Proposed 132kV Grid Connection to Lorg and Longburn Wind Farms

Routeing Consultation Report

SP ENERGY NETWORKS

REPORT N^{O} 70016687-001

LORG AND LONGBURN GRID CONNECTION

ROUTEING CONSULTATION REPORT

APRIL 2017

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APPENDICES

GLOSSARY

Term	Definition
AOD	Above Ordnance Datum
ASA	Archaeologically Sensitive Area
BGS	British Geological Survey
D&G	Dumfries and Galloway
D&GLA	Dumfries and Galloway Landscape Assessment
D&GWLCS	Dumfries and Galloway Windfarm Capacity Study
EIA	Environmental Impact Assessment
EIA Regulations	The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000
Electricity Act	The Electricity Act 1989
ES	Environmental Statement
G&DL	Gardens and Designed Landscapes “grounds that are consciously laid out for artistic effect”
GSP	Grid Supply Point
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HER	Historic Environment Record
Holford Rules	Guidelines developed by the late Lord Holford in 1959 for routeing overhead lines
IBA	Important Bird Area
Initial Study Area	Broad search area subsequently refined to identify the Route Option Area
DE Route	The 132 kV overhead line which the Lorg and Longburn Wind Farms will connect with
kV	Kilo-volt capacity of an electricity power line
LCT	Landscape Character Type
LCU	Landscape Character Unit
LDP	Local Development Plan
LOD	Limit of Deviation, an area which defines
m	metres
MoD	Ministry of Defence
OHL	Overhead line: an electric line in the open air and above ground level
Preferred Route	The preferred route identified through this routeing study process, which is yet to be subject to non-statutory consultation
Proposed Route	The amended proposed route following non-statutory consultation. The route which will go forward to Environmental Impact Assessment
Route Option Area	Area within which a number of feasible route options can be identified prior to appraisal
RSA	Regional Scenic Area: Area identified by local authorities of regional importance for scenic quality. Names vary between local authorities
RSPB	Royal Society for the Protection of Birds
Section 37 (s37) application	An application for development consent under section 37 of the Electricity Act 1989
SM	Scheduled Monument
SEPA	Scottish Environment Protection Agency

Term	Definition
SNH	Scottish Natural Heritage
SPEN	SP Energy Networks
SSSI	Site of Special Scientific Interest
ZTV	Zone of Theoretical Visibility

1 INTRODUCTION

1.1 BACKGROUND TO THE PROJECT

1.1.1 SP Energy Networks (SPEN) has a legal duty under the Electricity Act 1989 to provide grid connections to new electricity generating developments and has been approached by the developers for Lorg and Longburn Wind Farms to provide a grid connection to the wider electricity transmission network. The wind farms are located near Carsphairn in Dumfries and Galloway as illustrated in Figure 1.

1.1.1 In response to this, SPEN is proposing to construct a new 132kv wood pole overhead line (OHL) between the wind farms and a suitable point on the DE Route transmission line – which is currently under construction.

1.1.2 This request will lead to an application for consent under Section 37 of the Electricity Act.

1.1.2 As the licence holder, SPEN is required under the Electricity Act 1989 "to develop and maintain an efficient, co-ordinated and economical system of electricity transmission."

1.2 PURPOSE OF THE ROUTEING REPORT

1.1.3 The primary purpose of the routeing report is to identify a preferred route option to provide a grid connection to the DE Route OHL from Lorg and Longburn Wind Farms taking account of technical, environmental and economic considerations.

1.1.4 The report presents information on the approach taken in the identification of route options, appraisal methodology and the findings of the studies and appraisals, culminating in the selection of the preferred option.

1.1.5 This report is intended to inform consultees of the proposals and thus enable them to provide feedback and comment on the preferred option. The views and opinions of consultees are important to the development of route options and will feed into the subsequent selection of the proposed option which will be taken forward to the next stage in the process; Environmental Impact Assessment.

1.3 STRUCTURE OF THE ROUTEING REPORT

1.3.1 The report has been structured to initially provide context and information on what the project will comprise, followed by the process which was followed to arrive at the preferred option. The report has been spilt into the following sections.

- → Section 2: Legal Framework
- → Section 3: Project Description
- → Section 4: Approach to Routeing
- → Section 5: Technical and Environmental Routeing Considerations
- → Section 6: Routeing Strategy
- → Section 7: Development of Route Options

- Section 8: Appraisal of Route Options and Selection of Preferred Route
- Section 9: Next Steps

2 LEGAL FRAMEWORK

2.1.1 There are a number of legal provisions which apply to the development of electricity transmission and distribution lines and associated infrastructure. The key provisions are as follows:

- The Electricity Act 1989 is the principal legislation which applies in the UK;
- The Town & Country Planning (Scotland) Act 1997 as amended by The Planning etc. (Scotland) Act 2006; and
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000.

SCOTTISH POWER TRANSMISSION'S STATUTORY DUTIES

2.1.2 Scottish Power Transmission's licensed businesses are authorised to transmit and distribute electricity within its network areas under the Electricity Act 1989 (the Electricity Act). As such, Scottish Power Transmission has a statutory obligation to carry out the duties outlined within the Electricity Act.

2.1.3 Section 9 of the Electricity Act states that it shall be the duty of a license holder ''*to develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and to facilitate competition in the supply and generation of electricity''*.

2.1.4 Schedule 9 of the Electricity Act requires Scottish Power Transmission to take account of specific factors in formulating any relevant proposals. It states that the licence holder:

"(a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and

(b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."

CONSENTING REQUIREMENTS

2.1.5 Section 37 of the Electricity Act requires that, with the exception of certain specific examples, all electricity lines exceeding 20kV will require consent to be granted by the Scottish Ministers. This 'Section 37 consent' gives approval to install, and keep installed, an overhead electricity line. Section 57 of the Town & Country Planning (Scotland) Act 1997 as amended by The Planning etc. (Scotland) Act 2006 provides that ''*Planning permission may also be deemed to be granted in the case of development with government authorisation''*. In certain circumstances, deemed planning permission may include works that are 'ancillary' or necessary to the operation of the overhead line such as cable sealing and compounds.

2.1.6 In some instances, there may also be the need for separate planning permission where development does not form part of a Section 37 application. For example, separate planning permission may be required for 'ancillary development' such as a substation. Where consent for development is sought, an application must be made to the relevant planning authority, under the Town & Country Planning (Scotland) Act 1997 as amended, before such works are able to be carried out.

2.1.7 Finally, some forms of development, including underground cables, are classed as 'permitted development' under the Town and Country Planning (General Permitted Development) (Scotland) Order 1992 (as amended). Developments classified as permitted development may automatically be granted planning permission, by statutory order, and do not require submission of a planning application to the local planning authority.

2.1.8 At the same time as applying for Section 37 consent, SPEN will request deemed planning permission under Section 57 of the Town and Country Planning (Scotland) Act 1997 from Dumfries and Galloway Council as the planning authority for the overhead line and all ancillary elements.

THE ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (SCOTLAND) REGULATIONS 2000

2.1.9 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 require that, before consent is granted for certain developments, an Environmental Impact Assessment (EIA) must be undertaken. The EIA Regulations set out the types of development that are always subject to an EIA (Schedule 1 developments) and other developments which may require an EIA if they exceed certain thresholds and are likely to give rise to significant environmental effects (Schedule 2 developments). The Proposed Development currently falls under two Schedule 2 definitions:

"(c) an electric line installed above ground, the purpose of which installation is to connect the said line to a power station subject to an EIA; and

(d) an electric line installed above ground with a voltage of 132 kilovolts or more, the installation of which (or the keeping installed of which) will require a section 37 consent but which is not Schedule 1 development;"

2.1.10 SP Energy Networks take the view that an EIA will be required for the proposed route once established, due to the nature and scale of a development of this type. An Environmental Statement will be produced and submitted with the relevant consent application. Any sections of underground cable deemed necessary are included within the EIA as associated or ancillary development.

3 PROJECT DESCRIPTION

3.1 THE NEED FOR THE DEVELOPMENT

3.1.1 The connection to Lorg and Longburn wind farms follows a request from each wind farm developer for a connection to the electricity transmission network. SPEN, as transmission licence holder for the South of Scotland are obliged to offer a connection for any such request. As such, a grid connection is proposed on the following basis.

3.2 DESIGN

3.2.1 SPEN's policy is to seek a continuous overhead line solution for all transmission connections and only where there are exceptional constraints are underground cables considered an acceptable design option. Such constraints can be found in urban areas and in rural areas of the highest scenic and amenity value. Whilst underground cables have visual benefits, there are associated technical and environmental and economic disadvantages including:

→ the physical extent of land required;

- the fault repair time;
- difficulties associated with general maintenance;
- increased cost;
- greater ground disturbance from excavating trenches;
- the restriction of development and planting within the underground transmission cable corridor;
- requirements for cable sealing end compounds or platforms at each end of each section of underground cable; and
- the fact that underground cabling is a less efficient means of transporting electricity.

3.2.2 On this basis, the key design assumption is that this will be a continuous OHL connection throughout. Should the appraisal identify any areas where a proposed OHL is likely to give rise to unacceptable effects, alternative options (such as underground cables and alternative routes) will be considered.

3.2.3 The OHL is proposed as a 132kV connection to be supported by 'Trident' wood poles. It will connect to the DE Route at a T-in point located between New Cumnock substation and Dalquhandy sealing end compound (under construction). From here a 132kV OHL will be installed to a junction between Longburn and Lorg Wind Farms. From this junction separate 132kV OHLs will be installed to the Lorg and Longburn Wind Farm connection points. Lorg and Longburn Wind Farms are approximately 12.5 and 7.0 km from the DE route at their nearest points respectively.

3.2.4 The location of the DE Route connection, junction and OHL routes will to be determined through the routeing process undertaken within this document.

WOOD POLES

3.2.5 The Trident wood poles would carry single circuit lines operating at 132kV and the design specification would be in line with ENA TS 43-50 132kv Single Circuit Overhead Lines on Wood Poles a UK Electricity Industry Design Standard. Wood poles are fabricated from pressure impregnated softwood, treated with a preservative to prevent damage to structural integrity.

3.2.6 There are two configurations of Trident Wood Pole; a 'single' pole and an 'H' pole. 'H' poles are used for 'extreme environments' (above 200m) as they are subject to greater ice and wind loadings, whereas 'Single' poles are used in less extreme environments at lower altitudes. Figure 2 illustrates the main different pole types. Given the study area concerned which is mostly above 200m it is anticipated that the 'H' pole configuration is most likely to be used throughout.

3.2.7 There are three types of pole and can be either a single or H pole configuration:

- Intermediate: where the pole is part of a straight line section;
- Angle: where the OHL changes direction. Single poles can support changes in direction up to a maximum of 30 degrees and 'H' poles up to 70 degrees. All angle structures require to be back stayed; and
- Terminal: where the overhead line terminates into a substation or on to an underground cable section via a cable sealing end.

3.2.8 Typical heights for the Trident wood poles including insulators are approximately 13 m above-ground height, with a range between 10 m and 22 m.

3.2.9 The Trident wood poles would support three conductors (wires) in a horizontal flat formation as shown in Figure 2.

3.2.10 Typical spans between trident wood poles at elevations above 200 m are 50 – 75 m for 'Single' poles and 120 to 155 m for the 'H' pole configuration; however they will vary depending on factors such as the size of the conductor, the size of the structures, terrain, ice and wind loadings etc.

DE ROUTE T-IN

3.2.11 To connect to the DE route there would be a requirement for a sealing end compound and connection to a suitable tower on the DE Route itself.

- → The sealing end compound would be located within 20 m of the DE Route. It would potentially require an area of approximately 25 m² on relatively gentle slopes (maximum 6 degrees). A terminal wood pole would terminate at the sealing end compound
- → A suitable tower would be required on the DE route to connect to the sealing end compound. Should a terminal tower already exist at a potential T-in location this could be used. Alternatively new tower(s) would need to be constructed and this may require towers to be constructed off-line, diversion of the DE route, and then removal of the existing towers.

LORG AND LONGBURN JUNCTION

3.2.12 For the junction between the two wood pole OHLs there would be a sealing end compound which may contain a containerised modular building should a circuit breaker and protection and control equipment. The Trident OHL from each wind farm would end with a terminal pole connecting it to the sealing end compound; which would require an area of approximately up to 25 m². The final design will be made at the detailed design stage.

3.3 CONSTRUCTION

OVERHEAD LINE – WOOD POLE

3.3.1 The overhead line construction would comprise of the following stages:

- → Establishment of temporary infrastructure including construction compound(s) and other areas of temporary hard standing such as lay down areas. There may be a requirement to construct bellmouths to the public highway where narrow farm tracks are utilised
- → Provision of access to the pole locations. Access for wood pole construction would use low ground-pressure vehicles such as an argocat, tractor or quad bike; and a tracked excavator. Access may include the use of trackway to minimise the impact on soils, especially in peaty areas and temporary watercourse crossings may be required
- → Construction of pole foundations. Pole excavations are typically 3 m by 2 m deep. The excavated material would be sorted into appropriate layers and backfilled to maintain the original soil horizons. No concrete is anticipated to be required
- → Wood poles erected. The excavator(s) would hoist the assembled structure into position and once the structure has been braced in position the trench would be backfilled.
- → Stringing of conductors. The conductors would be winched to/pulled from section poles; these poles therefore require access for heavy vehicles to transport the conductor drums and large winches. Where the overhead line crosses a road a scaffold tunnel would be used to protect the vehicles from the works. Existing distribution lines would be either switched off, deviated or protected using 'live line' scaffolds.
- → Reinstatement of pole sites and removal and reinstatement of temporary infrastructure sites.

3.3.2 The sealing end compound would be excavated and constructed.

3.3.3 Disturbance to local residents and landowners would be minimised as far as possible through the application of proven construction methodologies.

4 APPROACH TO ROUTEING

4.1 INTRODUCTION

4.1.1 This study follows established best practice in OHL routeing first codified as the 'Holford Rules' (see Appendix A) in combination with the SPEN routeing methodology 2015 guidance 'Major Electrical Infrastructure Projects: Approach to Routeing and Environmental Impact Assessment', which is currently being revised. The guidance follows a two-stage process.

- → Stage 1: Appraisal of route options to select a preferred route including consultation with stakeholders and the wider public to establish a proposed route
- → Stage 2: Environmental Impact Assessment (EIA) of the proposed route and any associated infrastructure. Confirmation of the route alignment for application purposes

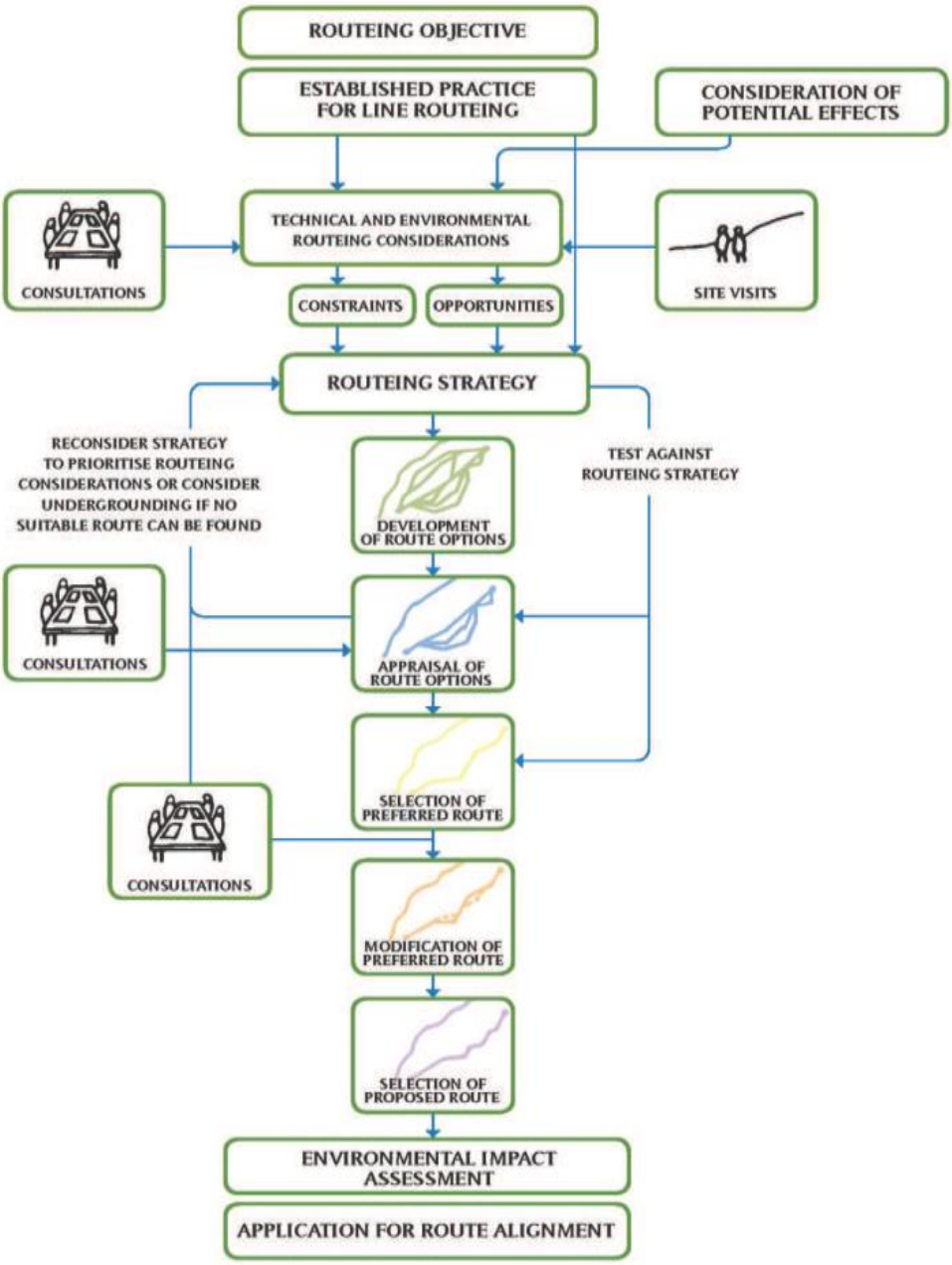
4.1.2 Stage 1 is the focus of this report. Under the Electricity Act, SPEN is required to consider environmental, technical and economic considerations, and to reach a balance between them. This means that the proposed route would be the one, selected after an appraisal of a number of route options, which balances technical feasibility and economic viability with the least disturbance to people and the environment. Following engagement with relevant stakeholders, including local communities, professional judgement is used to establish the balance.

4.2 SPEN ROUTEING APPROACH

4.2.1 SPEN's approach to routeing an overhead line is based on the premise that the major effect of an overhead line is visual and that the degree of visual intrusion can be reduced by careful routeing. A reduction in visual intrusion can be achieved by routeing the line to fit the topography, by using topography and trees to provide screening and/or background, and by routeing the line at a distance from settlements and roads. In addition, a well-routed line takes into account other environmental and technical considerations and would avoid, wherever possible, the most sensitive and valued natural and man-made features.

4.2.2 Chart 1 illustrates the process flow which SPEN adopts for OHL routeing and which has been applied to this project. The following sections describe the key stages in this process.

Chart 1: SPEN Approach to Routeing



ROUTEING OBJECTIVE

1.1.6 In accordance with the Electricity Act, the project routeing objective is:

"To identify a technically feasible and economically viable route for an overhead transmission line that meets the technical requirements of the electricity network and causes, on balance, the least disturbance to the environment and the people who live, work and recreate with in it."

1.1.7 SPEN's routeing objective is to identify a technically feasible and economically viable overhead line route, between specified points, which causes the least disturbance to people and the environment.

ESTABLISHED PRACTICE FOR LINE ROUTEING

THE HOLFORD RULES: GUIDELINES FOR THE ROUTEING OF NEW HIGH VOLTAGE OVERHEAD TRANSMISSION LINES

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

DESIGN TECHNIQUES FOR FOREST MANAGEMENT PLANNING (2014)

4.2.4 Guidelines have been produced by the Forestry Commission for the design of woodlands. These include a section on the design of open spaces in the forest, which discusses how OHL wayleaves can be integrated in the forest design.

ROUTEING CONSIDERATIONS

4.2.5 Overhead lines are linear elements in the landscape. They are likely to affect, to varying degrees, visual and other environmental aspects of the area through which they run. This part of the process predominantly comprises information gathering and consideration of the potential for effects.

4.2.6 The initial stage is to determine a study area and gather baseline information within this area through desk-based studies, site visits, and consultations in order to identify potential constraints and opportunities to routeing.

4.2.7 To define a route that meets the requirements of the Electricity Act, a balance must be struck between three sets of potentially conflicting considerations:

- → Economic - an affordable route
- → Technical - a constructible route
- → Environmental - a route that has the least possible adverse environmental effects

ECONOMIC CONSIDERATIONS

4.2.8 In compliance with Schedule 9 of the Electricity Act the routeing objective requires the proposed connection to be economical. It is understood that this is interpreted by SPEN as meaning that as far as possible, and all other things being equal, the connections should be as direct as possible and the route should avoid areas where technical difficulty or compensatory schemes would render the connection uneconomical.

TECHNICAL CONSIDERATIONS

4.2.9 Technical considerations potentially include existing infrastructure (in this case wind farms and overhead lines), altitude and slope angle, and physical constraints such as large water bodies.

4.2.10 These technical considerations are not considered as being absolute constraints but are a guide to routeing. The approach taken is to identify preferred environmental options informed by a staged review of technical issues.

ENVIRONMENTAL CONSIDERATIONS

4.2.11 Statutory duties imposed by Schedule 9 of the Electricity Act require licence holders to seek to preserve features of natural and cultural heritage interest and mitigate where possible, any adverse effects which a development may have. Experience across the electricity industry shows that an overhead transmission line is likely to affect to varying degrees the following:

- → Landscape, views and visual amenity
- → Ecology and nature conservation
- → Cultural heritage
- → Forestry and woodland

4.2.12 Other considerations which may affect routeing to a greater or lesser degree include:

- → Planning allocations and major applications
- → Noise
- → Traffic (access for construction)
- → Land Use (agriculture)
- → Socio-Economics (tourism and recreation)
- → Geology and hydrogeology

4.2.13 Following this, the potential constraints and opportunities for a project can been identified and used to formulate a site specific routeing strategy.

ROUTEING STRATEGY

4.2.14 A site-specific routeing strategy is developed, based on established practice for line routeing and a general understanding of the technical and environmental constraints and opportunities relating to routeing an overhead line through the identified study area.

4.2.15 The subsequent stages of route appraisal and selection repeatedly ‘test’ the options against this Routeing Strategy to ensure that the original aims are being met.

4.2.16 The Routeing Strategy for this project is defined in Section 6.

DEVELOPMENT OF ROUTE OPTIONS

4.2.17 Considerations identified in the routeing strategy are applied to the study area to establish a number of possible ‘route options’. This process involves designing routes in accordance with the Holford Rules, that best fit the landscape and minimise effects on visual amenity, whilst avoiding wherever possible areas of high environmental value. These areas generally include areas of natural and cultural heritage value designated at a national, European or international level as these are afforded the highest levels of policy protection.

APPRAISAL OF ROUTE OPTIONS

4.2.18 As each route option is developed, its effect on the routeing considerations is recorded. At this stage, a route option may be rejected, modified or studied in more detail.

4.2.19 In conjunction with the collection of relevant data and the evaluation of route options, the routeing considerations may be re-appraised and updated as more information becomes available. Route options may then be rejected or modified, or new route options developed.

4.2.20 By definition, the route of the line must be continuous and as a consequence, the environmental advantages for routeing in one area may be offset by the disadvantages of routeing through an adjoining area. A second application of the routeing strategy establishes the relative importance of these advantages and disadvantages by reference to the constraints map and appraisal criteria. The options which perform poorly in this initial appraisal are rejected. The remaining route options are then further refined and re-appraised. The objective of this process is to identify the 'preferred route' which causes the least likely disturbance to people and the environment of the options considered whilst being technically feasible and economically viable.

