SP ENERGY NETWORKS

The Dumfries and Galloway Strategic Reinforcement Project:

Routeing and Consultation Document

May 2015

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Preface

This Routeing and Consultation Document has been prepared on behalf of ScottishPower Energy Networks and relates to proposals to upgrade the electricity transmission network in the Dumfries and Galloway Region and Harker in the north of Cumbria. The upgrading is referred to as 'the Dumfries and Galloway Strategic Reinforcement Project' (the DGSR Project).

This Routeing and Consultation Document presents the methodology and findings of the routeing study which has been undertaken to inform consultation being undertaken on the DGSR Project.

This Routeing and Consultation Document is available to download for free from www.spendgsr.co.uk

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From June 1st until the close of the consultation period, this Routeing and Consultation Document will also be available for viewing at:

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1 Introduction

Purpose of this Report

1.1 This document has been prepared by LUC[1] on behalf of ScottishPower Energy Networks (SPEN), and relates to proposals to upgrade the electricity transmission network in the Dumfries and Galloway Region and Harker in the north of Cumbria. The upgrading is referred to as 'the Dumfries and Galloway Strategic Reinforcement Project' (the DGSR Project). This document explains the background to the DGSR Project and outlines the routeing and substation siting work that has been undertaken, culminating in the identification of preferred corridors and substation siting areas[2].

1.2 This document also sets out the process for consultation which will be undertaken on the routeing work to date, to enable feedback from stakeholders, including the public, to inform the subsequent line routeing and substation siting stage.

1.3 Further details about the project, including an electronic version of this document, and additional information on the consultation process, are available on www.spendgsr.co.uk

The Need for the Dumfries & Galloway Strategic Reinforcement Project

1.4 The existing electricity network is shown on **Figure 1.1**. This is typically a 132 kilovolt (kV) interconnected system with a 275kV circuit from Auchencrosh to Coylton. Significant developments have taken place since much of the network was constructed in the 1930s and the needs of the electricity system and its different users have changed during this time. The current network has inadequate capacity for the renewable generations that is contracted to connect in south-west Scotland. The infrastructure is also approaching the end of its life and the network is not fit for purpose. It is therefore essential to improve capacity and the security of supply for existing and future users of this network through major investment that will serve users for the next 60-70 year period.

1.5 In response to the existing limitations and constraints, SPEN, proposes to develop a new high voltage electricity transmission network of up to 400kV from Auchencrosh in South Ayrshire to Harker in Cumbria.

1.6 This upgraded transmission network will replace existing end of life infrastructure, thereby enhancing local electricity security of supply. It will also provide capacity for future renewable energy connections, required to meet Scotland's renewable energy targets, and will facilitate imports of electricity from the Northern Ireland ('Moyle') interconnector. As part of the upgrade, SPEN also intends to remove approximately 130km of existing 132kV lattice steel tower overhead line infrastructure that is no longer required as shown on **Figure 1.1.** Add cross ref to need document when avail. DGSR Need Case SPEN, 2015.

National Planning Framework 3

1.7 The third National Planning Framework ('NPF3'), which was laid in the Scottish Parliament on June 23rd 2014, is the spatial expression of the Scottish Government's Economic Strategy and plans for infrastructure investment and development priorities over the next 20 to 30 years. NPF3 strengthens the link between strategy and delivery through 14 national development priorities. In relation to development priority number four, 'An Enhanced High Voltage Electricity Network', the statement of need is as follows: *"These classes of development are needed to support the delivery of an enhanced high voltage electricity transmission grid which is vital in meeting national targets for electricity generation, statutory climate change targets, and security of energy supplies."*

[1] Planning and Environmental advisors to SPEN

[2] This work comprises Phase One of the overarching Project.

1.8 The description of classes of development to which the designation of national development applies is new/upgraded onshore electricity transmission cabling and supporting pylons and substations of or in excess of 132kV. The DGSR Project satisfies this description and it is therefore a 'National Development'. The need for the DGSR Project is therefore established.

SPEN's Statutory and Licence Duties

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

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

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

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

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

(b) to do what it reasonably can to mitigate any effects which the proposals would have on the natural beauty of the countryside or any such flora, fauna, features, sites, buildings or objects." (Schedule 9 Electricity Act 1989).

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

SPEN's Commitment

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

Stakeholder Engagement

1.14 Striking the right balance can be challenging, and in seeking to achieve this, SPEN recognises the importance of consulting effectively on proposals and of being transparent about the decisions that are made.

The Development and Consenting Process

1.15 The project comprises three key phases:

- Phase One: Line Routeing and Substation Siting;
- Phase Two: Environmental Impact Assessment;
- Phase Three: Application for Consent.

Phase One: Line Routeing and Substation Siting

1.16 Phase One comprises a strategic review of environmental, technical and economic considerations and the application of established step-by-step routeing principles to identify 'preferred' routes for the required transmission lines and 'preferred' sites for the required substations.

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

1.18 Responses to the consultation process will be evaluated and 'proposed' routes and 'proposed' substation sites confirmed for progression to the next stage.

Phase Two: Environmental Impact Assessment

1.19 Phase Two comprises an Environmental Impact Assessment (EIA) of the 'proposed' routes and 'proposed' substation sites. This is required under The Electricity Works (Environmental Impact Assessment) (Scotland)[3] Regulations 2000, given the nature and scale of the DGSR Project. The EIA process will seek to avoid, reduce and where possible, offset likely significant impacts on the environment through an iterative design process. This will culminate in the production of a single Environmental Statement (ES) which will cover the proposed DGSR Project in its entirety.

Phase Three: Applications for Consent

1.20 Following completion of the ES, SPEN will in Scotland be applying for consent, under Section 37 of the Electricity Act 1989 ('the Electricity Act'), to install, and keep installed, the proposed lines identified above. In conjunction with this, SPEN will apply for deemed planning permission for the lines, and proposed associated substation works, under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 ('the 1997 Act').

1.21 The section of overhead line within England will fall under the definition of a 'Nationally Significant Infrastructure Project (NSIP)' by virtue of being an above ground electric line with a voltage of 132kV or greater (Part 3, Section 16 of the Planning Act 2008. As such, an application for a Development Consent Order (DCO) will be submitted to the Planning Inspectorate who will examine the application and issue a recommendation to the Secretary of State, who makes the final decision whether to grant or refuse development consent. The Planning Act 2008 (as amended) enables the Secretary of State to issue a DCO that includes matters that relate, or are ancillary to, the development of the electric line.

Structure of this Report

1.22 This report is structured as follows:

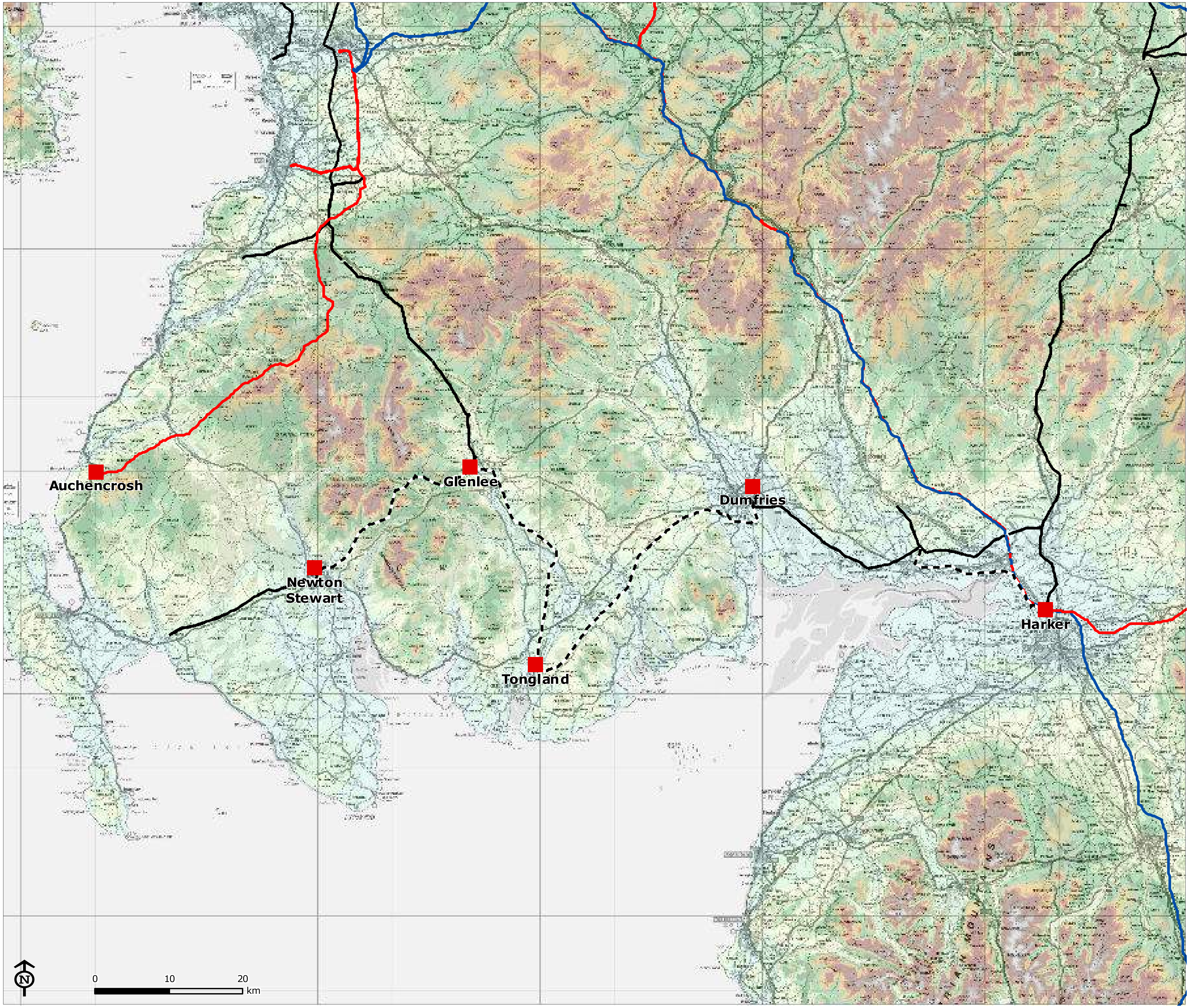
- **Chapter 1**: Introduction;
- **Chapter 2:** Approach to Routeing and to Substation Siting;
- **Chapter 3**: Project Description;
- **Chapter 4:** The Study Area;
- **Chapter 5:** Areas of Highest Environmental Value;
- **Chapter 6:**Options for Corridors and Substation Siting Areas;
- **Chapter 7:**Appraisal of Corridor Options and Substation Siting Areas;
- **Chapter 8:** Preferred Corridors and Substation Siting Areas and Implications for Existing Network;
- **Chapter 9:** The Consultation Process and the Next Steps in the Routeing Process.

1.23 This report is supported by a number of **figures** and **appendices**, as listed in the contents page.

[3] In England the relevant regulations are The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended).

Dumfries and Galloway Strategic Reinforcement

Figure 1.1: The Existing Transmission Network



- 132kV Overhead Line
- 275kV Overhead Line
- 400kV Overhead Line
- 400/275kV Overhead Line
- Existing 132kV line to be removed
- Existing Substation Location

Map Scale @ A3: 1:500,000

CB:SR EB:robertson_s LUCGLA FIG01-01_61A_ExistingNetwork_A3L 19/05/2015

2 Approach to Routeing and to Substation Siting

SPEN's Overall Approach

2.1 The Government, Ofgem and the Electricity Industry, including SPEN, have reviewed their positions on overhead lines. They remain of the view that economic, technical and environmental factors, which require to be balanced as a result of statutory duties and licence obligations, continue to support an overhead line approach in most cases.

2.2 It is therefore SPEN's view that wherever practical; an overhead line approach is taken when planning and designing new or reinforced transmission lines. However, SPEN accepts that there are specific circumstances in which an undergrounding approach should be considered.

2.3 SPEN has recently published a summary document outlining the approach taken to routeing transmission infrastructure (Approach to Routeing and Environmental Impact Assessment, SPEN 2015). This document is available at (www.spendgsr.co.uk).

Routeing and Siting Objective for the Project

2.4 To fulfil SPEN's statutory and licence duties, the objective for the DGSR Project is:

> *"To identify a technically feasible and economically viable route for continuous 275/400kV overhead line connection supported on lattice steel towers with associated substation infrastructure, connecting the existing network at Auchecrosh (South Ayrshire) to the existing network at Harker (Cumbria) via substations at Newton Stewart, Glenlee and Dumfries. The Project is also required to identify a new 132kV overhead line connection supported on lattice steel towers from Kendoon to Glenlee, and from Glenlee to Tongland." This route and the related connections, should, on balance, cause the least disturbance to the environment and the people who live, work and enjoy recreation within it"'.*

Routeing and Substation Siting Principles

2.5 The overarching principles which are informing the overhead line routeing and substation siting methodology are outlined below.

Environmental Considerations

2.6 Statutory duties imposed by the Electricity Act 1989 require licence holders to seek to preserve features of natural and cultural heritage interest and mitigate, where possible, any effects which their development may have on such features. The construction and operation of the connection will potentially have effects on the environment and the people who live, work and undertake recreation within it, including effects on (in no hierarchical order):

- visual amenity;
- landscape character;
- ecology and ornithology;
- hydrology and water resources;
- geology and soil;
- cultural heritage including archaeology;
- land uses including agriculture and forestry;
- residential amenity;
- recreation.

2.7 A number of these effects can be mitigated by careful routeing and substation siting. Other effects are best reduced through local deviations of the route, refining of tower and substation locations, designed mitigation measures, and specific construction processes.

Technical Considerations

2.8 The technical considerations which also influence routeing and substation siting for the DGSR Project comprise slope, altitude, access, waterbodies, peat, the existing electricity transmission network and windfarms.

Economic Considerations

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

Methodology Overview

2.10 The methodology for identifying the preferred route for each overhead line and preferred substation location is based on the Holford Rules 1959, with subsequent amendments, and on the Horlock Rules (National Grid 2006).

2.11 The methodology is also informed by the following:

- SPEN and LUC experience of routeing overhead lines and siting substations;
- relevant national and local planning policy and guidance;
- consultation with relevant stakeholders including the DGSR Project's Stakeholder Liaison Group.

The Holford Rules for Routeing Overhead Transmission Lines

2.12 It is generally accepted across the electricity industry that the guidelines developed by the late Lord Holford in 1959 for routeing overhead transmission lines, 'The Holford Rules', with subsequent updates[4], should continue to be employed as the basis for routeing high voltage overhead transmission lines. These guidelines for the routeing of new high voltage overhead transmission lines form the basis for routeing the Project. The Holford Rules also include Supplementary Notes on the Siting of Substations which have are referenced in the methodology for the siting of substations for the project.

2.13 Key principles of the Holford Rules include avoiding prominent ridges and skylines, following broad wooded valleys, avoiding settlements and residential properties and maximising opportunities for 'backclothing' and the screening of infrastructure.

The Horlock Rules for the Siting and Design of Substations

2.14 The Horlock Rules were devised in 2003 and updated in 2006 by the National Grid Company plc (NGC). The Horlock Rules provide guidelines for the siting and design of new substations, or substation extensions, to avoid or reduce the environmental effects of such developments[5]. These guidelines for the siting and design of substation extensions and new substations form the basis of the proposed substation siting methodology.

2.15 The Holford Rules and The Horlock Rules are included as **Appendix 1**.

Key Steps in the Methodology

2.16 The routeing of the overhead lines is inherently interlinked with the siting of the substations, with the findings in relation to one informing the other at all stages of the process. The methodology for line routeing

[4] NGC 1992, SHETL 2003

[5] It is important to note that whilst the Horlock Rules have not been reviewed to date to reflect Scottish circumstances, they are still considered to be relevant.

and substation siting for the DGSR Project comprises a number of broadly sequential steps as shown in **Figure 2.1**. For simplicity, the methodology is set out in a linear manner, with the findings of each step informing the next step, building up an ever increasing level of understanding to inform the routeing and substation siting process. However, it is important that the process for both the identification of routes and substation sites remains iterative. This means that the outcome of each step is subject to a technical and, where relevant, consultation 'check' to ensure that LUC, SPEN and key stakeholders are confident with the findings prior to commencing the next step.

2.17 The routeing methodology was informed by the findings of the strategic environmental review of network connection options (see Background to the Need Case Document (SP Energy Networks 2015) for details), and the ongoing findings of a high level review of the network and substation design options. The outcomes of these two studies comprised the initial technical requirements for the DGSR Project, i.e. the substations to which the overhead line requires to connect, the possible new substation size requirements and network implications e.g. rationalisation of the network.

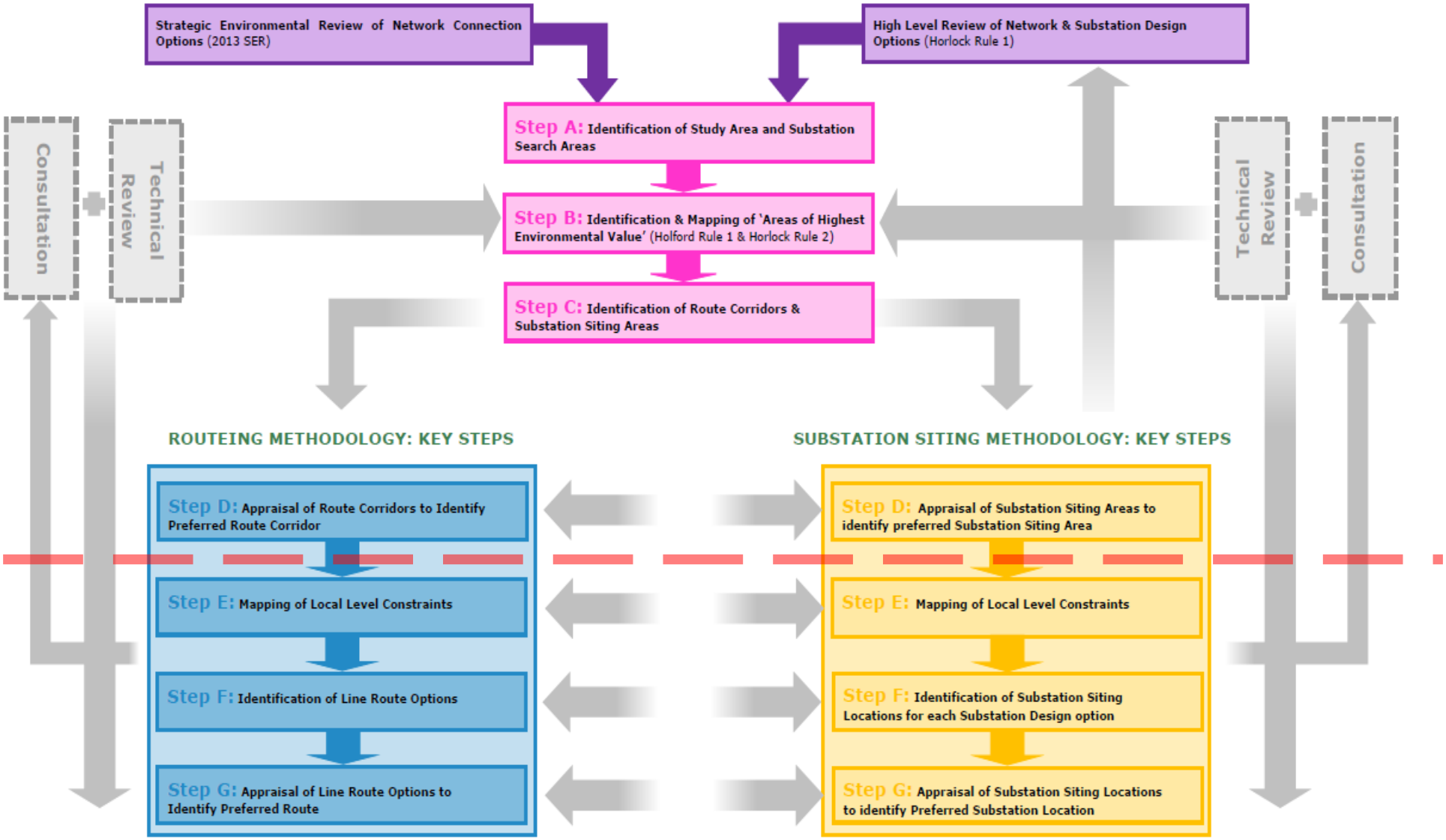
2.18 Steps A to D culminate in the identification of a 'preferred corridor' and, where required, a 'preferred substation siting area' for each Part of the DGSR Project. These are then taken forward for stakeholder and public consultation. Following the evaluation of feedback and further SPEN review, and assuming no requirement to revisit these preferences, the preferred corridor and preferred substation siting area for each Part are confirmed as the 'proposed corridor' and 'proposed substation siting area' (where required) for progression to the next stage.

2.19 Steps E to G culminate in the identification of the 'preferred route' for the overhead line and, where required, the 'preferred substation site' for each Part of the DGSR Project. Again, these are taken forward for stakeholder and public consultation. Following the evaluation of feedback and further SPEN review, and assuming no requirement to revisit these preferences, the preferred route and preferred substation site for each Part are confirmed as the 'proposed route' and 'proposed substation site' for progression to the next stage. A second round of consultation will be undertaken on the proposed routes and substation sites next year.

2.20 The proposed overhead line route and proposed substation site for each Part then progress to the more detailed review of the proposed line alignment and substation positioning which amongst other considerations is informed by the parallel EIA stage.

2.21 This routeing report provides further detail on Steps A-D of the methodology, i.e. the steps followed to identify preferred corridors, and where, required, preferred substation siting areas for each Part of the Project.

Figure 2.1: Overview of Routeing Methodology



3 Project Description

Introduction

3.1 This chapter provides a brief description of the connection requirements for the DGSR Project, including proposed new overhead lines and substations.

3.2 At this early stage of the Project, the final lattice steel tower design and substation layout cannot yet be confirmed. However, the parameters set out below are considered appropriate for the purpose of informing the overhead line routeing and substation site identification process.

3.3 The development of the DGSR Project will also enable SPEN to rationalise the electricity network through the removal of a number of existing overhead transmission lines within the Project area. Further details on this are also provided below.

Auchencrosh to Newton Stewart

3.4 A new substation accommodating a maximum voltage of 275kV is required near Auchencrosh, on the line of the existing 275kV overhead line between Auchencrosh and Mark Hill substation. The estimated footprint for the substation is 140m x 140m.

3.5 A new overhead line supported on lattice steel towers, accommodating a maximum voltage of 275kV, is required from the new substation at Auchencrosh to a new substation near Newton Stewart.

3.6 A new substation accommodating a maximum voltage of 400kV is required in the vicinity of Newton Stewart with an estimated footprint of 320m x 260m. The existing 132kV connection between Glenluce and Newton Stewart ('BT' route) will be retained and connectivity between the new substation and existing Newton Stewart substation will need to be established.

Newton Stewart to Glenlee

3.7 A new substation accommodating a maximum voltage of 400kV will be required in the vicinity of Glenlee, with an estimated footprint of 260m x 200m. The existing Glenlee substation will be retained.

3.8 A new overhead line supported on lattice steel towers accommodating a maximum voltage of 400kV is required from the new substation near Newton Stewart to the new substation near Glenlee.

