There is only a marginal difference between the forestry impacts of these routes and as such, there is **no preference**.
Hydrology and Flood Risk	Flood Zones and Waterbodies	All route options cross the Goukstane Burn at the northern combined routes section from the northern connection point. Route Option A1 further continues along the route of Goukstane Burn as the route travels south. SEPA Flood Maps show a wide area of fluvial flooding along the route of the Goukstane Burn on the Option A1 route. Based on mapped watercourses on 1:25k Ordnance Survey, there are a number of watercourses along the route that would need to be considered through detailed route design and likely spanned. The	All route options cross the Goukstane Burn at the northern combined routes section from the northern connection point. Based on mapped watercourse on 1:25k Ordnance Survey, there are a number of watercourses along the route that would need to be considered through detailed route design and likely spanned. SEPA Flood Maps show pluvial (surface water) flood risk on the combined section of A2 and A3; the pluvial risk likely relates to the low ground along the Park Burn and tributary channels, although the flood zone can be avoided or spanned		On balance, **Route Option A3** would be preferred as there are fewer watercourse crossings along this route.

Criterion	Sub-Criteria	Route Option A1	Route Option A2	Route Option A3	Preferred Route Option
		Water of Ae is also close to Option A1.			
Technical[25]	Altitude and Topography	Topography is given an amber/medium risk rating.	Altitude is given an amber/medium risk rating.		All technical risks can be considered further through detailed design and therefore there is no overall preference.
	Crossings to existing OHL transmission and distribution infrastructure	There are six 11kV OHL crossings (one avoidable) in this Route Option; this is given an amber/medium risk rating.	No amber/medium or red/high risks identified.		
	Proximity to existing OHL transmission and distribution infrastructure	No amber/medium or red/high risks identified.			
	Road / Railway Crossings along corridor	No amber/medium or red/high risks identified.			
	Ground Conditions	Amber/medium risk rating due to a small section of Alluvium Ground (1.1km, ~13%). Route follows/ crosses the Goukstane Burn with SEPA flood maps showing flooding potential south of Ae.	Amber/medium risk rating: No immediate signs of peat of poor ground, though part of corridor crosses open moorland where ground conditions could prove poor.		
	Watercourses/Catchment Areas Crossings	Amber/medium risk rating as part of corridor follows/ crosses the Goukstane Burn, resulting in possible difficult terrain.	No amber/medium or red/high risks identified.		

[25] Technical Appraisal undertaken by SPEN

Criterion	Sub-Criteria	Route Option A1	Route Option A2	Route Option A3	Preferred Route Option
Route Option A Emerging Preference		On balance, **Route Option A3** is the preferred option. The route is the shortest in length and avoids routeing in proximity to the village of Ae minimising visual impacts. The route is also furthest from the SSSI, avoids AWI and has the fewest water course crossings. Through detailed design, the route can avoid the Class 2 peat and the non-designated heritage assets.			

Table C.1: Route Option B Comparative Table

Criterion	Sub-Criteria	Route Option B1	Route Option B2	Route Option B3	Route Option B4	Route Option B5	Preferred Route Option
Approximate Length of Line Route	N/A	5369m	4586m	5253m	5177m	5325m	**Route Option B2** is preferred as it is the shortest length of line.
Biodiversity	Designated Sites (e.g. SAC, SPA, SSSI, Ramsar, National and Local Nature Reserves)	There are no designated sites within the route option corridors. Route Option B5 is closest to Locharbriggs Quarry (SSSI) (outside the study area) at circa 550m.					On balance and considering the ability to refine the routes through detailed design, there is **no preferred route** in relation to biodiversity interests.
	NatureScot Priority Peatland Habitats (Class 1 and 2)	None of the Route Option corridors cross areas of Priority Peatland Habitats (Class 1 and 2). Options B2, B3 and B4 cross a small area of Class 5 peatland.					
	Ancient Woodland Inventory (AWI)	A small section of Route Option B1 crosses woodland registered as both SWI and NWSS. This area could be avoided through detailed design of alignment to the north.	Route Option B2 passes a narrow strip of NWSS lowland mixed deciduous woodland. This area could be avoided through detailed design of alignment.	Route Options B3, B4 and B5 cross a small area of Ancient Woodland in the northern section of these route options. Route Options B3 and B4 further cross Bow Linn woodland which is designated within both AWI and NWSS The AWI designations could be avoided through detailed design.			
Landscape and Visual Amenity	Residential Visual Amenity with ‘150m	Route Option B1 and B2 skirts the fringes of a number of 150m ‘trigger for consideration zones’ as it crosses		Route Options B3 and B4 skirt the fringes of a number of 150m ‘trigger for consideration zones’ as they		Route option B5 includes a narrow section near the Manse of Tinwald, to avoid	**On balance, Route Option B5 is the preference.**

Criterion	Sub-Criteria	Route Option B1	Route Option B2	Route Option B3	Route Option B4	Route Option B5	Preferred Route Option
	trigger for consideration zone'	Amisfield Burn and as route options diverge either side of properties on the north-eastern flank of Black Hill. However, it will be possible to avoid these at detailed routeing stage.		route to the east of Amisfield and Tinwald, including a narrow part of the route options near Cotland, and as route options diverge either side of Tinwald Shaws. However, it will be possible to avoid these at detailed routeing stage.		routeing within the 150m 'trigger for consideration zone'. It will be possible to avoid any '150m trigger for consideration zones'. at detailed routeing stage.	This route option avoids the locally designated Torthorwald RSA and the Torthorwald Upland Fringe LLCA (medium-high susceptibility to OHL). This route option also routes through lower lying ground and less complex terrain to the west of the section, minimising the potential for views of the OHL seen on the horizon (including on the horizon of the Torthorwald Ridge, which provides a setting in views east from Lower Nithsdale).
	Visual Amenity	All route options cross the A701. Route Option B1 passes through more complex terrain, between scattered farms and properties on the north and eastern flank of Black Hill. A number of woodland belts in this area would require crossing, with associated wayleaves.	All route options cross the A701. Route Option B2 passes through more complex terrain, between and above scattered farms and properties on the north and eastern flank of Black Hill. A number of woodland belts in this area would require crossing, with associated wayleaves. This includes a distinctive and mature belt of trees which link to the hill fort on Barrs Hill.	All route options cross the A701. Route Option B3 crosses the western flank of the Torthorwald Ridge, which provides a setting in views east from Lower Nithsdale. This offers the potential for views of the OHL on the horizon. A number of woodland belts and areas of woodland would require crossing, with associated wayleaves.	All route options cross the A701. Route Option B4 crosses the western flank of the Torthorwald Ridge (on slightly lower ground to route option B3, to the south of the section) which provides a setting in views east from Lower Nithsdale. This offers the potential for views of the OHL on the horizon. A number of woodland belts and areas of woodland would require crossing, with associated wayleaves.	All route options cross the A701. Route Option B5 passes through lower ground to the west of Torthorwald Ridge. A number of woodland belts, to the west of Amisfield and Tinwald, would require crossing, with associated wayleaves. Woodland in this lower lying area would also provide opportunities for backclothing and screening.	