4.2.21 After the comparative appraisal of route options, SPEN selects a preferred option. This is then taken forward for stakeholder, including public, consultation.

4.2.22 This stage is iterative based on the findings of the appraisal and consultation responses and may result in modification to the routeing strategy and/or the route options which then require reappraising.

MODIFICATION OF PREFERRED ROUTE AND SELECTION OF PROPOSED ROUTE

4.2.23 The preferred route is subjected to further consideration in response to public consultation, and may be modified further in the light of these consultations. Modifications may result in further consultation if necessary.

4.2.24 The preferred route, modified to take into account consultations and the consideration of specific local issues, is then promoted as the 'proposed route'.

4.2.25 The proposed route is then taken forward to Stage 2 of the process; Environmental Impact Assessment where it is subjected to further detailed assessment to determine its likely effect on the environment. This may result in further minor deviations, prior to confirmation of the route alignment for application purposes.

5 TECHNICAL AND ENVIRONMENTAL ROUTEING CONSIDERATIONS

5.1 INITIAL STUDY AREA AND ROUTE OPTION AREA

5.1.1 The Initial Study Area was used as a starting point for the identification of route options, which broadly covered an area encompassing Lorg and Longburn Wind Farm substations, the DE Route and regions to the north and south as illustrated in Figure 1.

5.1.2 This Initial Study Area was further refined to identify the broad area within which feasible route options could be located; the Route Option Area.

5.1.3 The key factor defining the Route Option Area was topographic. An upper altitude limit of 500 m was applied, steep slopes avoided and hilltop high points at lower altitude were also excluded. The southern extent was limited by the DE Route connection point, which must be north of the Dalshangan sealing end compound near Polquhanty (tower 102R of the DE Route). The Route Option Area is illustrated in Figure 3.

5.1.4 The initial study area is characterised by a mountainous region to the north and northeast, comprising a number of peaks, the highest being Carnsmore of Carsphairn at 797 m AOD. The valleys follow a southerly/south-westerly direction joining with the lowland valley of the Water of Deugh, Kendoon Loch and Water of Ken which runs through the centre of the initial study area. The central and southern regions are of undulating topography with elevations generally below 300 m AOD, dropping towards the Water of Deugh, Kendoon Loch, and lower reaches of the Water of Ken; the lowest elevation is 110 m AOD at the southern end of the Route Option Area.

5.1.5 There is a swathe of forestry which runs down the centre and north-eastern section of the initial study area, and small copses of trees across more open lowland areas. The remaining land use is a mixture of open moorland and rough grazing with improved grassland in the lower lying areas.

5.1.6 The area is sparsely populated with Carsphairn being the only settlement within the initial study area, although outwith the Route Option Area.

5.1.7 The Route Option Area generally follows the valleys and lowland areas.

5.2 TECHNICAL CONSIDERATIONS

5.2.1 The following technical considerations have been taken into account in the routeing process:

Table 5.1: Technical Considerations

Designation/sensitivity	Features present in the Route Option Area
Topography and Slopes	See text below
Existing infrastructure	There are other overhead lines which run through the site as part of the distribution network
Proposed Wind Turbines	Wind turbines of Lorg and Longburn Wind Farms. Valid application[1] turbines at Windy Rig Wind Farm Valid application[1] Quantans Hill Wind Farm, turbine locations not known

5.2.2 The key technical considerations identified within the route option area are related to constructability; slope of the ground and construction access.

5.2.3 The technical requirements for wood pole overhead lines become more onerous with altitude because of issues such as wind loading and icing risk. Altitudes below 200 m are generally considered ‘normal environments’, and above 200 m ‘extreme environments’ where a H-pole design is appropriate. As previously discussed, the majority of the route option area is above 200 m AOD (an ‘extreme environment’).

5.2.4 Hill slopes in the area are generally relatively gentle but there are a number of areas of steeper ground to the north of the Route Option Area where construction access could prove more difficult. Gradients of 22 degrees or steeper have been identified in discrete areas across the site and more extensively in the northern region in the vicinity of the Lorg connection point. Figure 3

[1] A valid application is one which has been accepted by the Council for consideration. For Quantans Hill Wind Farm, although a valid application has not been received, a Proposal of Application Notice has been submitted indicating their intention to submit; it has therefore been included

shows the landform of the route option area coloured by height and the areas of steeper ground: between 15% and 22%, and over 22% gradient[2].

5.2.5 The proximity of the OHL to the wind turbines associated with wind farms has also been taken into consideration. There are two constraints to be considered as detailed in Energy Networks Association's document Separation between Wind Turbines and Overhead Lines[3] and summarised as follows:

- OHLs cannot be located within topple distance of a wind turbine which equates to the wind turbine height to blade tip plus 10% or height to blade tip plus the electrical safety distance which is 2.3 m for 132 kV OHLs
- The downwind wake effect of wind turbines can cause increased levels of movement of the OHL conductors which in extreme cases could lead to conductor clashing. The effects are negligible at a distance of 3 times the rotor diameter of the wind turbine, although there is some flexibility in this depending on the intervening topography.

5.3 ENVIRONMENTAL CONSIDERATIONS

INTRODUCTION

5.3.1 Baseline information was obtained from a number of sources as detailed in Appendix B and summarised below. Structured site visits were also undertaken on 24th November 2016 and 1st to 3rd February 2017.

- Designated or sensitive sites from SNH, Forestry Commission Scotland, Historic Environment Scotland, SUSTRANS and SEPA
- Development Plan documentation and maps
- Landscape character assessments published by SNH
- Ordnance Survey mapping (1:50,000 and 1:25,000) and aerial photography (Google Earth Pro, Google Streetview, Bing maps)
- Addresspoint dataset from Ordnance Survey
- Planning applications for developments not yet built
- Other local information through internet searches
- Other publically available Environmental Studies:
  - Longburn Wind Farm Environmental Statement
  - Lorg Wind Farm Environmental Statement
  - Blackcraig and Margree Environmental Statement
  - Loch Urr Routeing Study
  - Kendoon to Tongland Reinforcement Routeing Consultation Document
  - Quantans Hill Environmental Statement
  - Windy Rig Environmental Statement

[2] Gradients identified from OS Terrain 50 data which does not show small areas of steeper ground

[3] Energy Networks Association 2012: Engineering Recommendation L44, Separation between Wind Turbines and Overhead Lines Principals of Good Practice

LANDSCAPE

5.3.2 The landscape sensitivities within the route option area are summarised in Table 5.2 and illustrated on Figure 4: Landscape Character Areas and Designations.

Table 5.2: Landscape and Visual Sensitive Receptors

Designation/sensitivity	Features present in the Route Option Area
National Parks	None
National Scenic Areas	None
Regional Scenic Areas	Ayrshire Sensitive Landscape Area Dumfries and Galloway Regional Scenic Area
Wild Land Areas	No areas mapped as such by SNH. However, all but the edges and lowest parts of Southern Uplands LCT have a distinct remote and natural character.
Landscape Sensitivity	See Appendix C
Scenic Viewpoints	None identified on OS 1:50 000 or 1:25 000 maps
Important Skylines/Ridgelines	Distinctive shape of Cairnsmore of Carsphairn seen from the Glenkens
Landscape Character Types	See Appendix C
Gardens and Designed Landscapes	None on the HES Inventory. Knockgray Park recognised locally by D&G Council
Important outdoor recreation activities and tourist routes	Southern Upland Way Cairnsmore of Carsphairn (Corbett) (two main access routes to the hill) Forest trails at Polmaddy and Dundeugh A713 Galloway Tourist Route

LANDSCAPE AND LANDSCAPE-RELATED DESIGNATIONS

National designations

5.3.3 There are no national landscape or related designations within the route option area.

Local designations

5.3.4 The western half of the route option area forms part of the easternmost edge of the Galloway Hills Regional Scenic Area (RSA), designated by Dumfries and Galloway Council and covered by LDP Policy NE2. The RSA covers a large part of Dumfries and Galloway, centred on the hills of The Merrick and the Rhinns of Kells but extending to include the large tract of upland and valley landscapes that extend from the Ayrshire boundary almost to the coast by Kirkudbright.

5.3.5 The area north of the local authority boundary to the north of the route option area is designated a Sensitive Landscape Area in the East Ayrshire LDP Proposed Plan and covered by Policy Number ENV7.

5.3.6 Knockgray Park, just east of Carsphairn, is recognised as a designed landscape of sufficient value to be recognised locally, although it is not on the Historic Environment Scotland Inventory of Gardens and Designed Landscapes. Whilst designed landscapes are considered to be Cultural Heritage assets, they are recognised as having a particular landscape value and form a constraint to routeing.

TOPOGRAPHY

5.3.7 The route option area extends from the broad valley of the Glenkens to the head of the valley of the Water of Ken, and includes the lower parts of the rolling hillsides either side. The valley of the Glenkens is a broad valley, at an elevation generally just under 200 m AOD, running northwest – southeast, and occupied variously by the Water of Ken, Kendoon Loch, the Water of Deugh and Carsphairn Lane. The land rises relatively gently either side to intermediate rounded hills between 300 m and 400 m high.

5.3.8 To the north, and excluded from the route option area primarily because of altitude, the land rises more steeply to a more significant band of hills, some of which form the boundary with Ayrshire. The valley of the Water of Ken is a narrow valley, U-shaped in its upper reaches. The valley floor rises from under 200 m AOD, with gentle side slopes where it joins the Glenkens to over 300 m with steep side slopes at its head in the hills close to the Ayrshire boundary.

LANDSCAPE CHARACTER ASSESSMENT

5.3.9 The landscape character of Scotland has been classified and assessed in a series of studies coordinated by SNH, with the landscape of the route option area being described in the Dumfries and Galloway landscape assessment[4] (D&GLA). This assessment classifies the landscape of the region into four regional character areas and 21 distinct landscape character types (LCTs), some with a subcategory covering the presence of extensive forestry. In classifying these landscape types the D&GLA identifies 104 discrete Landscape Character Units (LCUs), areas within the different LCTs.

5.3.10 The route option area lies in the Southern Uplands regional character area, described as *"a landscape of uplands and dales that extends eastwards from the valley of the River Dee, consisting of characteristically smooth, conical peaks with extensive foothills and plateaux. Forestry and upland sheep farming are principal land uses, except in the dales where more cattle are grazed, arable crops and grass silage grown within walled and hedged enclosures."*

5.3.11 In detail, the route option area primarily consists of four landscape character types (LCTs):

- → Narrow Wooded River Valley (the upper valley of the Water of Ken, the Ken LCU);
- → Upper Dale (the broad valley of the Glenkens, Upper Glenkens LCU);
- → Southern Uplands (the open hillsides above the valleys, the Carsphairn LCU); and
- → Southern Uplands with Forest (the forested hillsides above the valleys, the Ken LCU)

5.3.12 A small part of the south of the route option area falls into the Foothills with Forest LCT. As this area was excluded from the developed route options area it is not considered further here.

LANDSCAPE SENSITIVITY AND CAPACITY

5.3.13 Landscape sensitivity refers to the degree to which the landscape is sensitive to the change brought about by the introduction of development, and thus how likely it is that a given change would lead to a significant effect on landscape character. Judgements on the sensitivity of a given

[4] Land Use Consultants 1998. Dumfries and Galloway landscape assessment. Scottish Natural Heritage Review No 94.

landscape are based on a combination of its susceptibility to change brought about by the development and the values accorded to the landscape[5].

5.3.14 Landscape sensitivity is development-specific: in other words it is a function of the type of development (its particular form and characteristics), how this affects the landscape directly (physical changes) and how this affects it indirectly (perceptual effects on how the character[6] of the landscape is appreciated).

5.3.15 Key factors that contribute to the sensitivity of landscape include: underlying physical aspects such as landform and scale; human aspects such as land use and land cover; and perceptual aspects, particularly the degree of wildness and perceived naturalness. These factors, which draw on the principles of the Holford Rules, are taken into account both in the laying down of route options and in the appraisal.

5.3.16 A high level appraisal of the LCUs within the Route Option Area was carried out as detailed in Appendix C. This draws on field observations as part of this study, the D&GLA, and the findings of the Dumfries and Galloway Windfarm Capacity Study[7].

5.3.17 The following paragraphs summarise the key attributes of the LCTs potentially affected and the landscape sensitivity of the LCUs.

Narrow Wooded River Valley (Ken LCU)

5.3.18 The Ken LCU consists of the valley of the Water of Ken from just below Smittons to Lorg Bridge, close to the site of the proposed Lorg grid connection point, almost all of which is potentially affected by route options.

5.3.19 The D&GLA identifies this LCT as having the following key characteristics:

- → *narrow incised valleys with wooded slopes enclosing pasture floors*
- → *dominant broadleaf (semi-natural) woodland character with conifers on higher slopes*
- → *lush trough-shaped river valleys with pasture/arable floors enclosed by deciduous wooded slopes*
- → *small pastures and arable fields enclosed by hedges/fences in lower reaches and drystone dykes in upper reaches*
- → *riparian trees and woodlands following meandering river courses in lower reaches*
- → *narrow lanes following valleys and linking isolated houses, occasional settlements and providing access to higher moorland*
- → *intimate unspoilt landscape focusing on river views with some adjacent policy landscape.*

5.3.20 Of the Summary Guidelines for this LCT in the assessment, the following may have relevance to OHL development:

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[5] Guidelines for Landscape & Visual Impact Assessment, Landscape Institute & IEMA, 3rd Edition 2013

[6] Landscape character is defined by SNH (Landscape Character Assessment Guidance for England and Scotland, The Countryside Agency and Scottish Natural Heritage, 2002) as "the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how these are perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape."

[7] Dumfries and Galloway Landscape Wind farm Capacity Study Final Main Report, Carol Anderson in association with Alison Grant, Landscape Architects, January 2011

- *conserve riparian woodland and wetland corridors*
- *reinstate hedgerow field boundaries*
- *ensure road engineering works preserve the informal character of the valley roads.*

5.3.21 The description of the landscape type in the D&GLA fits the valley quite well, although the lower and middle valley are dominated by commercial conifer forestry.

5.3.22 The central, broader part of the valley is a relatively attractive landscape, the form of which offers the possibility of a line following the linear form of the landscape along the edge of the valley floor with a hill background (Holford Rules 4 &5). The northern and southern sections are narrower and an OHL would risk becoming a dominant feature. Overall, the LCU is considered to have a **medium** level of landscape sensitivity.

Upper Dale (Upper Glenkens LCU)

5.3.23 The Upper Glenkens LCU consists of the broad valley trending NW-SE and followed variously by the Carsphairn Lane, the Water of Deugh and the Water of Ken, from just east of Loch Doon to St John's Town of Dalry. The central third of this LCU is potentially affected by route options.

5.3.24 The D&GLA identifies this LCT as having the following key characteristics:

- *wide 'V'-shaped valley, enclosed by high peaks and moorland*
- *open with long views*
- *improved valley pastures becoming rougher up the valley sides*
- *riparian woodlands along the main river and up tributary channels*
- *medium to large scale forestry plantations on the valley sides and extending over horizons from higher ground*
- *mining settlements and remnants of industrial activity e.g. mine ruins and bings.*

5.3.25 Of the Summary Guidelines for this LCT in the assessment, the following may have relevance to OHL development:

- *integrate new planting with valley woodlands*
- *support the restoration of drystone dykes as important features in this open landscape*
- *… medium scale wind power development may be suitable in areas where landform can minimise intrusion and cultural history provides an appropriate context.*

5.3.26 The un-forested parts of this LCU have an open character, with long views. The eye tends to be drawn along the valley with the peaks and moorland acting more as backdrop than focal point in most conditions, although in places views across to the Rhinns of Kells or to the distinctive form of Cairnsmore of Carsphairn are important. The landscape is clearly managed, mainly improved grazing, merging into semi-improved and moorland on the higher slopes. Landscape quality varies across the LCU with the lower reaches of the Water of Deugh as it merges into the narrow ribbon of Kendoon Loch and the Glenhoul Glen (below the Kendoon dam) being noticeably more attractive landscapes than the open valley above Carsphairn. The landscape of the area is clearly valued, recognised both in the RSA designation and as the setting to the A713 Galloway Tourist Route, a route promoted for its scenic qualities. Balancing the relatively small scale intrusion of the OHL and the extent of existing infrastructure in this LCU against the recognised landscape value, landscape sensitivity is considered to be **medium** overall, slightly higher along the valley south of Carsphairn and lower to the north.

Southern Uplands (Carsphairn Unit) & Southern Uplands with Forest (Ken Unit)

5.3.27 These two units are part of the south-western end of the Southern Uplands hill range, differentiated by the extent of commercial forestry and the effect this has on landscape character. They extend from the Glenkens in the west and merge into gentler landscape around Moniaive to the east and fade into the Foothills LCT at Culmark Hill. The named LCUs extend to the Ayrshire boundary to the north, although the landscape type continues north of this.

5.3.28 The D&GLA identifies the Southern Uplands LCT as having the following key characteristics:

- *large, smooth dome / conical shaped hills, predominantly grass covered*
- *open and exposed character except within incised valleys*
- *distinctive dark brown/purple colour of heather on some of the higher areas*
- *pockets of woodland in incised valleys*
- *stone dykes occasionally define the lower limit*
- *legacy of mining activity*

5.3.29 The Southern Uplands with Forest LCT are differentiated as follows:

- *large, smooth dome shaped hills with large scale dark green plantations on slopes and over lower summits*
- *changing landscapes with large scale felling, ploughing and replanting.*

5.3.30 The critical differences being the way that afforestation encloses the landscape for long periods, and the intermittent change and disturbance resulting from the long planting to harvest cycle. The boundaries between the LCUs as mapped reflects a historic pattern of forestry. More recent planting has extended into parts of the Southern Uplands LCT and wind farm development has resulted in the permanent clearing of parts of the Southern Uplands with Forest LCT

5.3.31 This is a large scale landscape of rounded hills. The un-forested areas are generally very open and exposed, whilst the forested ones can be quite enclosed. Parts of the lower slopes where it merges into the Upper Dale are semi-improved pasture and well drained but most of the un-forested area is open moorland with an exposed remote quality. The value attributed to the higher and more open parts of this landscape is evidenced by its inclusion in the Galloway Hills RSA, and Cairnsmore of Carsphairn, the summit to the north of Quantans Hill, is a popular Corbett[8] – a destination summit. There is a distinct degree of wild land character in the higher open areas, diminishing towards the edges, and a sense of timelessness. In the open areas, an OHL would potentially introduce an awkward scale contrast and would disrupt the sense of remoteness and naturalness, particularly if routed through the higher parts of the area. As such landscape sensitivity is considered to be high.

5.3.32 The forest areas by contrast vary distinctly over time. For long periods they may be seen as dark, brooding permanent features but when harvest and replanting is in progress they are a landscape of active change. The forests either side of the Water of Ken are currently being harvested and replanted and are thus a landscape of active change and very visible human influence. A wood pole OHL would be of a scale with mature plantation forestry and although a potentially noticeable wayleave would be required, in many places forestry would screen views of the line. Route alignments can be selected to follow firebreaks, tracks and burn-side clearings to reduce forestry

[8] Summit between 2500 and 3000 feet

loss. Landscape sensitivity of the forested parts of the units is therefore considered to be medium to low.

VISUAL AMENITY

5.3.33 There are three main types of sensitive visual receptors in the route option area:

- → Residential receptors - both scattered individual properties and small settlements
- → Recreational receptors – people using the countryside for outdoor recreation; and
- → Transport receptors – people travelling through the area on major and minor roads.

5.3.34 The nature of the views available in the route option area is generally determined by a combination of topography and forestry cover. There are open panoramic views available from some of the higher points inside and just outside the route option area, and broad open views available in much of the Southern Uplands LCT. In the upper parts of the Water of Ken valley, views are generally focussed along the valley and are mostly quite open, although in places filtered by scrub and woodland. In the lower valley, dense forestry cover leads to limited visibility and enclosed views. This however is a constantly changing situation as forestry parcels are felled and replanted. In the central part of the valley for example, views that were quite enclosed a year or two ago are today relatively open because of recent forest harvesting. Likewise in the Glenkens, views tend to be focussed along the valley and towards the river (except where forestry encloses the view) with the surrounding hills acting more as a backdrop than focal points.

5.3.35 The main settlement in the route option area is the hamlet of Carsphairn. There are clusters of houses at Dundeugh/Polmaddie, Kendoon and Polquhanity. Scattered farmsteads and individual properties are found mainly close to the roads along valley bottoms, particularly along the B729 and the B7000 and a scatter along the valley of the Water of Ken. A few outlying farms and houses can be found on the lower slopes of surrounding hills.

5.3.36 In terms of recreational use the key receptors are users of the Southern Upland Way, hillwalkers heading for the popular Corbett summit Cairnsmore of Carsphairn and, users of the forest trails at Polmaddy and Dundeugh.

5.3.37 The main road, and thus transport receptor, through the route option area is the A713 (Ayr to Castle Douglas). This is the main route through the Glenkens and is promoted as the Galloway Tourist Route. A secondary route, the B729 links Carsphairn to Moniaive running along the side of Kendoon Loch before turning up the Water of Ken and Stroanfreggan Burn valleys. The B7000 follows the east side of the Glenkens south from High Bridge of Ken to St John's Town. An unclassified road runs up the Water of Ken valley from Smittons Bridge and another unclassified road links the A713 and the B729 north of Dundeugh Hill.

CULTURAL HERITAGE

5.3.38 The cultural heritage features within the route option area and a 2 km area beyond it are listed in Table 5.3 and illustrated on Figure 5: Cultural Heritage Assets. A 2 km buffer was applied to take into consideration potential setting effects on cultural heritages assets in the vicinity of the route but not directly impacted by it.

Table 5.3 Cultural Heritage Designations

Designation/sensitivity	Features present in the Route Option Area
World Heritage Sites	None
Scheduled Monuments	WITHIN ROUTE OPTION AREA → Stroanfreggan Bridge, cairn (SM1043) → Stroanfreggan Craig, fort, Smittens Bridge (SM1095)

Designation/sensitivity	Features present in the Route Option Area
	→ Craigengillan, cairn (SM2238) → Dundeugh Castle (SM2476) → Polmaddy, medieval and post-medieval settlement (SM5391) WITHIN 2 KM OF ROUTE OPTION AREA → Cairn Avel, cairn 800m South of Carsphairn (SM1006) → Holm of Daltallochan, stone circle & standing stone (SM1029) → Braidenoch Hill, cross slabs (SM1105) → Holm of Daltallochan, cross slab (SM1106)
Listed Buildings	WITHIN ROUTE OPTION AREA A-Listed → None B-Listed → High Bridge of Ken (LB3627) → Smeatons bridge over Water of Ken (LB3628) → Galloway hydroelectric power scheme, Kendoon north dam (LB51691) → Galloway hydroelectric power scheme, Kendoon power station and valve-house (LB51694) → Galloway hydroelectric power scheme, Kendoon power station and valve-house (LB51694) → Galloway hydroelectric power scheme, Carsfad dam (LB51695) → Galloway hydroelectric power scheme, Carsfad power station (LB51696) C-Listed: → Dalshangan stables (LB3679) → Dalshangan dovecot (LB3680) → Galloway hydroelectric power scheme, Kendoon south dam (LB 51692) → Galloway hydroelectric power scheme, Kendoon surge tower (LB51693) WITHIN 2 KM OF ROUTE OPTION AREA A-Listed → None B-Listed → Barlaes (LB3676) → Carsphairn parish churchyard and McAdam Mausoleum (LB3678) → Holm of Daltailochan (LB3681) C-Listed → Carsphairn parish church, Church of Scotland (LB3677) → Knockreoch Bridge (LB9747)
Conservation Areas	None
Gardens and Designed Landscapes	None on the HES Inventory. Knockgray Park recognised locally by D&G Council and is later referred to as “Non-Inventory Garden and Designed Landscape”
Archaeologically Sensitive Areas	There are three Archaeologically Sensitive Areas within the route option area Stroanfreggan, Bardennoch – Garryhhorn and Polharrow Burn, and a fourth within 2 km to the north; Water of Deugh.
Registered Battlefields	None
Non-Designated Historic Environment Records of National Importance	There are three within the route option area. Round Craigs burial cairn, Stroanfreggan cairn and Glenhead Rig
Historic Environment Records	There are 279 within the route option area

5.3.39 The most sensitive features for route option identification would be the Scheduled Monuments within and in close proximity to the route option area where there is the potential for impacts on the setting of the feature. Although the citations do not specifically mention setting, the features in themselves are such that setting considerations would need to be taken into account.