3.9 Connectivity between the new substation and existing Glenlee substation will need to be established.

3.10 The Project will enable SPEN to remove the existing 132kV overhead line supported on lattice steel towers between the existing substation at Newton Stewart and the existing substation at Glenlee (the 'BG' route).

Glenlee to Dumfries

3.11 A new 400kV substation will be required in the vicinity of Dumfries with an estimated footprint of 320m x 260m.

3.12 A new overhead line supported on lattice steel towers, accommodating a maximum voltage of 400kV, is required from the new substation near Glenlee to the new substation near Dumfries.

3.13 Connectivity between the new substation and existing Dumfries substation will need to be established.

3.14 The Project will enable SPEN to remove the existing 132kV overhead line supported on lattice steel towers between the existing substation at Tongland and the existing substation at Dumfries (the 'S' route).

Kendoon Connection

3.15 A new overhead line supported on lattice steel towers, accommodating a maximum voltage of 132kV, is required from Polquhanity (Kendoon) to the new substation at Glenlee. There will also be rationalisation of the network in relation to the existing connections to Kendoon, Carsfad and Earlstoun hydro-power stations.

Tongland Connection

3.16 A new overhead line supported on lattice steel towers, accommodating a maximum voltage of 132kV, is required from the new substation at Glenlee to the existing Tongland substation.

3.17 The Project will enable SPEN to remove the existing 132kV overhead line supported on lattice steel towers between the existing substation at Glenlee and the existing substation at Tongland (the 'R' route).

Dumfries to Harker

3.18 Reinforcement works are required at the existing National Grid 400kV substation at Harker. The reinforcement requirements will be developed in consultation with National Grid as the Project detail is progressed.

3.19 A new overhead line supported on lattice steel towers, accommodating a maximum voltage of 400kV, is required from the new substation at Dumfries to the existing substation at Harker.

3.20 The Project will enable SPEN to remove the existing 132kV overhead line supported on lattice steel towers between Chapelcross and the Harker substation (the 'T' route).

4 The Study Area

Identification of the Study Area (Step A)

4.1 The first step in the line routeing and substation siting process was to identify the study area.

4.2 In identifying this, it was important to ensure that the area was large enough to accommodate all likely corridor options reflecting the DGSR Project routeing objective. On this basis, the study area was required to be able to accommodate a continuous 275/400kV overhead line connecting the existing network at Auchecrosh (South Ayrshire) to the existing network at Harker (Cumbria) via substations at Newton Stewart, Glenlee and Dumfries. The study area also required to accommodate a new 132kV overhead line from Kendoon to Glenlee, and from Glenlee to Tongland.

4.3 A preliminary check was also carried out to identify the presence of international, European or nationally designated areas within, or immediately outside, the study area, to ensure that potential effects on these areas could be considered. Taking account of the above; and also informed by topography and land mass, the maximum area across which the corridor options were likely to be located, was identified.

Identification of Substation Search Areas

4.4 Within the overarching study area, the first step in the substation siting process was to identify substation search areas for each of the locations which the proposed overhead line was required to connect, namely Auchencrosh, Newton Stewart, Glenlee, Dumfries, and Harker (in England). It was important that these search areas were large enough to include all potential substation siting areas which would be identified through Steps B and C (See **Figure 2.1**) of the substation siting methodology.

4.5 Each of the substation search areas was identified based on initial desk and field based study and taking account of international, European and nationally designated areas, topography (avoiding areas of high ground and steep slopes where possible) and the possible technical requirements of each location.

Description of the Study Area

4.6 The study area is shown on **Figure 4.1** and extends broadly from Stranraer in the west, to Carlisle in the east. It is broadly bordered by the coastline to the south and west and the Lowther Hills and Carsphairn Forest to the north. The study area incorporates both Dumfries and Galloway and South Ayrshire in Scotland and part of the administrative area of Cumbria, and locally Carlisle City Council in England.

4.7 The landscape of the study area gradually changes from the upland areas in the north, including the Carrick and and Glentrool Forests, to lowland, more populated areas such as Newton Stewart, Kirkcudbright, Dumfries and Annan.

4.8 Topography across the study area varies, from the elevated upland areas of the Galloway Hills, which form a key physical feature within the west of the study area, falling through rolling and undulating farmland, dissected by broad river valleys, to the low lying coastal flats north of the coastline. The variable topography across the study area is evident from **Figure 4.1** and represents both potential opportunities for, and constraints to, the routeing of overhead transmission infrastructure and the siting of substations.

4.9 The existing electricity transmission network across the study area is generally concentrated within the broad river valleys and along the low lying southern coastline of Dumfries and Galloway. Whilst much of the network pre-dates the introduction of the Holford Rules, it still appears to follow similar key principles (i.e. generally avoiding the most prominent ridges and skylines, following broad wooded valleys, avoiding settlements and residential properties and maximising opportunities for backclothing and screening of infrastructure). It comprises 132kV overhead lines supported on lattice steel towers. The infrastructure sections of this existing 132kV electricity network which connect substations at Newton Stewart, Glenlee, Tongland and Dumfries, are shown on **Figure 1.1**. There are also a number of lower voltage distribution overhead lines supported on wood poles within the study area.

4.10 The main communication routes within the study area comprise the A74(M) road and West Coast Mainline railway in the east, connecting England and Scotland, and the A75 connecting Dumfries with the A74 to the east and Newton Stewart in the west. Numerous other main A roads traverse the study area including the A747, A714, A712, A711 and the A762, many of which follow the route of the existing network.

4.11 The population within the study area is clustered along the lowland coastal areas, with the largest settlements including Dumfries, Newton Stewart, Kirkcudbright, Castle Douglas, Lockerbie, Annan and Gretna. The study area is more sparsely populated in the central and northern areas where the landscape generally comprises uplands and forested areas, which are extensive over much of the northern and western study area.

Planning Policy Context

4.12 The Development Plans set out the vision for their respective regions over a twenty[6] year period and will be material considerations in determining the DGSR Project.

4.13 The adopted Scottish Development Plans of relevance to the Project comprise:

- The South Ayrshire Local Development Plan (LDP) (adopted September 2014)[7];
- The Dumfries and Galloway Local Development Plan (adopted September 2014)[8].

4.14 At the time of writing, Carlisle City Council is consulting on the Proposed Submission Draft of the emerging Local Plan. This is expected to be adopted in Spring 2016 and, given the DGSR Project timescale, will be a material consideration when determining the Project. English Local Plans of current relevance to the Project therefore comprise:

- The Carlisle District Local Plan 2011-2016 (adopted September 2008)[9];
- The emerging Carlisle District Local Plan 2015-2030[10].

The South Ayrshire Local Development Plan

4.15 The South Ayrshire LDP sets out four overarching policy principles which are designed to guide

- economic development;
- communities;
- environment and climate change; and
- transport.

4.16 The LDP outlines broad support for vital infrastructure projects of this nature, stating in LDP policy: spatial strategy:

> *"We will not support development outwith the boundaries of settlements (towns and villages), except where we believe it can be justified because it will benefit the economy and there is a need for it in that particular area…".*

4.17 The South Ayrshire LDP also outlines support for the principle of renewable energy generation which is covered more widely under LDP policy: renewable energy, where it states *"electricity generated from renewable sources is a vital part of the response to climate change"*.

The Dumfries and Galloway Local Development Plan

4.18 The Dumfries and Galloway LDP is intended to reflect the Scottish Government's vision of *'sustainable economic growth'.* It also notes the Scottish Government's ambitious renewable energy targets and recognises that new renewable technologies are now coming to the fore in Dumfries and Galloway. This will place further pressure on existing electricity infrastructure.

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[6] In Scotland the LDP vision is 20 years, however policies have a lifespan of 10 years with the LDP being replaced every 5 years In England the LPs have a 15 year vision.
7 The Dumfries and Galloway Local Development Plan (2014), Available [online] at: http://www.dumgal.gov.uk/index.aspx?articleid=11907
8 The South Ayrshire Local Development Plan (2014), Available [online] at: http://www.dumgal.gov.uk/index.aspx?articleid=11907
9 Carlisle District Local Plan 2011-2016 (2008), Available [online] at: http://www.carlisle.gov.uk/downloads/CDLP_WS.pdf
10 Carlisle District Local Plan 2015-2030, proposed Submission Draft (February 2015), Available [online] at: http://www.carlisle.gov.uk/downloads/carlisle_district_local_plan_2015-2030.pdf

Carlisle District Local Plan 2001 – 2016

4.19 The current Plan recognises that development may be necessary to meet local infrastructure needs and that where possible overhead line routes should avoid sensitive areas. Where this is not an option, careful routeing, siting and design should be used as the most appropriate way to minimise their effects.

4.20 The Plan also highlights the Council's support in principle, of renewable energy, providing it meets with the various criteria set out in the Plan policies.

Carlisle District Local Plan 2015-2030

4.21 The Proposed Submission Draft Local Plan outlines broad support for vital infrastructure projects emphasising in Policy IP1: Delivering Infrastructure that new development must ensure that there is sufficient infrastructure in place to support it. The Policy also states that *"where land is earmarked for infrastructure development, it will be protected from development proposals with the potential to compromise its delivery."*

4.22 The Proposed Submission Draft Local Plan also outlines support for renewable energy within its policies, highlighting the importance of protecting the natural environment and making effective use of natural resources through renewable energy generation.

Description of Substation Search Areas

4.23 The Auchencrosh substation search area extends from the existing substation at Auchencrosh to an area approximately 9km to the north-east encapsulating the existing 275kV overhead line. The area incorporates parts of Glen Tig and the high plateau to the south and is contained to the north by high ground around Ford Hill and Farden Hill to the north of Glen Tig.

4.24 The Newton Stewart substation search area extends broadly north and west from the existing substation and provides siting opportunities away from the core of the settlement of Newton Stewart. The search area is dissected by the A714 and B7027 offering potential substation siting areas to the north and south of these roads.

4.25 The Glenlee substation search area extends from New Galloway in the south to Earlstoun Loch in the north and includes the existing substation at Glenlee. The search area provides a number of substation siting opportunities on land contained within the valley of the Water of Ken, and in more elevated locations outwith the valley to the east and west.

4.26 The substation search area at Dumfries extends for approximately 22km from Kirkton in the north-west to Ruthwell Station in the south-east, and approximately 14km in a south-west to north-easterly direction from Mabie Forest to Amisfield.

4.27 At Harker, the substation search area extends approximately 1.5km in all directions from the existing substation.

4.28 The substation search areas are shown on **Figure 4.1**.

Dumfries and Galloway Strategic Reinforcement

Figure 4.1: Study Area and Substation Search Areas

Study Area

Substation Search Area

Existing Substation Location

Auchencrosh

Glenlee

Dumfries

Newton Stewart

Tongland

Harker

0 10 20 km

Map Scale @ A3: 1:500,000

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5 Areas of Highest Environmental Value

Identification and Mapping of Areas of Highest Environmental Value (Step B)

5.1 Step B comprised the identification of 'areas of highest environmental value' to further focus the study area through identification of potentially constrained areas to the routeing overhead lines and the siting of substations. This approach reflected the guidelines included in both 'The Holford Rules' and 'The Horlock Rules'.

5.2 The Holford Rules are broadly hierarchical, with Rule 1 relating to the avoidance, where possible, of 'major areas of highest amenity value'[11]. SHETL clarification note b) states that 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, Circulars and Planning Advice Notes and the spatial extent of areas identified."* The Holford Rules provide examples to be considered.

5.3 Holford Rule 2 makes the following recommendation *"avoid smaller areas of high amenity value or scientific interest by means of deviation",* and SHETL clarification note a) states that *"small areas of highest amenity value not included in Rule 1 as a result of their spatial extent should be identified".*

5.4 Horlock Rule 1 states *"The siting of new National Grid substations, sealing end compounds and line entries should as far as reasonably practicable seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections."*

5.5 This is consistent with the approach outlined in the Supplementary Notes on the Siting of Substations found in the Holford Rules, which states: "*Respect areas of high amenity value (see Holford Rule 1) and take advantage of the containment of natural features such as woodland, fitting in with the landscape character of the area."*

5.6 On this basis, all areas considered to be of 'highest environmental value' regardless of their spatial extent were identified and mapped as Step B, reflecting both Rule 1 and Rule 2 in relation to spatial extent. Areas of highest environmental value located within the study area, and therefore considered within Step B of the methodology, comprise areas of natural and cultural heritage value designated at a national[12], European or international level.

5.7 On this basis, the areas of highest environmental value comprise:

- National Scenic Areas (NSAs) (Scotland): NSAs are designated under Section 263A of the Town and Country Planning (Scotland) Act 1997, and are defined as "of outstanding scenic value in a national context."
- Areas of Outstanding Natural Beauty (AONBs) (England): AONBs are designated under the provisions of the 1949 National Parks and Access to the Countryside Act, to secure their permanent protection against development that would damage their special qualities. The Countryside and Rights of Way (CROW) Act 2000 bought in new measures to help protect AONBs further. The role of local authorities was clarified; this now includes the preparation of management plans for the protection of AONBs.
- Wild Land (Scotland): Paragraph 4.4. of National Planning Framework 3 advises that Wild Land is considered to be a nationally important asset. Scottish Planning Policy (2014) (SPP) states that "wild land character is displayed in some of Scotland's remoter upland, mountain and coastal areas, which are very sensitive to any form of intrusive human activity and have little or no capacity to accept new development".
- Ramsar Sites: The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention or Wetlands Convention) covers all aspects of wetland conservation and wise use. The UK ratified the Convention in 1976. The UK has generally chosen to underpin the

[11] Interpreted in this report as 'environmental value' to reflect wider intrinsic value.
[12] National designations reflect those designated under both English and Scottish legislation.

designation of its Ramsar sites through prior notification of these areas as Sites of Special Scientific Interest (SSSIs). Accordingly, these receive statutory protection under the Wildlife & Countryside Act 1981(as amended).

- Special Protection Areas (SPAs): SPAs are protected sites designated under the EC Directive on the Conservation of Wild Birds (79/409/EEC) and are classified in accordance with Article 4 of the Directive. They are classified for rare and vulnerable birds (as listed in Annex I of the Directive), and for regularly occurring migratory species. The conservation objectives associated with SPAs are to ensure that the extent, distribution, structure and function of the qualifying habitat are maintained for the long term. Species distribution and viability and prevention of disturbance are also important to maintain favourable conservation status.
- Special Areas of Conservation (SACs): SACs are classified under the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Directive 92/43/EC) (the 'Habitats Directive'). Article 3 of the Habitats Directive requires the establishment of a European network of important high quality conservation sites that will make a significant contribution to habitats and species identified in Annexes I and II of the Directive (as amended). The conservation objectives associated with SACs are to ensure that the extent, distribution, structure and function of the qualifying habitat are maintained for the long term. Species distribution and viability and prevention of disturbance are also important to maintain favourable conservation status.
- Sites of Special Scientific Interest (SSSIs): SSSIs are defined in the Wildlife and Countryside Act 1981 (as amended) as areas of land or water which are of special interest by reason of their flora, fauna or geological or physiographical features.
- National Nature Reserves (NNRs): NNRs contain examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. NNRs are declared by the statutory country conservation agencies under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 (as amended).
- World Heritage Sites (WHSs): WHSs are designated by UNESCO for their special cultural or physical significance and are protected under an international agreement adopted by the General Conference of UNESCO in 1972 (the UNESCO World Heritage Convention). This includes their 'buffer zones'.
- Scheduled Monuments (SMs)[13]: SMs are monuments of national importance, given legal protection under the Ancient Monuments and Archaeological Areas Act 1979.
- Inventory Gardens and Designed Landscapes (GDLs): GDLs which are particularly important for their scenic quality and historic interest are identified in the Inventory of Gardens and Designed Landscapes in Scotland and are highlighted for their national importance within the Scottish Historic Environment Policy (SHEP).
- Category A Listed Buildings or Grade I and II* in England (LB)[9]: Listed Buildings are protected under the Listed Buildings and Conservation Areas (Scotland) Act 1997 and the Planning (Listed Buildings and Conservation Areas) Act 1990 in England. Buildings of special architectural or historic interest are divided into three categories to reflect their degree of interest. Category A or Grade 1 Listed Buildings are considered to be of national or international importance.
- Historic Battlefields (England): The English Heritage Register of Historic Battlefields identifies 43 important English battlefields. Its purpose is to offer them protection and to promote a better understanding of their significance.

5.8 For clarity, the following national level heritage designations were not included, as they are not present within the study area:

- National Parks;
- Registered Parks and Gardens;
- Inventory of Historic Battlefields (Scotland);[14]
- Heritage Coasts.

[13] Where individual SMs and LBs or clusters of SMs and LBs have a spatial extent considered large enough to influence the identification of corridors.

[14] Historic Scotland requested that the Sark Candidate Historic Battlefield is taken account of in the methodology. This site has been included at the appraisal stage (Step D).

5.9 In addition to the above, Supplementary Note a) of the Holford Rules states *"avoid routeing close to residential area as far as possible on the grounds of general amenity."* At this stage in the routeing methodology, settlements were identified to represent residential areas to be avoided where possible in the identification of corridors and substation siting areas. Settlements are defined as those areas identified within Development Plans.

5.10 On the basis of the above, the areas of highest environmental value are shown on **Figure 5.1**. These are described further in **Appendix 2.**

5.11 Areas of highest environmental value were avoided in identifying options for overhead line corridors and substation siting areas, taking account of other technical considerations[15].

Technical Review

5.12 In addition to the mapping of areas of highest environmental value, a review was undertaken by SPEN at this stage to identify any technical considerations which were required to be reflected as part of Step B. These are outlined below in relation to overhead line routeing and substation siting.

Line Routeing

5.13 SPEN advised that all operational and consented turbines [16] within the study area should be mapped as a use of the land and a distance of 3 x rotor diameter[17] applied to each turbine as a 'trigger for consideration[18] as part of Step B of the routeing methodology.

5.14 SPEN advised that areas of high ground and steep slopes can form technical considerations to inform the routeing of high voltage overhead lines. To identify topography, a Digital Elevation Model (DEM) was used which maps gridded Ordnance Survey (OS) Terrain 50 data with a resolution of 50m. To identify slope angles, the slope was calculated from the DEM using ArcGIS Spatial Analyst. Areas of higher ground and the main prominent ridges/steep slopes were mapped and identified as technical considerations.

Substation Siting

5.15 SPEN advised that areas of flood zones identified on the Scottish Environment Protection Agency (SEPA) and Environment Agency (EA) flood management maps as 1/200yr flood zones (in accordance with paragraph 263 of SPP) should be included as a consideration as part of Step B of the substation siting methodology. It was also agreed that 1/1000 year flood zones would be included as a precautionary measure.

5.16 The SEPA/EA flood zone data was mapped and taken into account during the identification of substation siting areas. These areas were deemed to represent a 'trigger for consideration' at this early stage of the methodology to refine areas within the overarching substation search areas which were unlikely to be technically, environmentally or economically viable as potential substation siting areas.

[15] Due to their size and/or geographic spread, some features e.g. Scheduled Monuments could not be avoided in identifying overhead line corridors and/or substation siting areas at this strategic stage.

[16] A 'cut-off' date of 1st October 2014 was applied for consideration of consented windfarms. Whilst this information remains in a state of constant potential change, it is important to 'freeze' the constraints data for the purpose of identifying route corridors.

[17] Energy Networks Association: Separation between Wind Turbines and Overhead Lines Principles of Good Practice (2012)

[18] 'trigger for consideration' zones were used to identify areas within which there may be potential for environmental effects and should therefore be considered during the routeing stage.

Dumfries and Galloway Strategic Reinforcement

Figure 5.1: Areas of Highest Environmental Value

Study Area

Landscape

- National Scenic Area (NSA) (Scotland)
- Area of Outstanding Natural Beauty (AONB) (England)
- Wildland

Cultural Heritage

- World Heritage Site Buffer Zone
- Listed Building - Category A (Scotland) & Grade I, II* (England)
- Garden and Designed Landscape
- Historic Battlefield
- Scheduled Monument

Biodiversity

- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)
- Ramsar Site (R)

Technical

- Wind Farm Operational/Consented
- Flood Risk - Fluvial and Coastal

Map Scale @ A3: 1:500,000

LUC

SP ENERGY NETWORKS

N

0 10 20 km

CB:SR EB:robertson_s LUCGLA FIG05-01_61A_r1_Highest_Env_Value_A3L 19/05/2015

Source: SNH, NE, HS, EH

6 Options for Corridors and Substation Siting Areas

Identification of Options for Route Corridors and Substation Siting Areas (Step C)

6.1 The development of electrical transmission infrastructure, including overhead transmission lines, substations and ancillary components is likely to have a number of landscape and visual effects which are difficult to avoid. The best way to limit adverse effects on landscape and visual amenity is by careful line routeing and careful siting and design of substations, undertaken by landscape architects based on professional judgement and informed by fieldwork. Taking account of the guidance provided in Rules 4 and 5 of the Holford Rules, overhead line infrastructure is judged to be more widely visible from surrounding areas when located on higher ground, for example ridges and skylines.

6.2 With consideration of areas of highest environmental value, technical considerations identified in Step B and informed by topography, potential route corridor options for each part of the Project were identified.

6.3 Substation siting areas were also identified within the substation search areas, within which potential substation locations would be explored in more detail through the subsequent stages of the methodology.

Technical Review

6.4 Note a) on Rule 1 and Note d) on Rule 2 of the Holford Rules state: *"If there is an existing transmission line through a major area of highest*[19] *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."* On this basis, the existing 132kV, 275kV and 400kV network was mapped at this stage and corridors and substation siting areas were identified which reflect the route and substation locations of the existing network, even where these are currently located within areas of highest environmental value.

6.5 There was also a requirement to exclude areas of steeper gradient which were judged to be unsuitable for the location of potential substation sites. These areas were considered during the identification of substation siting areas, based on the likely required construction techniques and resultant environmental effects which would occur from the construction and operation of a substation in such locations.

6.6 The identified corridor and substation siting area options are described below and shown as an overview on **Figure 6** and in detail on **Figures 6a-d**.

Description of Identified Corridor Options

6.7 Each corridor was given a unique reference which reflects the substation origin and termination points and the corridor option number. For example, corridors originating at Auchencrosh substation (A) and terminating at Newton Stewart (NS) substation would be prefixed with A/NS and then the corridor option number e.g. 1, 2, 3 etc.

Auchencrosh to Newton Stewart

6.8 Two alternative corridor options were identified between Auchencrosh (A) and Newton Stewart (NS).

6.9 Corridor A/NS1 runs from Auchencrosh to Newton Stewart in a south-east direction and broadly follows the valleys of the River Stincher, Duisk and Cree. The corridor extends beyond the valley in the western section to provide line routeing options on the higher ground south of the River Stinchar and Duisk valleys. The eastern half of the corridor has been routed to the north of the high ground at Glenvernoch Fell and provides line routeing options to the north of the A714 road and the SSSI/SAC located on the approach to Newton Stewart.

[19] Note d) on Rule 2 states "high".

6.10 Corridor A/NS2 also runs from Auchencrosh to Newton Stewart in a south-east direction. The corridor follows the same alignment as Corridor A/NS1 then diverges to the south of the high ground at Glenvernoch Fell providing routeing options to the south of the A714 and the SSSI/SAC located on the approach to Newton Stewart.