Criterion	Sub-Criteria	Route Option B1	Route Option B2	Route Option B3	Route Option B4	Route Option B5	Preferred Route Option
	Landscape Designations	Route Options B1 to B4 pass through the locally designated Torthorwald RSA.				Route Option B5 avoids the locally designated Torthorwald RSA.	
	Local Landscape Character (refer to Appendix B and Figure 5.2 for further information on location of Local LLCT and landscape susceptibility appraisal)	Route Options B1 to B3 pass through the Park Burn Upland Fringe LLCA (medium susceptibility to OHL) in the northern extents of section B and the Torthorwald Upland Fringe LLCA (medium-high susceptibility to OHL) in the southern extents of section B.			Route Option B4 passes through the Park Burn Upland Fringe LLCA (medium susceptibility to OHL) in the northern extents of section B, the Torthorwald Upland Fringe LLCA (medium-high susceptibility to OHL) in the central extents and the Dumfries Lower Dale LLCA (medium-low susceptibility to OHL) in the southern extents of section B.	Route Option B5 passes through the Park Burn Upland Fringe LLCA (medium susceptibility to OHL) in the northern extents of section B and the Dumfries Lower Dale LLCA (medium-low susceptibility to OHL) in the southern extents of section B.	
	Tourism and Recreation: OS promoted viewpoints (visual amenity –	There are no OS promoted viewpoints,	Route Option B2 crosses a Core Path, between	There are no OS promoted viewpoints, Sustrans routes, core paths, long distance trails or tourist attractions of note within route options B3 to B5.			

Criterion	Sub-Criteria	Route Option B1	Route Option B2	Route Option B3	Route Option B4	Route Option B5	Preferred Route Option
	Sustrans routes, core paths, long distance trails, tourist attractions and recreational areas such as golf courses)	Sustrans routes, core paths, long distance trails or tourist attractions of note within the route option.	Damhead and Bruntsfield.				
Cultural Heritage	Listed Buildings	There are no listed buildings within options B1 or B2. It is unlikely that either would give rise to significant setting change to listed buildings.		There are no listed buildings within any of the route options. Within the western portion of the study area, there are several listed buildings in the vicinity of options B3-5 focused around Amisfield House (LB17232) and Amisfield Tower (LB17233) and the church and manse complex in Tinwald. It is not currently anticipated that the setting of the majority of these listed buildings would be affected in a way that will affect their heritage significance, either from setting not contributing to their significance, intervening topography, or their setting not interacting with the proposed OHL routes. The exception is Amisfield Tower. Part of the significance of this asset derives from its functional relationship with the surrounding countryside and deliberate position within the landscape. As such, it is likely be susceptible to setting change.			On the basis of the available information, **Route Option B1** is preferred. This is the furthest from Amisfield Tower and won't appear in important western views from Barrs Hill fort. **Route Option B5** is a viable second preference as, although a number of non-designated assets lie within the route, it is likely that potential effects can be satisfactorily avoided or mitigated by design.
	Scheduled Monuments	There are no scheduled monuments within any of the route options however there are two in the study area in relatively close proximity to options B1 and B2. Murder Loch Roman fortlet (SM3833), located close to the line of a Roman Road which ran from Fairholm fort northeast in Annandale to Carzield fort in Nithsdale in the southwest. The asset is deliberately positioned in the landscape, albeit its principal relationships being with the road, the introduction of the OHL may interfere		Route Options B3-B5 are not considered to affect any scheduled monuments or their setting.			

Criterion	Sub-Criteria	Route Option B1	Route Option B2	Route Option B3	Route Option B4	Route Option B5	Preferred Route Option
		with functional relationships with other Roman assets on the road network (e.g. Amisfield temporary camp) Barrs Hill fort (SM643), a prehistoric oval plan fortification with a featureless interior, surrounded by bands of defences with an eastern entrance. Its position on top of Barr Hill would have afforded it widespread views across the lowland landscape to the west and north, into the Water of Ae and Nith valleys, where it would have been a prominent feature within the landscape. It likely also had spatial relationships with contemporary domestic and defensive monuments within the landscape, including the fort on White Hill immediately to the east					
	Non-designated heritage assets (recorded on Canmore)	There is one monument point within both route option corridors; Shaw's Hill farmstead (ID: 179126). This asset is of local importance and will be sensitive to physical change but its setting does not interact with the route options.		There are 12 monument points within Route Options B3, B4 and B5. They consist largely of prehistoric assets (including roundhouses, several burnt mounds and postholes), a section of the Torwood-Dalswinton-Crawford Roman road, including the site of a temporary camp (ID: 65882), and the Wallace's Thorn 13th century battle site. Whilst many of these assets will be of local importance, there are some that may be of regional or even equivalent to national importance (potentially those relating to the Roman period). All will be sensitive to physical change but not all will have a setting that contribute to their significance or which interacts with the Route Option. Six of the non-designated assets are burnt mounds dating to the Bronze Age. The function of this monument type is unknown but their typical appearance as clusters within a small area suggest repeated phases of short lived activity. This correlates to possible contemporary domestic roundhouses, structures and artefacts like			

Criterion	Sub-Criteria	Route Option B1	Route Option B2	Route Option B3	Route Option B4	Route Option B5	Preferred Route Option
				axeheads and querns. They are therefore susceptible to setting, alongside physical, change with the possibility of these Route Options interrupting their relationships within the landscape.			
				There are two other non-designated heritage assets within Option B3 and B4 route corridors. These are Townhead, enclosure (ID: 66319) and Bow Linn, building (ID: 179152). These assets are of local importance and will be sensitive to physical change but their settings will not be affected as it doesn't contribute to their significance.		There are two other non-designated heritage assets within Option B5. These are Tinwald, cairn (ID: 65878) and Tinwald Place, Tower House (ID: 66338). These monument types would have had prominent in the landscape, likely deliberately positioned to allow for widespread views. The assets will be sensitive to physical change and, located on the valley floor, are likely to have particularly high sensitivity to setting change due to the proposed route location.	
Land Use	Existing and Committed Development area allocated within the LDP including existing buildings/sites, residential use applications and valid planning applications for other non-residential uses of a size and geographic location to be considered major areas	There is no committed development within or in close proximity to these route options.					There is **no preferred Route Option** as there is no notable difference between the five routes in relation to land use

Criterion	Sub-Criteria	Route Option B1	Route Option B2	Route Option B3	Route Option B4	Route Option B5	Preferred Route Option
	(including mineral and wind farm turbines						
Forestry	Forestry (NFI)	All route options corridors include minor areas of farm shelterbelt/riparian woodlands which can mainly be avoided via the design process.			All route options corridors include minor areas of farm shelterbelt/riparian woodlands which can mainly be avoided via the design process. Route Options B4 and B5 are potentially the most constrained in relation to avoiding woodland.		All routes encounter similar areas and types of woodland. Route Options B4 and B5 will present more challenges to minimising the impact however, woodland can be avoided and as such there is no preference in terms of forestry impact
Hydrology and Flood Risk	Flood Zones and Waterbodies	Route Option B1 crosses the Amisfield Burn twice and runs parallel to the burn for all its length. Based on mapped watercourse on 1:25k Ordnance Survey, there are a number of water courses along the routes that would need to be considered through detailed route design and likely spanned.	All Route Options cross the Amisfield Burn and other smaller minor burns and channels Based on mapped watercourse on 1:25k Ordnance Survey, there are a number of water courses along the routes that would need to be considered through detailed route design and likely spanned.			Route Option B5 crosses the Amisfield Burn, just upstream of its' confluence with the Lochar Water. Downstream of the confluence, the SEPA Flood maps show a wide 200-year floodplain associated with the two watercourses and Jerico Loch. This is close to the southern end of Option B5 and would be difficult to span, but could be avoided by routing along the eastern side of Option B5. Based on mapped watercourse on 1:25k Ordnance Survey, there are also a number of smaller watercourses along the route that would need to be considered through detailed	**Route Options B2, B3 or B4** are preferred, as they cross the fewest watercourses.