5.3.40 Stroanfreggan Archeologically Sensitive Area at Longburn Wind Farm also encompasses Stroanfreggan Craig Fort Scheduled Monument and numerous Heritage Environment Recorded features, including two of national importance. Routeing would take place within this area as the connection point for Longburn Wind Farm is located within it. The setting of visible features, avoidance of excavation in areas of known buried features; and appropriate archaeological mitigation measures to manage the encountering of unknown buried assets needs to be taken into consideration.

5.3.41 For the listed buildings, no comment is made within the citations on the setting of the structures. Based on the type of structures concerned, potential impacts upon setting would be very localised in nature, relating to views of the structures in their local context.

ECOLOGY, ORNITHOLOGY AND PEAT

5.3.42 The ecological features within the route option area are listed in Table 5.4 and illustrated on Figure 6: Ecological Designations. In respect of designated sites search distances were used in accordance with CIEEM guidelines (CIEEM, 2013), sites with international designations were identified within a 10 km radius and sites with a national designation were identified within a 2 km radius. In respect of species and ecological features, these were identified within the route option area only due to the linear nature of the proposed development.

Table 5.4: Ecological Designations

Designation / sensitivity	Features present in the Route Option Area
Special Protection Areas	None within 10 km of the route option area
Special Areas of Conservation	None within the route option area. Merrick Kells SAC is within 10 km of the Route Option Area. Qualifying features include freshwater habitats, upland habitats and otter.
Wetland of International Importance	None within 10 km of the route option area
National Nature Reserves	None within 10 km of the route option area
Sites of Special Scientific Interest	Cleugh SSSI is within the route option area, which is the best example of unimproved grassland now left in Dumfries and Galloway. A wide range of grassland plant communities and uncommon plants. No other sites within a further 2 km.
Native Woodlands and Ancient Woodland Inventory Scotland	WITHIN ROUTE OPTION AREA → Native upland birch and wet woodland east of Dodd Hill. → Green Well of Scotland. → 'Site 51' and 'site 32' High Bridge of Ken Area. → Dundeugh Wood. → Dalshangan Plantation. → 'Site 19 and 'site 49' Dundeugh Hill area. → Glenhoul Wood. WITHIN 2 KM OF ROUTE OPTION AREA → Barlaes Wood. → Earlstoun Wood.

Designation / sensitivity	Features present in the Route Option Area
	→ Knocknalling Wood. → Drumgowan Wood. → 'Site 1' → 'Site 3' → 'Site 8'
Protected Species	WITHIN ROUTE OPTION AREA → Red squirrel priority woodland is present and in addition the route option area incorporates other habitat suitable for red squirrel. → Otter: Numerous watercourses with suitability for otter are present. → Pine marten: Suitable habitat present, → Badger: Suitable habitat present. → Bats. Suitable habitat present. → Water vole: Suitable habitat present.
RSPB/Birdlife Important Bird Area (IBA)	WITHIN ROUTE OPTION AREA Galloway Forest Park. The route option area extends into the IBA designation boundary near the Water of Deugh. Designated for breeding waders and species of forest and moorland.
Birds of Conservation Importance	WITHIN ROUTE OPTION AREA → Black grouse: black grouse leks have been identified within the route option area during previous surveys. → Red kite: flights have been recorded during previous surveys in the route option area and suitable nesting habitat is present within parts of the route option area. → Goshawk: flights have been recorded during previous surveys and suitable nesting habitat is present within parts of the route option area. → Osprey: flights have been recorded during previous surveys and suitable nesting habitat is present within parts of the route option area. → Hen harrier: flights have been recorded during previous surveys but there is unlikely to be suitable nesting habitat in the route option area. → Peregrine falcon: flights have been recorded during previous surveys but there is unlikely to be suitable nesting habitat in the route option area. → Merlin: flights have been recorded during previous surveys but there is unlikely to be suitable nesting habitat in the route option area. → Curlew: this species has been confirmed as breeding in the route option area during previous surveys. → Barn owl: this species has been confirmed as breeding in the route option area during previous surveys. → Nightjar: no records from previous surveys but the species should be considered given the breeding population located nearby in the Galloway Forest Park. Suitable habitat is present within parts of the route option area. → Crossbill: suitable breeding habitat is present within parts of the route option area.
Peatlands / Priority Habitat / GWDTE	Points of ground water dependent terrestrial ecosystems and peat forming habitats are present within the route option area. Figure 7 gives an indication of the high priority peatland habitats.
Salmonids	The Water of Deugh passes through the route option area and supports brown trout and Atlantic salmon.

5.3.43 In respect of the single internationally designated site identified within a 10 km radius of the route option area, Merrick Kells SAC, the proposed development is considered unlikely to impact on the qualifying features of the designation given the distance from the route option area and the nature

of the works taking place. Due consideration through the route appraisal process should be given to two designated sites within the route option area; Cleugh SSSI and Galloway Forest Park IBA. The integrity of these sites should not be affected following appropriate selection of final routes.

5.3.44 Sensitive habitats within the route option area include points of ground water dependent terrestrial ecosystems and native woodland. Due consideration through the route appraisal process should be given to the avoidance of such habitats as well as mitigation e.g. a peat management plan in respect of access track construction.

5.3.45 In terms of protected species the route appraisal process should consider, as much as possible, avoidance of habitats identified as most suitable for protected species e.g. mature broad-leaved woodland providing bat roosting and foraging habitat, larger water courses providing otter habitat and mature coniferous forestry providing red squirrel habitat. Given the extent of suitable habitat for some protected species within the route option area it would not be possible to avoid all of these, particularly with regard to otter and red squirrel. Where avoidance is not possible then the risk would be managed by undertaking preconstruction surveys and subsequently applying mitigation where required.

5.3.46 In respect of birds of conservation concern the greatest sensitivities are likely to be potential disturbance to black grouse lek sites and disturbance to wader nest sites, namely curlew. With regard to black grouse, avoidance of historic lek sites including an appropriate standoff for disturbance should be undertaken. Preconstruction surveys to locate additional lek sites followed by subsequent mitigation e.g. seasonal restrictions on construction activities within the area of a confirmed lek, would further manage this risk. Curlew is likely to be widely distributed at low densities within the route option area in areas of wet grassland and bog. Where possible route selection should avoid optimum habitat for this species and where this is not possible preconstruction nest checks and subsequent mitigation e.g. a buffer around identified nest sites would be undertaken.

5.3.47 A variety of other bird species of conservation concern have been recorded during previous surveys within the route option area including schedule 1 raptors. Previous surveys have recorded no confirmation of breeding from these species although it should be noted that these records are derived from previous EIA studies that do not provide full coverage of the route option area. The habitat within parts of the route option area is considered most suitable for goshawk, red kite and osprey nest sites where there are areas of mature forestry or in respect of red kite and osprey, small isolated plantations that contain mature trees. Preconstruction surveys of such habitats should be undertaken.

5.3.48 Similarly, ornithological flight path data derived from EIA studies does not provide full coverage of the route option area and therefore is not suitable for ruling out potential route options when used comparatively, although it is useful for appraisal but this context must be recognised. Further flight activity surveys may be required where there are gaps in coverage or previous survey data is greater than five years old.

5.3.49 Peat data has been derived from the British Geological Society superficial deposits maps and the SNH Carbon and Peatland 2016 map. Both derive the data in different ways and have their limitations. The BGS only reports peat depths greater than 1 m, whilst the SNH map reports it in terms of conservation status and therefore excludes areas of forestry for example. Data from both these maps have been presented in Figure 7 for information. Peat probing data that was undertaken for wind farm environmental statements in the area was also consulted.

RECREATION AND TOURISM

5.3.50 The recreation and tourism features within the route option area and a 2 km area beyond it are listed in Table 5.5 and illustrated on Figure 8: Recreation and Tourism. A 2 km buffer was applied to take into consideration potential effects on visual amenity of recreational users.

Table 5.5 Recreation and Tourism Features

Designation/sensitivity	Features present in the Route Option Area
National Trails/Cycleways/Bridleways	→ Southern Upland Way runs along the eastern edge of the route option area.
Core Paths Other named paths	→ Mountain Access Footpath: Cairnsmore of Carsphairn → Mountain Access Footpath: Knockgrey Trail → Heritage Path: Sanquhar to Stronfreggan → Heritage Path: Old Road from New Cumnock to Dalquharin → Scottish Hill Track: New Cumnock to St John's Town of Dalry by Glen Afton → Scottish Hill Track: St Johns Town of Dalry to Sanquhar There are also a series of core paths, some of which follow sections of the named paths above and the Southern Upland Way
Important Recreational Sites	→ Carsphairn Heritage Centre → Polmaddy settlement is a ruined traditional farming village which is a Forestry commission visitor attraction. There is also parking here and forest walks. → Dundeugh Hill has parking and forest walks including the Dundeugh Trail → The Green Well of Scotland has associations with ancient culture and may be a site of pre-Christian worship
Mountain Biking Trails and Road Cycling	→ Southern Upland Circular is a road cycling route which runs through the route option area on the A713 → Mountain Biking Carsphairn Forest is outside the route option area 1 km to the north
Watersports/Fishing/Picnic Areas/Campsites	Angling takes place on Kendoon Loch, Carsfad Loch, Water of Ken and Water of Deugh
Tourist Routes	The Galloway Tourist Route is a national tourist route which runs through the route option area on the A713

5.3.51 The Southern Upland Way is Scotland's only coast to coast long distance footpath and runs 340 km from Portpatrick on the southwest coast of Scotland to Cockburnspath on the eastern coast. The 'St Johns Town of Dalry to Sanquhar' section runs along the eastern boundary of the route option area.

LAND USE

5.3.52 Land use within the route option area is illustrated in Figure 9: Land Use Considerations and detailed in Table 5.6.

Table 5.6: Land Uses within the Route Option Area

Designation/sensitivity	Features present in the Route Option Area
Settlements & Properties (including committed development)	All existing residential properties and one committed residential development have been mapped with a 100 m buffer applied.
Commercial Forestry	There are a number of blocks of commercial forestry within the route option area. Aerial photography site visits and Forestry Commission mapping indicate that there has been felling of forestry compartments at staggered times over the past few years in line with active forestry management.

Designation/sensitivity	Features present in the Route Option Area
Agriculture	With the exception of forestry, the main agricultural land use is grazing on moorland, semi-improved grassland or improved grassland. The moorland areas are at higher altitude and the improved grassland is generally confined to the floor of the valleys.
Mineral Extraction	None
Waterbodies	There are a number of watercourses within the route option area. The two main rivers are as follows: → Water of Deugh, main tributaries include the Benloch Burn and Marbrack Burn; and → Water of Ken, main tributaries of which include Prolifferie Burn, Stroanfreggan Burn and the Holm Burn The Water of Deugh joins the Water of Ken at Kendoon Loch at the southern end of the route option area.
Local Plan Allocations	None. The Carsphairn Allocated Housing Site is more than 100 m from the route option area.
Valid Applications	Quantans Hill Wind Farm Proposal of Application Notice submitted April 2016 (16/N/2/0002). An application for consent under Section 36 of the Electricity Act for a larger scheme was previously refused. Windy Rig Wind Farm planning application submitted but not yet determined
Large Scale Development Proposals	None
MoD Sites	None
Civil and Military Defence Interests	None
Telescopes and Radar	No visibility to MoD onshore radar There is visibility to NATS radar for structures 20 m high, which is limited to the northern section in the immediate vicinity of Lorg Substation
Safeguarded Areas	None
Military Low Flying Areas	With the exception of the northern region in the vicinity of Lorg substation, the rest of the route option area is within a MoD high priority low flying zone.

5.3.53 River flood risk has been considered in the route option appraisal. Although wood poles can be constructed within flood plains, there are potential risks associated with river erosion and subsequent ground instability which may make these options less favourable.

5.4 PLANNING POLICY CONTEXT

5.4.1 The route option area is located within Dumfries and Galloway Local Authority Area. Therefore this section is predominantly concerned with the Dumfries and Galloway Local Development Plan (LDP) (2014) and Supplementary Guidance.

5.4.2 This section considers the following relevant planning policy:

- → The National Planning Framework 3 (NPF3) (2014);
- → Scottish Planning Policy (SPP) (2014);
- → Dumfries and Galloway Council LDP (2014);

5.4.3 Dumfries and Galloway Council Local Development Plan Supplementary Guidance (2015): Part 1 Wind Energy Development: Development Management Considerations.

NATIONAL PLANNING POLICY

NATIONAL PLANNING FRAMEWORK 3 (NPF3)

5.4.4 The NPF3 sets out the spatial strategy for Scotland's development. There is a commitment to increase renewable energy generation by 2020. In order to facilitate this and enhance the development of onshore wind in rural areas, electricity grid enhancements will need to take place across Scotland. The improvement of the high voltage electricity transmission network of or in excess of 132 kilovolts is listed as a National Development.

SCOTTISH PLANNING POLICY (SPP)

5.4.5 The SPP was published in 2014 and reflects the Scottish Ministers' priorities for operation of the planning system and for the development and use of land.

5.4.6 Paragraph 155 states that "*Development plans should seek to ensure an area's full potential for electricity and heat from renewable sources is achieved, in line with national climate change targets, giving due regard to relevant environmental, community and cumulative impact considerations*".

5.4.7 Under paragraph 156, the policy states that strategic development plans should support national priorities of the construction of improvement of strategic energy infrastructure, including *"generation, storage, transmission and distribution networks. They should address cross-boundary issues, promoting an approach to electricity and heat that supports the transition to a low carbon economy*".

LOCAL PLANNING POLICY

DUMFRIES AND GALLOWAY COUNCIL LOCAL DEVELOPMENT PLAN (LDP)

5.4.8 The Dumfries and Galloway LDP was published in September 2014. Table 5.7 highlights policies relevant to topic areas considered in the routeing study.

Table 5.7: Policies from the LDP which are relevant to this project

Policy	Topic Areas	Policy Text
OP1: Development considerations	Landscape and Visual Amenity Cultural Heritage Ecology, Ornithology and Geology	b. Historic Environment: *Development proposals should protect and/or enhance the character, appearance and setting of the region's rich historic environment principally by ensuring they are sympathetic to nearby buildings, sites and features, integrate well and complement the surrounding area.* c. Landscape: *Development proposals should respect, protect and/or enhance the region's rich landscape character, scenic qualities and features and sites designated for their landscape quality at any level. They should also reflect the scale and local distinctiveness of the landscape.* d. Biodiversity and Geodiversity: *Development proposals should respect, protect and/or enhance the region's rich and distinct biodiversity, geodiversity and sites designated for their contribution to the natural environment at any level including ancient and semi-natural woodland.*

Policy	Topic Areas	Policy Text
HE1: Listed Buildings	Cultural Heritage and Archaeology	*b) Proposals that involve the demolition or substantial demolition of a listed building or buildings or structures within its curtilage will only be supported where it is demonstrated that the four key texts for listed building demolition that are set out in the Scottish Historic Environment Policy (SHEP)[9] paragraph 3.46 are met.*
HE3: Archaeology		*a) The Council will support development that protects significant archaeological and historic assets, and the wider historic environment from adverse effects.* *In considering development proposals the Council will need to be satisfied that:* *• the development preserves or enhances the appearance, fabric or setting of the site or asset in-situ; and/or* *• where there is uncertainty about the location, extent or significance of these assets an agreed scheme of assessment and evaluation to inform the application is included with the proposal; and/or* *• due consideration has been given to the significance and value of the site or asset in relation to the long-term benefit and specific need for the development in the location proposed.* *b) Where, due to exceptional circumstances, development is to proceed and the preservation of historic assets in-situ including buildings is not possible, a scheme of mitigation involving excavation, recording, analysis, publication and archiving and any other measures appropriate to the case has been agreed with the Council.*
HE4: Archaeologically Sensitive Areas		*The Council will support development that safeguards the character, archaeological interest and setting of Archaeologically Sensitive Areas (ASAs) as designated by the Council.*
HE6: Gardens and Designated Landscapes		*a) The Council will support development that protects or enhances the significant elements, specific qualities, character, integrity and setting, including key views to and from, gardens and designed landscapes included in the Inventory of Gardens and Designed Landscapes or the Non-Inventory List.* *In considering development proposals the Council will need to be satisfied that:* *• the development protects or enhances the significant elements of the garden or landscape in-situ; and* *• due consideration has been given to the significance and value of the asset in relation to the long-term benefit and specific need for the development in the location proposed.* *b) Developers will be required to submit the results of an assessment of the impact of their proposals on the sites and their settings plus details of any potential mitigation measures.* *c) Proposals that would have a detrimental effect on the specific quality, character or integrity of a garden or designed landscape will not be approved unless it is demonstrated that the proposal has benefits of overriding public interest.*

[9] This policy is no longer in force, and has been replaced by the Historic Environment Scotland Policy Statement 2016.

Policy	Topic Areas	Policy Text
NE2: Regional Scenic Areas	Landscape	*The siting and design of development should respect the special nature of the RSA, and that development would only be permitted where the landscape character and scenic interest would not be adversely affected, or where there is a specific need for the development at that location which could not be located in a less sensitive area*
NE4: Species of International Importance	Biodiversity and Geodiversity	*Development proposals that would be likely to have an adverse effect on a European Protected Species will not be permitted unless it can be shown that:* *• there is no satisfactory alternative, and* *• the development is required for preserving public health or public safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment, and* *• the development would not be detrimental to the maintenance of the population of the species at a favourable conservation status in its natural range.*
NE5: Sites of National Importance for Biodiversity and Geodiversity	Biodiversity and Geodiversity	*Development that affects Sites of Special Scientific Interest, not designated as International Sites, and other national nature conservation designations will only be permitted where:* *• it will not adversely affect the integrity of the area or the qualities for which it has been designated, or* *• any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance.*
NE7: Trees and Development		*In assessing development proposals the Council will support proposals that promote additional tree planting and also:* *• maintain trees, woodlands (in particular ancient and semi-natural woodlands), and hedgerows (hereafter referred to as the 'woodland resource') and require developers to incorporate, wherever feasible, the existing woodland resource into their schemes;* *• appropriately incorporate the woodland resource into the overall design of the scheme;* *• show how existing trees will be appropriately protected during the construction period.* *If it is demonstrated to the satisfaction of the local Council that it is not possible to retain the woodland resource then an appropriate replacement planting will be required and agreed by the Council.*
NE8: Tree Preservation Orders		*The Council will make Tree Preservation Orders where appropriate to protect individual trees, groups of trees or woodlands where it is expedient in the interests of amenity or they are of cultural or historical significance. A development proposal that would result in the removal or damage, or would threaten the future survival of one or more trees covered by an Order will not be permitted unless either:* *• the removal of one or more tree would be in the interests of good arboricultural practice; or* *• the developer has demonstrated that the benefits of the development including any replacement planting will outweigh the harm caused by the removal of the tree or trees.*

Policy	Topic Areas	Policy Text
NE 11: Supporting the Water Environment	Water Environment	*The Council will not permit development which would result in deterioration in the status of a waterbody or which would likely impede the improvements in waterbody status as set out in the Solway Tweed River Basin Management Plan (2009) or any update or adopted review of it, unless there are exceptional justifying circumstances.* *Development proposals should not normally include the culverting of any waterbody. If culverting would be the only way to enable a proposed development, then permission could be granted if the Council is satisfied that there would be acceptable mitigation measures to protect habitats, passage of fauna, and river form and flow.* *Other physical alterations and changes to waterbodies should, if possible, be avoided.* *Development proposals which could adversely affect Drinking Water Protection Areas identified by the Scottish Government will be subject to consultation with SEPA.*
NE12: Protection of Water Margins	Water Environment	*Where new development is proposed adjacent to or in the vicinity of waterbodies, the water margins will, subject to Policy NE11 and Section 18 of the Flood Risk Management (Scotland) Act 2009, be protected unless there are compelling reasons to justify why this should not be done.*
NE13: Agricultural Soil	Land Use	*Developments located on areas of good quality agricultural soils (3.2 LCA or better) will only be supported where they conform to the Spatial Strategy of the Plan and there is no alternative on less quality land.*
CF4: Access Routes	Access and Recreation	*The Council as Access Authority will assert, protect and keep open and free from obstruction any route, waterway or other means by which access rights may reasonably be exercised. Development proposals should not impact adversely on any of the aforementioned access routes and Core Paths.*

6 ROUTEING STRATEGY

6.1.1 The objective of the routeing strategy is to identify a technically feasible and economically viable overhead line route to connect Lorg and Longburn wind farms to the DE Route, whilst causing the least disturbance to people and the environment.

6.1.2 The aim is to identify a preferred overhead line solution to join connections from Lorg and Longburn Wind Farms and then take a common overhead line to connect to the DE Route. The preferred route should be the shortest route which avoids steep gradients, altitudes above 500m and wind turbine technical constraints, and either avoids or minimises potential impacts to environmental factors. The areas identified for the Lorg and Longburn Junction and the T-in to the DE Route should be relatively flat (6 degrees slope or less is preferable) and not within an area of peat.

6.1.3 To limit adverse effects on visual amenity routes will, wherever possible, follow the grain of the landscape, avoiding high ground and ridgelines and generally following valleys so that the overhead lines and poles are seen against a hill or forest backdrop. In doing this, care will be taken to avoid or minimise effects on areas of high amenity and environmental value.

6.1.4 Given the multiplicity of potential routes through the area, the approach taken is to identify and appraise routes through the more sensitive regions of the route option area in the first instance, and then identify and appraise connecting routes through the remaining region(s) which have more flexibility in route positioning.

7 DEVELOPMENT OF ROUTE OPTIONS

7.1 APPROACH

7.1.1 The route options have been developed following the routeing guidance for OHL as discussed in Section 4, taking cognisance of the environmental constraints discussed in Section 5 and following the Routeing Strategy outlined in Section 6. The application of the routeing strategy may be described as threading best 'landscape fit' options through a maze of environmental constraints.

7.1.2 In terms of the Holford Rules including 2003 comments (provided in Appendix A) there are constraints within the Route Option Area which would be classified as 'areas of highest amenity value' under the definition in **Holford Rule 1**; Scheduled Monuments, Listed Buildings and one Site of Special Scientific Interest.

→ **Holford Rule 1:** Avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the line in the first place, even if the total mileage is somewhat increased in consequence.

7.1.3 In addition there are constraints which would be considered under **Holford Rule 2**, which are also included as strategic constraints.

→ **Holford Rule 2:** Avoid smaller areas of high amenity value, or scientific interests 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.

7.1.4 To identify route options within the Route Option Area the strategic constraints were categorised in terms of their potential to impact on the process of route option identification as follows:

- → **Hard Constraint**: Feature must be avoided
- → **Moderate Constraint**: Feature normally avoided where other alternative routes/alignments are available. If no other alternatives available, feature can be passed through with mitigation
- → **Soft Constraint**: Feature present that could be relatively easy to mitigate, either by design, micro-siting or construction practices

7.1.5 Landscape character is taken into account in two ways: landscape sensitivity is considered a soft or moderate constraint depending on the degree of sensitivity and; character is considered during the design of route options in that the aim is always to achieve the best possible 'landscape fit' balanced against minimising other environmental effects. Visual amenity is not considered as a constraint (although the land use buffer to residential properties applies a trigger for consideration) but as the major consideration in the design process of laying down route options in accordance with the routeing strategy.