Newton Stewart to Glenlee

6.11 Five alternative corridor options were identified between Newton Stewart (NS) and Glenlee (G).

6.12 Corridor NS/G1 runs from Newton Stewart to Glenlee in a north-east direction and follows the alignment of the existing 132kV overhead line. Through the central section, the corridor has been routed between the high ground of Millfore and Craignell and to the north of Clatteringshaws Loch.

6.13 Corridor NS/G2 runs from Newton Stewart to Glenlee in a north-east direction and follows the alignment of the A712 road. The corridor has been routed to the south to avoid Clatteringshaws Loch and north of the high ground at Cairnsmore of Fleet (and the associated ecological designations) and Black Craig of Dee. At its eastern extent on the approach to Glenlee, the corridor links in with Corridor NS/G1 (and the route of the existing 132kV overhead line).

6.14 Corridor NS/G3 runs from Newton Stewart to Glenlee in a north-east direction and follows the same alignment as Corridor NS/G2 before diverging to the south of the high ground at Black Craig of Dee. This provides alternative line routeing options south of the existing 132kV overhead line on the approach to Glenlee.

6.15 Corridor NS/G4 runs from Newton Stewart to Glenlee in a south-east direction in the western section and then a north-east direction in the eastern section. This corridor provides line routeing options to the south of the high ground at Cairnsmore of Fleet (and the associated ecological designations) whilst still avoiding the National Scenic Area and SSSIs further south. At its eastern extent on the approach to Glenlee, the corridor diverges north of the high ground at Cairn Edward Hill and links in with Corridor NS/G3 on the final approach to Glenlee.

6.16 Corridor NS/G5 also runs from Newton Stewart to Glenlee in a south-east direction in the western section and a north-east direction in the eastern section. This corridor follows the same alignment as Corridor NS/G4 before it diverges to the south of the high ground at Cairn Edward Hill on the approach to Glenlee. This provides alternative routeing options into Glenlee which crosses Loch Ken south of the SSSI/Ramsar designations to the north of the loch.

Kendoon to Glenlee

6.17 Due to the relatively short length of the connection, and limited opportunities for identifying multiple corridors due primarily to local topography, only one corridor option was identified, which follows the broad valley of Water of Ken between Kendoon (K) and Glenlee (G).

6.18 Corridor K/G1 runs from Glenlee to Polquhanity in a northern direction and provides a single wide corridor with line routeing options through the Glenkens valley, avoiding the higher ground to the west and east of the valley.

Glenlee to Tongland

6.19 Two alternative corridor options were identified between Glenlee (G) and Tongland (T).

6.20 Corridor G/T1 runs from Glenlee to Tongland in a southern direction providing routeing options which avoid Loch Ken (and its associated ecological designations). In the southern section, the corridor provides routeing options to the west of the high ground at Laurieston Forest.

6.21 Corridor G/T2 runs from Glenlee to Tongland in a southern direction and follows the alignment of the existing 132kV overhead line. In the northern section, the corridor provides routeing options to cross Loch Ken to the north of the SSSI/ Ramsar site and though the area where the existing 132kV overhead line crosses the loch. In the southern section, the corridor provides routeing options to the east of the high ground at Laurieston Forest.

Glenlee to Dumfries

6.22 Six alternative corridor options were identified between Glenlee (G) and Dumfries (D).

6.23 Corridor G/D1 runs from Glenlee to Dumfries in a north-east direction in the western half and then a south-east direction in the eastern half. In the western half, the corridor follows the alignment of the A702 road which passes through the valley of Blackmark Burn/ Castlefairn Water avoiding the high ground of Big Morton Hill to the north and Blackcraig Hill and Bogrie Hill to the south. In the eastern half, the corridor drops in elevation into the more settled landscape approaching Dumfries, broadly following the Cairn Water and Laggan Burn valleys, routeing to the north of the higher ground at Killyleoch Hill.

6.24 Corridor G/D2 also runs from Glenlee to Dumfries in a north-east direction in the western half and a south-east direction in the eastern half. In the western half, the corridor follows the same alignment as Corridor G/D1. In the eastern half, the corridor follows the Cairn Water Valley providing routeing options to the south of the higher ground at Killyleoch Hill.

6.25 Corridor G/D3 runs from Glenlee to Dumfries in a north-east direction in the western half and a south-east direction in the eastern half. In the western half, the corridor follows the alignment of the broad valley south of Blackcraig Hill/ Bogrie Hill and north of Darngarroch Hill, providing line routeing options both sides of the high ground at Castramon Hill. In the eastern half, the corridor follows the same alignment as Corridor G/D1, north of the higher ground at Killyleoch Hill.

6.26 Corridor G/D4 runs from Glenlee to Dumfries in a north-east direction in the western half and a south-east direction in the eastern half. In the western half, the corridor follows the same alignment as Corridor G/D3. In the eastern half, the corridor follows the same alignment as Corridor G/D2.

6.27 Corridor G/D5 runs from Glenlee to Dumfries in a south-east direction in the western half and a north-east direction in the eastern half. In the western half, the corridor follows the alignment of the A712 road, providing routeing options south of the high ground at Blackcraig Hill and Bennan on lower lying, typically more settled ground than the eastern sections of Corridors G/D1 –4. In the eastern half, the corridor follows the alignment of the A75 road on the lower lying and well settled approach to Dumfries, contained to the south by the existing Tongland/ Dumfries 132kV overhead line.

6.28 Corridor G/D6 runs from Glenlee to Dumfries in a south-east direction in the western half and a north-east direction in the eastern half. In the western half, this corridor provides routeing options to the south of the higher ground at Mochrum Fell and is contained to the south by the existing Glenlee/ Tongland 132kV overhead line and ecological designations south of Loch Ken. In the eastern half, the corridor follows the alignment of Corridor G/D5.

Dumfries to Harker

6.29 Four alternative corridor options were identified between Dumfries (D) and Harker (H).

6.30 Corridor D/H1 runs between Dumfries and Harker in a north-east direction in its western section and a south-east direction in its eastern section. In the western section, the corridor provides routeing options north of the settlements of Ecclefechan and Eaglesfield and is contained to the north by the high ground at Risp Hill and Collin hags. Between Gretna and Harker, the corridor provides routeing options to the north of the Solway Moss Registered Battlefield and the settlement of Longtown.

6.31 Corridor D/H2 runs between Dumfries and Harker in a north-east direction in its western section and a south-east direction in its eastern section. In the western section, the corridor provides routeing options north of the settlements of Ecclefechan and Eaglesfield and is contained to the north by the high ground at Risp Hill and Collin hags. Between Gretna and Harker, the corridor provides routeing options to the south of the Solway Moss Registered Battlefield and the settlement of Longtown.

6.32 Corridor D/H3 runs between Dumfries and Harker in an east direction and then a south-east direction between Gretna and Harker. In the western section, the corridor provides routeing options south of Ecclefechan and Eaglesfield and is contained to the south by ecological designations along the Solway Firth and larger settlements (including Annan). Between Gretna and Harker, the corridor follows the alignment of Corridor D/H1 (north of the battlefield and Longtown).

6.33 Corridor D/H4 also runs between Dumfries and Harker in an east direction and then a south-east direction between Gretna and Harker. The corridor initially follows the alignment of Corridor D/H3 (south of Ecclefechan and Eaglesfield) and then follows the alignment of Corridor D/H2 on the approach to Harker (south of the battlefield and Longtown).

Description of Identified Substation Siting Areas

Auchencrosh

6.34 Three alternative substation siting areas were identified for Auchencrosh (A).

6.35 Substation Siting Area A1 provides siting opportunities to the immediate east and north-east of the existing substation. The area does not extend west of the A77 road as it would be highly visible from this coastal route.

6.36 Substation Siting Area A2 is located approximately 1km north-east of the existing substation and provides siting opportunities which could tie in with the existing 275kV overhead line. The extent of this area has been informed by the SSSI and SPA designations.

6.37 Substation Siting Area A3 is located approximately 7.5km north-east of the existing substation and provides siting opportunities which could tie in with the existing 275kV overhead line. This area incorporates parts of Glen Tig and the high plateau to the south and is contained to the north by high ground at Ford and Farden Hill.

Newton Stewart

6.38 Five alternative substation siting areas were identified for Newton Stewart (NS).

6.39 Substation Siting Area NS1 is located approximately 2km north of the existing substation and provides siting opportunities to the north-east of the River Cree flood zone. The siting area is contained by rising ground to the north-east (the foot slopes of Knockman).

6.40 Substation Siting Area NS2 is located approximately 1km north of the existing substation and provides siting opportunities along the line of the existing 132kV Newton Stewart/ Glenlee overhead line. This area is relatively flat and is contained by the River Cree flood zone to the north and west and the settlement of Newton Stewart to the east.

6.41 Substation Siting Area NS3 provides siting opportunities to the immediate west of the existing substation on relatively flat ground. The area is contained to the east by the settlement of Newton Stewart.

6.42 Substation Siting Area NS4 is located within 1km west of the existing substation and provides siting opportunities along the line of the existing 132kV Glenluce/ Newton Stewart overhead line. The area is on undulating ground and is contained by the River Cree flood zone to the north-east.

6.43 Substation Siting Area NS5 is located approximately 2km north-west of the existing substation and provides siting opportunities to the west of the River Cree flood zone. The area is on gently undulating ground contained by rising ground to the north-west.

Glenlee

6.44 Six alternative substation siting areas were identified for Glenlee (G).

6.45 Substation Siting Area G1 is located within 1km north-east of the existing substation and provides siting opportunities along the line of the existing 132kV Glenlee/ Kendoon overhead line. The area is contained to the east by the Water of Ken flood zone and to the west by rising ground (Waterside Hill).

6.46 Substation Siting Area G2 is located approximately 3km north-east of the existing substation and provides siting opportunities on a higher plateau of land contained to the west by Blawquhain Hill and east by Bogue Fell.

6.47 Substation Siting Area G3 is located approximately 4km east of the existing substation and provides siting opportunities on the rising ground to the east of the Garple Burn and the associated SSSI.

6.48 Substation Siting Area G4 is located approximately 3km east of the existing substation and provides siting opportunities along the line of the existing 132kV Glenlee/ Tongland overhead line. The area is on gently rising ground and somewhat contained to the west by the Water of Ken flood zone.

6.49 Substation Siting Area G5 is located approximately 2km south-east of the existing substation. The area is situated on rising ground contained by Fintloch Hill to the north-west, Kil Hill to the north-east and the settlement of New Galloway to the south-east.

6.50 Substation Siting Area G6 is located within 1km south-east of the existing substation on the southern fringes of the Water of Ken floodplain. The area is contained by a SSSI to the west and steeply rising ground to the south-east.

Dumfries

6.51 Five alternative substation siting areas were identified for Dumfries (D).

6.52 Substation Siting Area D1 is located approximately 4km north-west of the existing substation. The area is situated on gently undulating ground contained by flood zones to the north and south and the settlement of Dumfries to the south-east.

6.53 Substation Siting Area D2 is located approximately 5km north-west of the existing substation. The area is situated on gently undulating ground contained to the east and south by flood zones.

6.54 Substation Siting Area D3 is located approximately 4km north-east of the existing substation. The area is situated on gently rising ground contained to the south-west by flood zones and higher ground (Shaws and Hempland Hill) to the north-east.

6.55 Substation Siting Area D4 is located approximately 5km south-east of the existing substation and provides siting opportunities along the line of the existing 132kV Dumfries/ Gretna overhead line. The area is on relatively flat land contained to the west and south-east by flood zones.

6.56 Substation Siting Area D5 is located approximately 9km south-east of the existing substation and provides siting opportunities along the line of the existing 132kv Dumfries/ Gretna overhead line. The area is on relatively flat land contained to the east by the higher ground around Panteth Hill.

Harker

6.57 One substation siting area was identified for Harker (H).

6.58 Substation Siting Area H1 is located immediately north-east of the existing substation. The area is on relatively flat ground, informed by the existing overhead line infrastructure and flood alert zone to the north.

Dumfries and Galloway Strategic Reinforcement

Figure 6.1: Corridor Options and Substation Siting Area Options

Study Area
Corridor
Substation Search Area
Substation Siting Area

0 10 20 km

Map Scale @ A3: 1:450,000

LUC

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Dumfries and Galloway Strategic Reinforcement

Figure 6.1a: Corridor Options and Substation Siting Area Options

Auchencrosh to Newton Stewart

Study Area

A/ NS1 Corridor

Substation Search Area

A1 Substation Siting Area

Map Scale @ A3:1:175,000

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Dumfries and Galloway Strategic Reinforcement

Figure 6.1b: Corridor Options and Substation Siting Area Options

Newton Stewart to Glenlee and Kendoon and Tongland 132KV Connections

Study Area

A/ NS1 Corridor

Substation Search Area

A1 Substation Siting Area

Map Scale @ A3:1:175,000

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Dumfries and Galloway Strategic Reinforcement

Figure 6.1c: Corridor Options and Substation Siting Area Options

Glenlee to Dumfries

Study Area

A/ NS1 Corridor

Substation Search Area

A1 Substation Siting Area

Map Scale @ A3: 1:175,000

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CB:SR EB:robertson_s LUCGLA FIG06-01a-d_61A_Strategic Options_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 6.1d: Corridor Options and Substation Siting Area Options

Dumfries to Harker

Study Area

A/ NS1 Corridor

Substation Search Area

A1 Substation Siting Area

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

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7 Appraisal of Corridor Options and Substation Siting Areas

Overall Approach to Appraisal of Route Corridor Options and Substation Siting Areas (Step D)

7.1 The objective of the appraisal of the route corridor options and substation siting areas within Step D was to identify preferred corridors for each Part of the Project and preferred substation siting areas where relevant. The process sought to:

- continue to reflect the overall Routeing Objective;
- continue to reflect the Holford Rules for Routeing Overhead Transmission Lines and the Horlock Rules for Siting of Substations;
- take cognisance of policy on the assessment of effects set out in Part 5 of the Overarching National Policy Statement for Energy EN-1 and Part 2 of the National Policy Statement for Electricity Networks Infrastructure EN-5[20];
- draw out distinctions between the corridors and substation siting areas to enable the relative strengths and weaknesses of each to be identified.

7.2 The comparative appraisal of route corridor options and substation siting areas has been undertaken in stages as set out below:

(i) identification of appraisal criteria, together with their reasoning for inclusion;

(ii) application of appraisal criteria to each corridor and substation siting area, following the appraisal methodology;

(iii) a comparative appraisal of corridor options for each Part of the Project e.g. Auchencrosh to Newton Stewart, to identify a preferred corridor;

(iv) a comparative appraisal of substation siting options for each substation location, e.g. Newton Stewart, to identify a preferred substation siting area;

(v) a subsequent appraisal to consider the combined effects of the preferred corridor and preferred substation siting area, and SPEN technical review, including system design requirements.

Appraisal Criteria

7.3 Based on the preliminary findings of Steps A-C, knowledge of the study area and previous routeing and substation siting experience, appraisal criteria were proposed in relation to the following:

(i) length of corridor (for line routes only);

(ii) biodiversity and geological conservation;

(iii) landscape and visual amenity;

(iv) cultural heritage;

(v) flood risk;

(vi) land use.

7.4 These criteria comprise both constraints/considerations identified in previous steps, e.g. areas of highest environmental value, and new constraints, e.g. areas of regional or local value, as required in this step.

[20] These documents are considered directly relevant, as part of the Project is located in England and are also taken into consideration as wider context to be appropriate for the part of the Project located in Scotland. Paragraph 1.5.2 of both EN-1 and EN-5 acknowledge that as the NPSs are statement of UK government energy policy, the NPSs "may therefore be a relevant consideration in planning decisions in Scotland".

7.5 Areas of highest environmental value were avoided during the identification of corridors and substation siting areas. However, due to the size, number or dispersed nature of certain features, e.g. Scheduled Monuments, for practical reasons, some of these were difficult to avoid in identifying broad level corridor and substation siting area options. Therefore, the location and nature of features located within each corridor and substation siting area and potential implications for future routeing, substation siting, and assessment, i.e. scope to avoid these at the line routeing and substation siting stage, were included within the relevant criteria.

7.6 In relation to areas of regional or local value, note a) on Rule 2 of the Holford Rules highlights *"other areas of regional or local high amenity value identified from development plans"* and note b) highlights that *"some areas (e.g. statutory designated Local Nature Reserves or local non-statutory designated local nature conservation sites) may require special consideration for ecological impacts (e.g. to their flora and fauna)".* In addition, Supplementary Note b) of the Holford Rules states *"where possible choose routes which cause the least disturbance to Areas of Great Landscape Value and other similar designations of Regional or Local value".* On this basis, a number of areas of regional or local value have been identified[21] as outlined below. However, as Rule 2 states that these area should be avoided by deviation, only where the regional or local value amenity areas are of such a geographic scale that they cannot be avoided at line routeing i.e. the 'deviation stage', are these included within the corridor and substation siting appraisal.

7.7 The reasoning for the proposed inclusion of the above criteria and an outline of the methodology for appraising each corridor against the criteria is set out below.

Length of Corridor

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

Biodiversity and Geological Conservation

7.9 In relation to biodiversity and geological conservation, areas of highest environmental value, in accordance with Rule 1, remain as those identified in Step B, regardless of geographic size, i.e. Ramsar Sites, Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs).

7.10 In relation more specifically to ornithology, strategic scale field work comprising an appraisal of suitable habitats and collation of desk based existing data (e.g. windfarm environmental data and publicly available data-sets) have been used to identify areas outwith those which are designated as SPAs, but which may be sensitive to overhead line development, primarily on the grounds of collision risk to wildfowl (swans and geese). These areas are outlined below and were agreed in consultation with Scottish Natural Heritage (SNH) and The Royal Society for the Protection of Birds (RSPB).

7.11 A 2km 'trigger for consideration zone' has been applied around SPAs where wildfowl species are cited as qualifying features. This takes in the majority of wildfowl feeding areas, and/or areas where flight activity levels by wildfowl are likely to be high, due to daily movements between roosts and feeding areas.

7.12 A 1km 'trigger for consideration zone' has been applied to SSSIs that are not designated as SPAs, but currently hold nationally important wildfowl populations as identified using British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) data. Non-designated areas are included for consideration, when BTO WeBS data indicated they support significant concentrations (5-year average count of swan or goose species that exceeds 1% of the GB population) of wildfowl.

7.13 In addition, a 2km 'trigger for consideration zone' has been applied to the Glen App SPA, extending approximately 2km beyond the SPA boundary on the eastern side where it abuts moorland, as this may be suitable and exploited habitat for foraging harriers within the SPA.

[21] The Galloway and Southern Ayrshire Biosphere, designated by UNESCO in 2012 to protect the biological and cultural diversity of a region while promoting sustainable economic development, is located within the study area. The Core Areas comprise the Cairnsmore of Fleet NNR the Silver Flowe NNR and the core of the Merrick Kells SSSI. The Buffer and Transition Areas extend across a vast portion of the Study Area which encompasses the settlements of Castle Douglas in the east and Ballantrae to the west. As the core areas already comprise 'areas of highest environmental value' and the buffer and transition areas do not comprise areas protected from development, the Biosphere is not included as a separate area of regional or local value in relation to the routeing process. The routeing methodology does however seek to reflect the principles of the Biosphere designation.

7.14 Finally, a 1km 'trigger for consideration zone' has been applied around SSSIs that are cited for their important upland bird assemblages (Merrick Kells and Laughenghie and Airie Hills). Habitats adjacent to these SSSIs may be important for nesting or foraging for some species.

7.15 The Wood of Cree RSPB Reserve which is located approximately 2km north-west of Newton Stewart, is also included at this stage as it cannot be avoided by line route deviation due to its geographic scale. It is also a consideration within the Dumfries and Galloway Local Development Plan.

7.16 The biodiversity considerations taken into account in the appraisal of the overhead line corridors and the substation siting areas are shown on **Figure 7.1 a-d**.

Landscape and Visual Amenity

Designated Landscapes

7.17 In addition to the landscape related areas of highest environmental value, i.e. NSAs, AONBs, and Wild Land, areas of regional or local value were identified to inform the appraisal as outlined below.

7.18 Regional Scenic Areas (Dumfries and Galloway) are areas of scenic value at the regional scale which have a level of protection in the Development Plan. Policy in relation to these areas states that "*The siting and design of development within a Regional Scenic Area should respect the special qualities of the area. Development within, or which affects Regional Scenic Areas (RSAs), may be supported where the local Council is satisfied that:*

· the landscape character and scenic interest for which the area has been designated would not be significantly adversely affected; or

· there is a specific need for the development at that location which could not be located in a less sensitive area."

7.19 Scenic Areas (South Ayrshire) cover much of the local authority area contained within the study area. These designated areas are protected within the Local Development Plan for South Ayrshire.

7.20 Within Cumbria, Landscapes of County Importance are defined as landscapes which are of importance for their particular topographical, visual, cultural or historical characteristics. These areas are included within the extant Carlisle District Local Plan, however they are not proposed for inclusion within the Proposed Submission Draft Local Plan. They have been included in the current appraisal due to their inclusion in the extant Local Plan, but will not form a material consideration in relation to the DGSR Project if excluded from the revised Local Plan.

7.21 The designated landscapes appraisal considerations taken into account in the appraisal of the overhead line corridors and the substation siting areas are shown on **Figure 7.2a-d**.

Landscape Capacity

7.22 The next criterion used in the appraisal of corridors and substation siting areas was 'landscape capacity'. Landscape capacity as used here refers to the ability of the landscape to accommodate lattice steel tower, high voltage overhead line development of the type and size proposed (up to 'L8' towers in the order of 46m high) and the different substation design options, without geographically extensive and/ or significant adverse effects on landscape character. Supplementary Note a) for the Siting of Substations outlined in the Holford Rules states*: "…take advantage of the containment of natural features such as woodland, fitting in with the landscape character of the area*."

7.23 Capacity is assessed with reference to the existing landscape characteristics and attributes of the landscape. Accordingly, the SNH suite of Landscape Character Assessments (LCAs) for Dumfries and Galloway (Report No. 94, Land Use Consultants 1998) and Ayrshire (Report No. 111, Land Use Consultants 1998), and the Cumbria Landscape Character Assessment Guidance and Toolkit (Cumbria County Council 2011) has been used as the starting point in determining landscape capacity across the study area. Each Landscape Character Type (LCT) which is potentially affected by a corridor or substation siting area option has been appraised on its ability to accommodate an overhead line or substation infrastructure of the type proposed, and categorised as having higher, medium or lower landscape capacity. This approach also draws on the principles set out in the Holford Rules and Horlock Rules.

7.24 In determining landscape capacity, professional judgement was applied alongside an understanding of how the proposed development would affect, or fit in with the landscape, and the degree to which potentially adverse effects could be reduced. This enabled a judgement to be made on the landscape capacity of each LCT, which was then presented graphically on a series of maps using GIS, and supported by written observations on the key landscape characteristics. Using these maps and observations, the landscape capacity

to accommodate overhead line and/or substation infrastructure for each corridor and substation search area option was appraised to feed into the identification of preferred corridors and preferred substation siting areas. The landscape capacity appraisal considerations taken into account in the appraisal of the overhead line corridors and the substation siting areas are shown on **Figure 7.2a-d**.