Criterion	Sub-Criteria	Route Option B1	Route Option B2	Route Option B3	Route Option B4	Route Option B5	Preferred Route Option
						route design and likely spanned.	
Technical[26]	Altitude and Topography	No amber/medium or red/high risks identified.	Topography is given an amber/medium risk rating.			No amber/medium or red/high risks identified.	All technical risks can be considered further through detailed design and therefore there is no overall preference.
	Crossings to existing OHL transmission and distribution infrastructure	There are four 11kV OHL crossings in this Route Option.	There is one 11kV OHL crossing in this Route Option.	There are two 11kV OHL crossings in this Route Option.	There are three 11kV OHL crossings in this Route Option.	There are three 11kV OHL crossings in this Route Option.	
	Proximity to existing OHL transmission and distribution infrastructure	No amber/medium or red/high risks identified.				The Route Option would parallel in proximity to one 11kV OHL (crossed above)	
	Road / Railway Crossings along corridor	No amber/medium or red/high risks identified.					
	Ground Conditions	No amber/medium or red/high risks identified.				Amber/medium risk rating as a small section of Alluvium Ground (1.55km, ~27%). Route crosses the Amisfield Burn with SEPA flood maps showing flooding potential North East of Locharbriggs	
	Watercourses/Catchment Areas Crossings	No amber/medium or red/high risks identified.					
Route Option B Emerging Preference		There are no overall emerging preferences but through careful consideration of environmental constraints, **Route Option B5** is preferred. Route Option B5 avoids the locally designated Torthorwald RSA and the Torthorwald Upland Fringe LLCA (medium-high susceptibility to OHL) and minimises potential views of OHL from sensitive receptors. Route Option B5 is also further from Barrs Hill fort Scheduled Monument and views					

[26] Technical Appraisal undertaken by SPEN

Criterion	Sub-Criteria	Route Option B1	Route Option B2	Route Option B3	Route Option B4	Route Option B5	Preferred Route Option
		would be partially screened. Through detailed design, the visual and setting effects of the OHL on Grade A Listed Building – Amisfield Tower will be considered. Through detailed design of Route Option B5, the 200-year floodplain can mostly be avoided.					

Figure C.2: Route Option C Comparative Table

Criterion	Sub-Criteria	Route Option C1	Route Option C2	Route Option C3	Preferred Route Option
Approximate Length of Line Route	N/A	2453m	2066m	1776m	**Route Option C3** is preferred as it is the shortest length of line.
Biodiversity	Designated Sites (e.g. SAC, SPA, SSSI, Ramsar, National and Local Nature Reserves)	There are no designated sites within the route option corridors.			On balance, **Route Option C2 or C3** would be the preferred routes as they both avoid peatland habitats and ancient woodlands.
	NatureScot Priority Peatland Habitats (Class 1 and 2)	Route Option C1 avoids of areas of Peatland Habitat (Class 1 and 2).	Route Option C2 avoids of areas of Peatland Habitat (Class 1 and 2).	Route Option C3 corridor crosses through an area of Class 1 Peatland Habitat. Through detailed design, the OHL could avoid the area of peat.	
	Ancient Woodland Inventory	Route Option C1 crosses a woodland area designated as both NWSS and AWI at Side Linn Wood. The AWI designated area is smaller than the NWSS area and there is potential to avoid this designation through detailed design.	Route Option C2 passes through one area of NWSS which is not within the AWI register. There is potential to limit crossing of the site to a narrow shelterbelt width of circa 20m.	There is a small area designated as NWSS at the southern end of Route Option C3. This narrow shelterbelt type woodland can be avoided through detailed design.	

Criterion	Sub-Criteria	Route Option C1	Route Option C2	Route Option C3	Preferred Route Option
Landscape and Visual Amenity	Residential Visual Amenity with '150m trigger for consideration zone'	Route Option C1 is not within any '150m trigger for consideration zones'.	Route Option C2 skirts the fringes of a number of 150m 'trigger for consideration zones' as it routes to the north and west of Tinwald House and between Greenbogue and Hemplands. However, it will be possible to avoid these at detailed routeing stage.	Route Option C3 skirts the fringes of the 150m 'trigger for consideration zone' as it routes to the west of properties at Greenbogue.	On balance, **Route Option C3** is the preference. This route option avoids the locally designated Torthorwald RSA and the Torthorwald Upland Fringe LLCA (medium-high susceptibility to OHL). This route option also routes through lower lying ground to the west of the section, minimising the potential for views of the OHL seen on the horizon (including on the horizon of the Torthorwald Ridge, which provides a setting in views east from Lower Nithsdale).
	Visual Amenity	Route Option C1 and C2 cross the western flank of the Torthorwald Ridge, which provides a setting in views east from Lower Nithsdale (Route Option C2 passes it on lower ground that Route Option C1). This offers the potential for views of the OHL on the horizon. Areas of woodland (including an area of Ancient Woodland near Hempland Hill, within the north of the route options) may also require crossing, with associated wayleaves.		Route Option C3 passes through lower ground to the west of Torthorwald Ridge. Some younger areas of woodland around the Lochar Water would require crossing, with associated wayleaves. Detailed routeing around woodland in Glencair Hill, with some areas of woodland loss, may also be required. Woodland in this lower lying area would also provide opportunities for back clothing and screening.	
	Landscape Designations	Both route options pass through the locally designated Torthorwald RSA.		Route Option C3 avoids the locally designated Torthorwald RSA.	
	Local Landscape Character (refer to Appendix B and Figure 5.2 for further information on location of Local LLCT and landscape susceptibility appraisal)	Route Option C1 largely passes through the Torthorwald Upland Fringe LLCA (medium-high susceptibility to OHL) with potential to, at detailed routeing stage, route within the Dumfries Lower Dale	Route Option C2 is largely within the Dumfries Lower Dale LLCA (medium-low susceptibility to OHL) with potential to, at detailed routeing stage, route within the Torthorwald Upland Fringe	Route Option C3 passes through the Dumfries Lower Dale LLCA (medium-low susceptibility to OHL).	

Criterion	Sub-Criteria	Route Option C1	Route Option C2	Route Option C3	Preferred Route Option
		LLCA (medium-low susceptibility to OHL).	LLCA (medium-high susceptibility to OHL).		
	Tourism and Recreation: OS promoted viewpoints (visual amenity – Sustrans routes, core paths, long distance trails, tourist attractions and recreational areas such as golf courses)	There are no OS promoted viewpoints, Sustrans routes, core paths, long distance trails or tourist attractions of note within Route Options C1 to C3.			
Cultural Heritage	Listed Buildings	There are no listed buildings within the route option. It is considered unlikely that this option would give rise to meaningful setting change to Tinwald House, although in-combination views with the principal elevation would need to be considered further at the detailed routeing stage.	There are no listed buildings within any of the route options. Within the study area, there are several listed buildings in the vicinity of options C2 and C3: ■ Tinwald House (LB17238) ■ Tinwald House Cottages (LB17239) ■ Tinwald House Farm Steading (LB17240) Tinwald House is deliberately designed to have a main southwest facing front elevation. Its position on natural topography would have provided widespread views into the valley below and allow the building to be prominent in views from the lower ground below. As such, it is likely to be susceptible to setting change from the route options appearing in this important view. These effects would be especially pronounced for C2		On the basis of the available information, **Route Option C1** is preferred due to the absence of non-designated heritage assets within the route option and the OHL not appearing in important southwestern views from the listed Tinwald House.
	Scheduled Monuments	There are no scheduled monuments within any of the route options or within close vicinity in the study area.			
	Non-designated heritage assets (Recorded on Canmore)	There are no non-designated heritage assets within route option C1.	There is one asset within the route option, Hemplands, settlement (ID: 66148). This asset is of local importance and will be sensitive to	There is one asset within the route option, Manse Moss, WWII Anti Glider Ditches (ID: 116667) associated with the former Heathhall airfield to the west of the asset. It is therefore susceptible to	