7.1.6 Table 7.1 details how this categorisation applies to the strategic constraints identified for this site.

Table 7.1: Strategic constraint categorisation

Topic	Hard Constraint	Moderate Constraint	Soft Constraint
Technical	Slopes greater than or equal to 22 degrees	Slopes greater than or equal to 15 degrees	
	Altitude limit of 500m	Wind turbine turbulence	
	Wind turbine topple distance		
Landscape	None	Regional Scenic Areas Landscapes appraised as highly sensitive	Landscapes appraised as being of medium sensitivity
Cultural Heritage	Scheduled Monument (SM)	Archaeologically Sensitive Areas (ASA)	None
	Listed Building	Non-inventory gardens and designed landscape (NIGDL)	
	Non-designated heritage asset of potentially national significance (NDPNS)		
Ecology, Ornithology and Geology	None	RSPB Important Bird Areas (IBA)	Planted Ancient Woodland Sites
		Native and nearly-native woodland	Water/Waterfowl Flight-path
		Site of Special Scientific Interest (SSSI)	Peat
		Red squirrel priority woodlands	
Land Use	Existing and committed residential properties	100m buffer to existing and committed residential properties	Forestry
		Valid Applications	Agriculture
Recreation and Tourism	None	None	None

7.1.7 Holford Rules 1 and 2 were applied to these site specific strategic constraints using the following hierarchy to identify and refine potential route options:

(1) Avoid residences, scheduled monuments, listed buildings and non-designated heritage assets of potentially national significance

(2) Preferably avoid or limit the distance travelled within the Archaeologically Sensitive Areas; RSPB Bird Sensitive Areas; SSSI, Red Squirrel Priority Woodlands, Non-inventory Gardens and Designed Landscape, Native/Nearly-native woodland and 100m buffer to existing and committed residential properties

(3) Cultural heritage assets should be considered from a setting perspective where they are of national importance, or where the setting is pertinent to its citation. When assessing the impact on setting, a buffer of 2 km from the cultural heritage asset has been used. Setting effects have been considered within the route option appraisal

(4) Where it is possible to do so, avoid or limit the distance travelled within Regional Scenic Areas, Planted Ancient Woodland Sites, Water/waterfowl flight-path, forested areas and peat

7.1.8 In addition to these strategic constraints, other considerations were identified which, although not applied in laying down the route options, have been taken into account as part of route option appraisal and will be used at later detailed alignment and design stages e.g. Galloway Tourist Route; Southern Upland Way, key walking routes, otter signs, bird flight paths and peat presence.

7.1.9 Throughout the application of this hierarchy, positioning of the line is to be considered. Laying down route options in accordance with the routeing strategy takes account primarily of **Holford Rules 4, 5 and 6** an is informed by the Forestry Commission guidance **Design Techniques for Forest Management Planning (2014**) (as introduced in Section 4,2).

7.1.10 Holford Rule 7 is not applicable for this site. Holford Rule 3 is less important for wood pole lines because the difference between intermediate supports and angle supports is less pronounced than the difference between steel lattice line towers and angle towers, to which the rule refers.

- → **Holford Rule 3**: Other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers[10]
- → **Holford 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
- → **Holford 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
- → **Holford 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 concentration or 'wirescape'
- → **Design Techniques for Forest Management Planning (2014**): Design of internal open spaces: The aim should be to link the open areas together to form a network. The next stage is the design of the edges of the open spaces to reflect the character of the landscape and the other shapes being used in the forest design

7.1.11 The strategic constraints were mapped on a Constraints Map, see Figure 10. Using this as a base, and taking into account the constraints hierarchy (above) preliminary route options were then considered in accordance with the routeing strategy (see para 6.1.3) seeking to balance the best 'landscape fit' and minimising potential visual impacts with potential adverse effects on other aspects of the environment.

7.1.12 This process identified a large number of potential route options across a wide area, with some sections with potential pinch-points and others where there was potential flexibility for route alignment across a comparatively broad swathe. The resultant potential route options are shown on Figure 11.

7.2 INITIAL APPRAISAL

7.2.1 On initial consideration of the many potential route options identified, it was clear that they could be categorised into four broad geographical groups: a single group linking south from Lorg to the Longburn area and three groups linking the Longburn area to the DE Route. See Figure 11 and Table 7.1.

[10] This rule is primarily applicable to lattice tower routes where the angle towers are substantially heavier structures than line towers and thus more visually intrusive. With trident wood pole lines, the angle poles and line poles are reasonably similar in appearance.

Table 7.1: Potential route options and geographical groups

Route Option Group	Description
Lorg	Route options connecting Lorg Wind farm to the Lorg-Longburn Junction
Longburn North	Route options connecting Longburn Wind farm to the DE Route passing north of Marsalloch Hill
Longburn Central	Route options connecting Longburn Wind farm to the DE Route passing between Marsalloch Hill and Dundeugh Hill
Longburn South	Route options connecting Longburn Wind farm to the DE Route passing south of Dundeugh Hill

7.2.2 An initial appraisal could therefore be undertaken: a high level comparative assessment of route option groups Longburn North, Central and South to identify whether any groups as a whole were significantly less acceptable than the others and could therefore be discounted prior to the detailed appraisal. Table 7.2 presents the findings of this exercise. The options for connection to Lorg Wind Farm were constrained by the 500 m maximum altitude limit.

7.2.3 Where there is grey shading this indicates that the constraint cannot be avoided. It is acknowledged that this does not give an indication of scale to which the constraint is affected, the length of OHL potentially within that constraint, nor the condition of the constraint at that particular location. However, this noted, it is still a useful tool in looking at the overall potential for effects when comparing the three route option groups with a view to discounting the least likely group(s) at this early stage.

CONSIDERATIONS

7.2.4 This exercise highlighted the following points which need to be considered when attempting to screen out route option categories:

1. Hard Constraints: All the hard constraints can be avoided by all the Longburn route option groups.

2. Moderate Constraints:

   - All Longburn groups are unable to avoid the Archaeologically Sensitive Area in the vicinity of Longburn substation. The distances travelled within this area are of a similar scale;
   - All Longburn groups are unable to a avoid wind turbine turbulence as the Longburn connection point is located within a turbulence constraint;
   - The RSPB Important Bird Area cannot be avoided by Longburn Central and South groups which both pass a similar distance inside it, although in different regions of this sensitive area;
   - Longburn Central group passes through a narrow belt of native woodland along the B729. Although there is the potential for there to be gaps in the trees within this narrow woodland section, the 80m tree free corridor that would be required for an OHL through forestry would impact on the native woodland; and
   - Longburn South group cannot avoid passing within the red squirrel priority woodland area.

3. Soft Constraints:

   - Longburn Central and South groups cross the water/waterfowl flight path which follows the line of the river.
   - All Longburn groups pass within the regional scenic area which entirely covers the western half of the route option area.

- All Longburn groups pass through regions of forestry.

4. Longburn North group does not impact any constraints that are not universally impacted by Longburn Central and South groups.

CONCLUSIONS

7.2.5 Route option group Longburn North is more favourable than Longburn Central and South in respect of high level screening of strategic constraints. Additionally, some of the route options in this group have the shortest route length of all route options.

7.2.6 The detailed assessment therefore focused on and further developed the route options in the Longburn North group. The route options in Longburn Central and South have not been considered further in this appraisal.

Table 7.2: Comparative assessment of route option groups

Constraint Category	Hard Constraint	Route Option Group		
		Longburn North	Longburn Central	Longburn South
Hard Constraint	Residences including 100m buffer			
	Scheduled Monument			
	Listed Building			
	Non-designated heritage asset of potentially national significance			
	Slopes greater than or equal to 22 degrees			
	Wind turbine topple distance			
Moderate Constraint	50m buffer of key cultural heritage assets			
	RSPB Important Bird Areas			
	Native and nearly-native woodland			
	Site of Special Scientific Interest			
	Non-inventory gardens and designed landscape			
	Red squirrel priority woodlands			
	Archaeologically Sensitive Areas			
	Wind turbine turbulence			
Soft Constraint	Planted Ancient Woodland Sites			
	Water/Waterfowl Flight-path			
	Regional Scenic Area			
	Forestry			
Route Length	Approximate route length range (km)	8.0 to 12.0	7.8	8.8 to 12.8

	Constraint <u>can</u> be avoided		Constraint <u>cannot</u> be avoided		Constraint <u>cannot</u> be avoided by any route option category

8 APPRAISAL OF ROUTE OPTIONS AND SELECTION OF PREFERRED ROUTE

8.1 APPRAISAL METHODOLOGY

8.1.1 Following the initial appraisal, the Longburn North area was considered in more detail and the Routeing Strategy re-applied to identify a series of developed route options to be taken forward to detailed appraisal.

8.1.2 Figure 12 illustrates the developed route options. They have been split into four Sections A, B, C and D to facilitate the appraisal process. The approach we have taken is to identify a preferred option for Sections A and C and then identify a Section B route which would sensibly join the preferred Section A and C routes taking account of environmental considerations. This approach was decided upon due to the limited number and extent of constraints within the Section B area.

8.1.3 The developed route options as illustrated in Figure 12 were appraised to decide on the preferred option. Ultimately this must take into consideration environmental, technical and economic factors.

8.1.4 The development of route options has taken strategic constraints into consideration as part of the identification of route options, however they are not all entirely avoidable. Additionally there are a number of non-strategic constraints which are taken into account when appraising the options, thus looking at a wider range of factors in the comparison of options. Section 5.3 lists the factors taken account of in the appraisal process, both strategic and non-strategic considerations.

8.1.5 Each option inevitably has different effects on the various aspects of the environment. The appraisal is therefore a balancing exercise comparing these and applying professional judgement.

8.1.6 The following figures illustrate the developed route options in relation to environmental strategic and non-strategic constraints.

- → Figure 13 Developed Route Options and Strategic Constraints
- → Figure 14 Developed Route Options and Landscape Character Areas and Designations
- → Figure 15 Developed Route Options and Cultural Heritage Assets
- → Figure 16 Developed Route Options and Ecological Designations
- → Figure 17 Developed Route Options and Peat Deposits
- → Figure 18 Developed Route Options and Recreation and Tourism
- → Figure 19 Developed Route Options and Land Use Considerations

8.2 APPRAISAL CRITERIA

8.2.1 The methodology for appraising the options for each environmental topic is detailed in the following sections.

LANDSCAPE

8.2.2 The landscape appraisal took into account the landscape character and sensitivity of the different LCUs affected, the degree to which the route options and potential alignments within the route option could be considered to fit the grain and form of the landscape, and the degree to which the

options conformed to the Holford Rules, particularly rules 4 and 5 (rules 1 to 3 were considered in the identification of route options). Consideration was given not only to the route itself but to the potential requirement for construction access tracks.

8.2.3 Because landscape was a key factor in designing the route options, the differences between them is relatively limited. The appraisal therefore takes a qualitative, discursive approach, drawing out the key differences between the options.

VISUAL AMENITY

8.2.4 Consideration was given to the potential visibility of the OHL from the sensitive receptors as set out in Section 5 - residential receptors, and particularly settlements; transport receptors, and particularly tourist routes (the A713) and; recreational receptors.

8.2.5 As part of this, the degree to which an OHL would actually be perceptible was taken into account. Studies have been undertaken by a number of landscape practitioners[11]. These suggest that wood poles may be perceived in most circumstances up to a distance of about 1.5 km, and that poles are not generally perceived beyond 6 km. The degree to which poles are perceived depends on whether they are seen against a backdrop or against the sky, the age of the line (new poles are dark and tend to blend in well, whist older poles weather to a light silver-grey and can be more visible in the middle distances), and the design of the pole (H-poles tend to be more noticeable than single poles).

8.2.6 Taking this into account, and taking account of screening provided by woodland and built form, the appraisal identified the receptors sufficiently close to the route to be considered to be at risk of significant adverse effects on visual amenity. This was undertaken through a combination of desk study and fieldwork.

CULTURAL HERITAGE

8.2.7 The proximity of the route options to cultural heritage assets (as identified in Section 5.3) was investigated. Assets of national importance were identified either within the route or within a 2 km buffer of the route; other Historic Environment Records were identified where located either partially of fully within the route.

8.2.8 For the nationally designated sites, setting effects were considered taking account of the type and aspect of the feature and its citation.

8.2.9 Where no assets were located within the route and 2 km buffer, or where there were assets which are avoidable and have no setting issues, it was concluded that there was unlikely to be any significant effects.

8.2.10 Potential for significant effects which may be avoidable are identified where the route cannot avoid a broad designation (such as the Archaeologically Sensitive Area, which does not relate to a specific feature); or where there is the potential for setting effects for a feature outwith the main route (i.e. within the 2km buffer); or a Historic Environment Record feature could not be entirely avoided but can be traversed.

8.2.11 A higher risk of significant effects are likely where the route was in close proximity to a feature and setting effects were likely.

[11] D Horn, I McAulay and M Turnbull (May 2010) High Voltage Wood Pole Transmission and Distribution Main Interconnector Lines in Rural Landscapes: Perceptibility

ECOLOGY, ORNITHOLOGY AND PEAT

8.2.12 Existing data collated from wind farm and OHL developments within the surrounding area were consulted to form the initial basis of the route appraisal. Furthermore, satellite imagery available for the area was reviewed to inform of habitats likely to be present as part of a high level study. Lastly, high-level walkover surveys were undertaken by suitably qualified ecologists and ornithologists in order to ground-truth habitats across all route options and further identify any potential ecological constraints from a high level.

8.2.13 The known presence of protected and priority species identified through existing data was used to inform the route appraisal. The presence of habitat suitable to support protected or otherwise notable species within route options was also considered, including areas of designated priority (e.g. red squirrel priority habitat).

8.2.14 With regards to birds, flight pattern data and known nest sites of target ornithological species were plotted against all route options. Route options were also assessed for their suitability to support bird activity, including black grouse leks and raptor nest sites, with consideration to known species within the wider area.

8.2.15 The presence of sensitive habitats, including bog and marshy grassland, and those likely to support GWDTEs was also factored into the route appraisal. A desk study to identify areas of conservation interest within the wider area was also undertaken, with locally and nationally designated sites reviewed up to 2 km from route options, and European designated sites reviewed up to 10 km from route options. Qualifying features of each designated site were noted, and influenced the route appraisal where appropriate.

8.2.16 A relative comparison of each route option was then completed in order to qualify preference between each option. A high-level evaluation of each receptor present/potentially present was completed in order to inform the comparison, which included consideration of designated value (e.g. red squirrel priority woodland), rarity and susceptibility to impact from OHL development, amongst other factors.

8.2.17 A more detailed assessment of the potential impacts on sensitive habitats and species of conservation concern within the preferred route option with regards to both collision risk and disturbance during construction and operational phases will be undertaken as part of the Environmental Impact Assessment of the proposed route.

PEAT

8.2.18 The appraisal focusses on the Class 1 and 2 peatland habitat from the SNH maps and the BGS peat data. However as the peat data is at a coarse level, there is still the potential for peat to be present across all routes. Peat depth surveys will be undertaken to more accurately determine the presence of peat once a proposed route has been identified. Peat therefore has not be used as a main factor to differentiate between route options, although it has been considered. Where there are small pockets of Class 1 or 2 peat or BGS peat which cannot be avoided, this has been noted as potential to have significant effects. Where there are extensive areas of peat which is unavoidable, this is noted as having a higher potential for significant effects.

RECREATION AND TOURISM

8.2.19 The effects on recreation and tourism have been appraised within the visual amenity topic as the effects relate to the visual experience of the recreational user. No direct effects have been identified and temporary diversions during construction would be managed through the construction environmental management process.

LAND USE

8.2.20 The land use topic covers a number of different features as follows:

- **Existing and Committed Development**: As part of the development of route options dwellings and other occupied premises have been avoided, or are avoidable with the route option for all route options; this includes an indicative 100m buffer as a trigger for consideration. Electric and magnetic fields do not form part of the appraisal.
- **Valid Planning Applications**: The two valid planning applications are both wind farm schemes; Quantans Hill and Windy Rig. For Quantans Hill there is currently no proposed infrastructure as the scheme is being re-evaluated; however we have commented on the routes in relation to the previous layout which was part of a Section 36 planning application for a larger wind farm, as it is likely that the preferred turbine locations would be a sub-set of those on this layout. The results therefore need to be considered carefully as they may not reflect the location of future infrastructure should the scheme proceed. For Windy Rig the proposed layout is available and has been used for comment. Where there is the potential for some significant effects this has been noted.
- **Land Use and Agriculture:** The predominant land uses have been considered. The effects are considered to be greater on arable farmland or enclosed improved grassland for grazing.
- **Forestry**: where there are areas of woodland within the route which are avoidable, this is considered to have no likely significant effects. Where woodland loss cannot be avoided but the scale is relatively small, this has the potential for some significant effects. Where the route passes through woodland for a considerable distance, this is considered to have a higher likelihood of significant effects.
- **Flooding**: Flooding has been considered in terms of the location of compounds required for the Lorg and Longburn junction, the T-in to the DE Route and overhead line positioning where flood risk is extensive. Where there is some potential for significant effects (on the infrastructure) this has been noted.

8.3 APPRAISAL OF ROUTE OPTIONS

8.3.1 The detailed appraisal of route options is presented in Appendix E. Colour coding has been used to indicate the likelihood of significant effects.

	No likely significant effects identified
	Potential for some significant effects
	Higher risk of significant effects

SECTION A

8.3.2 Table 8.1 summarises the findings of the detailed appraisal for Section A. No weightings have been applied to each of the topics, it is merely a visual guide which is further informed by the text both within and accompanying the table.

8.3.3 The appraisal comments for the both A1 and A2 are included in Table 8.1 as they are both considered to be acceptable route options from an environmental perspective. The comments for the remaining sections are provided in Appendix D.

Table 8.1: Summary of Route Option Appraisal Section A.

Route Option Section	A1	A2	A3	A4	A5a	A5b	A6
Landscape	Reasonable fit to form of the land. Some intrusion in a landscape with a degree of wildness, however low scenic value. Avoids crossing Water of Deugh valley.	Similar to A1 with the advantage of being approx. 1.7km shorter. Some intrusion in the more attractive pocket of landscape by the Green Well of Scotland - care will be needed in alignment here.					
Visual Amenity	Crosses hill access path and terminates close to A713. However, only one residential property likely to be affected. Likely least visual effect overall.	Terminates close to A713 by start of hill access path. However, only one residential property likely to be affected. Marginally more visual effect than A1.					
Cultural Heritage	No nationally designated assets within the route, nor setting issues within 2 km. Regional / local assets are avoidable.	No nationally designated assets within the route, nor setting issues within 2 km. Regional / local assets are avoidable.					
Ecology and Ornithology	Preferred. Any ecological constraints present will likely be minor and manageable.	Route extends close to an area of known high bat activity/presence (in relative terms); however, any ecological constraints present will likely be minor and manageable.					
Land Use including agriculture	No existing or committed development or valid applications or sensitive land uses. Main land use is rough grazing.	No existing or committed development or valid applications or sensitive land uses. Main land use is rough grazing.					
Forestry	Small areas of woodland within the route, which can be avoided.	Small areas of woodland within the route, which can be avoided.					
Flooding	Crossing Water of Deugh High flood risk area. Less than 100m span for flood risk area.	Crosses narrow section of High flood risk at Benloch Burn.					
Peat*	No peat currently identified based on high-level data.	No peat currently identified based on high-level data.					

* As the peat maps are high level, there is still the potential for peat to be present across all routes.

8.3.4 Taking into account the findings of the route option appraisal for Section A, it was determined that option A2 was marginally the preferred option from an environmental perspective. Route A1 also scored favourably and from an environmental perspective could also be considered an acceptable route option; the differences are as follows:

→ Route A2 is preferable from a landscape perspective, primarily because it is 1.7 km shorter and thus a smaller area affected by new OHL. It has the potential to be somewhat intrusive in the more attractive pocket of landscape by the Green Well of Scotland but the impacts are not

likely to be significant. From an ecological perspective option A2 extends close to an area of known high bat activity/presence (in relative terms); however, any ecological constraints present will likely be minor and manageable.

→ Route A1 is the preferred option from an ecological perspective. In landscape terms it is would cause a degree of intrusion in a landscape with some wild land characteristics, (although low scenic value) but the effects are not likely to be significant.

8.3.5 Section A includes the junction with the DE route lattice tower OHL. As noted in Section 3.2 of this report, this junction would entail the construction of a small sealing-end compound and connection to a tower on the DE route. There is an existing, suitable terminal tower at the junction with route A1. To connect route A2 would require a short diversion of the DE route to provide a new terminal tower; and is expected to comprise three or four new towers about 50 m off-line from DE route including the terminal tower and the removal of the same number of existing towers.

8.3.6 Given the marginal difference in environmental preference between options A1 and A2, it was considered that the technical issues, cost and disruption involved in diverting the DE route should be taken into consideration. Option A1 has therefore been taken forward as the preferred route for Section A.

SECTION C

8.3.7 Table 8.2 summarises the findings of the detailed appraisal for Section C. No weightings have been applied to each of the topics, it is merely a visual guide which is further informed by the text both within and accompanying the table.

Table 8.2: Summary of Route Option Appraisal Section C.

Route Option Section	C1a	C1b	C2a	C2b	C3a	C3b	C4
Landscape							Reasonable landscape fit in the northern part of the valley but likely to be skylined on the flanks of Auchrae Hill.
Visual Amenity							Limited potential for significant adverse visual effects.
Cultural Heritage							The route passes within a small section of the Stronfreggan ASA and towers would need to be constructed within it.
Ecology and Ornithology							Preferable. Route extends along/close to an existing forest track and through habitat with limited ecological potential. Limited ornithological potential.
Land Use including agriculture							No existing or committed development or valid applications or sensitive land uses. Main land use is commercial forestry.
Forestry							Most of route through commercial forestry. Potential to use forest tracks and forest rides to minimise loss.
Flooding							Crosses the Auchrae Burn and Water of Ken high flood risk areas. Less than 100m span of flood risk area.
Peat*							Small area of peat recorded on BGS map cannot be avoided.

* As the peat maps are high level, there is still the potential for peat to be present across all routes.

8.3.8 Taking into account the findings of the route option appraisal for Section C, it was determined that option C4 was the preferred option for this section of the overall route. In terms of landscape fit and visual amenity this route can be seen as the best compromise; it sits on the upper flanks of the valley for much of the route, out of sight and relatively unintrusive in the valley, at the cost of being more visible and intrusive across the flanks of Auchrae Hill. Although this route would result in commercial forestry loss, it has been placed to take advantage of existing forest roads and the interface between felling coupes for the majority of the route which would reduce the extent of forestry loss and effect on the pattern of forestry. From a cultural heritage perspective it extends within the Stroanfreggan Archaeologically Sensitive Area, however the route from Longburn cannot avoid this area and it would need to pass though it regardless of the C route selection. The appraisal comments for the preferred option are included in Table 8.2. The comments for the remaining sections are provided in Appendix D.

SECTION B

8.3.9 Section B was reviewed from the perspective of connecting route sections A2 to C4.

8.3.10 Two routes from the Longburn connection point were identified. The southern route (B0) was discounted when compared to the northern route due to the following considerations:

- → The disadvantage of Route B0 in landscape terms is that it would extend the influence of OHL on the Ken valley landscape through two valley crossings
- → About 650 m of the line runs parallel to (and under 300 m from) the Southern Upland Way albeit in the context of Longburn wind farm turbines
- → The Scheduled Monument Stroanfreggan Craig, fort, Smittens Bridge (SM1095) is approximately 0.5 km to the south of the route. There is some potential for setting effects depending on the route alignment in relation to local topography.
- → For ecology, land use, forestry and flooding there is little difference between the two routes.
- → Peat pockets are present for both the routes and looking at aerial photography, may be avoidable.