7.25 The methodology and findings of the landscape capacity appraisal are presented in **Appendix 3.**

Visual Amenity

7.26 Visual Amenity is defined as "*the overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area*" (Guidelines for Landscape and Visual Impact Assessment 3, Glossary - Page158).

7.27 The Further Notes on Clarification to the Holford Rules c) state *"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" with* note a) stating *"avoid routeing close to residential areas as far as possible on grounds of general amenity".*

7.28 Where it has not been possible to avoid settlements in identifying corridors, the location and geographical spread of such settlements has been identified and opportunities to avoid routeing through, or close to, settlements appraised.

7.29 Rule 4 of the Horlock Rules states that: *"The siting of substations, extensions and associated proposals should take advantage of the screening provided by land form and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum."* Rule 5 also states: *"The proposals should keep the visual, noise and other environmental effects to a reasonably practicable minimum."*

7.30 The consideration of effects on visual amenity is also highlighted in the Horlock Rule 5 Notes: Note 1 *"Allow sufficient space for screening of views by mounding or planting"* and Note 3 *"Use security measures which minimise visual intrusion from lighting".*

7.31 Visual amenity is partly considered when determining landscape capacity (i.e. horizons, skylines, and general spread of residential receptors). However, key viewpoints (e.g. recognised mapped viewpoints), tourist routes (including National Cycle Routes and long distance footpaths), major roads and population densities (and associated spread of residential receptors) were taken into consideration when appraising corridor and substation siting area options. The Galloway Forest Park is identified as a tourist designation within Dumfries and Galloway LDP Policy NE6: Forestry and Woodland and is therefore also considered in relation to visual amenity.

7.32 Horlock Rule 10 also states the importance of considering the interaction between existing low and high voltage overhead lines. On this basis, the high voltage 132kV, 275kV and 400kV network was mapped at this stage to identify potential areas of constraint, or opportunity, in relation to landscape capacity and general visual amenity.

7.33 With regard to existing OHL infrastructure and where this passes through or in close proximity to an area of designated landscape such as a Regional Scenic Area, it is recognised that the existing infrastructure is likely to increase the capacity of the receiving landscape to further OHL development. However, should the existing OHL infrastructure be kept in place then the cumulative effects of two lines in closer proximity would need to be considered. Should the existing OHL infrastructure be removed as part of the wider strategic works for DGSR, then the potential positive effects of locating new OHL infrastructure through non designated landscapes is also acknowledged.

7.34 The visual amenity appraisal considerations taken into account in the appraisal of the overhead line corridors and the substation siting areas are shown on **Figure 7.3a-d**.

Cultural Heritage

7.35 In relation to cultural heritage, areas of highest environmental value, in accordance with Holford Rule 1, remain as those identified in Step B, regardless of geographic extent. These comprise: World Heritage Sites, Scheduled Monuments, Inventory Gardens and Designed Landscapes, A/Grade I Listed Buildings, Historic Battlefields and their settings (including a 2km 'trigger for consideration' zone at this stage).

7.36 Conservation Areas (usually urban or the core of a village) are also considered worthy of preservation or enhancement because of their special architectural or historic interest. The current legislation in England and

Wales, the Planning (Listed Buildings and Conservation Areas) Act 1990 (Section 69 and 70), defines the quality of a Conservation Area as being: *"the character or appearance of which it is desirable to preserve or enhance*". The current Scottish legislation is the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.

7.37 Archaeologically Sensitive Areas, comprising areas of archaeological interest extending over large areas, have been designated by Dumfries and Galloway Council for protection under Policy HE4: Archaeologically Sensitive Areas within the LDP (2014).

7.38 The cultural heritage considerations taken into account in the appraisal of the overhead line corridors and the substation siting areas are shown on **Figure 7.4a-d**.

Flood Risk

7.39 In relation to potential conflicts with policy relating to flooding and to avoid potential increases to flood risk, SEPA/EA 200yr flood zones have been mapped using GIS. For appraising the route corridors, flood risk areas with a width of 300m or greater have been included as a 'trigger for consideration', on the basis that this presents constraints to the ability to be able to span the flood risk zone with lattice steel towers.

7.40 In addition to the 1/200 yr flood zone, the 1/1000yr flood zone has been mapped for substations. The potential for avoiding siting a substation within such areas was also considered.

7.41 The flood risk considerations taken into account in the appraisal of the overhead line corridors and the substation siting areas are shown on **Figure 7.5a-d**.

Land Use

7.42 The land use considerations taken into account in the appraisal of the overhead line corridors and the substation siting areas are shown on **Figure 7.6a-d**.

Woodland

7.43 Notes c) and d) in respect of Rules 4 and 5 of the Holford Rules state *"where possible follow open space and run alongside, not through woodland or commercial forestry and consider opportunities for skirting edges of copses and woods. Protect existing vegetation including woodland and hedgerows, and safeguard visual and ecological links with the surrounding landscape".* On this basis, woodland and commercial forestry identified within the Forestry Commission National Forest Inventory has been identified, as well as Ancient Woodland. Opportunities to avoid these areas in line routeing and substation siting have been appraised.

Agricultural Land

7.44 Rule 5 of the Horlock Rules states: *"The land use effects of the proposal should be considered when planning the siting of substations or extensions".* Note 1 of Rule 5 states *"Issues for consideration include potential sterilisation of nationally important land, e.g. Grade 1 agricultural land and sites of nationally scarce minerals".* Note c) of the Holford Rules Supplementary Notes on the Siting of Substations states: *"Use space effectively to limit the area required for development, minimising the effects on existing land use and rights of way*".

7.45 Given the very limited landtake associated with overhead lines, at this strategic level, the use of the land for agricultural production was considered during the substation siting area appraisal only. Land Capability for Agriculture classes 1, 2 and 3.1 in Scotland and Grades 1, 2 and 3a in England are referred to as 'Best and Most Versatile' land, and are afforded protection from development. These grades of agricultural land were mapped and opportunities to avoid them during substation siting were appraised.

Windfarms

7.46 In addition to the consented and operational windfarms mapped in Step B, windfarms which were the subject of valid planning applications/applications for s.36 consent under the Electricity Act [22] were mapped as a land use, and a 3x rotor diameter 'trigger for consideration' applied. The potential for each corridor or substation siting area to accommodate a route or substation site which avoids the windfarms was then appraised. Where such proposed developments are small in area, and can be avoided, these will be taken account of during the line routeing stage.

[22] To provide some certainty for the purpose of corridor appraisal, a 'cut-off' date of 1st October 2014 was applied for consideration of windfarms with valid planning applications/applications for s.36 consent.

Committed and Existing Development

7.47 Areas allocated within Local Development Plans (LDPs) for development were considered at this stage on the basis that these allocated areas are likely to be developed in the future and should therefore be given the same consideration in the appraisal as existing development.

7.48 On the basis that the proposed LDPs for both South Ayrshire and Dumfries and Galloway were at an advanced stage of progression[23], with modifications outlined within the Examination Report prepared by Scottish Ministers being taken into consideration, it was felt to be more appropriate to refer to these emerging Plans, rather than those which would be replaced prior to the submission of the application/s for consent. These areas were then re-considered to confirm their inclusion within the finalised LDP.

7.49 Cumbria County Council recommended the Proposed Submission Draft Carlisle District Local Plan is included, as this now forms a material consideration[24]. Therefore, the adopted Local Plan and the emerging Draft Local Plan were used to identify committed development at this stage.

7.50 Inset maps contained within the Local Plan and Draft Local Plan for Carlisle City and the Proposed LDPs for both South Ayrshire and Dumfries and Galloway were used to identify areas allocated for housing within proposed corridors which were unlikely to be avoidable in line routeing. These areas tend to be focussed around existing settlements.

7.51 The proposed LDPs also set out land allocated for 'industrial and business use'. These areas are likely to take a more irregular form and are often located more strategically, i.e. close to transport corridors. Whilst this land use is less constrained than housing with regard to routeing an overhead line, allocations were taken into account in the land use component of the appraisal.

7.52 A review of the proposed South Ayrshire LDP identified that no industrial and business use, or housing allocations, existed within the study area outwith those which are already designated as a settlement and therefore included as a Step B consideration. Therefore, these were not considered further within the appraisal.

7.53 Minerals extraction areas were also considered at this stage on the basis that construction and operation of the overhead-line and substation sites would not be compatible with minerals extraction operations. A desk based minerals assessment was carried out to determine the location and extent of minerals extraction sites, both operational and those allocated for development within the Study Area. These areas were mapped with reference to the following documents:

- The South Ayrshire Local Plan (2007);
- The South Ayrshire Proposed Local Development Plan (2013);
- The Adopted Wigtown Local Plan (2006);
- The Adopted Stewartry Local Plan (2006);
- The Adopted Nithsdale Local Plan (2006);
- The Adopted Annandale and Eskdale Local Plan (2006);
- The Dumfries and Galloway Proposed Local Development Plan (2013);
- The Dumfries and Galloway Local Development Plan Minerals Extraction Technical Paper (2013);
- The Carlisle District Local Plan 2001-2016;
- The Emerging Carlisle District Local Plan 2015 – 2030;
- Cumbria Minerals and Waste Development Framework Site Assessments Report - January 2012.

7.54 A preliminary assessment indicated that operational mining activities are limited to the Dumfries and Galloway part of the Study Area. 'Search Areas' for minerals extraction were mapped within the superseded Dumfries and Galloway Structure Plan, however the Dumfries and Galloway Local Development Plan Minerals Extraction Technical Paper (2013) indicated *"there was adequate supply of each mineral without any deficiencies and therefore it was not necessary to identify search areas in the LDP",* therefore no allocations for future minerals extraction were considered likely in this area.

[23] A cut-off date of 1st October 2014 was also applied for consideration of Committed Development.

[24] As requested in consultation response to routeing methodology April 2015, although after the 'cut-off' date applied elsewhere.

7.55 Desk based analysis also suggested that the South Ayrshire and Cumbria parts of the Study Area did not contain any areas designated for their minerals potential. However, this will be confirmed through consultation with the respective Councils.

7.56 Where minerals areas were considered smaller areas of high amenity value which could be avoided by deviation, these were not considered in the corridor and substation siting appraisal, and will be considered at the detailed routeing stage.

7.57 In addition, other areas of existing development which are shown on the 1:50,000 Ordnance Survey (OS) maps, and would be difficult to avoid in line routeing and substation siting, were also mapped and included within the appraisal e.g. the ex-Ministry of Defence site near Longtown.

Appraisal Findings

7.58 **Table 7.1** below presents the emerging preference i.e. the preference made in relation to environmental considerations only, for each corridor; including the overarching reasoning for the preference in relation to the appraisal findings.

7.59 **Table 7.2** below presents the emerging preference i.e. the preference made in relation to environmental considerations only, for each substation; including the overarching reasoning for the preference in relation to the appraisal findings.

7.60 The detailed appraisal findings are included as **Appendix 4**.

Table 7.1: Emerging Corridor Preferences

Corridor	Preference	Overarching Reason
Auchencrosh – Newton Stewart (A/NS)	**A/NS2**	Corridor A/NS2 is the preferred corridor as it has a lower density of Scheduled Monuments within the corridor and within 2km of the corridor (in relation to setting) (Holford Rule 1) and avoids the Archaeologically Sensitive Area (Holford Rule 2) and the RSPB Reserve (Holford Rule 2). Corridor A/NS2 is a greater distance from Wild Land (Holford Rule 1) and avoids the Ayrshire Scenic Area and Dumfries and Galloway Regional Scenic Area (Holford Rule 2). It is also likely to result in fewer effects on visual amenity including on the Galloway Forest Park, the National Cycle Network and the A714 road, whilst also providing an opportunity to avoid landscapes with medium and lower capacity to accommodate overhead line development. Corridor A/NS2 is also the shortest corridor (Holford Rule 3). However, it is important to note that Corridor A/NS2 is likely to result in a greater loss of woodland than A/NS1 (Holford Rule 4 and 5).
Newton Stewart – Glenlee (NS/G)	**NS/G1**	Corridor NS/G1 is the preferred corridor on the basis that it avoids the 'trigger for consideration zone' of the Loch Ken and River Dee Marshes Ramsar/SPA/SSSI and is a greater distance from the National Scenic Area. It is the shortest corridor (Holford Rule 3) and the presence of the existing 132kV overhead line within the corridor is also recognised (Note on Holford Rule 1). Corridor NS/G1 also provides opportunities to avoid landscapes with lower capacity to accommodate an overhead line as well as avoiding the more populated areas along main roads in relation to visual amenity. However, as with all the corridors, the presence of Scheduled Monuments and Listed Buildings may form a consideration at the line routeing stage (Holford Rule 1), the Regional Scenic Area (Holford Rule 2) cannot be avoided and there will be a requirement to fell woodland (Holford Rule 4 and 5).
Glenlee – Tongland (G/T)	**G/T2**	Corridor G/T2 is the preferred corridor as it avoids proximity to the National Scenic Area (Holford Rule 1) and in relation to visual amenity it avoids the more sensitive receptors around the Loch Ken area (viewpoints and tourist route). The corridor also avoids landscapes with low capacity for overhead line development, however, as with the other corridors, the Regional Scenic Area cannot be avoided (Holford Rule 2). Corridor G/T is also preferred on biodiversity grounds, primarily ornithology as the 'trigger for consideration zone' of the Loch Ken and River Dee Marshes SPA can be avoided. In relation to cultural heritage, Corridor G/T2 avoids the Archaeologically Sensitive Area and has a relatively lower density of Scheduled Monuments and Listed Buildings. Corridor G/T2 is also the shortest corridor (Holford Rule 3) and avoids the 1/200yr flood risk zones. However, the felling of woodland will be required to accommodate the overhead line (Holford Rule 4 and 5).
Kendoon – Glenlee (K/G)	**K/G1**	This is the only corridor option.
Glenlee – Dumfries (G/D)	**G/D3**	Corridor G/D3 is the preferred corridor on the basis that it is located a greater distance from the National Scenic Area (Holford Rule 1) than a number of the corridors, and avoids the Regional Scenic Area (Holford Rule 2). Corridor G/D3 is also one of the shortest corridors (Holford Rule 3). Whilst part of the corridor is located within the 2km 'trigger for consideration' zone of the SPA, this can be avoided at the line routeing stage (Holford Rule 1). However, the felling of woodland within this corridor cannot be avoided (Holford Rule 4 and 5) and cultural heritage features will form a consideration at the line routeing stage (Holford Rule 1).
Dumfries – Harker (D/H)	**D/H1**	Corridor D/H1 is the preferred corridor as this is located furthest from the Upper Solway Flats and Marshes Ramsar/SPA and SSSI reducing the bird collision risk for qualifying species (Holford Rule 1). The corridor is also located the greatest distance from the National Scenic Area and Area of Outstanding Natural Beauty (Holford Rule 1) and provides greatest opportunity to avoid landscapes with lower capacity to accommodate overhead lines. Corridor D/H1 also offers greatest opportunity to minimise effects on visual amenity

Corridor	Preference	Overarching Reason
		associated with the road network and settlements. In relation to cultural heritage, the corridor avoids the Hadrians Wall World Heritage Site 'trigger for consideration zone' and the Kinmount Garden and Designed Landscape, including the associated 2km 'trigger for consideration' zone, as well as the candidate Historic Battlefield (Holford Rule 1). The corridor also crosses the 1/200yr flood risk zone of the River Esk at its narrowest point and avoids the committed development at Longtown. As with all corridors, it may not be possible to avoid felling woodland (Holford Rule 4 and 5) and Corridor D/H1 is also the longest corridor (Holford Rule 3).

Table 7.2: Emerging Substation Siting Area Preferences

Substation Search Area	Substation Siting Area Preference	Overarching Reason
Auchencrosh (A)	**A3**	Substation Siting Area A3 is preferred as it avoids proximity to the Glen App and Galloway Moors SPA, SSSI and a Garden and Designed Landscape (Holford Rule 1) as well as being located outwith the Scenic Area (Holford Rule 2). However, felling of woodland may be required to accommodate the substation (Holford Rule 4 and 5).
Newton Stewart (NS)	**NS5**	Substation Siting Area NS5 is preferred as it is located more than 2km from the Newton Stewart Conservation Area (Holford Rule 1) and avoids the Regional Scenic Area (Holford Rule 2). It has a relatively higher landscape capacity to accommodate a substation than the other siting areas, as well as being likely to have less effect on visual amenity. NS5 also requires a shorter length of 275kV overhead line from Auchencrosh. This location also avoids establishing a new connection into the existing Newton Stewart substation by turning the existing 132kV BT route into the new substation.
Glenlee (G)	**G2**	Substation Siting Area G2 is preferred on the basis that it avoids the 'trigger for consideration zone' associated with the Loch Ken and River Dee Marshes Ramsar/SPA/SSSI (Holford Rule 1). There are also no cultural heritage constraints within the substation siting area (Holford Rule 1) and it avoids the Regional Scenic Area (Holford Rule 2). Substation Siting Area G2 has a medium landscape capacity to accommodate the substation and offers potential for minimising visual amenity effects when compared to other siting areas.
Dumfries (D)	**D4**	Substation Siting Area D4 is preferred as there are no cultural heritage features within the siting area (Holford Rule 1) and it is greater than 2km from the Conservation Area and Gardens and Designed Landscapes (Holford Rule 1). It also avoids the Regional Scenic Area (Holford Rule 2), however it is located in proximity to the A75 tourist route in relation to visual amenity considerations. D4 will result in loss of either prime agricultural land (Horlock Rule 6) or woodland (Holford Rule 4 and 5). This location also avoids establishing a new connection into the existing Dumfries substation by turning the existing 132kV BR route into the new substation.
Harker (H)	**H1**	The new overhead line will terminate at the existing Harker substation and reinforcements will be required at the existing substation.

Technical Review of Emerging Preferred Corridors and Substation Siting Areas

7.61 At this stage, the SPEN engineering team undertook a technical review of the emerging preferred corridors, to identify any potential technical constraints to routeing within these corridors. A similar technical review was also undertaken of the emerging preference for substation siting areas.

7.62 It was agreed that should the SPEN technical review highlight that the emerging preferred corridors and substation siting areas were not technically feasible, or would result in unreasonable economic implications (due to technical requirements), that the second best performing corridor and substation siting area would be reviewed further.

7.63 The technical considerations taken into account in the appraisal of the overhead line corridors and the substation siting areas are shown on **Figure 7.7a-d**.

Technical Review of Emerging Preferred Corridors

7.64 The technical review in relation to the overhead line corridors comprised consideration of:

- Altitude: topographic areas with a height exceeding 350m Above Ordnance Datum (AOD);
- Slope: areas in excess of 22°;
- Waterbodies: watercourses and/or waterbodies shown on 1:25,000 OS maps with a width >300m;
- Existing overhead line network: 132kV, 275kV or 400kV with a 'trigger for consideration' of 50m either side of the overhead line.

7.65 The overarching findings of the technical review are that all the emerging preferred corridors are considered technically viable to accommodate the required overhead line infrastructure.

7.66 However, there are a small number of technical 'pinch-points' whereby further technical input will be required to inform the progression of the corridors through routeing process. These include a section of the NS/G1 corridor where proximity to the existing 132kV overhead line will require more detailed technical input, and the D/H1 corridor in relation to the crossing of existing high voltage infrastructure.

Technical Review of Emerging Preferred Substation Siting Areas

7.67 The technical review in relation to the substation siting areas comprised consideration of:

- Slope: areas in excess of 5.71° (or 1 in 10);
- Peat: areas shown on British Geological Survey (BGS) maps as being overlain by peat >1m as a 'trigger for consideration';
- Access: general access to the substation siting area;
- Existing overhead line network: 132kV, 33kV and 11kV and implications for the network during construction and operation;
- Substation siting area size: in relation to the substation size requirement.

7.68 The overarching findings of the technical review are that all the emerging preferred substation siting areas are considered technically viable to accommodate the required substation infrastructure[25].

7.69 However, there are a number of technical considerations which will be required to be considered further during the substation siting and design stages. These include areas where peat is present within all or part of the siting area e.g. substations A3, NS5, D4, access requirements e.g. A3, slopes e.g. A3, NS5 and G2 and existing network and implications for the network e.g. G2 in relation to the hydro-stations connections in the Glenlee area.

[25] Further technical input is required from National Grid during the next steps in the routeing process in relation to the substation requirements at Harker.

7.70 On the basis of the findings of the technical review, the emerging preferred corridors and substation siting areas were progressed to the next stage of the routeing process whereby the combined effects of the corridors and substation siting areas were considered.

Consideration of Combined Effects of Emerging Preferred Corridors and Substation Siting Areas

7.71 Note f) of the Holford Rules Supplementary Notes on the Siting of Substations states that *"When siting substations take account of the effects of line connections that will need to be made".* Therefore, the environmental implications of 'joining' the emerging preferred corridors with the emerging preferred siting areas, i.e. the combined effects were considered at this stage.

7.72 The appraisal findings were reviewed in the areas where the corridors enter/exit the substation siting areas, extending to 2km from the emerging preferred substation siting area. It was agreed that should the combined effects be considered to render the project unviable, greater weight would be given to the preferred corridor, on the basis that environmental effects of an overhead line are most effectively mitigated during routeing, whereas there is more scope to mitigate the environmental effects of a substation through technical and/or environmental solutions. On this basis, the preferred corridor would be considered in combination with the substation siting area which performs relatively better in the initial appraisal until a preferred combined corridor and substation siting area was identified.

7.73 In addition, the relationship between existing and proposed overhead lines was also taken into account in the combined appraisal of corridors and substation siting areas, including the temporary relationship between new and old overhead lines and substation infrastructure within existing corridors and surrounding existing substation locations. Potential benefits of the removal of existing network/substation infrastructure was also considered at this stage in line with Horlock Rule 8, Note 1: *"Assess the benefit of removing redundant substation equipment from existing sites where this would improve their appearance".*

Environmental Review

7.74 The environmental review comprised consideration of the potential environmental implications of 'joining up' each of the preferred corridors and substations to form one continuous connection from Auchencrosh to Harker, including the 132kV connections to Kendoon and Tongland. The review followed the methodology used to identify and appraise the corridors and substation siting areas and the same criteria were applied to the areas where the corridors and substation siting areas combine.

7.75 On the basis that almost all of the areas where the corridors and substation siting areas combine cover a relatively small distance e.g. <5km, a continuous connection has been identified taking account of the environmental characteristics within each of the areas. The environmental review found that the combined effects of the emerging preferred corridors and substation siting areas would not render the project unviable and that these corridors and substation siting areas in combination could be progressed to the next stage of the routeing process.

7.76 However, in relation to the area around Dumfries, due to the large geographical extent of the substation search area, the emerging preferred corridor G/D3 ends approximately 13km north-west of the emerging preferred substation siting area D4, and emerging preferred corridor D/H1 starts approximately 6km south-east of D4. Therefore, a more detailed appraisal of the likely combined effects of the emerging corridor and substation preferences was undertaken.