Criterion	Sub-Criteria	Route Option C1	Route Option C2	Route Option C3	Preferred Route Option
			physical change but its setting will not be affected.	setting, alongside physical, change with the possibility of this Route Option interrupting its relationships with other military installations in the landscape.	
Land Use	Existing and Committed Development area allocated within the LDP including existing buildings/sites, residential use applications and valid planning applications for other non-residential uses of a size and geographic location to be considered major areas (including mineral and wind farm turbines	There is no committed development within or in close proximity to any of the Route Options.			There are no direct impacts on land use and as such, there is **no overall preferred** route options.
Forestry	Forestry (NFI)	Route Option C1 has the potential to cross approximately 420m of woodland across two woodland areas along its corridor.	The impact on woodlands by Route Option C2 can be limited to the crossing of the narrow shelterbelt designated as NWSS for a distance of 20m	This route has a small area designated as NWSS at the southern end of this route. This narrow shelterbelt type woodland can be avoided by detailed design.	On balance **Route Option C3** is preferred as it would result in least impact to woodlands. Micro-siting of the line would also minimise impact.
Hydrology and Flood Risk	Flood Zones and Waterbodies	Based on mapped watercourses on 1:25k Ordnance Survey, there are only two watercourses which Route Option C1 would need to cross.	Based on mapped watercourses on 1:25k Ordnance Survey, there are a number of water courses and an area of potential flood risk from the Torthowald Burn and Lochar Water in the south that would need to be considered through detailed route design and likely spanned.	Option C3 is wide and although it parallels the Lochar Water, the 200-year floodplain of the watercourse and its tributaries can be avoided by detailed routeing in the eastern part of the option. However, at the southern end of Route Option C3 (where it merges into Route Option	**Route Option C1** would be the preferred route as it has fewer watercourse crossings to navigate through detailed design and avoids the floodplain of the Lochar Water.

Criterion	Sub-Criteria	Route Option C1	Route Option C2	Route Option C3	Preferred Route Option
				D3/D4) there is a wide floodplain associated with the confluence of the Mill Cleugh watercourse and the Lochar Water, which would be problematic to avoid and span to get to Route D to the south.	
Technical[27]	Altitude and Topography	Topography is given an amber/medium risk rating.	No amber/medium or red/high risks identified.		
	Crossings to existing OHL transmission and distribution infrastructure	There is one 11kV OHL crossing within the Route Option.	There is one 11kV OHL crossing within the Route Option.	There are no OHL crossings within the Route Option.	All technical risks can be considered further through detailed design and therefore there is no overall preference.
	Proximity to existing OHL transmission and distribution infrastructure	No amber/medium or red/high risks identified.			
	Road / Railway Crossings along corridor	No amber/medium or red/high risks identified.			
	Ground Conditions	No amber/medium or red/high risks identified.	Red/high risk rating sure as the full route corridor is within poor alluvium ground and a high flood risk zone.		
	Watercourses/Catchment Areas Crossings	No amber/medium or red/high risks identified.			
Route Option C Emerging Preference		On balance, **Route Option C3** is preferred. The route is the shortest in length; avoids the locally designated Torthorwald RSA and the Torthorwald Upland Fringe LLCA; and views of the route from the horizon are also minimised. Through detailed design, the route can avoid the Class 1 Peatland and NWSS.			

[27] Technical Appraisal undertaken by SPEN

Figure C.3: Route Option D Comparative Table

Criterion	Sub-Criteria	Route Option D1	Route Option D2	Route Option D3	Route Option D4	Preferred Route Option
Approximate Length of Line Route	N/A	5312m	5184m	3196m	3256m	**Route Option D3** is preferred as it is the shortest length of line.
Biodiversity	Designated Sites (e.g. SAC, SPA, SSSI, Ramsar, National and Local Nature Reserves)	There are no designated sites within the route option corridors.				**Route Options D1 and D2** are equally preferred as they avoid peatland habitat and through detailed design, the AWI designation could be avoided.
	NatureScot Priority Peatland Habitats (Class 1 and 2)	Route Options D1 and D2 avoid of areas of Peatland Habitat (Class 1 and 2).		Option D3 crosses through large areas of Class 1 Peatland Habitat. This corridor contains the greatest area within Peatland Habitat with limited options to avoid the designation.	Route Option D4 crosses a large area of Class 1 Peatland Habitat (Class 1 and 2) with limited options to avoid the designation.	
	Ancient Woodland Inventory	Both Route Options include a small area of Ancient Woodland adjacent to Linns Burn. This can be avoided through detailed design.		Both Route Options avoid Ancient Woodland		
Landscape and Visual Amenity	Residential Visual Amenity with '150m trigger for consideration zone'	Route Option D1 incorporates the 150m 'trigger for consideration zone' for two properties at Oxgang Farm. Route Option D1 skirts the fringes of a number of 150m 'trigger for consideration zones' as it routes to the west of Torthorwald.	Route Option D2 incorporates the 150m 'trigger for consideration zone' for two properties at Oxgang Farm. Route Option D2 skirts the fringes of a number of 150m 'trigger for consideration zones' as it routes to the west of Torthorwald and through a narrow part of the route	Route Option D3 skirts the fringes of the 150m 'trigger for consideration zones' as it routes to the east of Mid Dargavel. However, it will be possible to avoid these at detailed routeing stage.	Route Option D4 skirts the fringes of the 150m 'trigger for consideration zones' as it routes to the west of Mid Dargavel. However, it will be possible to avoid these at detailed routeing stage.	**On balance, Route Option D3 is the preference.** This route option avoids the locally designated Torthorwald RSA and the Torthorwald Upland Fringe LLCA (medium-high susceptibility to OHL). This route option also routes through lower lying ground to the

Criterion	Sub-Criteria	Route Option D1	Route Option D2	Route Option D3	Route Option D4	Preferred Route Option
			option near east of Braehead.			west of the section around the Lochar Water, between areas of woodland which provide opportunities for back clothing and screening. However, the need to negotiate a high level of hydrological constraints and deeper peat through this route option is recognised, which may have visual implications for the type of infrastructure required (larger wood poles with bigger foundations, etc).
	Visual Amenity	All route options cross the A709 and continue south up to the A75. Route Option D1 and D2 cross the lower western flank of the Torthorwald Ridge (Route Option D2 passes on lower ground), to the west of Whiteside Hill.		Route Option D3 passes through lower ground to the west of Torthorwald Ridge. Some areas of woodland, around the Lochar Water, may require removal. Woodland in this lower lying area would also provide opportunities for back clothing and screening.	Route Option D4 passes through lower ground to the west of Torthorwald Ridge. Some areas of woodland, around pools in restored areas of Dargavel Quarry and the Lochar Water, will require removal, with associated wayleaves. Woodland in this lower lying area would also provide opportunities for back clothing and screening.	
	Landscape Designations	Both route options pass through the locally designated Torthorwald RSA, at the northern extents of this section. Route Option D2 provides greater scope to avoid routeing in the RSA.		Both route options avoid the locally designated Torthorwald RSA.		
	Local Landscape Character (refer to Appendix B and Figure 5.2 for further information on location of Local LLCT and landscape susceptibility appraisal)	Route Option D1 is largely within the Dumfries Lower Dale LLCA (medium-low susceptibility to OHL) with a short section passing through the Torthorwald Upland Fringe LLCA (medium-high susceptibility to OHL).	Route Option D2 is largely within the Dumfries Lower Dale LLCA (medium-low susceptibility to OHL) with a short section within the Torthorwald Upland Fringe LLCA (medium-high susceptibility to OHL), but which could be avoided at detailed routeing stage.	Route Option D3 and D4 pass through the Dumfries Lower Dale LLCA (medium-low susceptibility to OHL).		