8.3.11 The northern route was therefore progressed, and four route options appraised B1 to B4.

8.3.12 Table 8.3 summarises the findings of the detailed appraisal for Section B. No weightings have been applied to each of the topics, it is merely a visual guide which is further informed by the text both within and accompanying the table. The appraisal comments for the preferred option are included in Table 8.3. The comments for the remaining sections are provided in Appendix D.

Table 8.3: Summary of Route Option Appraisal Section B.

Route Option Section	B1	B2	B3	B4
Landscape				Significant landscape effects unlikely.
Visual Amenity				Visual effect on Marbrack unlikely to be significant however this requires ground-truthing, which has not been possible at this stage because of access issues.
Cultural Heritage				Passes within Stroanfreggan ASA. It also passes in close proximity to the Round Craigs Rig Non-Designated Heritage Assets of Potential National Importance and other heritage environment records although micro siting would seek to avoid the known features.

Route Option Section	B1	B2	B3	B4
Ecology and Ornithology				Route extends through bog and GWDTE habitat, and across multiple features suitable to support otter, bat activity (although no roosting potential) and red squirrel habitat. Target ornithological species interest within and immediately adjacent to route option, in form of flight activity. Any ecological constraints are likely to be manageable and localised.
Land Use including agriculture				Potential for wake from Quantans Hill turbines can be avoided based on Section 36 layout, and should the scheme proceed. Land use rough grazing on moorland and semi-improved grassland and commercial forestry.
Forestry				Passes through a section of commercial forestry. Potential to utilise forest rides to reduce forestry loss.
Flooding				Crossing of high risk flood area at Water of Ken, Marbrack Burn and Benloch Burn. Less than 100m span for flood risk areas.
Peat*				Areas of Class 1 peat south and west of Fermiston Craig and smaller pocket to the west of Quantans Hill may potentially be avoided. Small pocket of Class 1 peat at Longburn site can be avoided.

* As the peat maps are high level, there is still the potential for peat to be present across all routes.

8.3.13 The differences between the B route options were not as marked as for the other sections of the route. All routes affect the Archaeologically Sensitive Area, affect commercial forestry and peat to some extent and may be influenced in varying degrees by the Quantans Hill scheme should it go ahead. Route B4 was marginally preferred from a landscape perspective as it avoided the higher, more wild land to the northwest, keeping close to the interface between the moorland and the improved grazing. It also crossed the ridge north of Marsalloch Hill at an oblique angle through a dip in the ridge in line with Holford Rule 4. This route was also least likely to impact on peat deposits and be impacted by the potential development at Quantans Hill should it go ahead.

SECTION D

8.3.14 For completeness, Table 8.4 presents the findings from the assessment of the D route, although there is no alternative route option for this section due to the technical constraints of altitude and slope.

Table 8.3: Summary of Route Option Appraisal Section D.

Route Option Section	
Landscape	Locally intrusive but significant effects on the wider landscape unlikely.
Visual Amenity	Significant effects unlikely.
Cultural Heritage	No constraints.
Ecology and Ornithology	Route extends through area known to have ornithological target species flights, has signs of otter and badger presence as well as suitable habitat. Summer bat roost confirmed along route option and potentially GWDTE habitats present.
Land Use including agriculture	No constraints. Predominant land use is rough grazing on moorland.
Forestry	No constraints.
Flooding	Route runs parallel to Water of Ken high flood risk area which is less than 100m wide and can be avoided.
Peat*	No peat based on high level data.

LORG AND LONGBURN JUNCTION

8.3.15 The region for the junction between the Lorg and Longburn routes has been selected as there are minimal constraints at this location:

- → No forestry
- → No peat (based on high-level peat data)
- → Ground with slopes of 6 degrees or less. Figure 20 illustrates the slopes at the junction locations
- → Low altitude
- → No flood risk (based on high-level flood data)

8.3.16 It is located within the Stroanfreggan Archaeologically Sensitive Area however the location can be microsited to avoid known features and further studies undertaken to identify and use appropriate archaeological mitigation to manage the potential presence of currently unknown buried archaeology.

T-IN TO DE ROUTE

8.3.17 Similarly, the T-in to the DE route has been located in a minimally constrained area as above, but also with no archaeological considerations. This location is suitable for a 25 m x 25 m sealing end compound connecting directly to the DE Route. Figure 20 illustrates the slopes at this location.

8.4 PREFERRED ROUTE

8.4.1 The preferred route from an environmental perspective is as illustrated in Figure 21 and is 20.9 km in length.

8.4.2 It routes south from the Lorg connection point along the Water of Ken valley for approximately 1 km before diverting uphill in a south-easterly direction into a region of commercial forestry. It continues through the forestry mostly running alongside existing forest tracks and breaks in a southerly direction for approximately 6 km and then drops back down to the floor of the Water of Ken valley where it joins the connection from Longburn Wind Farm, northwest of the wind farm site.

8.4.3 The combined route now follows a south-westerly direction through a smaller region of commercial forestry north of Marsalloch Hill and to the west through areas of rough grazing (moorland and semi-improved grassland), skirting the southern boundary of the Quantans Hill Wind farm valid application boundary, and routeing behind Holm Hill to T-in with the DE route on the western flank of Holm Hill.

8.5 PLANNING POLICY COMPLIANCE

8.5.1 The proposed route broadly complies with national and local planning policy as set out in Section 5.4. The design of the route alignment will further seek to minimise potential environmental effects and the Environmental Impact Assessment will take cognisance of planning policy when devising appropriate management and mitigation measures.

9 NEXT STEPS

9.1 CONSULTATION ON PREFERRED ROUTE

9.1.1 This report presents the findings of our initial route option appraisal and identification of the preferred option. To ensure that all available information, views and opinions have been gathered and considered in route option selection it is good practice to undertake a consultation to acquire further local information and views from statutory consultees for the EIA/S37 process, non-statutory consultees and the general public.

9.1.2 The list of consultees included in this consultation is provided in Appendix E. In addition, the general public is encouraged to be involved in the process and Consultation Events will be held in Carsphairn where the project team will be available to discuss the proposals in person. They will be advertised in the local press.

9.1.3 This document is being provided to inform consultees of the initial proposals for the Lorg and Longburn grid connection and to provide a mechanism by which consultees can comment on the proposals.

9.2 CONTACT DETAILS AND FURTHER INFORMATION

9.2.1 If you would like to comment on any aspect of this scheme, please contact:

Lorg and Longburn Grid Connection Project Manager
Land & Planning Team
SP Energy Networks
3rd Floor, Ochil House
10 Technology Avenue
Hamilton International Technology Park
Blantyre
G72 0HT

9.2.2 Or alternatively, please email us at:

Lorg-LongburnConnection@spenergynetworks.co.uk

9.2.3 Or in person at the following Consultation Event.

25th and 26th April 2017 – Lagwyne Village Hall, Carsphairn – 1400-2000 hrs.

9.2.4 SPEN would seek comment and responses on the 'Preferred Route' described within this Routeing Consultation Report by 7th July 2017.

9.2.5 Copies of this document are also available to download at:

http://cms.spenergynetworks.co.uk/pages/lorg__longburn_wind_farms_grid_connection.aspx

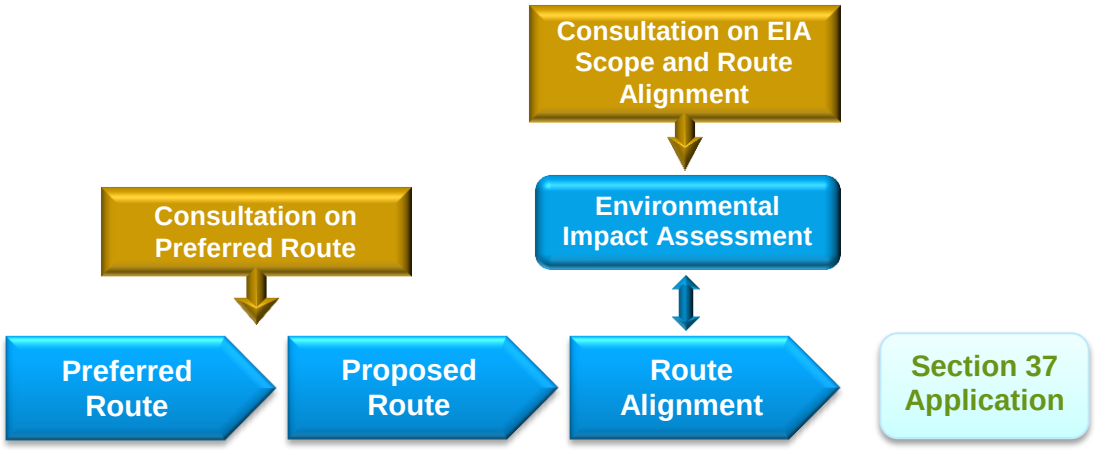
9.3 MODIFICATION OF PREFERRED ROUTE, EIA AND SECTION 37 APPLICATION

9.3.1 The responses from this consultation will be considered and the design may be modified further in the light of these consultations. Modifications may result in further consultation if necessary.

9.3.2 The preferred route, modified to take into account consultations and the consideration of specific local issues, is then promoted as the 'proposed route'.

9.3.3 The proposed route is then taken forward to Environmental Impact Assessment where it is subjected to further detailed assessment to determine its likely effect on the environment and to inform the design of the route alignment. Further consultation with statutory consultees, non-statutory consultees and the general public will take place at this time with further Public Exhibition events held.

9.3.4 The route alignment is then further assessed and once finalised taken forward to Section 37 Application.



Appendix A

THE HOLFORD RULES INCLUDING THE 2003 REVIEW

THE HOLFORD RULES : GUIDELINES FOR THE ROUTEING OF NEW HIGH VOLTAGE OVERHEAD TRANSMISSION LINES WITH NGC 1992 AND *SHETL 2003 NOTES*

RULES 1-7

Rule 1

Avoid altogether, if possible, the major areas of highest amenity value, 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 the 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*[12]*, 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)*
Special Protection Area	*(NPPG 14)*
Ramsar Site	*(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 (SSSI)	*(NPPG 14)*
Schedule of Ancient Monuments	*(NPPG 5)*
Listed Buildings	*(NPPG 18)*
Conservation Areas	*(NPPG 18)*
World Heritage Sites (a non-statutory designation)	*(NPPG 18)*
Historic Gardens and Designed Landscapes (a non-statutory designation)	*(NPPG 18)*

[12] National Planning Policy Guideline series (NPPG) has been superseded by Scottish Planning Policy (SPP) published on 23 June 2014. The areas of highest amenity value are now included within SPP.

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) Effects 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.

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.

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Rules 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 effects 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 effects on the amenity of existing development and on proposals for new development.

c) When siting substations take account of the effects 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 titled 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 houses, 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 effects on existing land use and rights of way.

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

e Consider the relationship of towers 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 effects of line connections that will need to be made.

APPENDIX A

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, of 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 licence 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 NPPG 5: 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 of Listed Buildings. None of these documents define setting.

APPENDIX B

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

1 In Scotland relevant national or international designations for major areas of highest amenity value include the following identified from Scottish Planning Policies and National Planning Policy Guidelines[10].

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	*(NPGG 18)*
Historic Gardens and Designed Landscapes	*(NPPG 18)*

Other Smaller Areas of High Amenity Value

2 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

3 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 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.

4 Area of Historic, Archaeological or Architectural Value

Certain designations covering more limited areas are of relevance to the protection of views and the settings of towns, villages, buildings of 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 Designed Landscapes included in the Inventory of Gardens and Designed Landscapes of Scotland

Green Belts

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

Appendix B

ENVIRONMENTAL DATA SOURCES

Feature	Data Source
Ancient Woodland Inventory	SNH
Archaeologically Sensitive Areas	D&G Council
Battlefields	Historic Environment Scotland
Conservation Areas	Historic Environment Scotland
Core Paths	D&G Council
Cycle Routes	Sustrans
Existing Transmission Infrastructure	SPEN
Flood Risk Zones	SEPA
Woodlands / Forests	FCS
Historic Environment Records	D&G Council
Gardens and Designed Landscapes Non-Inventory Gardens and Designed Landscapes	Historic Environment Scotland D&G Council
Important Bird Areas	SNH
Landfills	D&G Council
Landscape Character Types	SNH
Listed Buildings	Historic Environment Scotland
Local Nature Reserves	D&G Council
Mineral Extraction	D&G Council
National Nature Reserves	SNH
National Routes	Sustrans
National Scenic Areas	SNH
Peat Superficial Deposits	BGS
Peatland Priority Habitats	SNH
Ramsar Sites	SNH
Regional Routes	Sustrans
Residential Properties	Ordnance Survey AddressBase Plus
Consented and valid planning applications, and local plan allocations	D&G Council
RSPB Reserves	SNH
Scheduled Monuments	Historic Environment Scotland
Scottish Wildlife Sites	D&G Council
Sites of Special Scientific Interest	SNH
Special Area of Conservation	SNH
Special Landscape Areas	SNH
Special Protection Areas	SNH
Waterbodies	SEPA
Wild Land Areas	SNH
World Heritage Sites	Historic Environment Scotland

Appendix C

LANDSCAPE SENSITIVITY

INTRODUCTION

Landscape sensitivity refers to the degree to which the landscape is sensitive to change through the introduction of development, and thus how likely it is that a given change would lead to a significant effect on landscape character. Judgements on the sensitivity of a given landscape are based on a combination of its susceptibility to change brought about by the development and the values accorded to the landscape[13].

Landscape sensitivity is development-specific: in other words it is a function of the type of development (its particular form and characteristics), how this affects the landscape directly (physical changes) and how this affects it indirectly (perceptual effects on how the character[14] of the landscape is appreciated).

The proposed development would introduce a 132kV OHL on wood poles averaging 15m tall (about the height of mature trees) across a range of landscapes. Consideration has therefore been given to the susceptibility of each of these landscapes to this change, and to the value ascribed to each of the landscapes affected.

Aspects of a wood pole line that could adversely affect a landscape are primarily its linear nature, its size and its industrial character. For instance, wood poles averaging 15 m high (between 10 m and 22 m) and are of a similar size to mature trees may be well screened in a landscape with good tree cover, could be hidden by moderate sized hills or placed where they have a hill or forest backdrop to reduce their visibility or prominence. A new linear feature may also be able to fit comfortably in a broad valley. Conversely, a line of wood poles may be intrusive in open landscapes with little or no tree cover, or could disrupt the pattern of a small-scale, complex landscape. The industrial nature of overhead lines may pass little noticed in a heavily developed area but be seen as intrusive in scenic landscapes or where they could disrupt the character of natural, remote and wild landscapes.

Landscape sensitivity is directly related to landscape capacity. The latter refers to the ability of the landscape to accommodate a given change without significant effect on its character and is effectively the inverse of sensitivity: a highly sensitive landscape would have a lower capacity to accept the new OHL without significant effects.

METHODOLOGY

Key factors that contribute to the sensitivity of landscape to the introduction of a wood pole OHL have been drawn from a number of sources, including the Holford Rules, SPEN, SSEN and National Grid guidance on OHL routeing and previous Routeing Studies by WSP and others in the public domain.

As noted above, landscape sensitivity derives from a combination of susceptibility to change and the values ascribed to it. The following table sets out the main factors influencing the susceptibility of the landscape to a wood pole OHL. The weight given to different factors can vary from landscape to landscape and even within a single landscape unit, and in all cases there is a spectrum of potential susceptibility.

[13] Guidelines for Landscape & Visual Impact Assessment, Landscape Institute & IEMA, 3rd Edition 2013

[14] Landscape character is defined by SNH & Natural England (Landscape Character Assessment Guidance, see references in Section 5) as “the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how these are perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape.”

SUSCEPTIBILITY

Physical Factors

Characteristic	Less susceptible	More susceptible
Landform & scale	Gently rolling topography Moderate slopes and small hills that can provide backcloth to views Broad valleys Medium scale landscapes with enclosed or limited views Lacking distinctive landforms, landmarks and vantage points	Complex topography where the linear nature of the line could be intrusive Steeply sloped or very flat landscapes Large scale landscapes with open views, very intimate landscapes Distinctive landforms and skylines, elevated vantage points
Land cover & pattern	Arable and managed pasture – land regularly disturbed Regular patterns and features – particularly linear grain if the line can follow the grain Frequent individual and small clumps of trees and hedges Actively managed plantation forestry	Open moorland and wetlands – land that is rarely disturbed or could take time to recover after disturbance Uncluttered open fields with few trees or hedges Extensive natural woodland Even-aged and unmanaged plantation forestry
Settlement Pattern	Sparsely settled areas Clustered settlements (that can be avoided)	Widespread individual and small groups of properties, particularly where relatively dense
Landscape Condition	Derelict and degraded landscapes	Well managed and/or high quality landscapes

Perceptual Factors

Characteristic	Less susceptible	More susceptible
Human influence, tranquillity & wildness	Areas with strong human influence: • Industrial areas • Intensively farmed landscapes • Substantial presence of telecoms and other masts, pylons or turbine	Areas with little obvious human influence: • Wild land and areas with a sense of remoteness, naturalness or tranquillity • Unspoilt rural areas with less intensive farming

VALUE

The UK is a signatory to the European Landscape Convention which takes the approach that all landscapes are important. Whilst this is generally true[15], it is a recognisable fact that some landscapes are valued more highly than others.

Value can be ascribed directly or formally, such as by national and regional landscape designations (National Scenic Areas and Regional Scenic Areas). It can be ascribed by cultural and literary association: for example 'Burn's country' and it can derive from recreational and public amenity use. Examples of the latter include areas offering access to destination hill summits (e.g. Munros and Corbetts) and heavily used landscapes such as the Pentland Hills, views from scenic routes and public viewpoints, and recognised views (such as the Queen's View at Tummel). It can even be ascribed simply by common recognition of certain areas being particularly attractive.

[15] almost all landscapes are important to someone, and perceptions of landscapes change over time, so we cannot predict for sure what will be relatively more important in the future

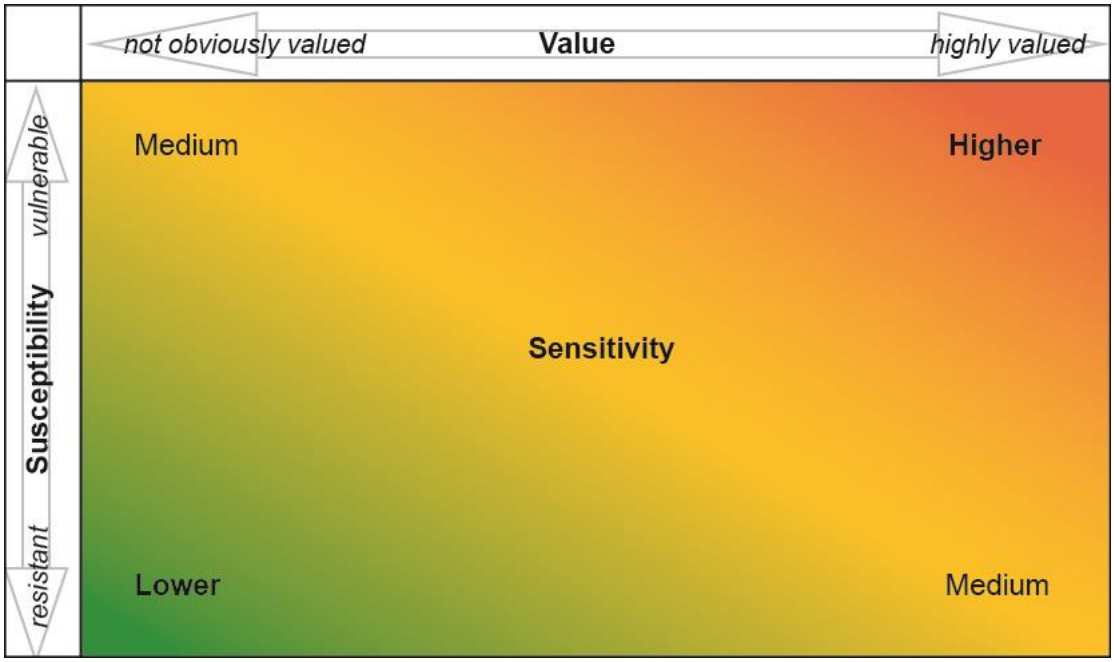
Landscape Change

The landscape is not a static entity: uses change and landscapes evolve over time, mainly through human influence. Landscapes which are changing rapidly enough for this change to be generally noticed by the public tend to be less sensitive to further change than those which may be seen as more stable, even immutable.

LEVELS OF LANDSCAPE SENSITIVITY

Each landscape unit potentially affected is considered in terms of the influence of these factors, and with reference to existing landscape assessments and capacity studies, then a professional judgement made to draw a conclusion about the relative sensitivity of the landscape. This is made on a simple three point scale indicating the relative position on what is clearly a spectrum of sensitivity.

Degree of Sensitivity



FINDINGS

The following paragraphs set out the findings in relation to landscape sensitivity for each LCU potentially affected.

Reference is made to relevant findings in the Dumfries and Galloway Landscape Assessment (D&GLA)[16] where this referred to tall structures, masts and turbines, and in the Dumfries and Galloway Windfarm Capacity Study[17] (D&GWLCS), particularly its findings in relation to smaller turbines).

[16] Dumfries and Galloway Landscape Assessment (SNH Report No. 94, Land Use Consultants, 1998);
[17] Dumfries and Galloway Windfarm Landscape Capacity Study – Main Report (Carol Anderson in association with Alison Grant, Landscape Architects, 2011)

NARROW WOODED RIVER VALLEYS (KEN LCU)

This LCT is described in the D&GLA as follows:

The narrow wooded river valley landscapes are found ... in areas of more resistant solid geology where the extents of glacial and fluvial erosion have been limited to narrow incised channels.

These valleys are clearly defined topographic features whose profiles change throughout their length. The upper reaches are typically V shaped with steep wooded slopes. The lower reaches usually have flat valley floors, sometimes discontinuous through which the river meanders. These flat sections have river meadows and riparian woodland; their side slopes are also steep and mostly wooded.

Woodlands are an essential feature of this landscape type; they create intimate enclosure and restrict views. They typically comprise a mixture of semi-natural woodlands, shelterbelts, farm and policy woodlands with small to medium scale coniferous plantations extending from the higher slopes. The woodlands are separated by pastures of small scale that provide spatial interest and permit views across the valleys. The fields are divided by hedges and fences in the lower areas with stone dykes more prevalent in the upper reaches. These landscapes typically contain minor roads which follow the valley floor giving access to isolated houses some of which have large gardens ….

The D&GLA identifies this LCT as having the following key characteristics:

- narrow incised valleys with wooded slopes enclosing pasture floors
- dominant broadleaf (semi-natural) woodland character with conifers on higher slopes
- lush trough-shaped river valleys with pasture/arable floors enclosed by deciduous wooded slopes
- small pastures and arable fields enclosed by hedges/fences in lower reaches and drystone dykes in upper reaches
- riparian trees and woodlands following meandering river courses in lower reaches
- narrow lanes following valleys and linking isolated houses, occasional settlements and providing access to higher moorland
- intimate unspoilt landscape focusing on river views with some adjacent policy landscape.

The D&GLA made no specific reference to sensitivity or to structures such as wood pole lines, although the Strategies and Guidelines section states: *"The main features of this landscape type are the narrowness of the valleys and their wooded slopes which emphasise this narrowness."*

The D&GWLCS found: *"The often small scale of the valleys, and the diverse patterns of the vegetation and settlement, severely limits scope for larger wind farm typologies … but a low sensitivity to small wind turbines."*

The upper and lower reaches of the Ken valley are relatively narrow with a mix of open moorland and commercial forestry. The central reach from Strahanna to Holm of Dalquhairn is broader and more open, with a patchwork of fields, small woodland and improved grazing with a scatter of individual properties. The landform and scale of the broad valley areas are such that this part of the LCU is less susceptible to change and therefore more able to accommodate an OHL. The western slopes of the southern part of the LCU are forested, and the river side itself is dotted with riparian woodland, potentially providing a suitable backcloth for the OHL, and restricting long-distance views. However both here and in the upper valley (north of Holm of Dalquhairn) the valley floor is narrower and an OHL, particularly on H poles, risks dominating the landscape. The northern and southern sections of the valley are of relatively low scenic value and do not appear to be valued landscapes. The central, broader part is relatively attractive and appears to be locally valued. The LCU is therefore appraised as being of **medium** sensitivity to the introduction of wood pole OHL, possibly medium – low if lines

follow the edge of the valley floor to take advantage of hill backdrop and do not disrupt the linear form of the valley.