7.77 Following Step C of the routeing methodology, two corridors were identified commencing from the end of G/D3 and routeing broadly to the north and south of Dumfries to connect with the substation siting area at D4 and continuing on to connect with corridor D/H1. These two corridors were labelled Dumfries North and Dumfries South and are shown on **Figure 6.1c.**

7.78 The two corridors were then subjected to an environmental appraisal in accordance with Step D of the routeing methodology, the detailed findings of which are presented in **Appendix 4**. The overarching findings of the appraisal are that the preference is for **Dumfries North** on the basis that it is located outwith the 'trigger for consideration' zone of the Upper Solway Flats and Marshes SPA, Ramsar Site and SSSI (Holford Rule 1), is a relatively greater distance from the NSA (Holford

Rule 1) and provides opportunities to avoid the RSA (Holford Rule 2) and landscapes with lower capacity to accommodation overhead lines. The Dumfries North corridor is also shorter than Dumfries South (Holford Rule 3). However, the presence of existing and committed development (minerals) and cultural heritage features will form a key consideration at the line routeing stage.

Technical Review

7.79 The SPEN engineering design review then further considered the network requirements of the combined emerging preferred corridor and substation siting areas, including the rationalisation of the existing network.

7.80 The technical review findings are that the emerging preferred corridors and substation siting areas can be combined to deliver a continuous overhead line grid connection. The findings of the technical review of the combined effects of G/D3 joining D/H1 via the preferred substation siting area at D4 are that this combination is considered technically viable, however further technical input will be required in relation to the existing network south of Dumfries.

Conclusion

7.81 On the basis of the findings of the environmental appraisal and technical review undertaken as Step D of the routeing process, the emerging preferred corridors and substations were confirmed by SPEN as preferred corridors and substation siting areas.

7.82 Therefore, the conclusion of Steps A to D of the routeing process is that a continuous corridor, including substation siting areas, has been found for an overhead line development which meets the Project routeing objective.

7.83 An overarching description of the preferred corridors and substation siting areas as well as the implications for the existing network are provided in **Chapter 8.**

Dumfries and Galloway Strategic Reinforcement

Figure 7.1a: Biodiversity Criteria

Auchencrosh to Newton Stewart

- Study Area
- A/ NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Biodiversity Criteria

- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)
- Ramsar Site (R)
- RSPB Reserve
- Sensitive Bird Area 'trigger for consideration'

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-01a-d_61A_r1_Biodiversity Criteria_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 7.1b: Biodiversity Criteria

Newton Stewart to Glenlee and Kendoon and Tongland 132KV Connections

- Study Area
- A/ NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Biodiversity Criteria

- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)
- Ramsar Site (R)
- RSPB Reserve
- Sensitive Bird Area 'trigger for consideration'

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-01a-d_61A_r1_Biodiversity Criteria_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 7.1c: Biodiversity Criteria

Glenlee to Dumfries

Study Area

A / NS1 Corridor

Substation Search Area

A1 Substation Siting Area

Biodiversity Criteria

Special Protection Area (SPA)

Special Area of Conservation (SAC)

Site of Special Scientific Interest (SSSI)

National Nature Reserve (NNR)

Ramsar Site (R)

RSPB Reserve

Sensitive Bird Area 'trigger for consideration'

Map Scale @ A3: 1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-01a-d_61A_r1_Biodiversity Criteria_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 7.1d: Biodiversity Criteria

Dumfries to Harker

- Study Area
- A / NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Biodiversity Criteria

- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)
- Ramsar Site (R)
- RSPB Reserve
- Sensitive Bird Area 'trigger for consideration'

Map Scale @ A3: 1:175,000

LUC

SP ENERGY NETWORKS

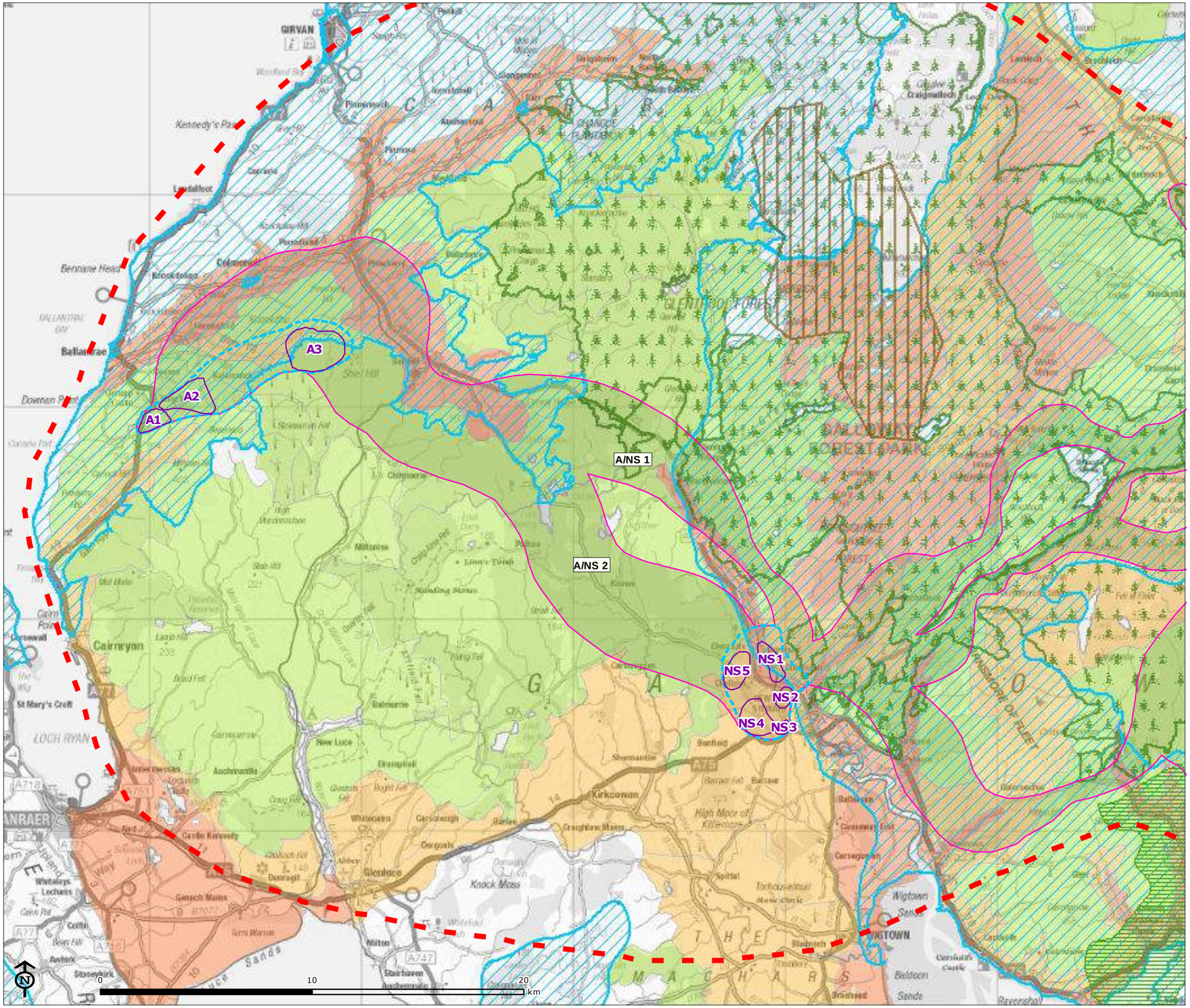
CB:SR EB:robertson_s LUCGLA FIG07-01a-d_61A_r1_Biodiversity Criteria_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 7.2a: Landscape Criteria

Auchencrosh to Newton Stewart



Study Area

A/ NS1 Corridor

Substation Search Area

A1 Substation Siting Area

Landscape Criteria

- National Scenic Area (Scotland)
- Wildland
- Dumfries and Galloway Regional Scenic Area/ South Ayrshire Scenic Area/ Landscapes of County Importance
- Galloway Forest Park
- Higher Landscape Capacity
- Medium Landscape Capacity
- Lower Landscape Capacity

Source: SNH, NE, HS, EH, Carlisle County Council

Map Scale @ A3: 1:175,000

LUC

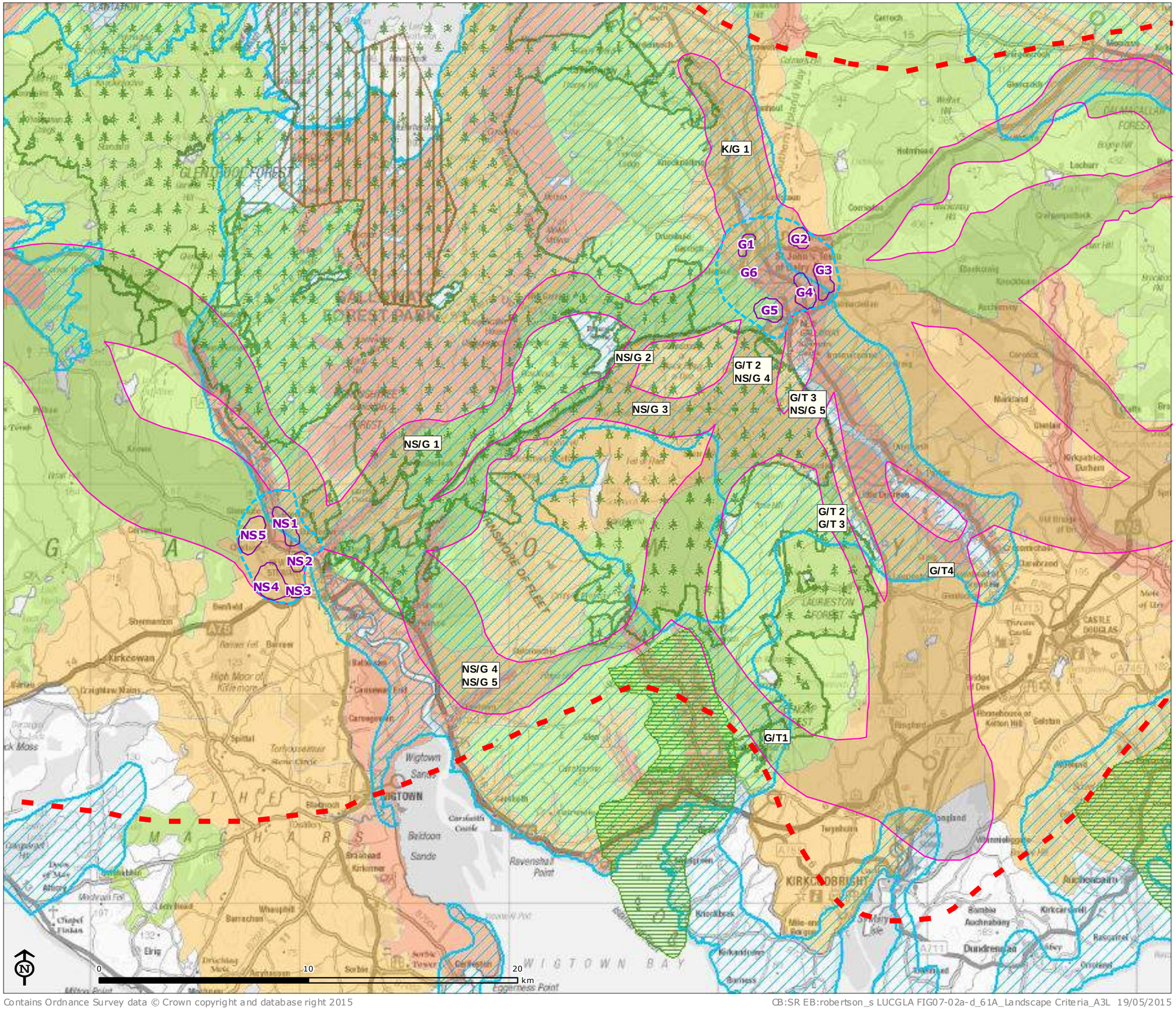
SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-02a-d_61A_Landscape Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 7.2b: Landscape Criteria

Newton Stewart to Glenlee and Kendoon and Tongland 132KV Connections



- Study Area
- A/ NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Landscape Criteria

- National Scenic Area (Scotland)
- Wildland
- Dumfries and Galloway Regional Scenic Area/ South Ayrshire Scenic Area/ Landscapes of County Importance
- Galloway Forest Park
- Higher Landscape Capacity
- Medium Landscape Capacity
- Lower Landscape Capacity

Source: SNH, NE, HS, EH, Carlisle County Council

Map Scale @ A3:1:175,000

LUC

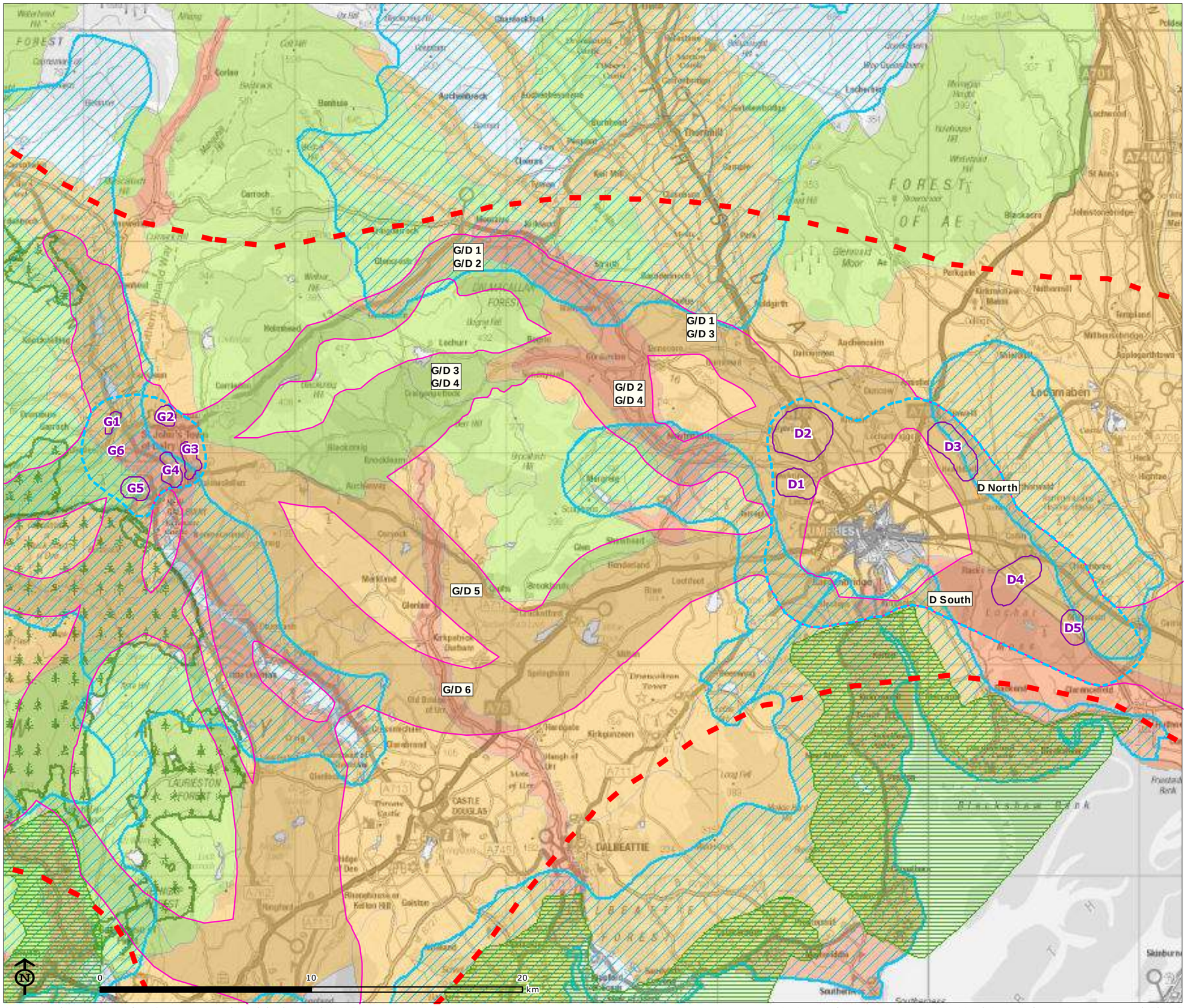
SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-02a-d_61A_Landscape Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 7.2c: Landscape Criteria

Glenlee to Dumfries



- Study Area
- A/ NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Landscape Criteria

- National Scenic Area (Scotland)
- Dumfries and Galloway Regional Scenic Area/ South Ayrshire Scenic Area/ Landscapes of County Importance
- Galloway Forest Park
- Higher Landscape Capacity
- Medium Landscape Capacity
- Lower Landscape Capacity

Source: SNH, NE, HS, EH, Carlisle County Council

Map Scale @ A3: 1:175,000

LUC

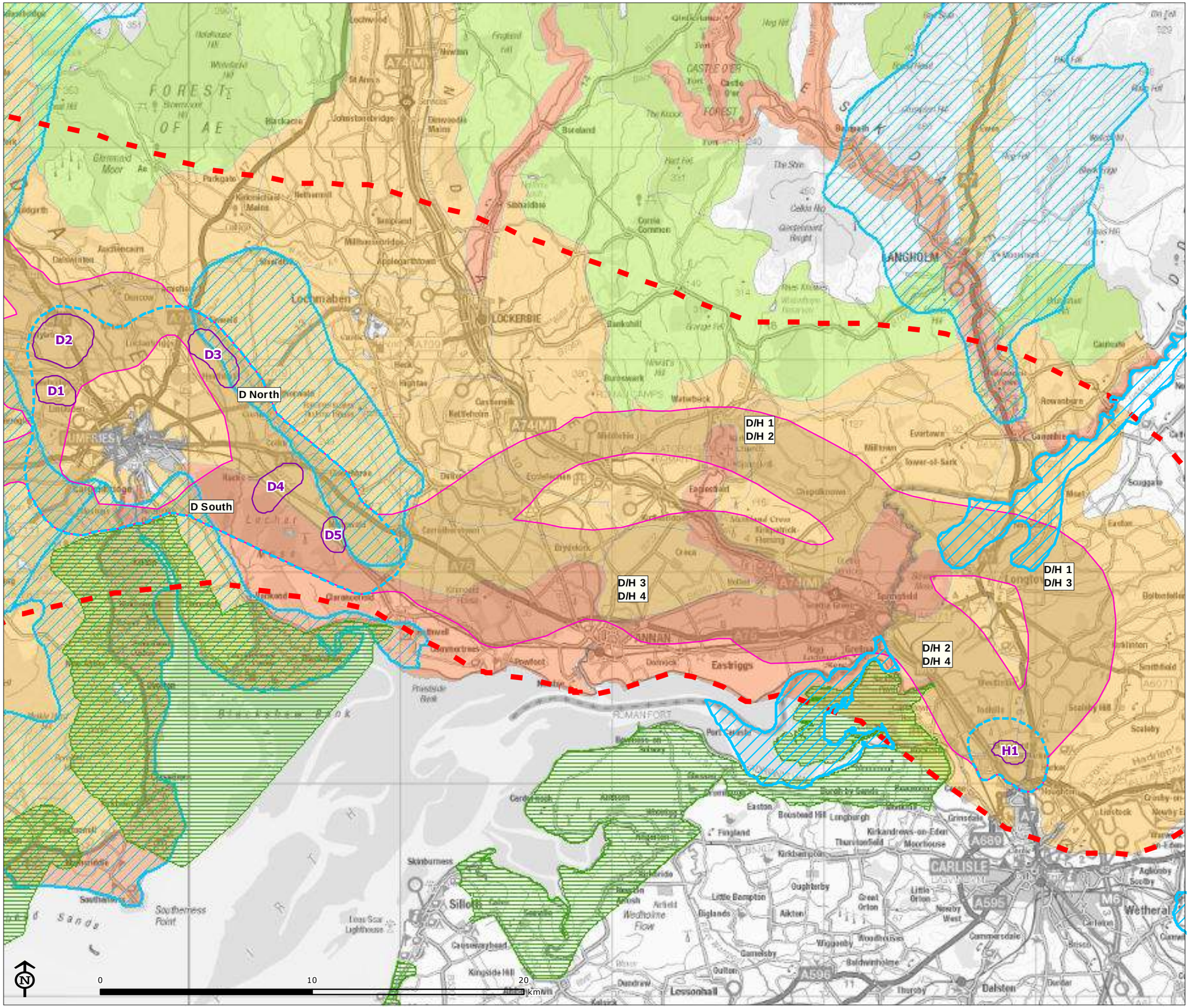
SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-02a-d_61A_Landscape Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 7.2d: Landscape Criteria

Dumfries to Harker



Study Area
A/ NS1 Corridor
Substation Search Area
A1 Substation Siting Area

Landscape Criteria

- National Scenic Area (Scotland)
- AONB (England)
- Dumfries and Galloway Regional Scenic Area/ South Ayrshire Scenic Area/ Landscapes of County Importance
- Higher Landscape Capacity
- Medium Landscape Capacity
- Lower Landscape Capacity

Source: SNH, NE, HS, EH, Carlisle County Council

Map Scale @ A3: 1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-02a-d_61A_Landscape Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 7.3a: Visual Amenity Criteria

Auchencrosh to Newton Stewart

- Study Area
- A/ NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Viewpoints and Key Tourist Routes

- Southern Upland Way
- Burns Heritage Trail
- Solway Heritage Trail
- Robert Bruce Trail
- Galloway Tourist Route
- Ayrshire Coastal Path
- Mull of Galloway Trail
- National Cycle Network

Source: SNH, NE, HS, EH

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-03a-d_61A_Visual Amenity Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

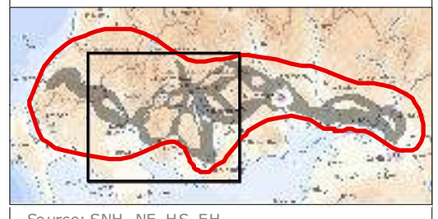
Figure 7.3b: Visual Amenity Criteria

Newton Stewart to Glenlee and Kendoon and Tongland 132KV Connections

- Study Area
- A/ NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Viewpoints and Key Tourist Routes

- Viewpoint
- Southern Upland Way
- Burns Heritage Trail
- Solway Heritage Trail
- Robert Bruce Trail
- Galloway Tourist Route
- Galloway Kite Trail
- National Cycle Network



Source: SNH, NE, HS, EH

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-03a-d_61A_Visual Amenity Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 7.3c: Visual Amenity Criteria

Glenlee to Dumfries

- Study Area
- A/ NS1 Corridor
- Substation Search Area
- A1 Substation Siting Area

Viewpoints and Key Tourist Routes

- Viewpoint
- Southern Upland Way
- Burns Heritage Trail
- Solway Heritage Trail
- Robert Bruce Trail
- Galloway Tourist Route
- Galloway Kite Trail
- Annandale Way
- Telford Trail
- Romans and Reivers Route
- National Cycle Network

Source: SNH, NE, HS, EH

Map Scale @ A3: 1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-03a-d_61A_Visual Amenity Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 7.3d: Visual Amenity Criteria

Dumfries to Harker

- Study Area
- A/ NS1 Corridor
- Substation Search Area
- A1 Substation Siting Area

Viewpoints and Key Tourist Routes

- Burns Heritage Trail
- Solway Heritage Trail
- Robert Bruce Trail
- Galloway Tourist Route
- Annandale Way
- Telford Trail
- Romans and Reivers Route
- National Cycle Network