Criterion	Sub-Criteria	Route Option D1	Route Option D2	Route Option D3	Route Option D4	Preferred Route Option
	Tourism and Recreation: OS promoted viewpoints (visual amenity – Sustrans routes, core paths, long distance trails, tourist attractions and recreational areas such as golf courses)	There are no OS promoted viewpoints, Sustrans routes, core paths or long-distance trails within these route options.				
Cultural Heritage	Listed Buildings	There are no listed buildings with the D Route Options. There are further listed buildings located within the study area: ■ Torthorwald Village Mill Cottage (LB17152) ■ Torthorwald Parish Church, Churchyard and Gatepiers (LB17153) ■ Torthorwald Village Cruck Cottage (LB17157) ■ Torthorwald Village Crossway House (LB17158) ■ Drumberg Farm North and East Steading Ranges and Former Horsemill (LB17172) It is not currently anticipated that the setting of these listed buildings would be affected in a way that will affect their heritage significance, either from setting not contributing to their significance, intervening topography, or their setting not interacting with the proposed OHL routes.				On the basis of the available information, **Route Option D3 or D4** is preferred. There is a limited number of known non-designated heritage assets within the route options and they are located furthest away from Torthorwald Castle, where the OHL would be less prominent in the landscape.
	Scheduled Monuments	Torthorwald Castle (SM713) is located in close proximity to the proposed route options, particularly options D1 and D2. This is a multi-period castle site occupied between the 12th and 18th centuries, with the remains of a tower house, defensive earthworks and a surviving bailey to its south and west. It was located on a natural but much modified knoll overlooking the alluvial plain to the north and west, where it is a prominent landmark in views. The lack of large-scale development around Torthorwald and on the plain afford an opportunity to view and study the monument in a landscape not widely divorced from its original context, which is rare at extensively altered castles in southern Scotland. Therefore, the monument is highly susceptible to setting change from not only the proposed route options D, but also the scheme as a whole. The proposed development would appear in the important views across the plan from the monument and also interrupt views of the castle from the plain.				
		There is one non-designated asset within route option D1, Gars				

Criterion	Sub-Criteria	Route Option D1	Route Option D2	Route Option D3	Route Option D4	Preferred Route Option
	Non-designated heritage assets (Recorded on Canmore)	Hill, West Roucan fort (ID:66134), a later prehistoric fort. This monument would have been prominent in the landscape and likely deliberately positioned to allow for widespread views to the lower ground to the west. Although now visible as a cropmark, the asset will still be sensitive to physical change and will likely by sensitive to setting change due to the proposed route locations.				
		There are two assets within route options D1 and D2; Bucklerhold, Tower House (ID: 66138) and Shawrakes Bridge (ID: 232865). The latter is the same asset as the listed building LB17174 and while it will be sensitive to physical change, its setting will not be affected. The former is medieval dwelling which may be contemporary with nearby Torthorwald Castle and may have a visual link. Therefore it is sensitive to setting change alongside physical effects.		There are no other heritage assets within the route options.		
Land Use	Existing and Committed Development area allocated within the LDP including existing buildings/sites, residential use applications and valid planning applications for other non-residential uses of a size and	There are no committed developments within or in close proximity to these route options.				There is no preferred Route Option as there is no notable difference between the five routes in relation to land use

Criterion	Sub-Criteria	Route Option D1	Route Option D2	Route Option D3	Route Option D4	Preferred Route Option
	geographic location to be considered major areas (including mineral and wind farm turbines					
Forestry	Forestry (NFI)	Woodlands impacted by Route Option 1 are limited to narrow farm hedgerow trees.	Route Option D2 crosses two farm hedgerow woodlands and A709 roadside trees.	Route Option D3 crosses over a number of woodlands recorded within the NWSS register. Micro-siting of the line would greatly reduce the impact on these areas.	Route Option D4 crosses over a number of woodlands recorded within the NWSS register and some small woodland areas with no designation. Micro-siting of the line would reduce the impact on these woodlands.	**Route Options D1 and D2** are equally preferred to the other options with regard to impact on forestry.
Hydrology and Flood Risk	Flood Zones and Waterbodies	In the north, there is a wide floodplain associated with the confluence of the Mill Cleugh watercourse and the Lochar Water which would require to be crossed to reach Route Option D1 from Option C3. This would be problematic to avoid and span.	In the north, there is a wide floodplain associated with the confluence of the Mill Cleugh watercourse and the Lochar Water which would require to be crossed to reach Route Option D2 from Option C3. This would be problematic to avoid and span. The remainder of this route crosses a number of small watercourses. There is a small area of flood risk associated with the Linns Burn in the south of the route. These would need to be considered through	Route Option D3 parallels the Lochar Water for its entire length. The watercourse has a relatively wide 200-year floodplain along most of the route and there are limited options to avoid or span the floodplain. This route should be avoided from a flood risk perspective.	The northern section of Option D4 runs alongside the Lochar Water and is within the predicted 200-year floodplain of the watercourse, with limited options to avoid the flood risk area. Further south the route crosses two areas of surface water ponds/lochs.	**Route Options D1 and D2** are preferred, as these avoid the wide floodplains associated with the Lochar Water.

Criterion	Sub-Criteria	Route Option D1	Route Option D2	Route Option D3	Route Option D4	Preferred Route Option
			detailed route design and likely spanned.			
Technical[28]	Altitude and Topography	No amber/medium or red/high risks identified.				All technical risks can be considered further through detailed design and therefore there is no overall preference.
	Crossings to existing OHL transmission and distribution infrastructure	There are two 11kV OHL crossings within the Route Option.	There are two 11kV OHL crossings within the Route Option.	There are two 11kV OHL crossings within the Route Option.	There are two 11kV OHL crossings within the Route Option.	
	Proximity to existing OHL transmission and distribution infrastructure	No amber/medium or red/high risks identified.				
	Road / Railway Crossings along corridor	Route Option crosses two major roads (A709 and A75). One major road is also a high load route (A75).				
	Ground Conditions	Amber/medium risk rating: no immediate signs of peat or poor ground; short section with flood risk crossed just south of A75.		Red/high risk rating as the Route Corridor crosses area of poor alluvium ground, while the majority of the corridor shown to be in a high flood risk area.	Red/high risk rating as the Route Corridor crosses areas of peat and alluvium ground, with some of the corridor shown to be in a high flood risk area.	
	Watercourses/Catchment Areas Crossings	No amber/medium or red/high risks identified.			Amber/medium risk rating; Route Corridor crosses large ponds (possible flooded quarry) south of the A709.	
Route Option D Emerging Preference		On balance, the emerging preferred route is **Route Option D2**. The route avoids peatland habitat and avoids running parallel with the Lochar Water for its entire length. Through detailed design, visual effects of the OHL on the locally designated Torthowald RSA and the				

[28] Technical Appraisal undertaken by SPEN

Criterion	Sub-Criteria	Route Option D1	Route Option D2	Route Option D3	Route Option D4	Preferred Route Option
		Upland Fringe LLCA will need to be considered and the OHL is expected to avoid the AWI designation. There will be a requirement to consider how to technically cross from the preferred Route Option C3 to D2 as spanning may be problematic.				

Figure C.4: Route Option E Comparative Table

Criterion	Sub-Criteria	Route Option E1	Route Option E2	Route Option E3	Route Option E4	Preferred Route Option
Approximate Length of Line Route	N/A	3640m	3470m	1835m	670m	**Route Option E3** would be the preferred route as it requires the shortest connection.
Biodiversity	Designated Sites (e.g. SAC, SPA, SSSI, Ramsar, National and Local Nature Reserves)	There are no designated sites within the route option corridors.				On balance, **Route Options E1** or **E2** would be preferred as they avoid areas of Peatland Habitat.
	NatureScot Priority Peatland Habitats (Class 1 and 2)	Route Options E1 and E2 avoids areas of Peatland Habitat (Class 1 and 2).		Route Option E3 would have to pass through areas of Class 1 Peatland Habitat with limited options to avoid the designation.	Route Option E4 contains Class 1 Peatland Habitat along the eastern boundary of the corridor. The designation could potentially be avoided through detailed design.	
	Ancient Woodland Inventory	All Route Options avoid Ancient Woodland.				
Landscape and Visual Amenity	Residential Visual Amenity with '150m trigger for consideration zone'	Route Option E1 incorporates the 150m 'trigger for consideration zone' for the southern property at Oxgang Farm (just north of the A75). The western boundary of the E1	Route Option E2 incorporates the 150m 'trigger for consideration zone' for the southern property at Oxgang Farm (just north of the A75). The	Route Option E3 incorporates the 150m 'trigger for consideration zone' for the southern property at Oxgang Farm (just north of the A75) and a	Route Option E4 skirts the 150m 'trigger for consideration zone' as it routes to the east of Nether Dargavel. However, it will be possible to avoid this	On balance, **Route Option E4 is the preference**. This presents the shortest route which is likely to be visible from the lowest number of properties and other recreational and transport receptors. However, the need to negotiate a high level of hydrological constraints and deeper peat