UPPER DALE VALLEY (UPPER GLENKENS LCU)

This LCT is described in the D&GLA as follows:

The upper dale landscape type is found in the upper stretches of two of the main river valleys in the region; the Ken/Deugh above Dalry and the Nith above Mennock. The upper dale landscapes coincide with more resistant geology and differ in their profiles from the lower and middle dales, becoming a simpler broad V shape with some flat areas on the valley floor. The effects of glacial erosion are more evident and the relationship with the uplands is stronger with upland peaks forming the main horizons.

The landscape is less cultivated and woodlands less extensive. Pastures are generally improved on the valley floor but become rougher on the valley sides. Fields are of medium to large size enclosed by dry stone dykes which are essential features in this more stark landscape. The topography of the lower slope moraines is undulating but long views are frequently possible in this open and rather exposed landscape.

Narrow riparian woodlands are features of the tributary channels on the valley sides as are forestry plantations of policy and more recent origins. The more recent plantations are mostly of large scale lacking the less regimental outlines of earlier estate forests.

The upper dales contain remote settlements and scattered farmsteads. The legacy of coal and lead mining is evident in the buildings of these settlements and in the remains of mining activity. Hydro schemes, power lines and communication routes are also a feature of this landscape.

This description fits the section of the Glenkens well. There is extensive commercial forestry in the lower section of the valley, and works associated with the hydro schemes is evident around Kendoon.

The D&GLA identifies this LCT as having the following key characteristics:

- wide 'V'-shaped valley, enclosed by high peaks and moorland
- open with long views
- improved valley pastures becoming rougher up the valley sides
- riparian woodlands along the main river and up tributary channels
- medium to large scale forestry plantations on the valley sides and extending over horizons from higher ground
- mining settlements and remnants of industrial activity e.g. mine ruins and bings.

The D&GLA states that: "*proposals should…seek to ensure that the siting and design does not allow interruption of skylines from key viewpoints and that topography is used to provide backclothing and foreground screening. Long views down the valley as well as views across the valley should be protected from skyline obstructions*."

The D&GWLCS found: "*The openness and more expansive scale of the broader parts of these upper dales, however, offer some opportunities for smaller typologies and there would be a medium sensitivity to the small-medium typology (20-50m)*."

This valley LCU is rather more exposed than the Narrow Wooded River Valley LCU, allowing some long-distance views, although these tend to be more common south of Carsphairn. The landscape here is typically arable and managed, with large sections of woodland, particularly around Knockgray Park and Marscalloch Hill. Riparian woodland is also evident, particularly along the northern edge of

the B729 route, which already features an OHL which runs parallel to the route. Siting of overhead lines may be more suitable around the wooded areas with respect to long distance views down the valley, but could also be accommodated around the hillier areas of Carsphairn. Due to the relatively small scale intrusion of the OHL in this case and the existing pylons visible on the skyline which traverse the A713 the landscape sensitivity is considered to be **medium-low**.

SOUTHERN UPLANDS (CARSPHAIRN LCU) & SOUTHERN UPLANDS WITH FOREST (KEN LCU)

These two units are part of the south-western end of the Southern Uplands hill range, differentiated by the extent of commercial forestry and the effect this has on landscape character. They extend from the Glenkens in the west and merge into gentler landscape around Moniaive to the east and fade into the Foothills LCT at Culmark Hill. The named LCUs extend to the Ayrshire boundary to the north, although the landscape type continues north of this.

The two units are discussed together here because the boundaries between the LCUs as mapped reflects a historic pattern of forestry. More recent planting has extended forestry into parts of the Southern Uplands LCT and windfarm development has resulted in the permanent clearing of parts of the Southern Uplands with Forest LCT.

The Southern Uplands LCT is described in the D&GLA as follows:

The southern uplands type landscape is typical of the higher parts of the Southern Upland range. This landscape type ranges between 200 and 500 metres and is characterised by large smooth domed or slightly conically shaped hills. The hills have a strong relief, dissected by steeply sided clefts and glens, many of which have been enlarged by glacial erosion. This is a large scale landscape, although there is some confinement between the peaks. The hill slopes are generally smooth but there are some incised gullies, rock outcrops, and screes.

The majority of this landscape type is covered by coarse grassland but the highest areas also have heather moorland which is distinctive in appearance. The mosaic of grasses, bracken, rushes and heather contribute to this character. The Southern Uplands generally lack walled enclosures and have an exposed remote quality. There are few trees, these mostly confined to the more sheltered courses of incised burns.

This landscape has been subject to mineral extraction for generations and its legacy is an important cultural feature. Tunnels, chimneys, spoil heaps and mine tracks are important local features in this landscape.

This description fits the hillsides above valleys, although outwith the route option area the hills are higher – up to just under 800m at Cairnsmore of Carsphairn.

The D&GLA identifies the main landscape issues that need to be considered in the Southern Uplands LCT to be:

- → loss or deterioration of heather moorland;
- → large scale forestry expansion;
- → demands for wind farms and radio-mast developments.

For the Southern Uplands with Forest LCT it develops these as:

- → the further expansion of forestry, loss of open ground and obscuring of topographic interest;
- → the potential for considerable enhancement to landscape character through forest design;
- → the threat of forest and wind farm developments to areas of scenic and wild land values;
- → potential wind farm development.

The D&GLA stated that, in relation to windfarms they should: "*avoid breaking the skyline, avoid locations which are most visible from the main valleys and their roads, and be sited so as to follow their contours where possible*."

The D&GWLCS found that: "*Small typologies would appear trivial in relation to the predominantly large scale of these uplands, especially if sited on ridges and summits. There may be some limited opportunities for the small typology to be sited on lower, less complex hill slopes in association with existing settlement providing that key views to distinctive hills or landform features are avoided."*

The Southern Uplands with Forest LCT is described as:

In topographic respects, the southern uplands with forests landscape type is the same as the Southern Uplands type. Its character is, however, considerably different due to the dominant forestry landcover. Indeed, the visual influence of these forests extends over considerably larger areas than those plotted on the above plan. The forestry is predominantly Sitka Spruce, the main variations being in mixes with Larch which provides colour contrasts between the dark green of Spruce and the light greens to browns of Larch. The forests generally extend over the summits or are concentrated on the side slopes leaving the domed peaks exposed. The rotational nature of forest management provides long term textural and colour changes related to the felling and replanting coups.

The D&GLA stated In relation to windfarms that: *"(Wind turbines would)…require siting below ridge and summit lines in positions which provide backclothing from main viewpoints. Locations within open ground in forest dominated areas should seek to utilise as far as possible any forestry and local access roads."*

The D&GWLCS stated that: "*The majority of this landscape is not covered by landscape designations and this, together with an absence of recreational use or other non-designated interests, would result in low sensitivity in respect of landscape values."*

The critical differences between the two LCTs are in the way that afforestation encloses the landscape for long periods, and the intermittent change and disturbance resulting from the long planting to harvest cycle.

Overall, this is a large scale almost unpopulated landscape of rounded hills, generally between 200 and 500m AOD. The un-forested areas are generally very open and exposed, whilst the forested ones can be quite enclosed. Parts of the lower slopes where the Southern Uplands merge into the Upper Dale are semi-improved pasture and well drained but most of the un-forested area is open moorland with an exposed remote quality. The value attributed to the higher and more open parts of this landscape is evidenced by its inclusion in the Galloway Hills RSA, and Cairnsmore of Carsphairn, the summit to the north of Quantans Hill, is a popular Corbett[18] – a destination summit.

There is a distinct degree of wild land character in the higher open areas, diminishing towards the edges, and a sense of timelessness. In the open areas, an OHL would potentially introduce an awkward scale contrast and would disrupt the sense of remoteness and naturalness, particularly if routed through the higher parts of the area. As such landscape sensitivity is considered to be high.

The forest areas by contrast vary distinctly over time. For long periods they may be seen as dark, brooding but permanent and, to the untutored eye, natural features but when harvest and replanting is in progress they are a landscape of active change. The forests either side of the Water of Ken are currently being harvested and replanted and are thus a landscape of active change and very visible human influence. A wood pole OHL would be of a scale with mature plantation forestry and although a potentially noticeable wayleave would be required, in many places forestry would screen views of the

[18] Summit between 2500 and 3000 feet

line and alignments can be selected to follow firebreaks, tracks and burn-side clearings. Landscape sensitivity of the forested parts of the units is therefore considered to be medium to low.

Appendix D

ROUTE OPTION APPRAISAL

Route Option Appraisal – Section A

CRITERION	Sub-Criteria	A1	A2	A3	A4	A5a	A5b	A6
Approximate Length (km)		3.15	1.40	2.27	2.56	3.24	3.38	4.25
Landscape	Regional Scenic Areas	All route options are within the Regional Scenic Area. All routes cross the Southern Uplands and Upper Dale Landscape Character Types.						
	Landscape	Runs across an area of gently rolling moorland (although mapped as separate LCTs, in this area they are indistinguishable) of generally low scenic interest, with the exception of the valley of the Water of Deugh which is relatively attractive. Landscape has slightly more wild land characteristics than other options.	Runs across an area of gently rolling moorland (see A1 re LCTs) of generally low scenic interest, with the exception of the valley of the Water of Deugh around the Green Well of Scotland which is relatively attractive. However, highly likely that detailed alignment can avoid the attractive area.	Runs across an area of gently rolling moorland (see A1 re LCTs) of generally low scenic interest, skirting around the designed landscape of Knockgray Park.	Runs across an area of gently rolling moorland of generally low scenic interest, crossing the moderately attractive valley of the Water of Deugh northwest of Burnfoot, then through forestry to join the DE route close to Bardennoch.	Both variants of this route runs across an area of gently rolling rough grazing of generally low scenic interest between Marbrack and Furmiston, coming together at relatively narrow gap between properties southeast of Burnfoot, then crossing the moderately attractive valley of the Water of Deugh northwest of Burnfoot, then through forestry to join the DE route.	Runs across an area of gently rolling rough and improved grazing of generally low scenic interest along the forestry edge by Furmiston, but diverting away from this to skirt the property at Nether Loskie, then crossing the moderately Kendoon Loch. South of the loch, the route runs around the edge of and through forestry north of Carminnows before meeting the DE line by Polquhanity, where the line would cross the A713.
Appraisal		Reasonable fit to form om the land. Some intrusion in a landscape with a degree of wildness, however low scenic value. Avoids crossing Water of Deugh valley.	Similar to A1 with the advantage of being approx. 1.7 km shorter. Some intrusion in the more attractive pocket of landscape by the Green Well of Scotland - care will be needed in alignment here.	Reasonable fit to form om the land. Mainly across semi-improved pasture. Avoids crossing Water of Deugh valley.	Crosses moderately attractive valley but 'cleanly' straight across, minimising effects Junction with DE route set back from A713.	Crosses moderately attractive valley but 'cleanly' straight across, minimising effects. Junction with DE in forestry (at least until harvest).		Follows edge of woodland to reduce landscape intrusion. Crosses Water of Deugh valley / Kendoon Loch with a somewhat tortuous alignment.
Visual amenity	Visual Amenity: Residential The residential properties mentioned are not a full inventory of those that may be affected, they highlight the likely to be most affected	Potential visual effects on Brockloch Tower	Potential visual effects on Bridge-end	Potential visual effects on about half a dozen properties at Lingat and Knockgray (although away from their main aspects) and on properties on the edge of Carsphairn,	Potential visual effects on a small number of properties at Marbrack and Burnfoot	Potential visual effects on about half a dozen residential properties (relatively close to two of them),		Potential visual effects on a small number of properties along the B729, Carminnows and Polquhanity.
	Visual Amenity: Recreation and Tourism: key viewpoints promoted viewpoints, tourist attractions and recreational areas)	Potential visual effects on the A713 (tourist route) and would cross one of the main routes up Cairsmore of Carsphairn.	Potential visual effects on the A713 (tourist route) (terminal tower risks being in direct line of sight from road but locally partly screened by roadside trees). Would run parallel to one of the main routes up Cairsmore of Carsphairn	Potential visual effects on the A713 (tourist route) (terminal tower risks being in direct line of sight from road) and the B729.	Potential visual effects on the A713 (tourist route) and the B729 & Kendoon Loch.	Potential visual effects on the A713 (tourist route) and the B729 & Kendoon Loch.		Crosses the A713 (tourist route) to terminate just beyond the crossing, and crosses the B729 & Kendoon Loch.
Appraisal		Crosses hill access path and terminates close to A713. However, only one residential property likely to be affected. Likely least visual effect	Terminates close to A713 by start of hill access path. However, only one residential property likely to be affected. Marginally more visual effect than A1	Junction with DE route set back from A713 but potentially in direct line of sight. Visible from properties on edge of Carsphairn although closest properties face away from the line.	Affects a small number of residential properties along the B729. Junction with DE route set back from A713.	Affects a small number of residential properties along the B729 – but closer than A4. Junction with DE in forestry and thus out of sight of tourist route - until harvest.		Crosses A713 tourist route with junction close to road. Close to a number of residential properties along the B729 and at Polquhanity.

CRITERION	Sub-Criteria	A1	A2	A3	A4	A5a	A5b	A6
Cultural Heritage	Scheduled Monuments	Two within 2 km of the route, Holm of Daltallochan Stone Circle & Standing Stone (SM1029), and Holm of Daltallochan cross slab (SM1106). The setting of these SMs is not anticipated to be adversely affected	Three within 2 km of the route. Holm of Daltallochan Stone Circle & Standing Stone (SM1029), and Holm of Daltallochan cross slab (SM1106), closer proximity than A1. Cairn Avel just within 2km. The setting of these SMs is not anticipated to be adversely affected	Three within 2 km of the route. Holm of Daltallochan Stone Circle & Standing Stone (SM1029), and Holm of Daltallochan cross slab (SM1106); and Cairn Avel (SM1006). The setting of these SMs is not anticipated to be adversely affected	One within 2 km of the route, Braidenoch Hill Cross Slabs (SM1105). The setting of this SM is not anticipated to be adversely affected	One within 2 km of the route, Braidenoch Hill Cross Slabs (SM1105). The setting of this SM is not anticipated to be adversely affected	One within 2 km of the route, Braidenoch Hill Cross Slabs (SM1105). The setting of this SM is not anticipated to be adversely affected	One within 2 km of the route, Braidenoch Hill Cross Slabs (SM1105). The setting of this SM is not anticipated to be adversely affected
	Listed Buildings	One within 2 km of the route, B-Listed Holm of Daltallochan farmhouse.	Three within 2km of route, Holm of Daltallochan farmhouse (B-listed), Carsphairn parish churchyard and McAdam Mausoleum (B-listed) and Carsphairn parish church, Church of Scotland (C-listed)	Three within 2km of route, Holm of Daltallochan farmhouse (B-listed), Carsphairn parish churchyard and McAdam Mausoleum (B-listed) and Carsphairn parish church, Church of Scotland (C-listed)	None	One within 2 km, Galloway hydroelectric power scheme, Kendoon north dam (B-listed)	One within 2 km, Galloway hydroelectric power scheme, Kendoon north dam (B-listed)	Three within 2 km, Galloway hydroelectric power scheme, Kendoon north dam (B-listed), Dalshangan stables (C-listed) and Dalshangan dovecot (C-listed).
	Archaeologically Sensitive Areas (ASA)	One ASA lies within 2 km of all the route options, 'Bardennoch – garryhhorn', and slightly within route A4.						
	Non-Designated Heritage Asset of Potential National Importance	None within 2 km of all route options						
	Non-Designated Heritage Asset - Other (recorded within D&G HER)	There is one feature of regional / local importance which lies within the route: Willieanna, Structure and clearance cairn (MDG 3437). These features could be avoided during alignment.	There is one feature of regional / local importance which lies within the route: Willieanna, Structure and clearance cairn (MDG 3437). These features could be avoided during alignment.	There is one feature of regional / local importance which lies within the route: Cemetery Wood Knockgray, funeral enclosure, plantation (MDG26898). These features could be avoided during alignment.	There are two features of regional / local importance within the route: Bardennoch enclosure, building (MDG 13624); Standing Stone Rig (MDG3470). These features could be avoided during alignment.	There is one feature of regional / local importance which lies within the route: Furmiston Bridge structure (MDG13627). These features could be avoided during alignment.	There is one feature of regional / local importance which lies within the route: Furmiston Boundary Bank (MDG17317). These features could be avoided during alignment.	There are three features of regional / local importance within the route: Carminnows field system (MDG13626); Furmiston Bridge Field System (MDG13625); Furmiston Farmstead (MDG26155); Furmiston Cairn (MDG3968). These features could be avoided during alignment.
	Non-Inventory Gardens and Designed Landscape	Knockgray Park is location within 2km of all route options. It is closest to route A3 to which is located to the north and marginally lies within it however it can be avoided. A4 is the next closest to the east. The setting of this park may be adversely affected by Route A3 depending on its visibility both within the park and from the public highway.						
Appraisal		No nationally designated assets within the route, nor setting issues within 2 km. Regional / local assets are avoidable	No nationally designated assets within the route, nor setting issues within 2 km. Regional / local assets are avoidable	The potential for indirect effects due to the proximity to Knockgrey park make this option less favourable	The route passes into the ASA and would require tower construction within the ASA, therefore this option is least favourable	No nationally designated assets within the route, nor setting issues within 2 km. Regional / local assets are avoidable	No nationally designated assets within the route, nor setting issues within 2 km. Regional / local assets are avoidable	No nationally designated assets within the route, nor setting issues within 2 km. Regional / local assets are avoidable
Biodiversity and Nature Conservation	Ornithology	Flight paths of greylag goose, osprey, pink-footed goose, red kite, peregrine, merlin, hen harrier, goshawk, whooper swan previously recorded in general area surrounding Carsphairn.						
		Small isolated plantation of mature scots pine near Water of Deugh currently bisected by proposed route option. Potential raptor nesting habitat (e.g. red kite). Holm hill area provides suitable lekking habitat for black grouse.	Ornithological constraints noted adjacent to route option.	Ornithological constraints noted adjacent, but outwith route option. Suitable habitat for breeding waders within route option.	Route in proximity to barn owl roost, but roost outwith route option (c. 0.5 km).	Route option crosses area designated as RSPB Important Bird Area. Route in proximity to barn owl roost, but roost outwith route option (c. 0.5 km). In the north of the route option suitable breeding wader habitat around Furmiston Craig.	Route option crosses area designated as RSPB Important Bird Area. In the north of the route option suitable breeding wader habitat around Furmiston Craig.	Route option crosses area designated as RSPB Important Bird Area. Suitable nesting habitat for crossbill at northern termination of the route.

CRITERION	Sub-Criteria	A1	A2	A3	A4	A5a	A5b	A6
	Red Squirrel priority Woodland	Route option extends adjacent to red squirrel priority woodland in northwest.	Not applicable	Not applicable	Route option extends through red squirrel priority woodland at the beginning of the option.	Route option extends through red squirrel priority woodland at the beginning of the option (A5a&b).	Route option extends through red squirrel priority woodland at the beginning of the option (A5a&b).	Route option extends through red squirrel priority woodland at the beginning of the option and also incorporates suitable habitat at its northern termination.
	Otter activity	Crosses watercourse likely to offer otter potential	Route option crosses Benloch Burn, a tributary of Water of Deugh, and offers potential to support otter.	Route option crosses Knockgray Burn, a tributary of Water of Deugh, likely to support otter.	Route option crosses Water of Deugh, considered to support otter.	Route option A5a&b crosses Water of Deugh, then travels adjacent to tributary of Water of Deugh, considered to support otter.	Route option A5a&b crosses Water of Deugh and follows tributary, considered to support otter.	Route option crosses Water of Deugh and tributaries, considered to support otter.
	Bat activity	Bat activity recorded in general area	Route begins adjacent to 'Green Well of Scotland' with collective high population of bats. Bat activity previously recorded adjacent to route option.	Not applicable	Not applicable	Not applicable	Stone outbuildings at Furmiston Farm have bat roost potential.	Route option follows edge of woodland habitat, potentially used as a commuting corridor by bats.
	Water Vole activity	Not applicable	Not applicable	Suitable habitat within route option.	Not applicable	Suitable habitat within route option.	Suitable habitat within route option.	Not applicable
	Priority habitat / GWDTE / Native Woodland (NWSS)	Wet modified bog and moorland/wetland habitat noted adjacent to route option; but no sensitive habitats noted within route option from existing data.	Not applicable	Points of groundwater dependent terrestrial ecosystems noted within route option.	Sensitive habitats present within route option; marshy grassland and bog.	Not applicable	Not applicable	Not applicable
	Other	Not applicable	Not applicable	Not applicable	Route option crosses Water of Deugh, which supports brown trout and Atlantic salmon.	Route option crosses Water of Deugh, which supports brown trout and Atlantic salmon.	Route option crosses Water of Deugh, which supports brown trout and Atlantic salmon.	Route option crosses Water of Deugh, which supports brown trout and Atlantic salmon.
Appraisal		Preferred. Any ecological constraints present will likely be minor and manageable.	Route extends close to an area of known high bat activity/presence (in relative terms); however, any ecological constraints present will likely be minor and manageable.	Less favoured. Route extends through areas of known ornithological target species activity.	Less favoured. Route extends through areas of known ornithological target species activity, including across wader flightpaths along the Water of Deugh.	Less favoured. Route extends through areas of known ornithological target species activity, including across wader flightpaths along the Water of Deugh. Route also bisects priority red squirrel woodland and an RSPB Important Bird Area.	Less favoured. Route extends through areas of known ornithological target species activity, including across wader flightpaths along the Water of Deugh. Route also bisects priority red squirrel woodland and an RSPB Important Bird Area.	Less favoured. Route extends through areas of known ornithological target species activity, including across wader flightpaths along the Water of Deugh. Route also bisects priority red squirrel woodland and an RSPB Important Bird Area.
Land Use	Existing and Committed Development.	None	None	None	None	None	None	Existing development can be avoided
	Valid Planning Applications	None	None	Passes through access to Quantans Hill Wind Farm	Very small section at the north within application boundary for Quantans Hill Wind Farm	Small section at the north within application boundary for Quantans Hill Wind Farm	None	None
	Predominant land use and agriculture	Rough grazing on moorland	Rough grazing on moorland	Rough grazing on moorland and semi-improved grassland	Rough grazing on semi-improved grassland and commercial forestry	Rough grazing on semi-improved grassland and commercial forestry	Rough grazing on semi-improved grassland and commercial forestry	Rough grazing, improved grassland and commercial forestry
Appraisal		No likely significant effects identified	No likely significant effects identified	No likely significant effects identified	No likely significant effects identified	No likely significant effects identified	No likely significant effects identified	No likely significant effects identified

CRITERION	Sub-Criteria	A1	A2	A3	A4	A5a	A5b	A6
Forestry / Woodlands		Small areas of woodland within the route, which can be avoided	Small areas of woodland within the route, which can be avoided	Small areas of woodland within the route, which can be avoided	At the southern end passes through a small section of commercial forestry. Potential to utilise forest rides to reduce forestry loss. Otherwise small areas of woodland within the route, which can be avoided	At the southern end passes through a section of commercial forestry. Potential to utilise forest rides to reduce forestry loss.	At the southern end passes through a section of commercial forestry. Potential to utilise forest rides to reduce forestry loss	At the southern end passes through a section of commercial forestry. May be able to utilise forest rides and there are large gaps between the trees which would be utilised.
Flood Zones and Waterbodies		Crossing Water of Deugh High flood risk area. Less than 100m span for flood risk area. No flood risk at DE connection	Crosses narrow section of High flood risk at Benloch Burn	None	Crossing Water of Deugh High flood risk area. Less than 100m span for flood risk area. No flood risk at DE connection	Crossing Water of Deugh High flood risk area at a wider section of the river. Technical consideration required. No flood risk at DE connection	Crossing Water of Deugh High flood risk area at a wider section of the river. Technical consideration required.	Crossing Water of Deugh High flood risk area at a wider section of the river. Technical consideration required.
Peat		No peat based on high-level data	No peat based on high-level data	Class 1 peat cannot be avoided	BGS peat can be avoided	Class 1 peat cannot be avoided	No peat based on high-level data, although in close proximity to Class 1 peat therefore potentially peat present	No peat based on high-level data, although in close proximity to Class 1 peat therefore potentially peat present