Source: SNH, NE, HS, EH

Map Scale @ A3:1:175,000

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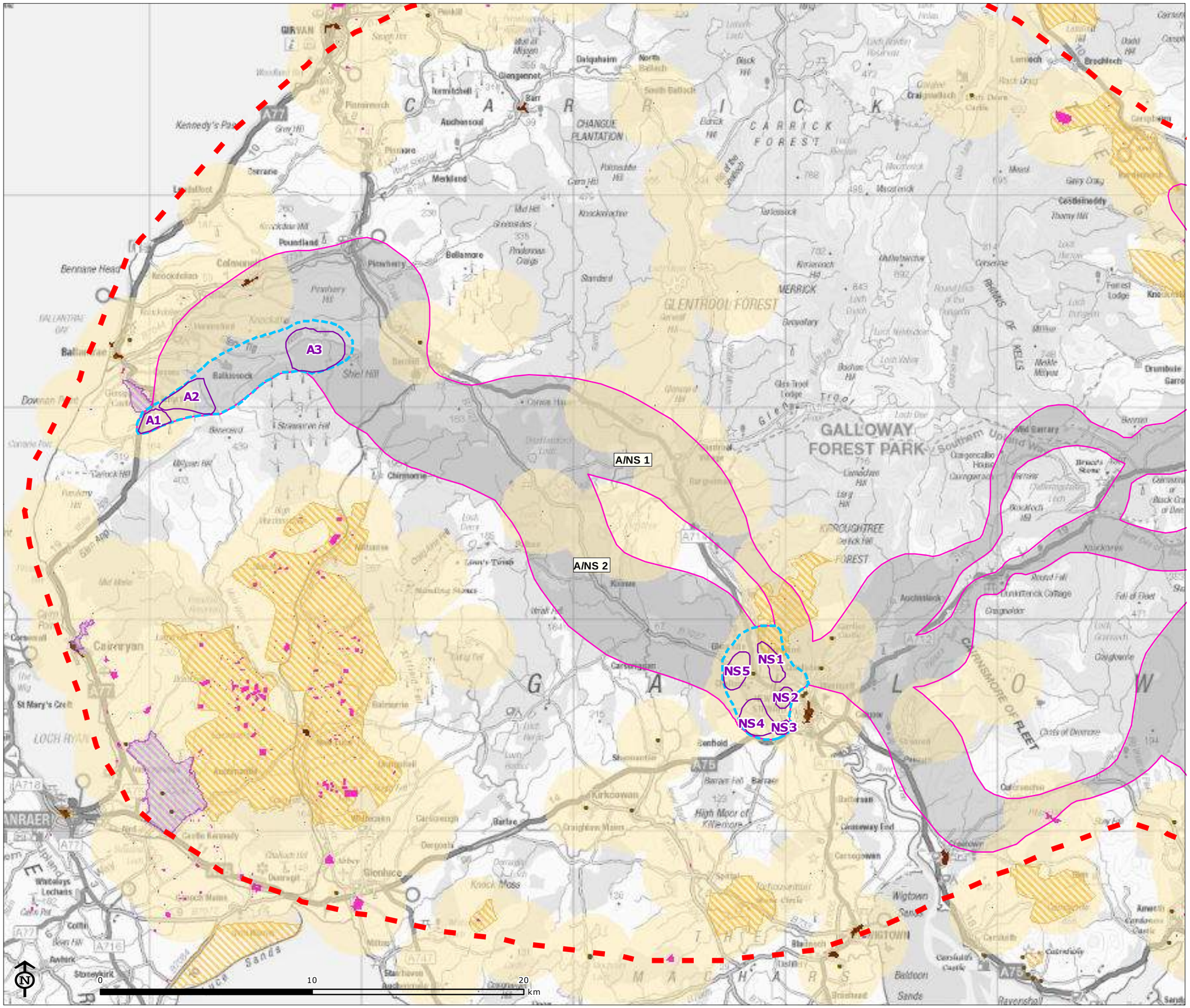
SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-03a-d_61A_Visual Amenity Criteria_A3L 19/05/2015



Dumfries and Galloway Strategic Reinforcement

Figure 7.4a: Cultural Heritage Criteria

Auchencrosh to Newton Stewart

▬ ▬	Study Area
A/ NS1	Corridor
▭	Substation Search Area
A1	Substation Siting Area

Cultural and Heritage Criteria

●	Listed Building - Category A (Scotland) and Grade I, II* (England)
▨	Garden and Designed Landscape
■	Scheduled Monument
■	Conservation Area
■	Cultural Heritage Features 2km Trigger
▨	Archaeologically Sensitive Areas (Dumfries & Galloway)

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-04a-d_61A_Cultural Heritage Criteria_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 7.4b: Cultural Heritage Criteria

Newton Stewart to Glenlee and Kendoon and Tongland 132KV Connections

- Study Area
- A/ NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Cultural and Heritage Criteria

- Listed Building - Category A (Scotland) and Grade I, II* (England)
- Garden and Designed Landscape
- Scheduled Monument
- Conservation Area
- Cultural Heritage Features 2km Trigger
- Archaeologically Sensitive Areas (Dumfries & Galloway)

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

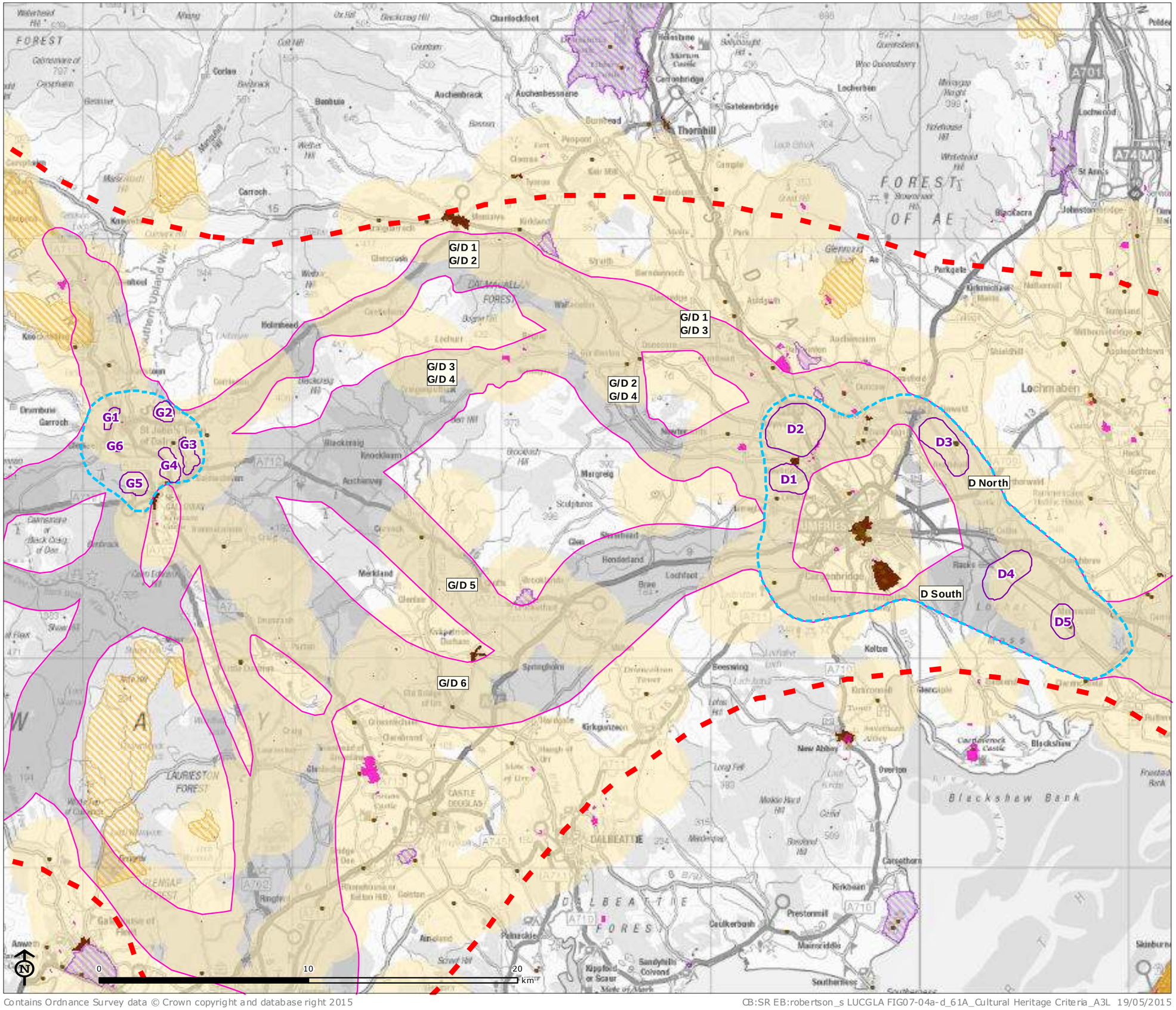
CB:SR EB:robertson_s LUCGLA FIG07-04a-d_61A_Cultural Heritage Criteria_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 7.4c: Cultural Heritage Criteria

Glenlee to Dumfries



Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

- Study Area
- A/ NS1 Corridor
- Substation Search Area
- A1 Substation Siting Area

Cultural and Heritage Criteria

- World Heritage Site Buffer Zone
- Listed Building - Category A (Scotland) and Grade I, II* (England)
- Garden and Designed Landscape
- Scheduled Monument
- Conservation Area
- Cultural Heritage Features 2km Trigger
- Archaeologically Sensitive Areas (Dumfries & Galloway)

CB:SR EB:robertson_s LUCGLA FIG07-04a-d_61A_Cultural Heritage Criteria_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 7.4d: Cultural Heritage Criteria

Dumfries to Harker

D2
D1
D3
D North
D4
D South
D5
D/H 1
D/H 2
D/H 3
D/H 4
D/H 1
D/H 3
D/H 2
D/H 4
H1

Study Area
A/ NS1 Corridor
Substation Search Area
A1 Substation Siting Area

Cultural and Heritage Criteria

- World Heritage Site Buffer Zone
- Listed Building - Category A (Scotland) and Grade I, II* (England)
- Garden and Designed Landscape
- Historic Battlefield
- Scheduled Monument
- Conservation Area
- Cultural Heritage Features 2km Trigger
- Archaeologically Sensitive Areas (Dumfries & Galloway)

Map Scale @ A3: 1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-04a-d_61A_Cultural Heritage Criteria_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 7.5a: Flood Risk Criteria

Auchencrosh to Newton Stewart

- Study Area
- A/ NS1 Corridor
- Substation Search Area
- A1 Substation Siting Area

Flood Risk Criteria

- Flood Risk

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-05a-d_61A_Flood Zone Criteria_A3L 19/05/2015

Source: SEPA, EA

Dumfries and Galloway Strategic Reinforcement

Figure 7.5b: Flood Risk Criteria

Newton Stewart to Glenlee and Kendoon and Tongland 132KV Connections

Study Area

A/ NS1 Corridor

Substation Search Area

A1 Substation Siting Area

Flood Risk Criteria

Flood Risk

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-05a-d_61A_Flood Zone Criteria_A3L 19/05/2015

Source: SEPA, EA

Dumfries and Galloway Strategic Reinforcement

Figure 7.5c: Flood Risk Criteria

Glenlee to Dumfries

Study Area

A/ NS1 Corridor

Substation Search Area

A1 Substation Siting Area

Flood Risk Criteria

Flood Risk

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-05a-d_61A_Flood Zone Criteria_A3L 19/05/2015

Source: SEPA, EA

Dumfries and Galloway Strategic Reinforcement

Figure 7.5d: Flood Risk Criteria

Dumfries to Harker

- Study Area
- A/ NS1 Corridor
- Substation Search Area
- A1 Substation Siting Area

Flood Risk Criteria

- Flood Risk

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

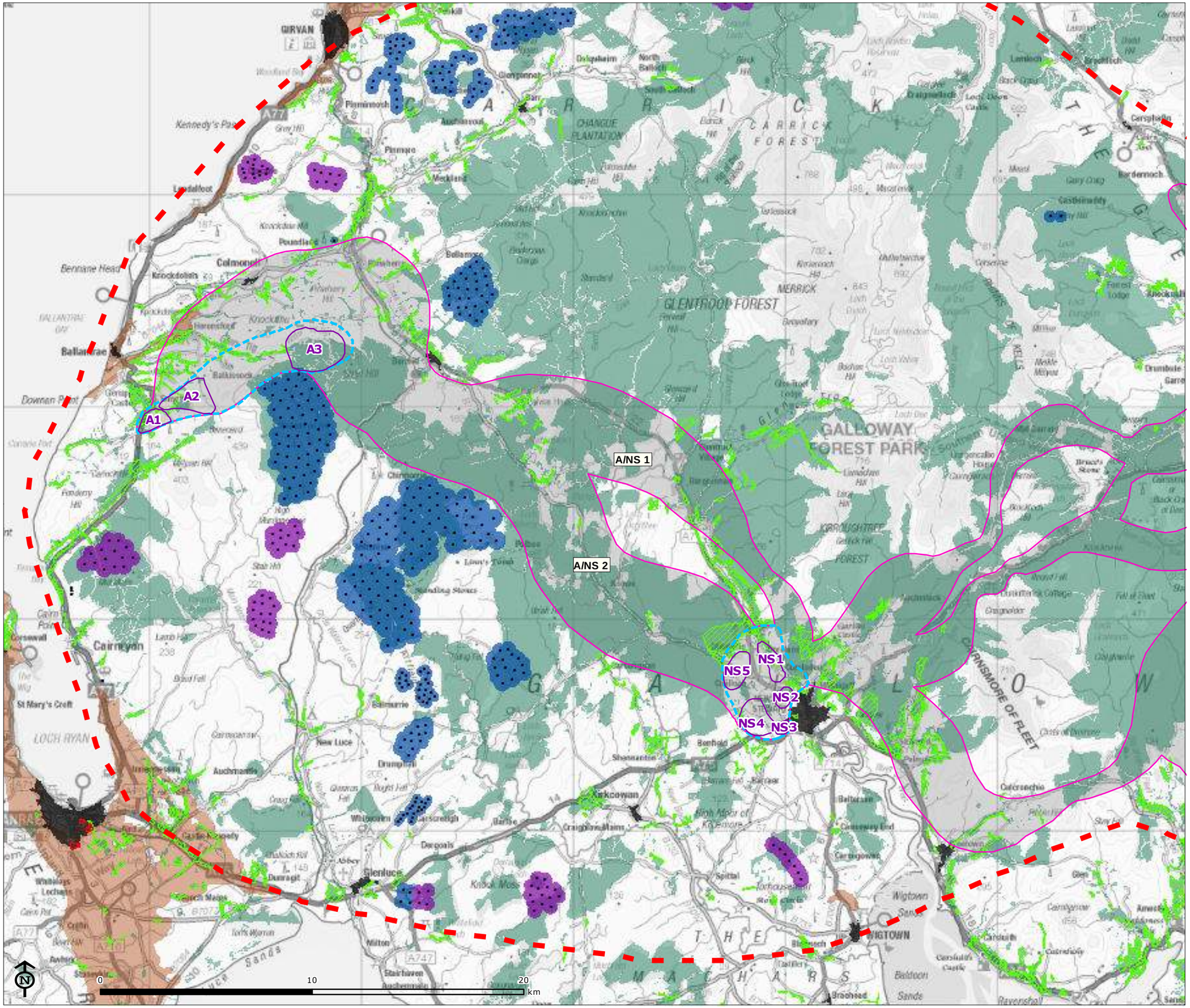
CB:SR EB:robertson_s LUCGLA FIG07-05a-d_61A_Flood Zone Criteria_A3L 19/05/2015

Source: SEPA, EA

Dumfries and Galloway Strategic Reinforcement

Figure 7.6a: Land Use Criteria

Auchencrosh to Newton Stewart



Study Area

A/ NS1 Corridor

Substation Search Area

A1 Substation Siting Area

Land Use Criteria

- Turbine
- Wind Farm Operational/Consented
- Wind Farm Application Submitted
- Settlement
- Ancient Woodland
- Woodland
- Best and most Versatile Agricultural Land
- Existing and Committed Development

Source: South Ayrshire, Dumfries and Galloway and Cumbria Local Authorities SNH, NE, FC, Carlisle County Council

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-06a-d_61A_Land Use Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

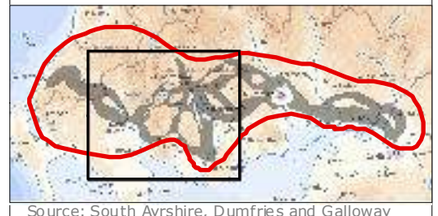
Figure 7.6b: Land Use Criteria

Newton Stewart to Glenlee and Kendoon and Tongland 132KV Connections

- Study Area
- A / NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Land Use Criteria

- Turbine
- Wind Farm Operational/Consented
- Wind Farm Application Submitted
- Settlement
- Ancient Woodland
- Woodland
- Best and most Versatile Agricultural Land
- Existing and Committed Development



Source: South Ayrshire, Dumfries and Galloway and Cumbria Local Authorities SNH, NE, FC, Carlisle County Council

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-06a-d_61A_Land Use Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 7.6c: Land Use Criteria

Glenlee to Dumfries

- Study Area
- A / NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Land Use Criteria

- Turbine
- Wind Farm Operational/Consented
- Wind Farm Application Submitted
- Settlement
- Ancient Woodland
- Woodland
- Best and most Versatile Agricultural Land
- Existing and Committed Development

Source: South Ayrshire, Dumfries and Galloway and Cumbria Local Authorities SNH, NE, FC, Carlisle County Council

Map Scale @ A3: 1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-06a-d_61A_Land Use Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 7.6d: Land Use Criteria

Dumfries to Harker

- Study Area
- A/ NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Land Use Criteria

- Turbine
- Wind Farm Operational/Consented
- Wind Farm Application Submitted
- Settlement
- Ancient Woodland
- Woodland
- Best and most Versatile Agricultural Land
- Existing and Committed Development

Source: South Ayrshire, Dumfries and Galloway and Cumbria Local Authorities SNH, NE, FC, Carlisle County Council

Map Scale @ A3: 1:175,000

LUC

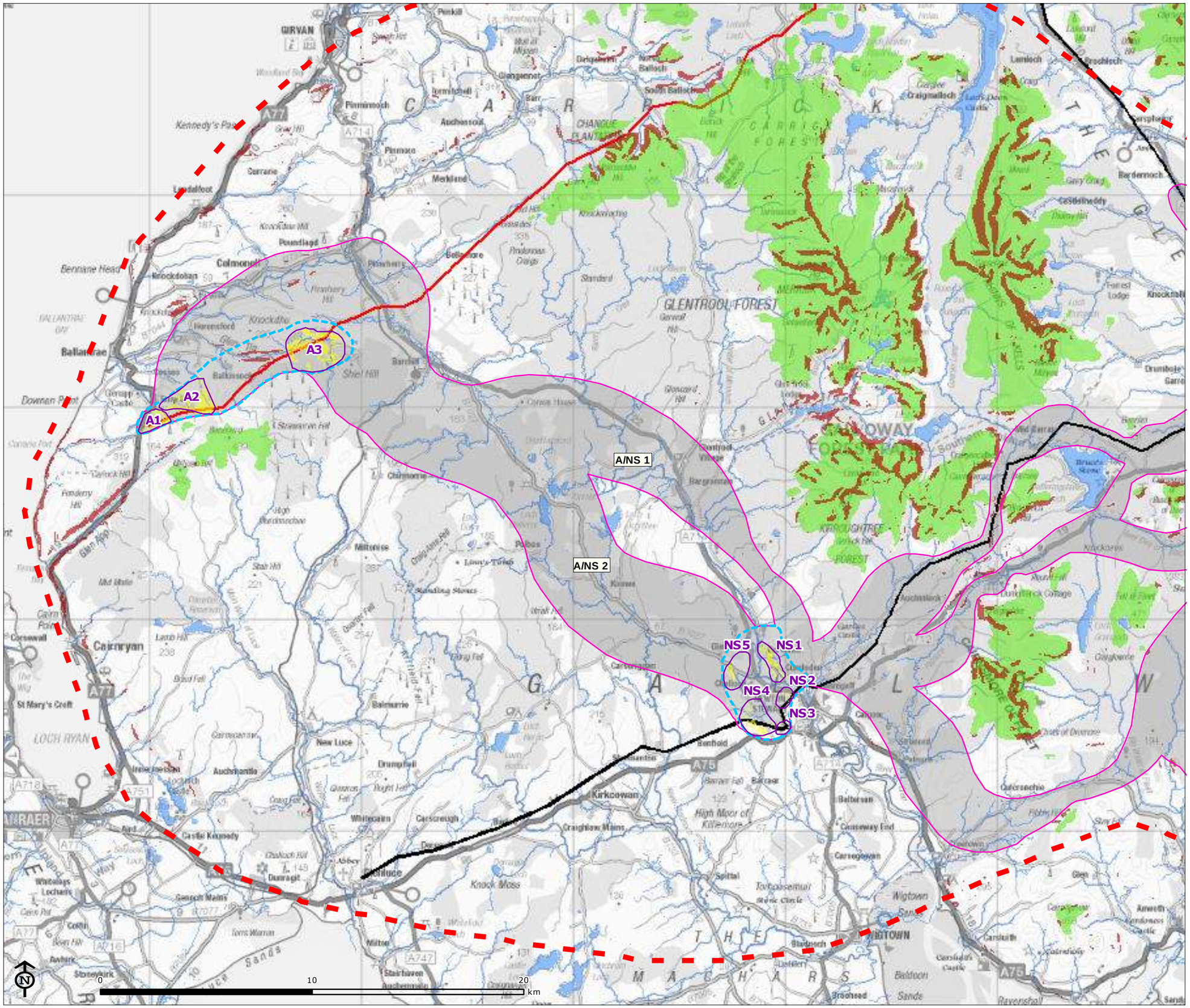
SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-06a-d_61A_Land Use Criteria_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 7.7a: Technical Criteria

Auchencrosh to Newton Stewart



- Study Area
- A/ NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Technical Criteria

- 132kV Overhead Line
- 275kV Overhead Line
- 400kV Overhead Line
- 400/275kV Overhead Line
- Slope Angle > 22 degrees
- Slope Angle > 5.71 degrees (substation siting areas only)
- Height > 350m
- Waterbody / Watercourse

Due to the scale of the figures areas of peat within the substation siting areas are not shown.

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-07a-d_61A_r1_Technical Criteria_A3L 19/05/2015

Source: OS, National Grid

Dumfries and Galloway Strategic Reinforcement

Figure 7.7b: Technical Criteria

Newton Stewart to Glenlee and Kendoon and Tongland 132KV Connections

- Study Area
- A / NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Technical Criteria

- 132kV Overhead Line
- 275kV Overhead Line
- 400kV Overhead Line
- 400/275kV Overhead Line
- Slope Angle > 22 degrees
- Slope Angle > 5.71 degrees (substation siting areas only)
- Height > 350m
- Waterbody / Watercourse

Due to the scale of the figures areas of peat within the substation siting areas are not shown.

Map Scale @ A3:1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-07a-d_61A_r1_Technical Criteria_A3L 19/05/2015

Source: OS, National Grid

Dumfries and Galloway Strategic Reinforcement

Figure 7.7c: Technical Criteria

Glenlee to Dumfries

- Study Area
- A/ NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Technical Criteria

- 132kV Overhead Line
- 275kV Overhead Line
- 400kV Overhead Line
- 400/275kV Overhead Line
- Slope Angle > 22 degrees
- Slope Angle > 5.71 degrees (substation siting areas only)
- Height > 350m
- Waterbody / Watercourse

Due to the scale of the figures areas of peat within the substation siting areas are not shown.