Criterion	Sub-Criteria	Route Option E1	Route Option E2	Route Option E3	Route Option E4	Preferred Route Option
		corridor skirts the trigger for consideration zone of the Rigghead and Ballantrae House properties, on their eastern extents. At the southern tie in to E1, there are properties within the route option (Roadside and Fieldside Cottages). It will not be possible to avoid routeing within the 150m trigger for consideration of Fieldside Cottage, which lies directly south of the tie in point. The route option also skirts the trigger for consideration zone of other properties to the east and west of Roadside Cottage.	western boundary of the E2 corridor skirts the trigger for consideration zone of the Rigghead and Ballantrae House properties, on their eastern extents. The route corridor then travels west to cross the B724 and then runs parallel with the existing BR Route OHL to the south of Wath. It will not be possible to avoid routeing within the 150m trigger for consideration of Fieldside Cottage, which lies directly south of the tie in point.	number of properties at Collin and Greenlea as it routes between these small settlements. However, it will be possible to avoid these at detailed routeing stage.	at detailed routeing stage.	through this route option is recognised, which may have visual implications for the type of infrastructure required (larger wood poles with bigger foundations, etc).
	Visual Amenity	A number of woodland belts/ tree lines would require crossing, with associated wayleaves. This is a longer route option when compared with the other options, which will result in greater visible of OHL to	A number of woodland belts/ tree lines would require crossing, with associated wayleaves. Views from the B724, and properties along this route, tend to	Areas of woodland, between the settlements of Collin and Greenlea, would require crossing/ some level of vegetation removal. Visibility from a number of properties,	Some tree/ hedgerow removal to the south of the A75 would likely be required. This is a shorter section with the potential to be visible from a lower number of properties.	

Criterion	Sub-Criteria	Route Option E1	Route Option E2	Route Option E3	Route Option E4	Preferred Route Option
		the south of the A75 and from a number of scattered properties in this area.	be oriented to the south-west, looking over the broad Lochar Water Valley. Routeing through here would be visible in these views, seen alongside the existing OHL.	including those with more open views on northern edge of Greenlea, would likely be possible. Visibility from a number of properties, including those with more open views on northern edge of Greenlea, would likely be possible.		
	Landscape Designations	All route options avoid the locally designated Torthorwald RSA.				
	Local Landscape Character (refer to Appendix B and Figure 5.2 for further information on location of Local LLCT and landscape susceptibility appraisal)	All route options are within the Dumfries Lower Dale LLCA (medium-low susceptibility to OHL development).				
	Tourism and Recreation: OS promoted viewpoints (visual amenity – Sustrans routes, core paths, long distance trails, tourist attractions and recreational areas such as golf courses)	There are no OS promoted viewpoints, Sustrans routes, core paths or long distance trails within Route Option E1. This route option passes to the north-west of Drummuir Farm, which has an ice cream parlour with outdoor seating.	There are no OS promoted viewpoints, Sustrans routes, core paths or long distance trails within Route Option E1. This route option passes to the south-east of Drummuir Farm, which has an ice	There are no OS promoted viewpoints, Sustrans routes, core paths, long distance trails or tourist attractions of note within Route Options E3 and E4.		

Criterion	Sub-Criteria	Route Option E1	Route Option E2	Route Option E3	Route Option E4	Preferred Route Option
			cream parlour with outdoor seating.			
Cultural Heritage	Listed Buildings	There is one listed building, Shawrakes Bridge (ID: LB17174), within option E1. While the introduction of the OHL would result in change within its setting, this would be unlikely to result in major change to its cultural significance, as its key relationships (with the watercourse it crosses and the road it carries) would remain intact. The route option also passes in close proximity to Mousewald Grange windmill tower (LB17390). Standing within a historic farmstead, this remains a prominent feature in the immediate vicinity. It would be sensitive to setting change. The route also passes relatively close to Brocklehirst (LB44185) – a 19th century country house, set in a modest designed landscape. Although likely screened	There is one listed building, Shawrakes Bridge (ID: LB17174), within option E2. While the introduction of the OHL would result in change within its setting, this would be unlikely to result in major change to its cultural significance, as its key relationships (with the watercourse it crosses and the road it carries) would remain intact. The remainder of the route avoids direct interactions with Listed Buildings.	There are no listed buildings within, or with potential to experience significant effects as a consequence of route options E3 or E4.		Either Route Option **E3** or **E4** would be preferred, as the shortest routes with the least potential for effects to the historic environment.

Criterion	Sub-Criteria	Route Option E1	Route Option E2	Route Option E3	Route Option E4	Preferred Route Option
		by topography and vegetation, there is potential for effects from change in its setting.				
	Scheduled Monuments	There are no scheduled monuments within, or adjacent to, any E route options.				
	Non-designated heritage assets (Recorded on Canmore)	A single non-designated asset, a cropmark enclosure of indeterminate but likely prehistoric date (Ref: 66209) is located within route options E1 and E2. While physical effects could be avoided by design, the asset's setting would be substantially changed by the introduction of the OHL. However, as no surface trace of the asset remains, its significance is drawn principally from its archaeological value.		There are no non-designated assets within either route option E3 or E4.		
Land Use	Existing and Committed Development area allocated within the LDP including existing buildings/sites, residential use applications and valid planning applications for other non-residential uses of a size and geographic location to be considered major areas (including mineral and wind farm turbines)	There are no committed developments within or in close proximity to these route options.				There is no preferred Route Option as there is no notable difference between the five routes in relation to land use
Forestry	Forestry (NFI)	Route Option E1 could impact A75 roadside mature trees, minor public road (Rigghead – Woodside road trees	Route Option E2 could impact A75 roadside mature trees, minor public	Route Option E3 passes through 5.4ha of scrub, broadleaved trees	Route Option E4 could impact A75 roadside mature trees and tree compartments to the south of A75. Two of	Being the shortest - **Route Option E4** is has the potential to have least impact on forestry, with all route options been seen to

Criterion	Sub-Criteria	Route Option E1	Route Option E2	Route Option E3	Route Option E4	Preferred Route Option
		are recorded within NWSS register) and individual field boundary located trees. Route option E1 has potential to impact 0.5ha and 0.33ha recorded within NWSS register and 1.9ha of woodland not registered under NWSS. Out of 140ha of the E1 route area, there is scope to microsite the line and reduce the impact to woodland.	road (Rigghead – Woodside road trees are recorded within NWSS register), trees along the Wath Burn and individual field boundary located trees. Route Option E2 is likely to affect trees growing along Wath Burn, proportion of which (0.57ha) are recorded within NWSS register and 0.58ha of trees growing along Wath Burn not registered under NWSS. Out of the 120ha of the E2 route area, there is scope to microsite the line and reduce the impact to woodland. .	woodland, out of which – 1.1ha is recorded within the NWSS register. Micro-siting of the line could greatly reduce the impact on these areas.	five of those compartments (2.7ha net forest area within 27 hectares of E3 land, meaning 10% of woodland tree cover) are recorded within the NWSS register. Micro-siting of the line could greatly reduce the impact on these areas.	benefit in terms of forest loss by micro siting of the route.
Hydrology and Flood Risk	Flood Zones and Waterbodies	Route Option E1 runs parallel to the Linns Burn/ Wath Burn for much of the route and	Route Option E2 runs parallel to the Linns Burn/ Wath Burn in its northern	The northern section of Route Option E3 is close to Linns Burn, which has a small	Route Option E4 parallels the Lochar Water for its entire length. The	**Route Option E1** is the preferred option, as it avoids the flood risk location associated with the proposed tie-in tower for Options E3 and E4 (to tower BR72). It