Route Option Appraisal – Section B

CRITERION	Sub-Criteria	B1	B2	B3	B4	B0
Approximate Length (km)		8.83	8.62	8.93	8.87	
Landscape	Regional Scenic Areas	All route options are within the Regional Scenic Area.				n/a
	Landscape	All routes cross the Southern Uplands, Southern Uplands with Forest and Narrow Wooded River Valley Landscape Character Types. In this area the Southern Uplands LCT is gently rolling moorland of generally low scenic interest, with the 'with Forest' being the same but covered by plantation. The Southern Uplands LCT has a degree of wildness, more pronounced in the interior and higher parts. The routes cut directly across the Water of Ken valley minimising the effect on the river valley landscape and cross the ridge to the west of the valley in the dip between Craigengillan and Marscalloch Hills (Route B4 most closely follows Holford Rule 4 here). There is little to differentiate the four options in terms of landscape effect, except that Route B1 is likely to require the most new construction access tracks with consequential potential landscape effects and passing higher in the Southern Uplands landscape has a slightly greater effect on the wild land characteristics. Route B4 conversely has the least effect on wildness and is likely to require the least new track construction				This route crosses the Southern Uplands and Narrow Wooded River Valley LCTs. The disadvantage of Route B0 in landscape terms is that would extend the influence of OHL on the Ken valley landscape through two valley crossings.
Appraisal		Potential to be somewhat intrusive in the area with the greatest degree of wild land characteristic.	Significant landscape or effects unlikely	Significant landscape effects unlikely.	Significant landscape effects unlikely.	Extends the influence of OHL on the Ken valley landscape through two valley crossings.
Visual amenity	Visual Amenity: Residential The residential properties mentioned are not a full inventory of those that may be affected, they highlight the likely to be most affected	No residential receptors within 500 m	No residential receptors within 500 m	Marbrack within 400 m of route centreline, although the property faces away from the direction of the route	Marbrack within 400 m of route centreline, although the property faces away from the direction of the route	No residential receptors within 500 m
	Visual Amenity: Recreation and Tourism: key viewpoints promoted viewpoints, tourist attractions and recreational areas)	No known recreation or tourism visual receptors noticeably affected, except for the SUW at Longburn, common to all options.				About 650 m of line parallel to (& under 300m from) the SUW albeit in the context of Longburn wind farm turbines
Appraisal		Significant visual effects unlikely.	Significant visual effects unlikely	Visual effect on Marbrack unlikely to be significant however this requires ground-truthing	Visual effect on Marbrack unlikely to be significant however this requires ground-truthing	Significant visual effects unlikely.
Cultural Heritage	Scheduled Monuments	Stroanfreggan Craig, fort, Smittens Bridge (SM1095) is approximately 1.6 km to the south of all routes and slightly closer route B4. Due to the shielding effects of local topography, setting effects are not anticipated. Craigengillan, cairn (SM2238) is located in close proximity to routes B1, B2 and to a lesser extent B3. There is the potential for setting effects in the absence of forestry.				Stroanfreggan Craig, fort, Smittens Bridge (SM1095) is approximately 0.5 km to the south of the route. There is some potential for setting effects depending on the route alignment in relation to local topography.
	Listed Buildings	One within 2 km of the route, B-Listed Smeatons Bridge over Water of Ken				One within 2 km of the route, B-Listed Smeatons Bridge over Water of Ken
	Archaeologically Sensitive Areas (ASA)	One ASA is located within the route, Stroanfreggan ASA which must be crossed by all routes to access Longburn connection point.				

CRITERION	Sub-Criteria	B1	B2	B3	B4	B0
	Non-Designated Heritage Asset of Potential National Importance	Two are located in close proximity to (one is marginally within) the route, although it can be avoided; Round Craigs cairn and burnt mound.				Within 2 km of Round Craigs cairn and burnt mound.
	Non-Designated Heritage Asset - Other (recorded within D&G HER)	The following non-designated heritage assets are located within the route: Willieanna structure and clearance cairn (MDG3437); Willieanna clearance cairn(s) and structure (Canmore ID 63839); Benloch Strand, Farmstead and Field System (Canmore ID 177170); Marbrack Burn Wall, enclosure, sheep fold (MDG15850); and Marbrack Burn enclosure and sheep fold (MDG15851); Knockwhirn building (MDG3918) and Canmore ID (64328). Polshagg Burn Sheep Fold (MDG26169); Craigengillan Burn Field system and Sheepfold (Canmore ID 177486) (MDG15849); Craigengillan Burn Sheep Fold (MDG25434); Scalloch / Little Auchrae Farmstead and Field System (MDG11404); Scalloch Sheep Fold (MDG25731); Scalloch Sheepfold (Canmore ID 177505); Round Craigs Cairnfield (MDG25732); Round Craigs Cairnfield (MDG3940); Round Craigs Clearance Cairns Canmore ID 64350) Round Craigs Clearance Cairns (MDG3941).	The following non-designated heritage assets are located within the route: Willieanna structure and clearance cairn (MDG3437); Willieanna clearance cairn(s) and structure (Canmore ID 63839); Craigengillan Burn Field system and Sheepfold (Canmore ID 177486) (MDG15849); Craigengillan Burn Sheep Fold (MDG25434); Scalloch / Little Auchrae Farmstead and Field System (MDG11404); Scalloch Sheep Fold (MDG25731); Scalloch Sheepfold (Canmore ID 177505); Round Craigs Cairnfield (MDG25732); Round Craigs Cairnfield (MDG3940); Round Craigs Clearance Cairns Canmore ID 64350) Round Craigs Clearance Cairns (MDG3941).	The following non-designated heritage assets are located within the route: Willieanna structure and clearance cairn (MDG3437); Willieanna clearance cairn(s) and structure (Canmore ID 63839); Big Loskie Field System and sheepfold (Canmore ID 177485); Craigengillan Burn Field system and Sheepfold (Canmore ID 177486) (MDG15849); Craigengillan Burn Sheep Fold (MDG25434); Scalloch / Little Auchrae Farmstead and Field System (MDG11404); Scalloch Sheep Fold (MDG25731); Scalloch Sheepfold (Canmore ID 177505); Round Craigs Cairnfield (MDG25732); Round Craigs Cairnfield (MDG3940); Round Craigs Clearance Cairns Canmore ID 64350) Round Craigs Clearance Cairns (MDG3941).	The following non-designated heritage assets are located within the route: Willieanna structure and clearance cairn (MDG3437); Willieanna clearance cairn(s) and structure (Canmore ID 63839); Big Loskie Field System and sheepfold (Canmore ID 177485); Hare Strand Sheep Fold (MDG 25359); Craigengillan Burn Field system and Sheepfold (Canmore ID 177486) (MDG15849); Craigengillan Burn Sheep Fold (MDG25434); Scalloch / Little Auchrae Farmstead and Field System (MDG11404); Scalloch Sheep Fold (MDG25731); Scalloch Sheepfold (Canmore ID 177505); Round Craigs Cairnfield (MDG25732); Round Craigs Cairnfield (MDG3940); Round Craigs Clearance Cairns Canmore ID 64350) Round Craigs Clearance Cairns (MDG3941).	The following non-designated heritage assets are located within the route: Willieanna structure and clearance cairn (MDG3437); Willieanna clearance cairn(s) and structure (Canmore ID 63839); Big Loskie Field System and sheepfold (Canmore ID 177485); Marscallooch Hill Farmstead and Field System (Canmore ID 177484); Marscallooch Hill / Smeaton Farmstead and Field System (MDG15847); Water of Ken Sheep Fold (MDG25358); Little Auchrae Burn Enclosure (Canmore ID 177503); Little Auchrae Burn Enclosure (MDG15866); Kiln Knowe / Stroanpartrick Corn Drying Kiln; Farmstead; Field System (MDG15860); Kiln Knowe Corn Drying Kiln and Farmstead (Canmore ID 177497); Round Craigs Clearance Cairns (MDG3941).
	Non-Inventory Gardens and Designed Landscape	Knockgray Park is within 2 km of routes B2, B3 and B4. As the routes are at a distance from the park effects on setting are not anticipated.				None

CRITERION	Sub-Criteria	B1	B2	B3	B4	B0
Appraisal		Passes within Stroanfreggan ASA and in close proximity to Craigengillen Cairn SM. It also passes in close proximity to the Round Craigs Rig Non-Designated Heritage Assets of Potential National Importance.	Passes within Stroanfreggan ASA and in close proximity to Craigengillen Cairn SM. It also passes in close proximity to the Round Craigs Rig Non-Designated Heritage Assets of Potential National Importance.	Passes within Stroanfreggan ASA and in close proximity to Craigengillen Cairn SM. It also passes in close proximity to the Round Craigs Rig Non-Designated Heritage Assets of Potential National Importance.	Passes within Stroanfreggan ASA. It also passes in close proximity to the Round Craigs Rig Non-Designated Heritage Assets of Potential National Importance and other heritage environment records although micro siting would seek to avoid the known features.	Passes within Stroanfreggan ASA. It also passes to the north of Stroanfreggan Craig, fort, Smittens Bridge (SM1095). Some potential for setting effects depending on alignment
Ecology and Ornithology	Ornithology	Route option passes within c. 400 m of historic black grouse lek. General area has potential for breeding waders-snipe and curlew. Greylag goose and hen harrier flight lines previously recorded through route option.	Hen harrier flight lines previously recorded through route options. Grassland could provide suitable lek sites for black grouse.	No existing bird data. Grassland could provide suitable lek sites for black grouse.	Black grouse lek previously recorded immediately north of route option, north of Marbrack. Barn owl nest potential within Marbrack buildings, c. 400 m south of route option. Hen harrier previously recorded adjacent to east of route option. Flight paths of greylag goose, osprey, red kite, hen harrier previously recorded in/immediately adjacent to route option and general area surrounding Carsphairn. Plantation section unlikely mature enough to support nesting red kite, however crossbill potential.	Black grouse leks previously recorded immediately north of route option.
	Red Squirrel priority Woodland	Red squirrels were considered unlikely to use habitats within open areas of these route options; isolated pockets of plantation are not connected to red squirrel priority woodland within the wider area. Route options extend across plantation woodland outwith areas designated as red squirrel priority woodland; however there is potential for red squirrel to access these areas.		Route options extend across plantation woodland outwith areas designated as red squirrel priority woodland; however there is potential for red squirrel to access these areas.		
	Otter activity	Route option crosses Benloch Burn and tributaries which offer potential for otter.	Route option crosses Polhay Burn and Marbrack Burn, with multiple tributaries, which offer potential for otter.	No suitable otter habitat was noted within open areas in route option; Craigengillan Burn within plantation may offer otter potential.	Route option crosses numerous water courses within open habitat and follows Black Burn through plantation forestry, and crosses Water of Ken, likely to support otter activity.	Route option crosses Water of Ken, likely to support otter activity.
	Bat activity	No previous bat activity recorded across route option; no bat roost potential was noted during a high level study. Bats may use watercourses within these route options for foraging and commuting to the wider area.			No suitable bat roost features were noted within the route option; however farm houses at Marbrack, c. 400 m south of route may offer roosting potential. Bats may use watercourses for foraging and commuting to the wider area. *Nyctalus* sp. and *Myotis* sp. previously recorded along plantation edge and Water of Ken in east of route option.	Plantation edge habitat and Water of Ken offered suitable foraging and commuting habitat for bats; roost potential was limited.

CRITERION	Sub-Criteria	B1	B2	B3	B4	B0
	Water vole activity	Water courses were considered generally unsuitable to support water vole, with fast, vigorous flow at time of high level survey. Smaller tributaries may offer potential for burrows/activity. No records of water vole within the area from existing data.		No suitable water vole habitat was noted within route option.	Water courses were considered generally unsuitable to support water vole, with fast, vigorous flow at time of high level survey. Smaller tributaries may offer potential for burrows/activity. No records of water vole within the area from existing data.	No suitable water vole habitat was noted within route option.
	Priority habitat / GWDTE / Native Woodland (NWSS)	GWDTE noted c. 0.5 km south of route option; but no sensitive habitats noted within route option from existing data. Marshy grassland present surrounding watercourses.	GWDTE previously recorded within route option. Marshy grassland present surrounding watercourses. Route extends through areas of bog habitat, south of Quantans Hill.	GWDTE previously recorded within route option. Route extends through large areas of bog habitat, south of Quantans Hill and northwest of Marbrack.	GWDTE previously recorded immediately north of route option, south of Quantans Hill, and within route option where C routes join. Route extends through large areas of bog habitat, south of Quantans Hill and northwest of Marbrack.	No sensitive habitats noted within route option from existing data. Marshy grassland present surrounding watercourses.
	Other	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Appraisal		Most favoured. Route extends adjacent to areas of known ornithological target species activity (black grouse leks) and flight lines. Otter potential noted along watercourses within route option and red squirrel within plantation to northeast. Any ecological constraints are likely to be manageable and localised.	Route extends through areas of ornithological target species flight pattern activity, with potential for black grouse leks. GWDTE previously recorded within route option and bog habitat present. Potential for otter and red squirrel. Any ecological constraints are likely to be manageable and localised.	GWDTE previously recorded within route option and bog present. Otter and red squirrel potential within plantation woodland and potential for black grouse leks within open habitat. Any ecological constraints are likely to be manageable and localised.	Route extends through bog and GWDTE habitat, and across multiple features suitable to support otter, bat activity (although no roosting potential) and red squirrel habitat. Target ornithological species interest within and immediately adjacent to route option, in form of flight activity. Any ecological constraints are likely to be manageable and localised.	Less favoured. Route extends adjacent to areas of known ornithological target species activity, including black grouse leks. Red squirrel potential within woodland; otter potential along Water of Ken and previously recorded bat activity. Any ecological constraints are likely to be manageable and localised.
Land Use	Existing and Committed Development.	None	None	None	None	None
	Valid Planning Applications	Crosses the Quantans Hill site for a short distance (approximately 600m) and skirts the northern boundary, although it can avoid the site at this point. Route passes in close proximity to turbines shown on the Section 36 application layout; potential turbulence issues.	Passes directly through the centre of the Quantans Hill site; potential turbulence issues.	Passes through the south-eastern corner of Quantans Hill site and along the southern boundary (within the site). Route passes in close proximity to turbines shown on the Section 36 application layout; potential turbulence issues.	Passes along the southern boundary of the Quantans Hill site, within the site. Route passes in close proximity to turbines shown on the Section 36 application layout; potential turbulence issues can be avoided.	None
	Predominant land use	Rough grazing on moorland and commercial forestry	Rough grazing on moorland and semi-improved grassland and commercial forestry	Rough grazing on moorland and semi-improved grassland and commercial forestry	Rough grazing on moorland and semi-improved grassland and commercial forestry	Rough grazing on moorland and semi-improved grassland
Appraisal		Proximity to Quantans Hill has the potential to cause turbulence should the project proceed.	Proximity to Quantans Hill has the potential to cause turbulence should the project proceed.	Proximity to Quantans Hill has the potential to cause turbulence should the project proceed.	Potential for turbulence from Quantans Hill turbines can be avoided based on Section 36 layout.	

CRITERION	Sub-Criteria	B1	B2	B3	B4	B0
Forestry / Woodlands		Passes through a section of commercial forestry. Potential to utilise forest rides to reduce forestry loss.	Passes through a section of commercial forestry. Potential to utilise forest rides to reduce forestry loss.	Passes through a section of commercial forestry. Potential to utilise forest rides to reduce forestry loss.	Passes through a section of commercial forestry. Potential to utilise forest rides to reduce forestry loss.	None
Flood Zones and Waterbodies		Crossing Water of Ken High flood risk area. Less than 100m span for flood risk area. High Risk flood area at Benloch Burn can be avoided.	Crossing of high risk flood area at Water of Ken, Marbrack Burn and Benloch Burn. Less than 100m span for flood risk areas.	Crossing of high risk flood area at Water of Ken, Marbrack Burn and Benloch Burn. Less than 100m span for flood risk areas.	Crossing of high risk flood area at Water of Ken, Marbrack Burn and Benloch Burn. Less than 100m span for flood risk areas.	None
Peat *		Extensive area of Class 1 peat north of Fermiston Craig and smaller pocket to the north of Quantans Hill cannot be avoided. Small pocket at Longburn site can be avoided	Extensive area of Class 1 peat north and west of Fermiston Craig and smaller pocket to the west of Quantans Hill may potentially be avoided. Small pocket of at Longburn site can be avoided	Areas of Class 1 peat south and west of Fermiston Craig and smaller pocket to the west of Quantans Hill may potentially be avoided. Small pocket at Longburn site can be avoided	Areas of Class 1 peat south and west of Fermiston Craig and smaller pocket to the west of Quantans Hill may potentially be avoided. Small pocket of Class 1 peat at Longburn site can be avoided. Most favourable route	Small pocket at Longburn site cannot be avoided.

Route Option Appraisal – Section C

CRITERION	Sub-Criteria	C1a	C1b	C2a	C2b	C3a	C3b	C4
Approximate Length (km)		9.38	7.41	10.32	8.12	6.68	6.46	7.63
Landscape	Regional Scenic Areas	About half the route runs through RSA		n/a	n/a	n/a	n/a	n/a
	Landscape	Runs across the lower slopes of Beninner (open moorland) & Moorbrook Hill (though plantation), then both options climb over a ridge at about 450m AOD at Mid Hill of Glenhead. Relatively poor landscape fit.		Runs through forestry across the mid-slope of Craigengillan Hill, then up a forest firebreak up the lower flank of the Polifferie Burn valley, then both options climb over a ridge at about 450m AOD at Mid Hill of Glenhead as C1. Reasonable landscape fit except for crossing of ridge.		Runs down a relatively attractive valley, part of the Narrow Wooded Valley LCT. However, this is a good 'landscape fit' (meets Holford Rule 5)		Most of route through area of lower scenic value - forestry (generally following forest track / parcel edges) across the mid-slope of the Water of Ken valley. However likely skylining across the flank of Auchrae Hill.
Appraisal		Relatively poor landscape fit. Affects some of the comparatively wilder parts of the area. Option a longer than b for no apparent gain.		Reasonable landscape fit except for crossing of ridge. Option a longer than b for no apparent gain.		A good fit to the form of the landscape but would potentially affect the scenic quality of the glen.		Reasonable landscape fit except at Auchrae Hill.
Visual amenity	Visual Amenity: Residential	3 properties potentially affected (Nether Holm and Upper Holm of Dalquhairn, Moorbrook) although away from main aspect in all cases.		As C1: 3 properties potentially affected (Nether Holm and Upper Holm of Dalquhairn, Moorbrook) although away from main aspect in all cases.		About 10 properties along the valley potentially affected.		2 properties potentially affected at Craigengillan
	Visual Amenity: Recreation and Tourism: key viewpoints promoted viewpoints, tourist attractions and recreational areas)	Beninner sometimes climbed as part of a circuit with Cairnsmore but position of route on lower flanks unlikely to be intrusive on visitor experience.		No known key viewpoints, tourist attractions or recreational areas affected		No known key viewpoints, tourist attractions or recreational areas affected		No known key viewpoints, tourist attractions or recreational areas affected
Appraisal		Limited potential for visual effects.		Limited potential for visual effects.		More potential visual effects than alternatives		Limited potential for visual effects.
Cultural Heritage	Scheduled Monuments	One lies within 2 km of all the route options; Craigengillan, cairn (SM2238). The cairn is located within commercial forestry and is not visible from the public highway at present. In the absence of forestry the setting of the cairn is most likely to be affected by routes passing in close proximity to it. If routed to the north and west of the cairn it is possible this would reduce the potential for setting effects when compared to routing to the south and east. Although within the 2 km buffer, Stroanfreggan Craig, fort, Smittens Bridge (SM1095) has been appraised with the 'B' route options as they are closer and therefore have a greater potential for setting effects. This approach avoids duplication.						
	Listed Buildings	None within 2 km of all route options						
	Archaeologically Sensitive Areas (ASA)	None within 2 km	None within 2 km	One is located within 2 km of the route, Stroanfreggan ASA	One is located within 2 km of the route, Stroanfreggan ASA	One is located within 2 km of the route, Stroanfreggan ASA	One ASA is located within the route, Stroanfreggan ASA	One ASA is located within the route, Stroanfreggan ASA
	Non-Designated Heritage Asset of Potential National Importance	One lies within 2 km of all route options and marginally within C2, Glenhead Rig						
	Non-Designated Heritage Asset - Other (recorded within D&G HER)	The following features are of regional / local importance and lie within the route: Mid-Rig Hill, Clearance Cairn (MDG3910); Allwhannie Knowes, Mound (MDG27); Mid-Hill of Glenhead, Road (MDG5178); Glenhead, Ridge and Furrow (MDG4789); Glenhead, Boundary Bank (MDG9506); Glenhead Bank (Earthworks) (MDG4793); Glenhead, Ridge and Furrow (MDG4788); Polifferie Burn / Moorbrock Hill, Ridge and Farrow	The following features are of regional / local importance and lie within the route: Mid-Rig Hill, Clearance Cairn (MDG3910); Mid-Hill of Glenhead, Road (MDG5178); Glenhead Farmstead (MDG4792); Glenhead, Ridge and Furrow (MDG4789); Glenhead, Boundary Bank (MDG9506); Glenhead Bank (Earthworks) (MDG4793); Glenhead, Ridge and Furrow (MDG4788); Polifferie Burn / Moorbrock Hill, Ridge and	The following features are of regional / local importance and lie within the route: Craigengillan Burn, Sheep fold (MDG25438); Craigengillan Farmstead; Enclosure (MDG25436); Craigengillan Sheep Fold (MDG25477) and (MDG25435); Moorbrock, Enclosure (MDG12790); Glenhead Rig, clearance cairn and enclosure (MDG3915); Glen Farmstead and field system (MDG12788); Glenhead Rig, Farmstead, sheep fold,	The following features are of regional / local importance and lie within the route: Mid-Rig Hill, Clearance Cairn (MDG3910); Mid-Hill of Glenhead, Road (MDG5178); Glenhead Farmstead (MDG4792); Glenhead, Ridge and Furrow (MDG4789); Glenhead, Boundary Bank (MDG9506); Glenhead Bank (Earthworks) (MDG4793); Glenhead, Ridge and Furrow (MDG4788); Polifferie Burn /	The following features are of regional / local importance and lie within the route: Craigengillan Burn Field System, Sheep Fold (MDG15849); Craigengillan Farmstead Enclosure (MDG25436); Craigengillan Sheep Fold (MDG25477); Glenhead Rig Field System (MDG15854); Polifferie Burn Sheep Fold (MDG26176); Strahanna Enclosure (MDG12789). These features could be avoided during	The following features are of regional / local importance and lie within the route: Scalloch / Little Auchrae Farmstead, Field System (MDG11404); Scalloch, Sheep Fold (MDG25731); Craigengillan / Craigengillan Bridge; Water of Ken Findspot (MDG 3961 and MDG 3962); Strahanna Enclosure (MDG12789). These features could be avoided during	The following features are of regional / local importance and lie within the route: Scalloch / Little Auchrae Farmstead, Field System (MDG11404); Scalloch, Sheep Fold (MDG25731). These features could be avoided during alignment.