Map Scale @ A3: 1:175,000

LUC

SP ENERGY NETWORKS

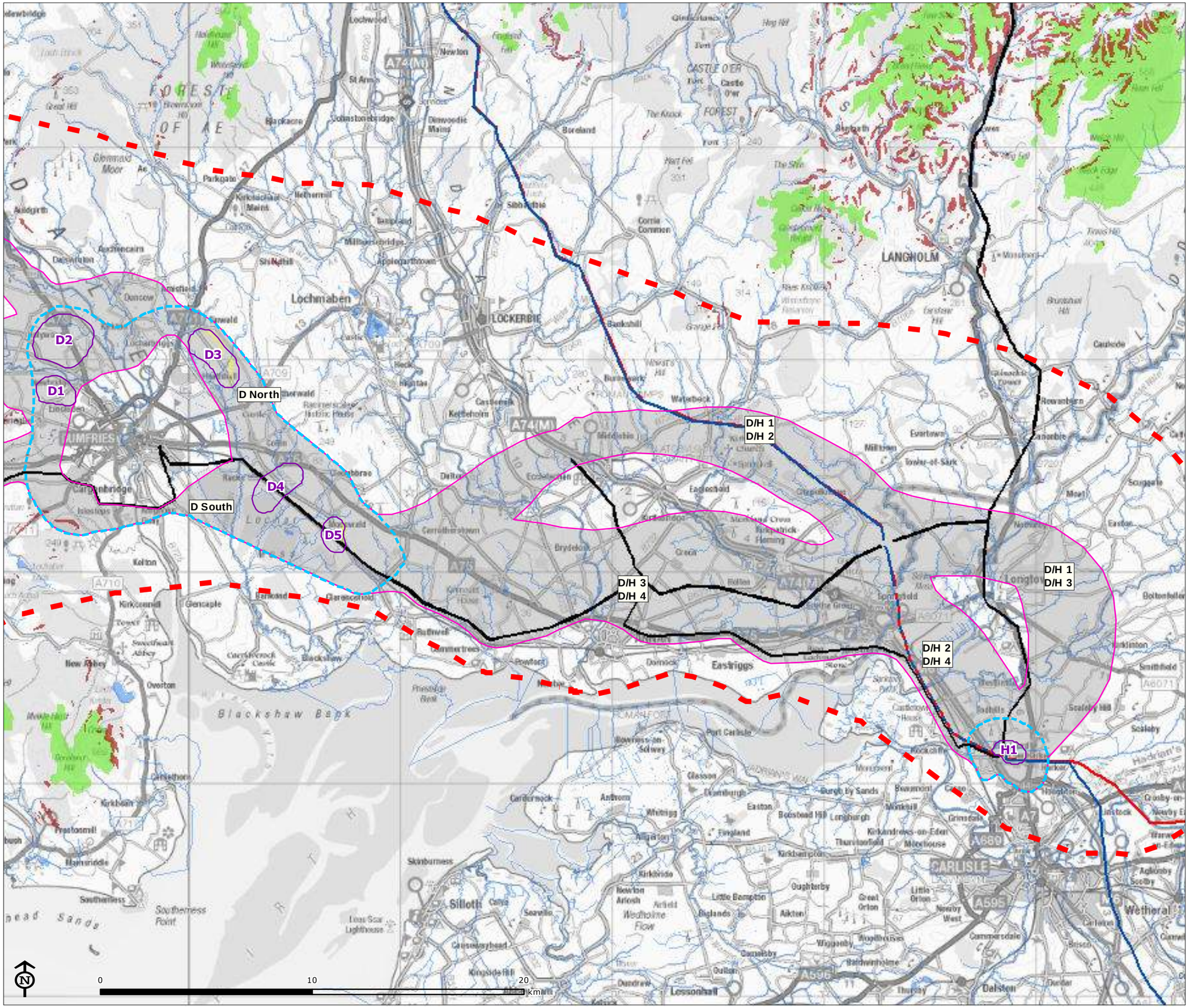
CB:SR EB:robertson_s LUCGLA FIG07-07a-d_61A_r1_Technical Criteria_A3L 19/05/2015

Source: OS, National Grid

Dumfries and Galloway Strategic Reinforcement

Figure 7.7d: Technical Criteria

Dumfries to Harker



- Study Area
- A / NS1 — Corridor
- Substation Search Area
- A1 — Substation Siting Area

Technical Criteria

- 132kV Overhead Line
- 275kV Overhead Line
- 400kV Overhead Line
- 400/275kV Overhead Line
- Slope Angle > 22 degrees
- Slope Angle > 5.71 degrees (substation siting areas only)
- Height > 350m
- Waterbody / Watercourse

Due to the scale of the figures areas of peat within the substation siting areas are not shown.

Map Scale @ A3: 1:175,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-07a-d_61A_r1_Technical Criteria_A3L 19/05/2015

Source: OS, National Grid

8 Preferred Corridors and Substation Siting Areas and Implications for Existing Network

Preferred Corridors and Substation Siting Areas

8.1 The preferred corridors and substation siting areas are shown as an overview on **Figure 8** and in detail on **Figure 8.1 a-d** and an overview description of the preferences provided below.

8.2 The preferred Project commences at substation siting area **A3** north-east of the existing substation at Auchencrosh and follows corridor **A/NS2** south-eastwards to the substation siting area **NS5**, located to the north-west of Newton Stewart. From Newton Stewart, corridor **NS/G1** routes in a north-easterly direction, paralleling the existing 132kV network to a new substation at substation siting area **G2** to the north-east of the existing Glenlee substation. Corridor **K/G1** routes northwards from the substation siting area at G2 to Kendoon and corridor **G/T2** routes southwards to the existing Tongland substation.

8.3 Corridor **G/D3** routes broadly eastwards following corridor **Dumfries North** to connect with substation siting area **D4**. From here corridor D/H1 routes further eastwards to cross the border with England and terminating at the existing substation at Harker, substation siting area **H1**.

Implications for Existing Network

8.4 As outlined in **Chapter 3**, the development of the DGSR Project will enable SPEN to rationalise the electricity network through the removal of a number of existing overhead transmission lines within the Project area.

8.5 At Newton Stewart, the existing 132kV connection between Glenluce and Newton Stewart will be retained, with a circuit also connected into the new substation. This will potentially allow SPEN to remove approximately 30km of existing 132kV overhead line between the existing substation at Newton Stewart and the existing substation at Glenlee.

8.6 SPEN will also potentially be able to remove up to 44km of existing 132kV overhead line between the existing substation at Tongland and the existing substation at Dumfries and there will also be rationalisation of the network in relation to the existing connections to Kendoon, Carsfad and Earlstoun hydro-power stations.

8.7 SPEN will also potentially be able to remove approximately 33km of existing 132kV overhead line between the existing substation at Glenlee and the existing substation at Tongland, and approximately 23.5km of existing 132kV overhead line between Chapelcross and the Harker substation.

8.8 In total, approximately 130.5km of existing overhead line network within the study area will potentially be able to be removed by SPEN as a result of the DGSR Project.

Dumfries and Galloway Strategic Reinforcement

Figure 8.1: Overview of Preferred Route Corridors and Substation Siting Areas

Study Area
Preferred Corridor
Preferred Substation Siting Area

0 10 20 km

Map Scale @ A3: 1:450,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG08-01_61A_Emerging Route_A3L 19/05/2015

Dumfries and Galloway Strategic Reinforcement

Figure 8.1a: Preferred Corridors and Preferred Substation Siting Areas

Auchencrosh to Newton Stewart

- Study Area
- Preferred Corridor
- Preferred Substation Siting Area

Existing Transmission Network

- 132kV Overhead Line
- 275kV Overhead Line
- 400kV Overhead Line
- 400/275kV Overhead Line
- Existing 132kV line to be removed

Map Scale @ A3:1:150,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG08-01a-d_61A_Emerging Route_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 8.1b: Preferred Corridors and Preferred Substation Siting Areas

Newton Stewart to Glenlee and Kendoon and Tongland 132 KV Connections

- Study Area
- Preferred Corridor
- Preferred Substation Siting Area

Existing Transmission Network

- 132kV Overhead Line
- 275kV Overhead Line
- 400kV Overhead Line
- 400/275kV Overhead Line
- Existing 132kV line to be removed

Map Scale @ A3: 1:150,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG08-01a-d_61A_Emerging Route_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 8.1c: Preferred Corridors and Preferred Substation Siting Areas

Glenlee to Dumfries

- Study Area
- Preferred Corridor
- Preferred Substation Siting Area

Existing Transmission Network

- 132kV Overhead Line
- 275kV Overhead Line
- 400kV Overhead Line
- 400/275kV Overhead Line
- Existing 132kV line to be removed

Map Scale @ A3:1:150,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG08-01a-d_61A_Emerging Route_A3L 19/05/2015

Source: SNH, NE, HS, EH

Dumfries and Galloway Strategic Reinforcement

Figure 8.1d: Preferred Corridors and Preferred Substation Siting Areas

Dumfries to Harker

- Study Area
- Preferred Corridor
- Preferred Substation Siting Area

Existing Transmission Network

- 132kV Overhead Line
- 275kV Overhead Line
- 400kV Overhead Line
- 400/275kV Overhead Line
- Existing 132kV line to be removed

Map Scale @ A3:1:150,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG08-01a-d_61A_Emerging Route_A3L 19/05/2015

Source: SNH, NE, HS, EH

9 The Consultation Process and Next Steps in the Routeing Process

The Consultation Process

The Legislative Process

9.1 As set out in **Chapter 1**, applications will be submitted to the Scottish Government and the Planning Inspectorate for the DGSR Project. Prior to submission of the applications, SPEN must consult stakeholders and the public in line with the requirements of the different consenting regimes in Scotland and England. However, SPEN is adopting a consistent approach to consultation on both sides of the border to ensure that local communities are treated in the same way despite the different consenting regimes. SPEN intends to conduct several rounds of informal consultation before the mandatory pre-application consultation stage, which will take place before the final application is made.

The First Round of Consultation

9.2 As outlined in **Chapter 1**, this report presents the findings of Steps A-D of Phase One of the DGSR Project (see **Figure 2.1**), the routeing and substation siting process, resulting in the identification of preferred corridors and substation siting areas.

9.3 SPEN has already been consulting statutory stakeholders through its Stakeholder Liaison Group. This group comprises the Scottish Government, Scottish Natural Heritage, Natural England, the Scottish Environment Protection Agency, the Environment Agency, Historic Scotland, Historic England (formerly part of English Heritage) and the four local authorities within which the DGSR Project is proposed (South Ayrshire Council, Dumfries and Galloway Council, Cumbria County Council and Carlisle City Council).

9.4 To ensure all residents and stakeholders potentially affected by the proposals are consulted, SPEN has defined consultation zones that include all residential and business addresses within the preferred corridors, preferred substation siting areas and areas close to them. This is defined as an area generally extending to a kilometre either side of the preferred corridor. Exceptions to this rule are where communities are bisected by a consultation zone. In these cases, the zone area is being extended to cover the entire community. This applies to Newton Stewart and Kirkcudbright, in Dumfries and Galloway, and at Longtown and Rockcliffe, in Cumbria. At the far eastern end, where the preferred corridor is bounded by the M6 to the south, the consultation zone will not be extended beyond the preferred corridor. However, any member of the public is welcome to participate in the consultation, attend an exhibition or make a comment using one of the channels outlined within this document.

9.5 The consultation will include the statutory and non-statutory consultees, as well as approximately 14,000 homes and businesses within the consultation zones, elected members of the four local authorities, community and parish councils, Members of Parliament (MPs) and Members of the Scottish Parliament (MSPs), identified local interest and community groups, and the public in general.

Consultation Launch and Duration

9.6 The first round of consultation will run for seven weeks from June 8 to July 24, 2015.

9.7 Prior to the consultation, adverts will appear in local weekly newspapers at least seven days before the first exhibition. A news release will be issued to local media announcing the impending start of

the consultation. A leaflet explaining the project and the consultation will be posted out to homes and businesses, community and parish councils, local interest and community groups.

The Focus of the First Round of Consultation

9.8 The focus of the first round of consultation will be to request people's views on:

- the DGSR Project as a whole;
- the preferred corridors and preferred substation siting areas;
- the potential removal of existing overhead lines in some areas;
- any other factors they would like us to consider, including other corridors or siting areas and any local issues or concerns that people wish to draw to our attention.

9.9 To make this easier, the preferred corridors are split into seven consultation zones:

- **Zone 1:** Auchencrosh to Newton Stewart, including substation siting areas A3 and NS5;
- **Zone 2:** Newton Stewart to Glenlee, including substation siting areas NS5 and G2;
- **Zone 3:** Glenlee to Tongland, including substation siting area G2;
- **Zone 4:** Glenlee to Kendoon, including substation siting area G2;
- **Zone 5:** Glenlee to Dumfries, including substation siting areas G2 and D4;
- **Zone 6a:** Dumfries to the border with England, including substation siting area D4;
- **Zone 6b:** English border to Harker, including substation siting area H1.

Sources of Information about the Consultation

9.10 A map showing the consultation zones is provided as **Figure 9.1** and will be included in the principal sources of information about the consultation, which comprise the DGSR Project leaflet and DGSR Project website (www.spendgsr.co.uk).

Project Leaflet: Powering Your Future

9.11 The leaflet will be mailed to every home and business in, or within, a kilometre of the preferred corridors[26]. It will consist of an A1 map (folded to A4) showing the preferred corridors and substation siting areas by zone. It will also include details of the scheme and consultation process, how to find out more and how to submit comments by feedback form, website, post, email or phone.

Project Website: *www.spendgsr.co.uk*

9.12 The website will build on the information in the leaflet, with publicly available consultation documents for download, an interactive map and online feedback form. Although it will go live in May 2015, the online feedback form will not be enabled until consultation starts on June 8, 2015.

9.13 The leaflet, and other consultation documents, will be available for download from the DGSR Project website.

9.14 Hard copies of the consultation documents will be lodged at a number of publicly-accessible information points from June 1st for people who do not have access to the internet or are unable to attend one of the exhibitions. Details of these points are listed within the Preface of this document.

[26] Other than in those towns where the consultation zone has been extended or retracted as referred to above.

How People can make a Comment

9.15 There will be a number of ways for people to make comments:

- in person at an exhibition;
- online, using the feedback form on the website;
- by post, using a paper feedback form;
- by email, sending an electronic copy of the feedback form;
- by phone to the SPEN DGSR Consultation Contact Centre.

In person

9.16 SPEN will hold nine public exhibitions between June 9th and 25th within the local area where people can look at maps, talk to members of the project team and pick up a feedback form. Locations have been chosen so everyone within a kilometre of one of the consultation zones is only a short distance from their nearest exhibition by car or public transport. The dates and venues are listed in full on the project leaflet and on the website. The format will be an afternoon/evening drop-in, Tuesdays to Thursdays, and within school term time.

9.17 The exhibitions will be held at the following locations from 2pm until 8pm:

- **Tuesday June 9, Barrhill**: Barrhill Memorial Hall, Main Street, KA26 0PP;
- **Wednesday June 10, New Galloway**: New Galloway Town Hall, High Street, DG7 3RL;
- **Thursday June 11, Newton Stewart**: McMillan Hall, Dashwood Square, DG8 6EQ;
- **Tuesday June 16, Dumfries**: Cairndale Hotel, English Street, DG1 2DF;
- **Wednesday June 17, Locharbriggs**: Locharbriggs Community Centre, Auchencrieff Road, DG1 1UX;
- **Thursday June 18, Kirkcudbright**: Kirkcudbright Community Centre, St Marys Wynd, DG6 4JN;
- **Tuesday June 23, Ecclefechan**: Ecclefechan Village Hall, Ecclefechan, DG11 3DR;
- **Wednesday June 24, Carrutherstown**: Hetland Hall Hotel, Carrutherstown, DG1 4JX;
- **Thursday June 25, Longtown**: Longtown Community Centre, Arthuret Road, CA6 5SJ.

Online:

9.18 People will be able to make comments online at www.spendgsr.co.uk using an interactive electronic mobile and tablet-friendly version of the feedback form which will be available until midnight on July 24, 2015.

Post

9.19 A hard-copy feedback form will available at public exhibitions, for download from the website, by request to the *SPEN DGSR Consultation Contact Centre* on 0800 157 7353 or by email to dgsr@communityrelations.co.uk. Completed forms must be returned to FREEPOST SPEN DGSR by July 24, 2015. If returning completed forms by post please allow up to 7 days for these to be received. It may not be possible to consider forms received after this date.

E-Mail

9.20 SPEN will also accept comments relating to the specific focus of this first round of consultation by e-mail to dgsr@communityrelations.co.uk by July 24th 2015.

Phone

9.21 Comments will be received via phone call free on 0800 157 7353. The SPEN DGSR Consultation Contact Centre is open Monday to Friday (except bank holidays) between the hours of 9am and 5.30pm. There is a voicemail facility outside these hours.

Report of the First Round of Consultation

9.22 The responses received in the first round of consultation will be evaluated by SPEN and reported back in the form of a Consultation Report later in 2015.

9.23 Although SPEN may not be able to respond to all individual comments, people will be able to request to be informed by email as and when there are project developments, such as the availability of the first Consultation Report. People interested in being kept informed this way can register on the website or send their email address to dgsr@communityrelations.co.uk

Next Steps in the Routeing Process

9.24 The responses received from the consultation process will be considered in combination with the findings of this report to enable SPEN to decide on the proposed corridors and substation siting areas to be progressed to the next stage of the routeing process.

9.25 The next stage of the routeing process is the line routeing and substation siting stage, comprising Steps E to G of the routeing methodology (see **Figure 2.1**).

9.26 The line routeing and substation siting steps will continue to take account of the Holford and Horlock Rules, as well as National Policy and Guidance, and will also take account of more issue and/or locale specific guidance such as the Forest Landscape Design Guidelines (1994), Landscape and Design Guidance for Forests and Woodlands in Dumfries and Galloway (1998); Guidelines for Landscape and Visual Impact Assessment (2014) and Cumbria County Council Cumulative Impacts of Vertical Infrastructure Study (2014/2015).

9.27 The line routeing and substation siting steps will involve the collation of more localised data e.g. individual properties, supported by field work, to identify and appraise overhead line route and substation site options, culminating in the identification of preferred line routes and substation sites for the DGSR Project. In addition to the environmental and technical characteristics taken account of during Steps A-D, additional factors will be included in Steps E-G, such as cumulative issues (overhead line wirescapes and windfarms), forest design plans, peatlands and individual Listed Buildings/Scheduled Monuments and their settings. A number of other issues will be taken account of during the subsequent Environmental Impact Assessment (EIA) stage.

9.28 Following the identification of preferred line routes and substation sites, SPEN will hold a second round of consultation on these preferred line routes and substation sites, the responses to which will again enable SPEN to confirm the proposed line routes and substations to be progressed to the EIA stage.

Dumfries and Galloway Strategic Reinforcement

Figure 9.1: Consultation Zones

Zone 1
Zone 2
Zone 3
Zone 4
Zone 5
Zone 6a
Zone 6b
A3
G2
D4
NS5
H1

Study Area
A1 Substation Siting Area

Consultation Zones
- Zone 1: Auchencrosh to Newton Stewart
- Zone 2: Newton Stewart to Glenlee
- Zone 3: Glenlee to Tongland
- Zone 4: Glenlee to Kendoon
- Zone 5: Glenlee to Dumfries
- Zone 6a: Dumfries to English border
- Zone 6b: English border to Harker

Location of Public Exhibition
1. Barrhill
2. New Galloway
3. Newton Stewart
4. Dumfries
5. Kirkcudbright
6. Ecclefechan
7. Carruthers town
8. Longtown

Existing Transmission Network
- 132kV Overhead Line
- 275kV Overhead Line
- 400kV Overhead Line
- 400/275kV Overhead Line
- Existing 132kV line to be removed

Map Scale @ A3: 1:450,000

N

0 10 20 km

CB:SR EB:robertson_s LUCGLA FIG09-01_61A_ConsultationZones_A3L 19/05/2015

LUC

SP ENERGY NETWORKS

Glossary

SPEN: ScottishPower Energy Networks, responsible for the development, operation and maintenance of electricity transmission and distribution networks in Central and Southern Scotland.

Overhead Line: an electric line installed above ground usually supported by lattice steel towers or wooden poles.
Substation: controls the flow and voltage of power by means of transformers and switchgear, with facilities for control, fault protection and communications.
Study Area: area within which the routeing study takes place.

Corridor Options: number of corridors connecting two substations, may be a number of kilometres wide.

Emerging Preferred Corridor: corridor identified as being preferred on the basis of environmental considerations only.

Preferred Corridor: culmination of the Step D appraisal the preferred corridor is identified following technical and environmental considerations.

Substation Search Area: areas within which the substation siting takes place.

Substation Siting Area: number of broad areas within the substation search areas, large enough to accommodate each substation design option in a number of locations.

Emerging Substation Siting Area: substation siting area identified as being preferred on the basis of environmental considerations only.

Preferred Substation Siting Area: culmination of Step D appraisal the preferred substation siting area is identified following technical and environmental considerations.

The National Grid: The electricity transmission network system operator of the UK.

National Grid Electricity Transmission : responsible for the electricity transmission network (275kV and above) in England and Wales and for overseeing the operation of the 275kV and 400kV network across Scotland, England and Wales.

Volts: the international system unit of electric potential and electromotive force.

Kilovolt (kV): 1,000 volts

Watt: the unit of electric power.

Megawatt (MW): 1,000,000 watts

Appendix 1: The Holford Rules & Horlock Rules

The Holford Rules for the Routeing of New High Voltage Overhead Transmission Lines

It is generally accepted across the electricity industry that the guidelines developed by the late Lord Holford in 1959 for routeing overhead transmission lines, 'The Holford Rules', should continue to be employed as the basis for routeing high voltage overhead transmission 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 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 principles of these guidelines for the routeing of new high voltage overhead transmission lines, with the NGC 1992 and SHETL 2003 notes have been considered within this Strategic Environmental Review. The Holford Rules are detailed below.

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 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, 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)

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 spatialextent should be identified along with other areas of regional or local high amenity value identified from development plans.

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

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

Rule 3

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

Note on Rule 3

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

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

Rule 4

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

Rule 5

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

Notes on Rules 4 and 5

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

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

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

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

Rule 6

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

Note on Rule 6

a) In all locations minimise confusing appearance.

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

Rule 7

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

Note on Rule 7

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

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

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

Explanatory Note on Rule 7

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

Supplementary Notes

a) Residential Areas

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

b) Designations of Regional and Local Importance

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

c) Alternative Lattice Steel Tower Designs

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

FURTHER NOTES ON CLARIFICATION TO THE HOLFORD RULES

Line Routeing and People

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

The following notes are intended to reflect this.

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

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

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

Supplementary Notes on the Siting of Substations

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

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

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

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

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

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

The Horlock Rules: NGC Substations and the Environment: Guidelines on Siting and Design (2006)

THE NATIONAL GRID COMPANY plc.