Criterion	Sub-Criteria	Route Option E1	Route Option E2	Route Option E3	Route Option E4	Preferred Route Option
		crosses four small watercourses, which could be spanned. There is a ~150m wide floodplain associated with the Shaw Burn, however it is likely this could be spanned. The proposed tie-in tower BR61 has no hydrology constraints, apart from a small ditch approximately 50m to the south-west of the tower.	section and crosses the Shaw Burn, which has a ~150m wide floodplain, however it is likely this could be spanned. The route then has to cross the Linns / Wath Burn twice. The floodplain widths at the two crossing locations are ~75m and 100m, which can be spanned. The proposed tie-in tower BR61 has no hydrology constraints, apart from a small ditch approximately 50m to the south-west of the tower.	floodplain. This can be avoided or spanned. The tie-in tower BR72 is hydrologically constrained, as it is within 30m of the Lochar Water and within the 200-year floodplain. The floodplain cannot be avoided at the tie-in location and the proposed circuit breaker compound would likely be in a flood risk location. A detailed Flood Risk Assessment of the proposed compound would be required to fully assess flood risk.	watercourse has a relatively wide 200-year floodplain along the route. The floodplain could be avoided for most of the route, apart from at the tie-in tower BR72. The tie-in tower is hydrologically constrained, as it is within 30m of the Lochar Water and is within the 200-year floodplain. The floodplain cannot be avoided at the tie-in location and the proposed circuit breaker compound would likely be in a flood risk location. A detailed Flood Risk Assessment of the proposed compound would be required to fully assess flood risk.	also avoids two crossings of the Linns Burn/ Wath Burn and its associated floodplain as in E2 (to BR61).
Technical[29]	Altitude and Topography	No amber/medium or red/high risks identified.				**Route Options E1 or E2** would be the preferred routes as they would avoid the high flood risk associated with the termination at tower BR72.
	Crossings to existing OHL transmission and distribution infrastructure	One LV OHL crossing, two 11kV OHL crossings and three 33kV OHL crossings within the Route Option.		One 33kV OHL crossing.	Two 11kV OHL crossings and three 33kV OHL crossings	

[29] Technical Appraisal undertaken by SPEN

Criterion	Sub-Criteria	Route Option E1	Route Option E2	Route Option E3	Route Option E4	Preferred Route Option
					within the Route Option.	
	Proximity to existing OHL transmission and distribution infrastructure	No amber/medium or red/high risks identified.	Amber risk identified: parallel proximity to 132kV OHL (BR route) for approximately 3.2km. Clearance can be maintained within corridor (100m+)	No amber/medium or red/high risks identified	No amber/medium or red/high risks identified	
	Road / Railway Crossings along corridor	Crosses two minor roads including the B724.		Crosses one minor road (B724)	Crosses two minor roads including the B724.	
	Ground Conditions	No immediate signs of peat or poor ground. Short section with flooding risk crossed.		Corridor crosses area of poor Alluvium ground and some areas shown to be in a high flood risk area. Termination point lies within high risk flood area which will result in construction tee-in compound in high risk area.	Corridor crosses area of poor Alluvium ground and some areas shown to be in a high flood risk area. Termination point lies within high risk flood area which will result in construction tee-in compound in high risk area.	
	Watercourses/Catchment Areas Crossings	No amber/medium or red/high risks identified. Crosses minor irrigation/burns/channels along the route		No amber/medium or red/high risks identified. Crosses Lochar Water. Termination point next to the river. This will result in the construction of a	Amber/medium risk identified: corridor crosses Lochar Water, terminating at tee-in point next to the river. This will result in the construction of a compound also	

Criterion	Sub-Criteria	Route Option E1	Route Option E2	Route Option E3	Route Option E4	Preferred Route Option
				compound also adjacent to the Lochar Water.	adjacent to the Lochar Water.	
Route Option E Emerging Preference		The emerging preference from an environmental perspective is Route Option E4 as it is the shortest of the three route options in this section and therefore will have the fewest impacts on the environmental considerations. However, where Route Option D2 (see table C.4) is the preferred adjoining section, there is no physical way to link Route Option D2 to Route Option E4 Route Option E4 must therefore be discounted for consideration. Environmentally the next preferred option would be Route Option E3 (to tower BR72) as it is the shortest of the remaining route options, however from a technical and hydrological perspective, the termination point in to tower BR72 poses a high risk due to flooding therefore Route Option E3 (to tower BR72) must also be discounted for consideration. It is noted that of the remaining two Route Options E1 and E2 (both to tower BR61), from the A75 both routes which follow the same corridor and then split off to the north of Drummuir. Route Option E1 is preferred in terms of hydrology impacts as it would avoid two crossings of the Linns Burn/ Wath Burn and its associated floodplain as in E2 (to BR61). Route Option E1 is also preferred in relation to biodiversity impacts as it avoids areas of peat and it would keep new electricity infrastructure to the north of the existing OHL, to the north of Fieldside Cottage. Route Option **E1** is the most environmentally and technically feasible route option (subject to detailed design).				

Figure C.5: Summary of Overall Emerging Preference

Route Options	Route Option A	Route Option B	Route Option C	Route Option D	Route Option E
Emerging preference	A3	B5	C3	D2	E1
Overall Emerging Preferred Route	**A3-B5-C3-D2-E1 (Figure 6.1)**				

Appendix D

Draft Newspaper Advertisement Text

SP Energy Networks

Public Consultation for a new wood pole overhead line connecting Harestanes West wind farm to the existing steel tower line east of Dumfries, near Mouswald

Development: A 23km overhead line supported by wood poles and operating at 132kv between Harestanes West wind farm substation and existing steel tower BR61, including a new circuit breaker compound adjacent to tower BR61, southeast of Dumfries.

The consultation will start on 1st August 2023 and close on 1st September 2023 at midnight.

SP Transmission, the transmission license holder, is a subsidiary of SP Networks responsible for the transmission of electricity in central and southern Scotland. SP Transmission has received a grid connection application from the wind farm developer for Harestanes West wind farm via National Grid and is required under the Electricity Act 1989 to seek a connection to the grid network.

Members of the public, landowners and other interested parties are invited to take part in the consultation for the proposed wood pole overhead line.

The project team are now consulting on the preferred route corridor, which will be refined post consultation to include pole locations, after which a second round of consultation will take place with this additional detail.

The consultation material will be based online at the SP Energy Networks website, which can be accessed at this web address:

http://www.spenergynetworks.co.uk/pages/overhead_line_for_harestanes_west_wf.aspx

Comments can be emailed to HarestanesWestOHL@spenergynetworks.co.uk

Or posted to:

Harestanes West Overhead Line Project

SP Energy Networks

55 Fullarton Drive

Glasgow

G32 8FA

Hard copies of the Routeing and Consultation document will be available between 1st August 2023 and 1st September 2023 at the addresses listed here and can be provided on request.

Georgetown Library Gillbrae Road Georgetown Drive Dumfries DG1 4EJ	Lochthorn Library Edinburgh Road Lochthorn Dumfries DG1 1UF

Appendix E

Project Consultation Leaflet

SP Energy Networks

Harestanes West Wind Farm 132kV Overhead Line Grid Connection

Public Consultation Leaflet

Background

ScottishPower Renewables (SPR) is proposing to develop Harestanes West Wind Farm comprising up to 13 wind turbines with an expected generating capacity of up to 78 megawatts (MW). The wind farm will be east of Thornhill, Dumfries and Galloway and adjacent to the operational Harestanes Wind Farm and proposed Harestanes South Wind Farm. SP Energy Networks (SPEN), as the electricity transmission and distribution licence holder for central and southern Scotland, has a legal duty to keep its network up-to-date to safeguard electricity supplies, as well as to enable new connections for the generation of electricity.