CRITERION	Sub-Criteria	C1a	C1b	C2a	C2b	C3a	C3b	C4
		(MDG4801) These features could be avoided during alignment.	Farrow (MDG4801) These features could be avoided during alignment.	field system (MDG15852); Glenhead Rig Clearance Cairn, enclosure (MDG3915); Polifferie Burn Sheep fold (MDG26174); Glenhead Farmstead (MDG4792); Glenhead, Ridge and Furrow (MDG4789); Glenhead, Boundary Bank (MDG9506); Glenhead Bank (Earthworks) (MDG4793); Mid-Rig Hill, Clearance Cairn (MDG3910); Allwhannie Knowes, Mound (MDG27); Mid-Hill of Glenhead, Road (MDG5178). These features could be avoided during alignment.	Moorbrock Hill, Ridge and Farrow (MDG4801); Glen Farmstead and field system (MDG12788); Glenhead Rig, Farmstead, sheep fold, field system (MDG15852); Glenhead Rig Clearance Cairn, enclosure (MDG3915); Moorbrock, Enclosure (MDG12790); Craigengillan Burn, Sheep fold (MDG25438); Craigengillan Farmstead; Enclosure (MDG25436); Craigengillan Sheep Fold (MDG25477) and (MDG25435). These features could be avoided during alignment.	alignment.	alignment.	
Appraisal		No nationally designated assets within the route, nor setting issues within 2 km. Regional / local assets are avoidable	No nationally designated assets within the route, nor setting issues within 2 km. Regional / local assets are avoidable	Passes in close proximity to Craigengillen Cairn SM. If routed to the north and west of the cairn it is possible this would reduce the potential for setting effects when compared to routing to the south and east. It also passes in close proximity to the Glenhead Rig Non-Designated Heritage Asset of Potential National Importance.		Passes in close proximity to Craigengillen Cairn SM. If routed to the north and west of the cairn it is possible this would reduce the potential for setting effects when compared to routing to the south and east.	The route passes within the Stronfreggan ASA and towers would need to be constructed within it. This option is therefore less favourable	The route passes within the Stronfreggan ASA and towers would need to be constructed within it. This option is therefore less favourable
Biodiversity and Nature Conservation	Ornithology	The open hillsides/moorland are likely to support low-level raptor presence in the area (merlin observed), and potentially black grouse.	Black grouse in the area, with suitable habitat mosaic present for the species.	Red kite observed on hillside adjacent to route option. Route option c. 0.5 km from black grouse lek site. Route option extends through plantation woodland and across a tributary of the Water of Ken. The open hillsides/moorland in the north are likely to support low-level raptor presence in the area (merlin observed), and potentially black grouse.		Route option c. 0.5 km from black grouse lek site. Habitat appears suitable for nightjar in area of clearfell and restocked plantation. Suitable habitat for crossbill in more mature plantations. At Auchrae Farm three brick outbuildings providing potential nesting habitat for barn owl. Flood plain south of Nether Holm of Dalquhairn has potential for breeding waders.		Barn owl roost c. 0.5 km southeast of route option. Potential to support crossbill in conifer plantation although not optimal habitat.
	Badger activity	Not applicable	Not applicable	Potentially suitable habitat for badger as provides foraging and setting areas.		Potentially suitable habitat for badger as provides foraging and setting areas.		Not applicable
	Bat activity	Bat commuting/foraging activity recorded in surrounding area; suitable habitat mosaic for bats – especially relative the rest of the study area.	Suitable habitat mosaic for bats – especially relative the rest of the study area.	Bat commuting/foraging activity recorded in surrounding area.		Suitable habitat present, especially along the Water of Ken. Bat roosting opportunities within out buildings at Auchrae Farm.		Potentially suitable foraging/commuting habitat likely to be present.
	Pine marten activity	Pine marten sighting adjacent to route option; suitable habitat present.	Suitable habitat present.	Suitable habitat present.		Limited suitable habitat present in areas of remnant forest.		Limited suitable habitat present.
	Otter activity	Otter activity recorded at watercourse which lies within route option.	Route option crosses tributary of Water of Ken, considered to support otter.	Route option travels through plantation woodland and adjacent to water courses likely to support otter.		Route option follows Water of Ken, considered highly likely to support otter.		Route option crosses multiple watercourses, with limited potential to support otter.

CRITERION	Sub-Criteria	C1a	C1b	C2a	C2b	C3a	C3b	C4
	Red squirrel activity	Suitable habitat present.	Suitable habitat present.	Suitable habitat present.		Suitable habitat present in the south of the section.		Route passes through extensive plantation forest, much of which has been clearfelled or subsequently replanted and is of limited use to red squirrel.
	Habitat / GWDTE / Native woodland (NWSS)	Route option extends through plantation woodland and across a tributary of the Water of Ken.	Route option extends through plantation woodland and across a tributary of the Water of Ken.	Route option extends through plantation woodland and across a tributary of the Water of Ken.		Point of groundwater dependent terrestrial ecosystems noted within route option. Native woodland present within the wider option		Plantation forest throughout.
Appraisal		Less favoured. Potential for greater interaction with ornithological constraints around Dodd Hill and Mid Hill of Glenhead, especially black grouse and raptors. Also represents loss/fragmentation of potentially suitable red squirrel and pine marten habitat.	Less favoured. Potential for greater interaction with ornithological constraints around Dodd Hill and Mid Hill of Glenhead, especially black grouse and raptors. Also represents loss/fragmentation of potentially suitable red squirrel and pine marten habitat.	Less favoured. Potential for greater interaction with ornithological constraints around Dodd Hill and Mid Hill of Glenhead, especially black grouse and raptors. Also represents greater loss/fragmentation of potentially suitable red squirrel and pine marten habitat than C1a/b.	Less favoured. Potential for greater interaction with ornithological constraints around Dodd Hill and Mid Hill of Glenhead, especially black grouse and raptors. Also represents greater loss/fragmentation of potentially suitable red squirrel and pine marten habitat than C1a/b.	Least favoured. Route potentially extends through recorded native woodland on the eastern slopes of Dodd Hill, as well as extending along the course of the Water of Ken for much of its route. Greatest potential for more significant impacts to European Protected Species.		Preferable. Route extends along/close to an existing forest track and through managed habitat with limited ecological potential. Limited ornithological potential.
Land Use	Existing and Committed Development.	Existing development can be avoided	None	None	None	None	None	None
	Valid Planning Applications	Crosses Windy Rig Access Track	Crosses Windy Rig Access Track	Crosses Windy Rig Access Track	Crosses Windy Rig Access Track	Crosses Windy Rig Access Track	Partially passes within Windy Rigg application boundary but can avoid it	None
	Predominant land use and agriculture	Moorland and commercial forestry	Moorland and commercial forestry	Moorland and commercial forestry	Moorland and commercial forestry	Rough grazing, commercial forestry and improved grassland	Rough grazing, commercial forestry and improved grassland	Commercial forestry
Appraisal		No likely significant effects identified	No likely significant effects identified	No likely significant effects identified	No likely significant effects identified	No likely significant effects identified	No likely significant effects identified	No likely significant effects identified
Forestry / Woodlands		Passes through two broad sections of commercial forestry. May be able to utilise forest rides	Passes through two broad sections of commercial forestry. May be able to utilise forest rides	Passes through three broad sections of commercial forestry. May be able to utilise forest rides	Passes through three broad sections of commercial forestry. May be able to utilise forest rides	Passes through commercial forestry at the southern section; thereafter passes around sections of woodland. It may be possible to mostly avoid woodland for the latter remainder of the route.	Passes around sections of woodland. It may be possible to mostly avoid woodland. Affects the least amount of forestry	Passes through broad sections of commercial forestry. Will be able to use forest tracks and forest rides. Affects the most amount of forestry
Flood Zones and Waterbodies		Crosses the Poldores Burn and Polifferie Burn high flood risk areas. Less than 100m span of flood risk area. Route also crosses and runs parallel to Holm Burn high flood risk area, although can be avoided depending on alignment.	Crosses the Poldores Burn, Polifferie Burn and Holm Burn high flood risk areas. Less than 100m span of flood risk area.	Crosses the Polifferie Burn high flood risk areas. Less than 100m span of flood risk area. Route also crosses and runs parallel to Holm Burn high flood risk area, although can be avoided depending on alignment.	Crosses the Polifferie Burn and Holm Burn high flood risk areas. Less than 100m span of flood risk area.	Crosses the Polifferie Burn with a flood risk area span of less than 100m. Crosses and runs parallel to the Water of Ken high risk flood area / flood plain. Flood risk to be considered in the route alignment. Flood plain can be avoided.	Crosses the Polifferie Burn with a flood risk area span of less than 100m. Crosses and runs parallel to the Water of Ken high risk flood area / flood plain. Flood risk to be considered in the route alignment. Flood plain can be avoided.	Crosses the Auchrae Burn and Water of Ken high flood risk areas. Less than 100m span of flood risk area.
Peat		Class1 and Class 2 peat cannot be avoided	Class1 and Class 2 peat cannot be avoided	Class 2 peat cannot be avoided	Class 2 peat can be avoided	Small area of BGS peat can be avoided	Small area of BGS peat can be avoided	Small area of BGS peat cannot be avoided

Route Option Appraisal – Section D

CRITERION	Sub-Criteria	D
Approximate Length (km)		1.28
Landscape	Regional Scenic Areas	n/a
	Landscape	Runs down a relatively attractive valley, mostly part of the Narrow Wooded Valley LCT. However, this is a good 'landscape fit' (meets Holford Rule 5)
Appraisal		Reasonable landscape fit.
Visual amenity	Visual Amenity: Residential The residential properties mentioned are not a full inventory of those that may be affected, they highlight the likely to be most affected	No known properties affected, assuming Lorg farmhouse is not retained as a dwelling.
	Visual Amenity: Recreation and Tourism: key viewpoints promoted viewpoints, tourist attractions and recreational areas)	No known key viewpoints, tourist attractions or recreational areas affected
Appraisal		Significant effects unlikely
Cultural Heritage	Scheduled Monuments	None within 2 km
	Listed Buildings	None within 2 km
	Archaeologically Sensitive Areas (ASA)	None within 2 km
	Non-Designated Heritage Asset of Potential National Importance	None within 2 km
	Non-Designated Heritage Asset - Other (recorded within D&G HER)	None within route
	Non-Inventory Gardens and Designed Landscape	None within 2 km
Appraisal		No cultural heritage constraints
Ecology and ornithology	Ornithology	Target species flights noted within route option including raptors at PCH, however few in number. Breeding bird territories noted along route option.
	Red Squirrel priority Woodland	No woodland present along this area of the proposed route, conifer plantation present directly adjacent to the south.
	Otter activity	Multiple Otter spraints noted on watercourse by Lorg and Lorg Bridge and 3 potential resting sites identified within 1.5km upstream. Potential Couch at Lorg Bridge. Suitable habitat for foraging and holting along Water of Ken.
	Bat activity	Small summer Roost confirmed at Lorg Farmhouse (Common and Soprano Pip), additional general activity recorded in area.
	Priority habitat / GWDTE / Native Woodland (NWSS)	Potential moderately dependent GWDTE present along proposed route adjacent to the road running to Lorg (Rush pasture) and the parcel surrounding Lorg with a Sphagnum mire/rush pasture combination. Small area of potentially moderate GWDTE by Sheepfold near Lorg Bridge.
	Other	Badger snuffle hole and multiple latrines noted on south east side of road near Holm of Dalquhairn Bridge. Latrines also noted in general area near Lorg. Water of Ken suitable habitat to support different age classes of fish.
Appraisal		Route extends through area known to have ornithological target species flights, has signs of otter and badger presence as well as suitable habitat. Summer bat roost confirmed along route option and potentially GWDTE habitats present. Any ecological constraints are likely to be manageable and localised.
Land Use	Existing and Committed Development.	None
	Valid Planning Applications	None
	Predominant land use	Rough grazing on moorland
Appraisal		No land use constraints
Forestry / Woodlands		No forestry
Flood Zones and Waterbodies		Route runs parallel to Water of Ken high flood risk area which is less than 100m wide and can be avoided
Peat		No peat based on high level data

Appendix E

LIST OF CONSULTEES

Consultees	
Statutory Consultees	
Energy Consents	Scottish Environment Protection Agency
Dumfries and Galloway Council	Scottish Natural Heritage
Historic Environment Scotland	
Non Statutory Consultees	
Association of Salmon Fishery Board	Marine Scotland
The Coal Authority	RSPB Scotland
Defence Infrastructure Organisation/MOD?	Scottish Water
Forestry Commission Scotland	Scottish Wildlife Trust
Other Consultees	
British Horse Society	NATS Safeguarding
British Trust for Ornithology Scotland (BTO)	Nuclear Safety Directorate (HSE)
BT	OFCOM
Civil Aviation Authority - Airspace	OFWAT
Dumfries and Galloway Badger Network	RAF
Dumfries and Galloway Bat Group	Ramblers Association (Scotland)
Dumfries and Galloway Raptor Study Group	Red Squirrels in Scotland (Southwest Scotland)
Galloway Fisheries Trust	Scottish Badgers
Game and Wildlife Conservation Trust	Scottish Outdoor Access Network (SOAN)
Garden History Association	Scottish Rights of Way and Access Society (ScotWays)
Health and Safety Executive	Sustrans Scotland
JNCC (for Geological Conservation Review)	The Crown Estate
John Muir Trust	The Woodland Trust
Mountaineering Council of Scotland	Transport Scotland
National Farmers Union	Visit Scotland
National Trust for Scotland	
Local Community Councils	
Carsphairn Community Council	Tynron Community Council
Dalry Community Council	Penpont Community Council
Glencairn Community Council	Sanquhar Community Council
Landowners	

Appendix F

FIGURES

Date Saved: 08/03/2017

Document Path: \\uk.wspgroup.com\central data\Projects\700256xx\700256617 - SPEN Longburn Lorg OHLTE Models and Drawings\99 GIS\MXD\Report Figures March 2017\Figure 1 - Initial Study Area and Context.mxd

Key

- Initial Study Area
- District Boundary
- DE Route
- Longburn Windfarm
- Lorg Windfarm

N

0 1 2 3 4 5 km

WSP | PARSONS BRINCKERHOFF

Client: SP ENERGY NETWORKS

Project: Lorg and Longburn Grid Connection

Title: Figure 1
Initial Study Area and Context

Date:	08 March 2017			Scale:	125,000 @ A3
Drawn:	GH	Checked:	SM	Approved:	RL

Trident Single Pole Intermediate (Foreground), Angle (Middle Ground)

Trident 'H' Pole Angle

Trident 'H' Pole Terminal

Document Path: \\uk.wspgroup.com\central data\Projects\70025xx\70025617 - SPEN Longburn Lorg OHLtE Models and Drawings\99 GIS\MXD\Report Figures March 2017\Figure 2 - Trident Wood Pole Types.mxd

Date Saved: 07/04/2017

WSP | PARSONS BRINCKERHOFF

Client: SP ENERGY NETWORKS

Project: Lorg and Longburn Grid Connection

Title
Figure 2
Trident Wood Pole Types

Date:	6 April 2017			Scale:	Not to Scale
Drawn:	GH	Checked:	SM	Approved:	RL

Key

- Initial Study Area
- Route Option Area
- Windfarm Connection Point
- DE Route

Height (m)

- 0 - 75
- 75 - 100
- 100 - 150
- 150 - 200
- 200 - 250
- 250 - 300
- 300 - 350
- 350 - 400
- 400 - 450
- 450 - 500
- Over 500
- Slopes Between 15° and 22°
- Slopes over 22°

N

0 1 2 3 4 5 km

WSP | PARSONS BRINCKERHOFF

Client: SP ENERGY NETWORKS

Project: Lorg and Longburn Grid Connection

Title: Figure 3
Route Options Area and Topographical Features

Date:	8 March 2017			Scale:	75,000 @ A3
Drawn:	GH	Checked:	SM	Approved:	RL

Date Saved: 08/03/2017

Document Path: \\uk.wspgroup.com\central data\Projects\700256xx\70025617 - SPEN Longburn Lorg OHL\E Models and Drawings\99 GIS\MXD\Report Figures March 2017\Figure 3 - Topographical Features and Broad Corridor.mxd

Date Saved: 28/03/2017

Document Path: \\uk.wspgroup.com\central data\Projects\700256x\x700256617 - SPEN Longburn Lorg OHLTE Models and Drawings\99 GIS\MXD\Report Figures March 2017\Figure 4 - Landscape Character Areas.mxd

Key

- Route Option Area
- Windfarm Connection Point
- DE Route

Landscape Character Area

- Foothills
- Foothills With Forest
- Inland Loch
- Narrow Wooded River Valleys
- Rugged Granite Uplands
- Southern Uplands
- Southern Uplands with Forest
- Upland Glen
- Upper Dale (Valley)
- Dumfries and Galloway Regional Scenic Area/East Ayrshire Sensitive Landscape Character
- Non-Inventory Gardens and Designed Landscape

N

0 1 2 3 km

WSP | PARSONS BRINCKERHOFF

Client: SP ENERGY NETWORKS

Project: Lorg to Longburn Grid Connection

Title: Figure 4
Landscape Character Areas
and Designations

Date:	8 March 2017			Scale:	60,000 @ A3
Drawn:	GH	Checked:	SM	Approved:	RL

Date Saved: 28/03/2017

Document Path: \\uk.wspgroup.com\central data\Projects\700256x\700256617 - SPEN Longburn Lorg OHLTE Models and Drawings\99 GIS\MXD\Report Figures March 2017\Figure 5 - Cultural Heritage Assets.mxd

Key

- Route Option Area
- Windfarm Connection Point
- DE Route
- Listed Building (A, B and C)
- Scheduled Monument
- Non-Designated Heritage Asset of Potential National Importance
- Non-Inventory Gardens and Designed Landscape
- Archaeologically Sensitive Area

N

0 1 2 3 km

WSP | PARSONS BRINCKERHOFF

Client: SP ENERGY NETWORKS

Project: Lorg and Longburn Grid Connection

Title: Figure 5
Cultural Heritage Assets

Date:	8 March 2017			Scale:	60,000 @ A3
Drawn:	GH	Checked:	SM	Approved:	RL

Date Saved: 24/03/2017

Document Path: \\uk.wspgroup.com\central data\Projects\700256xx\70025617 - SPEN Longburn Lorg OHLIE Models and Drawings\99 GIS\MXD\Report Figures March 2017\Figure 6 - Ecological Designations.mxd

Key

- Route Option Area
- Windfarm Connection Point
- DE Route
- Special Area of Conservation (Sco)
- RSPB Important Bird Area
- Wader/Waterfowl Flightpaths
- Red Squirrel Priority Woodland
- Site of Special Scientific Interest
- Special Area of Conservation (Sco)
- Native Woodland
- Nearly-Native Woodland
- Planted Ancient Woodland Site (PAWS)
- Ancient Woodland Inventory

N

0 1 2 3 km

WSP | PARSONS BRINCKERHOFF

Client: SP ENERGY NETWORKS

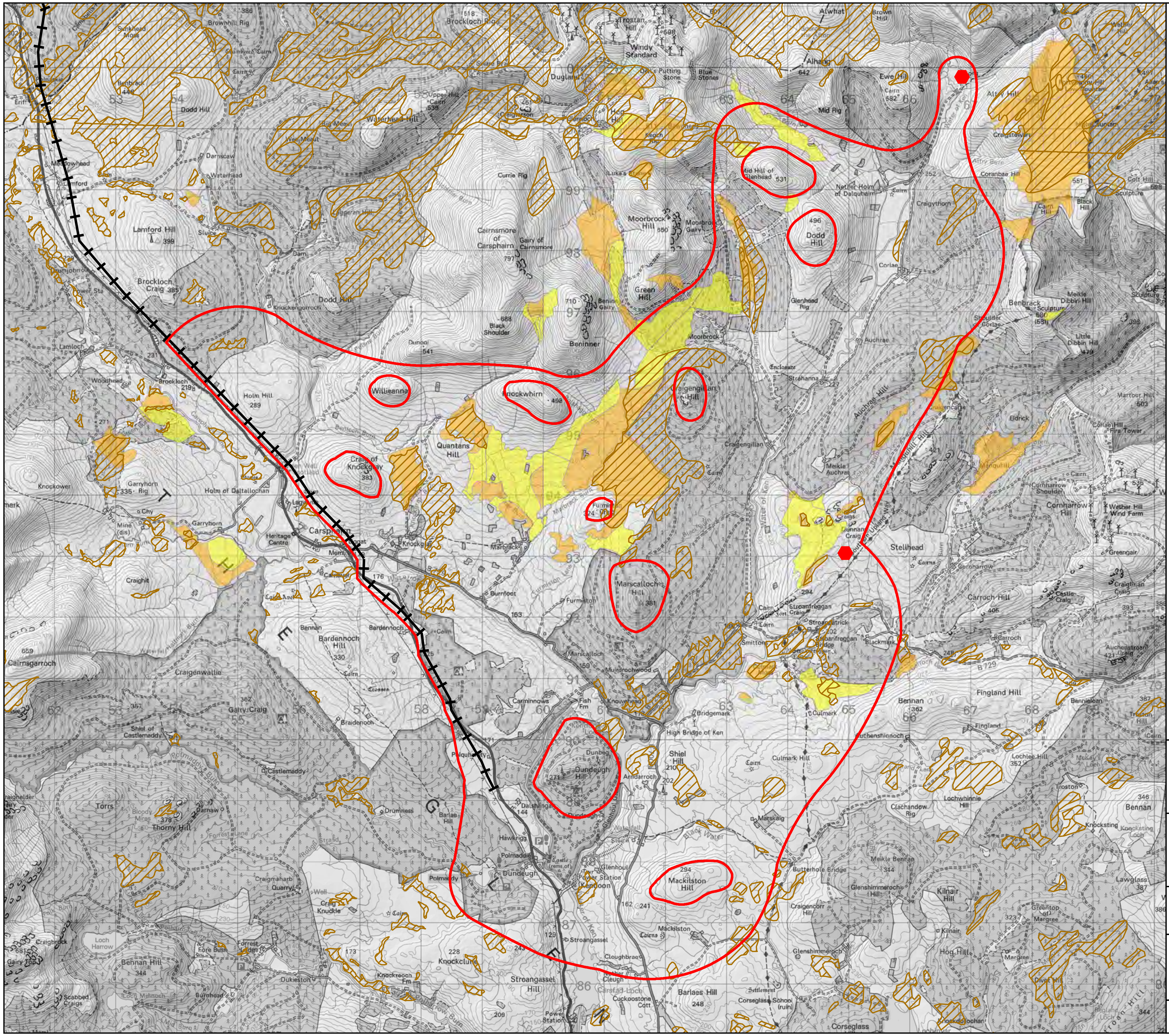
Project: Lorg and Longburn Grid Connection

Title: Figure 6
Ecological Designations

Date:	8 March 2017			Scale:	60,000 @ A3
Drawn:	GH	Checked:	SM	Approved:	RL

Date Saved: 06/04/2017

Document Path: \\uk.wspgroup.com\central data\Projects\700256xx\70025617 - SPEN Longburn Lorg OHL\E Models and Drawings\99 GIS\MXD\Report Figures March 2017\Figure 7 - Peat Deposits.mxd



Key

- Route Option Area
- Windfarm Connection Point
- DE Route

BGS 1:50k Superficial Deposits

- Peat

Soil Types - SNH Carbon and Peatland Map

- Class 1: All vegetation cover is priority peatland habitats: All soils are carbon-rich soils and deep peat
- Class 2: The vegetation cover is priority peatland habitat. All soils are carbon-rich soils and deep peat

N

0 1 2 3 km

WSP | PARSONS BRINCKERHOFF

Client: SP ENERGY NETWORKS

Project: Lorg and Longburn Grid Connection

Title
Figure 7
Peat Deposits

Date:	8 March 2017			Scale:	60,000 @ A3
Drawn:	GH	Checked:	SM	Approved:	RL