To meet its licence obligations and provide an electricity grid connection for Harestanes West Wind Farm, SPEN will seek consent from Scottish Ministers under Section 37 of the Electricity Act to construct and operate a new 132 kilovolt (kV) overhead line ('the new OHL') supported on wood poles between the proposed Harestanes West Wind Farm substation to a suitable tie-in point on the existing 132kV 'BR' Route. The new OHL will be wholly within Dumfries and Galloway.

SP Energy Networks is now seeking views on the proposals and the work undertaken to date to identify a preferred route for the new OHL. Further Information about the project, our plans for consultation, and how to make comments, is provided overleaf.

The Harestanes West Wind Farm 132kV Overhead Line Grid Connection Project

What are the Proposals?

The new OHL will be approximately 23 km in length and supported on double 'H' wood poles. One 33kV circuit breaker and one transformer will be required at the Harestanes West Wind Farm substation as well as a circuit breaker compound at the tie-in point on the 'BR' Route. As part of the wider approach, a land right will be sought with each landowner for a corridor, typically 60m wide (30m either side of the centre of the OHL), to protect the resilience of the new OHL from future development and from falling trees.

The section of OHL between the wood poles is known as the 'span'. Span lengths between the wood poles will average between 80 metres and 100 metres. The wood poles will be dark brown in colour when newly constructed and weather over the years to a light grey. The exact location of new wood poles along the final proposed route of the new OHL will be confirmed through a detailed design/technical review process as the project progresses, and will be informed by the findings of this public consultation.

OHL cables generally require refurbishment after approximately 40 years. Should the new OHL still be needed to support the operation of Harestanes West Wind Farm at the end of its operational life, then it is likely that it will be re-equipped with new conductors and insulators and refurbished. At this time, it is expected that the new OHL will be decommissioned fully when Harestanes West Wind Farm has reached the end of its operational life.

Routeing

SPEN has been working with independent consultants to identify potential route options for the new overhead line (OHL). Our objective is to identify a route for the OHL which meets the technical requirements of the electricity system, which is economically viable and causes, on balance, the least disturbance to the environment and the people who live, work and enjoy recreation within it.

Following the identification of an appropriate study area and informed by mapped key environmental and technical routeing considerations, different route options split into sections A to E were identified for the new OHL. Each of the route options were given an alpha numeric reference: A1 to A3, B1 to B5, C1 to C3, D1 to D4, E1 to E4. There are four towers on the existing 'BR' route within the study area which, from a technical perspective, were considered at the outset to be capable of accommodating the connection of the new OHL. These were towers BR61, BR70, BR72 and BR77. Following further technical review, including consideration of the proximity of these tie-in points to residential properties, towers BR70 and BR77 were discounted and not considered further.

The route options were appraised against environmental and technical criteria, including local landscape character and views, cultural heritage, biodiversity, topography, proximity to existing OHLs and route length to identify the preferred route. The preferred route is the one which achieves the best overall balance between limiting impacts on the environment and people, whilst also meeting SPEN's technical requirements.

Routeing Methodology

- **A** Identification of Routeing Study Area
- **B** Desk Based Surveys and Mapping of Routeing Considerations
- **C** Identification of Route Options
- **D** Mapping of Appraisal Considerations and Environmental Appraisal of Route Options
- **E** Technical Review
- **F** Identification of Preferred Route
- **G** Consultation

Proposed Route for Environmental Appraisal

More information about the process we have followed to identify and appraise route options to select the preferred route can be found in our Routeing and Consultation Documents (April 2023). This is available on the project website: www.spenergynetworks.co.uk/pages/overhead_line_for_harestanes_west_wf.aspx

Typical Trident 132kV 'H' wood pole

What we would like your views on?

As part of the consultation we would particularly like your views on:

1. The preferred route for the new OHL
2. The alternative route options we considered during the routeing process.
3. Any other issues, suggestions or feedback you would like us to consider. We would particularly like to hear your views on your local area, for example areas you use for recreation, local environmental features you would like us to consider, and any plans you may have to build in proximity to the preferred route.

Please note comments at this stage are informal comments to SPEN and are made to allow SPEN to determine whether changes to the preferred route are necessary. An opportunity to comment formally to the Scottish Government Energy Consents Unit, who will be the decision makers on the Section 37 application, will follow at a later stage in the process.

How do I make comments or find out more information?

Our consultation will run from **Tuesday 1st August 2023 until Friday 1st September 2023**. The closing date for you to send your responses to us is **midnight on Friday 1st September**. Following this date, the information will remain accessible online and available to download.

Please find below the best ways to find out more or talk to us.

Visit the website: (from 1st August 2023)	**www.spenergynetworks.co.uk/pages/overhead_line_for_harestanes_west_wf.aspx** You can view or download all the project documents (including the Routeing and Consultation Document (2023)) and this leaflet on our website
Email us:	**harestaneswestohl@spenergynetworks.co.uk**
Send us a letter	Harestanes West wind Farm 132kV Overhead Line Grid Connection Project Land and Planning Team, SP Energy Networks, 55 Fullarton Drive, Glasgow, G32 8FA
Attend a public exhibition	The exhibitions will be held at the following locations from **12pm to 6pm** on the days stated: • **24th August 2023 at the Hetland Hall Hotel**, Near Carrutherstown, A75, Carrutherstown, Dumfries, DG1 4JX • **25th August 2023 at Heathall Community Centre**, Barnett Rd, Heathhall, Dumfries, DG1 3RU

What happens next

- **A** Gathering of Feedback from Public Consultation to identify 'Proposed Route'
- **B** Request Environmental Impact Assessment (EIA) Screening Opinion from the Scottish Government Energy Consents Unit (ECU)
- **C** Undertake consultation Round 2 to present the 'Proposed Route' (details to be confirmed)
- **D** Undertake baseline environmental surveys
- **E** Identification of final alignment (pole locations) and associated infrastructure for the new OHL following feedback from specialist team and landowners
- **F** Undertake EIA (if required)/Environmental Appraisal to assess the effects of the construction and operation of new OHL
- **G** Submit Section 37 application for consent to Scottish Government
- **H** Discharge of planning conditions (if consent is granted)
- **I** Construction of new OHL

Thank you for taking the time to read this leaflet.

Appendix F
Stakeholder Consultee List

Consultee List

Statutory Consultees

- Dumfries and Galloway Council
- SEPA (south west)
- Nature Scot (southern Scotland)
- Historic Environment Scotland

Community Councils

- Kirkmahoe
- Auldsgirth and District
- Closeburn
- Kirkmichael
- Tinwalld Parish
- Mouswald

Internal Scottish Government Advisors

- Transport Scotland
- Marine Scotland
- Scottish Forestry

Non-Statutory Consultees

- British Horse Society
- BT
- Crown Estate Scotland
- Fisheries Management Scotland
- Fisheries - Local District Salmon Fisheries (River Nith District Salmon Fishery Board)
- John Muir Trust
- Mountaineering Scotland
- Mountaineering Scotland
- RSPB Scotland
- Scottish Rights of Way and Access Society (ScotWays)
- Scottish Water

- Scottish Wildlife Trust
- Visit Scotland
- Scottish Badgers
- South Scotland Red Squirrel Group
- Dumfries and Galloway Raptor Study Group
- National Farmers Union of Scotland
- Ramblers Association
- Scottish Outdoor Access Network
- Sustrans Scotland
- Health and Safety Executive (HSE)
- National Trust for Scotland
- Coal Authority