NGC SUBSTATIONS AND THE ENVIRONMENT: GUIDELINES ON SITING AND DESIGN

Section I INTRODUCTION

1 The National Grid Company plc.'s (NGC's) policy statement on the environment recognises the importance of giving due regard to protecting and enhancing the environment and taking into account the environmental effects of the Company's actions. The Company has statutory duties in relation to preservation of amenity under Schedule 9 of the Electricity Act 1989, and has published a Schedule 9 Statement setting out the manner in which it proposes to meet these duties.

2 NGC has a statutory duty under the Act to develop and maintain an efficient, co-ordinated and economical transmission system of electricity for England and Wales. New transmission lines, new substations, sealing end compounds, line entries, additions and extensions to existing substations may be required to provide new connections for customers or reinforcement of the national grid system arising from changes in the demand for and generation of electricity.

3 This document explains the approach NGC takes towards such developments (Section II) and contains Guidelines (Section III) to assist those responsible for siting and designing substations to mitigate the environmental effects of such developments and so meet the Company's policy. The document complements the Company's Holford Rules guidelines on the routeing of high voltage transmission lines and when appropriate should be used in conjunction with them.

4 The guidelines are to be used by NGC staff, their consultants, and contractors in the siting and design of new substations and extensions to substations. They reflect the criteria the company requires its staff, consultants and contractors to satisfy.

5 As recognised in its Schedule 9 Statement NGC places importance on consultation with statutory planning and amenity bodies over its proposals for new developments. NGC believes that the availability of these guidelines will assist in such discussions by referring to the main considerations relevant to substation siting, and will thereby assist in achieving the most appropriate siting and design solutions.

Section II NGC'S APPROACH TO DESIGN AND SITING OF SUBSTATIONS

Approach to the Environment

6 NGC's environmental policy recognises the importance of giving due regard to protecting and enhancing the environment and taking into account the effect on the environment of all the Company's actions. Following the principle of integrating environmental considerations into all its activities, NGC seeks to keep known adverse effects on the environment to a reasonably practicable minimum and, in accordance with its duties under Schedule 9 of the Electricity Act, the Company gives due regard to the preservation of amenity and takes reasonable steps to mitigate the effects of its relevant proposals. To achieve these aims the Company therefore has to balance technical, economic and environmental considerations to reach reasonably practicable development proposals.

7 The guidelines (Section III) deal with the amenity issues associated with the siting and design of new substations and major extensions or major modifications to existing substations. They cover a range of key issues from the time options are initially considered to final design, including form, silhouette and colour of the entire development in relation to the surrounding area, and also related issues such as overhead line entries, since these are dominant features in any substation.

Environmental Report

8 In order to achieve these objectives, the environmental effects of new substations and extensions or modifications to existing substations will be assessed and where appropriate an environmental report prepared describing the effects and mitigative measures. Items to be considered are summarised in Appendix A.

Integrating Environmental Considerations into Power System Planning

9 The nature of transmission system planning is such that scheme proposals and options may go through various stages before it is finally decided to proceed with construction.

10 The purpose of each proposal for substation, sealing end compound or line entry development should be set out in a brief, and a range of system and siting options should be evaluated and documented as part of the selection of the preferred solution. In each case the effects of the overall development on the environment should be assessed, prior to a commitment to a particular site or design.

11 When it is clear a project is likely to proceed, an assessment should be made of any additional skills required to deal effectively with the range of environmental, land use, planning and design issues. Consideration should also be given to consultation as soon as reasonably possible with appropriate statutory planning and amenity bodies.

Liaison with other Electricity Companies

12 NGC will encourage and recommend other parties such as power generators or regional electricity companies to adopt these guidelines when working with NGC on proposals for substations, sealing end compounds or line entries.

Post Construction Review

13 Following completion of the project, a review should be undertaken to check that the necessary measures identified in the environmental report have been implemented.

Section III GUIDELINES

Overall System Options and Site Selection

1 **In the development of system options including new substations, consideration must be given to environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum.**

Amenity, Cultural or Scientific Value of Sites

2 **The siting of new NGC substations, sealing end compounds and line entries should as far as reasonably practicable seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections.**

Notes:

1 *Internationally and nationally designated areas of highest amenity, cultural or scientific value are:*

National Parks;
Areas of Outstanding Natural Beauty; Heritage Coasts;
World Heritage Sites;

Ramsar Sites;
Sites of Special Scientific Interest;
National Nature Reserves; Special Protection Areas;
Special Areas of Conservation.

2 *Care should be taken in relation to all historic sites with statutory protection e.g. Ancient Monuments, Battlefields and Listed Buildings.*

3 *Account should be taken of Government Planning Policy Guidance and established codes of practice.*

4 *Account should be taken of any development plan policies relevant to the siting or design of substations.*

3 Areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas should be protected as far as reasonably practicable.

Local Context, Land Use and Site Planning

4 The siting of substations, extensions and associated proposals should take advantage of the screening provided by land form and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum.

Notes:

1 *A preliminary study should be undertaken to identify the extent of land required to meet both operational and environmental needs.*
In some instances it may be possible to site a substation partially or fully enclosed by existing woodlands.
Topographical information should be obtained at an early stage. In some cases a geotechnical survey may be required.

5 The proposals should keep the visual, noise and other environmental effects to a reasonably practicable minimum.

Notes:

1 *Allow sufficient space for screening of views by mounding or planting.*
2 *Consider appropriate noise attenuation measures where necessary.*
3 *Use security measures which minimise visual intrusion from lighting.*
4 *Consider appropriate on-site water pollution prevention measures.*
5 *Consider adjoining uses and the amenity of local inhabitants.*

6 The land use effects of the proposal should be considered when planning the siting of substations or extensions.

Notes:

1 *Issues for consideration include potential sterilisation of nationally important land, e.g. Grade 1 agricultural land and sites of nationally scarce minerals.*
2 *Effects on land drainage.*

Design

7 In the design of new substations or line entries, early consideration should be given to the options available for terminal towers, equipment, buildings and ancillary development appropriate to individual locations, seeking to keep

effects to a reasonably practicable minimum.

Notes:

1 *With outdoor equipment, a preference should be given normally to a low profile design with low height structures and silhouettes appropriate to the background.*
2 *Use lightweight narrow section materials for taller structures especially for gantries over about 6 metres in height.*
3 *Commission exterior design and colours appropriate to the surroundings.*
4 *Materials and colours for buildings, equipment and fencing should be chosen to harmonise with local surroundings.*
5 *Where possible avoid the use of prominent insulators by consideration of available colours appropriate to the background.*
6 *Where possible site buildings to act as visual screens for switchgear.*
7 *Ensure that the design of high voltage and low voltage substations is co-ordinated by early consultation between NGC and its customers.*
8 *Where there are particular technical or environmental constraints, it may be appropriate to consider the use of Gas Insulated Switchgear (GIS) equipment which occupies less space and is usually enclosed within a building.*
9 *Early consideration should be given to the routeing of utility service connections.*

8 **Space should be used effectively to limit the area required for development consistent with appropriate mitigation measures and to minimise the adverse effects on existing land use and rights of way, whilst also having regard to future extension of the substation.**

Notes:

1 *Assess the benefit of removing redundant substation equipment from existing sites where this would improve their appearance.*

9 **The design of access roads, perimeter fencing, earthshaping, planting and ancillary development should form an integral part of the site layout and design to fit in with the surroundings.**

Line Entries

10 **In open landscape especially, high voltage line entries should be kept, as far as possible, visually separate from low voltage lines and other overhead lines so as to avoid a confusing appearance.**

11 **The inter-relationship between towers and substation structures and background and foreground features should be studied to reduce the prominence of structures from main viewpoints. Where practicable the exposure of terminal towers on prominent ridges should be minimised by siting towers against a background of trees rather than open skylines.**

END

APPENDIX A

NGC SUBSTATIONS – ENVIRONMENTAL REPORT

Introduction

All proposals for significant extensions of existing substations or for new substations and associated development should be the subject of an environmental appraisal and an environmental report should be produced. The project manager will be responsible for ensuring that an appropriate appraisal is undertaken and report prepared, with due regard to expert advice available to the team.

For a major development a scoping exercise should be undertaken with the contribution of appropriate skills to establish the range and depth of the appraisal. It will generally be appropriate at this stage to consider consultation with the local planning authority.

A clear distinction should be drawn between the preparation of an environmental report which will be undertaken in most cases and a full environmental statement (ES) which may on occasion be required under UK environmental assessment legislation, for example where the substation forms part of a major new power station for which an ES may be needed.

Recommended Content of Environmental Reports for Substations

Section 1

Information describing the project during construction, when operational and on de- commissioning including:-

1.1 Purpose and physical characteristics of the project, including details of access and transport arrangements and employment.

1.2 Land use requirements and other physical features of the project.

1.3 Operational features of the project and relevant measurements of emissions such as noise, vibration, light, heat and electric and magnetic fields.

1.4 Main alternative sites considered and reasons for final choice.

Section 2

Information describing the site and its environment including:-

2.1 Physical features such as

- Flora and fauna
- Soil: agricultural quality, geology
- Water courses including land drainage generally
- Climatic factors
- Historic heritage and archaeological sites
- Landscape and topography
- Local recreational uses
- Proximity of population and any other relevant environmental features.

2.2 The policy framework

The policy framework including all relevant statutory designations such as national nature reserves, sites of special scientific interest, national parks, areas of outstanding natural beauty, heritage coasts, special protection areas, special areas of conservation, regional parks, country parks, national forest parks, local nature reserves, areas affected by tree preservation orders, water protection zones, minerals protection zones, nitrate sensitive areas, conservation areas, listed buildings, scheduled ancient monuments, and designated areas of archaeological importance. It should also include references to Structure, Unitary and Local plan policies applying to the site and the surrounding area which are relevant to the proposed development as well as to any international designations.

Section 3

Assessment of effects on the surrounding area and landscape including:-

3.1 Visual effects, emissions during normal operation, noise, light, impact on local roads and transport.

3.2 Effects of the development on buildings, the architectural and historic heritage and archaeological features.

3.3 Loss of, and damage to flora, fauna and geology.

3.4 Land use/resource effects such as:
quality and quantity of agricultural land to be taken
sterilisation of mineral resources and alternative uses of the site.

3.5 Changes to hydrographic characteristics.

3.6 Air and Climate

3.7 Indirect matters such as
traffic (road, rail, air, water) related to the development
development associated with the project, e.g. new roads, sewers, power lines, pipelines, telecommunications etc.

Section 4

Mitigation measures

4.1 Where significant adverse effects are identified, a description of the measures to be taken to avoid, reduce or remedy those effects, e.g.

a) site planning;
c) technical measures e.g. equipment selection, recycling of waste or redundant parts, pollution control and treatment, containment (e.g. shielding of transformers and bunding)

d) aesthetic and ecological measures e.g.
mounding, design, colour, landscaping, tree planting
measures to preserve particular habitats or create alternative habitats
recording of archaeological sites
measures to safeguard historic buildings or sites.

END

Appendix 2: Areas of Highest Environmental Value

This Appendix provides further information on the Areas of Highest Environmental Value found within the study area. Where a designated area/site for which the qualifying interest and/or geographic scale is such that it has influenced the routeing process to date, details of its key features/qualifying interest are presented within the tables below. Where the qualifying interest of an area/feature has not directly influenced routeing (but has been taken account of), e.g. Listed Building, these are presented in list form only.

Landscape Designations

National Scenic Areas (NSAs)

There are three NSAs located within the study area, each situated along the coast of the Solway Firth. These are listed in **Table A2.1** below.

Table A2.1: National Scenic Areas within the Study Area

Designation	Key Features
Nith Estuary NSA	Key Special Qualities[27]: - *A working, farmed landscape against a backdrop of hill and estuary;* - *The meeting of land, sea and sky;* - *The interplay of natural and cultural landscapes;* - *The detailed patterns of merse and estuary;* - *Landmarks, contributing to the identity of the area;* - *The view out to the Cumbrian Fells.*
Fleet Valley NSA	Key Special Qualities: - *A compact, working landscape of great charm;* - *The gradation from coastal islands to upland hills;* - *The traditional boundaries of dyke and hedge;* - *Abundance of trees and woodlands;* - *Views out of the Fleet Valley to the Isle of Man and the Merrick;* - *A rich variety of colour, light, texture and scale.*
East Stewartry Coast NSA	Key Special Qualities: - *A working landscape of great beauty;* - *A coastline of endless variety;* - *A landscape of woods, fields, dykes and hedges;* - *A sense of calm and enclosure at the heart of the NSA;* - *A dynamic coast contrasting with the static inland landscape;* - *The sense of the sea without seeing the sea;* - *Landmarks, contributing to the identity of the area;* - *A wide horizon of the Cumbrian Fells and the open sea.*

[27] Scottish Natural Heritage (2010). *The special qualities of the National Scenic Areas. SNH Commissioned Report No.374.*

Areas of Outstanding National Beauty (AONBs)

The Solway Coast AONB is within the study area and stretches along the north Cumbria coastline of the Solway Firth. It represents a unique mosaic of coastal and pastoral landscapes set among a wide and low lying coastal plain, with wide open views north-west towards the Galloway Hills.

Areas of Wild Land

The Merrick Area of Wild Land is within the study area and covers 8,176 hectares (ha) in Galloway, to the north of Newton Stewart. This area has been identified by SNH as being an extensive area of high wildness and nationally important in Scottish Planning Policy.

Cultural Heritage Designations

World Heritage Sites

Hadrian's Wall crosses the study area and was designated as a World Heritage Site (WHS) by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 1987, as the most complex and best preserved of the frontiers of the Roman Empire. This long, linear monument stretches the width of Britain between the Solway in the west and the Tyne in the east. The Hadrian's Wall Management Plan[28] outlines a buffer zone which is recommended by UNESCO to provide additional protection. The buffer zone varies between 1 and 6km in distance. In the rural sections, the buffer zone is mapped as a visual envelope, through consultation with local authorities. In urban areas, the buffer zone is a narrow band along the length of the WHS.

Battlefields

The English Heritage Register of Historic Battlefields and the Historic Scotland Inventory of Historic Battlefields provide information on the sites and offer them protection and to promote a better understanding of their significance. One Historic Battlefield and one candidate Inventory Historic Battlefield are located within the study area; Solway Moss Battlefield (1542) (England) and candidate Sark Battlefield (1448) (Scotland). Solway Moss Battlefield lies to the south of Longtown, between the River Lynne and the River Esk. Sark Battlefield (candidate) comprises fields on the west bank of the Kirtle Water, the north bank of the River Esk and the flat low lying ground between River Sark and the Kirtle Water.

Gardens and Designed Landscapes

There are a number of GDLs located within the study area. These are listed in **Table A2.2** below.

Table A2.2: Gardens and Designed Landscapes within the Study Area

Designation	Key features
Kinmount GDL	A parkland and woodland designed landscape, forming a spectacular setting for the category A listed Kinmount House. The scenic and nature conservation qualities are high.
Bargany GDL	An outstanding designed landscape and important wildlife haven, comprising woodland, rock gardens and a walled garden, which form an attractive setting for a category A listed house.
Castlehill GDL	An attractive garden comprising pond side, terrace and trough plantings, which forms an attractive setting for a Victorian house.
Cowhill GDL	An attractive designed landscape comprising parkland, woodland, an interesting shrub collection in a woodland garden, and some notable architectural features.
Dalswinton GDL	An informal late 18th century design, comprising woodland, parkland and lakes, overlays an earlier formal one.
Maxwelton (Glencairn Castle) GDL	An attractive parkland landscape which makes an outstanding contribution to the surrounding upland scenery.

[28] *Frontiers of the Roman Empire World Heritage Site Hadrian's Wall Management Plan 2008-2014* (2008) Hadrian's Wall Country

Designation	Key features
Brooklands GDL	An early 19th-century designed landscape, containing an attractive well-stocked woodland garden, and a beautifully laid-out walled garden featuring old-fashioned roses.
Threave GDL	An attractive garden which is now a horticultural training facility for the National Trust for Scotland, as well as providing the setting for some notable architectural features.
Broughton House GDL	An early 20th century town garden, it is designed as a series of compartments which back on to the banks of the River Dee, and the garden provides the setting for a category A listed house.
Glenapp GDL	The arboretum within the designed landscape hosts an interesting collection of trees and the woodland and water habitats provide a valuable wildlife asset.
Lochryan GDL	An early 18th century landscape of parkland and woodland blocks and strips, with a woodland garden, formal garden, large walled garden and extensive plant collection. The parkland provides the setting for category A listed buildings.
Castle Kennedy GDL	An outstanding example of an 18th century formal gardens of terraces and banks, including an important plant collection, parkland and woodland. The garden provides the setting for a scheduled ancient monument, several category A listed buildings and a SSSI.

Scheduled Monuments

There are a number of Scheduled Monuments within the study area. These are listed in the tables below.

Table A2.3: Scheduled Monuments within the Study Area (Scotland)

Scheduled Monument Name and Location	
Shaw's Moor, cairnfield and ring-cairn S of Hospital Wood	Chlenry Hill, hut circle 780m ESE of Chlenry
Shaw's Moor, cairnfield and ring-cairns SE of Hospital Wood	Balker Moor, cairn 1470m NNE of Balker
Carleton Mains, enclosure 280m SE of	Milton of Larg, corn mill 810m SSW of
Milton of Larg, hut circle 1100m WNW of	High Airyolland, hut circle 400m NW of
Drumacissock, hut circle 990m SSE of Awies	High Airyolland, burnt mounds 430m WNW of
Diddles Hill, hut circles & enclosures 800m W of Dalhabboch	High Airyolland, burnt mound 490m WSW of
Dalswinton Mains, ring ditch and pit alignments	High Airyolland, hut circle 680m S of
Burnside of Baltersan, ring ditch, pits and Roman camp 700m S of	Pularyan, hut circle 900m SSW of
Curriestanes, cursus E of	Beoch Burn, hut circle & enclosure 500m NNW of Braid Fell
Dunragit, enclosures and pit alignments S of	Diddles Hill, hut circle & field system 900m WNW of Dalhabboch
Miltonise, hut circle and cairns 800m NE of	Altibrair, hut circle and field system 1160m NE

Scheduled Monument Name and Location	
	of Dalhabboch
Miltonise, cairns 670m NNE of	Altaggart, hut circle 870m NNE of Pularyan
Little Larg, farmstead 1950m SW of, Auchie	Awies, hut circle 420m WNW of
Miltonise, burnt mound 1430m NNE of	Awies, hut circle 700m SSW of
Castle Earthworks, enclosure 500m SSW of Mains of Greenlaw	Dunnerum, burnt mounds 910m NE of Dalhabboch
Kilroy, enclosures E and NE of	Diddles Hill, cairn 800m WNW of Dalhabboch
Mote of Annan, motte-and-bailey castle, 70m SSW of Moat House	Awies, hut circle and shielings 670m NW of
Repentance Tower	Awies, hut circle and cairn 480m WSW of
Scots' Dike, boundary earthwork, Scotsdike Plantation	Barlure, burnt mound & enclosure 470m NNE of
Gallaberry Hill, fort	Kilfeddar, burnt mound 860m NE of
Malls Castle, settlement 320m W of Mallscastle	Kilfeddar, burnt mound 640m NE of
Castle Hill, motte-and-bailey castle	Little Larg, cairn 890m S of
Birrens Hill, enclosure and farmstead 750m W of Carruthers	Kilfeddar, cairn 320m ENE of
Applegarth House, motte 65m S of	Barlure, burnt mound 810m NW of
Burnbrae, enclosure 270m W of	Craigbirnoch, hut circle 1100m WNW of
Milligansbush, palisaded enclosure 250m SW of	Kilfeddar, hut circle 1120m NNE of
Thistle cottage, fort 130m E of	Little Larg, hut circles and field system 1000m WSW of
Scalewood, enclosure 370m W of	Tonnachrae, enclosure 70m SE of
Whinnyrig, enclosed settlement, droveway and field system 130m ENE of	Tonnachrae, palisaded enclosure 260m NNW of
The Bracken, enclosed settlement and droveway 370m WSW of	Tonnachrae, palisaded enclosure 450m N of
Robgill Mains, cairn 320m E of	Tonnachrae, enclosure 500m NNW of
St Bryde's Kirk, church 95m W of Brydekirk Mains	Beoch, farmstead 340m E of
Braehill, enclosed settlement 450m SW of	Beoch, palisaded enclosure 470m WNW of
Robgill Tower, fort 90m NW of	Beoch, palisaded enclosures 800m WNW of
Woodhouse Tower, tower house	Drummuckloch Hill, hut circles & field system

Scheduled Monument Name and Location	
	900m NE of Drummuckloch
Dryfesdalegate, fort 75m SSE of	Drummuckloch Hill, hut circle 1070m NNE of Drummuckloch
Hallmuir, settlement 510m WSW of	White Cairn, cairn 1600m NNE of Beoch
Hallmuir, settlement 630m SW of	Beoch, cairn 1300m NNE of
Hallmuir, settlement 490m S of	Drummuckloch Hill, cairn & standing stone 1140m NNE of Drummuckloch
Nutholmhill, settlement 160m E of	Knockdon, enclosure 700m NE of
Raggiewhate, enclosure 210m ESE of	Blacket House Tower
Douglashall Pendicle, cairn 415m W of	Bonshaw Tile Works, NW of Bonshawside, Kirtlebridge
Nutholm Hill, fort 400m ENE of Nutholmhill	Erncrogo Loch, fish ponds 400m S of Erncrogo
St Mungo's Church, church and graveyard	Meikle Wood Hill, fort, Kelton Mains
Chalkyhill Wood, settlement 320m SW of Cairnhill	Cumstoun Castle
Annan old graveyard, recumbent grave marker 45m ENE of town hall	Craigcaffie, palisaded enclosure 410m WSW of
Gilnockie Castle, earthwork NE of Gilnockie Bridge	Drumcoltran Castle (Tower)
Torwood, enclosure 270m SW of	Laggangarn, standing stones
Minsca, settlement 295m WNW of	Merkland Cross, Woodhouse
Corrie Church, church and graveyard	Maclellan's Castle
Park House, cairn 730m SSE of	Donald's Isle, Loch Doon, settlement 750m SSW of Lamdoughty Farm
Woodhead, enclosure 200m NE of	Loch Doon Castle, original site & remains of, 570m NE of Craigmalloch
Greenhillhead, fort	Cordorcan, cairn 750m NE of
Mouswald Grange, windmill	Suie tollhouse, 670m SW of Kirriereoch Farm
Bankfoot, three enclosures	Lincluden College, motte and precinct
Ellisland, Roman camps	Loch Doon Castle
Johnstonehall, Roman camps SE of	Lochmaben Peel and Castle
Lochmaben Stone, standing stone & stone	Threave Castle
Boreland Mote, earthwork 500m NNE of	Dow Hill,fort

Scheduled Monument Name and Location	
Holywood, cursus 1250m SSE of	Bankhead, Roman fort, Dalswinton
Minnoch, Old Bridge of	Hoddom Church, church, burial ground and monastery
Bankfoot, Roman camps & forts, Dalswinton	Holywood, cursus, linear earthwork, pit alignment & enclosures 975m SE of
Maurs Cairn, hut circle and field clearance cairns 1000m WNW of	Auchencairn, cairn 500m NNE of
Corrafeckloch, hut circle and field system 1150m SE of	Glenluce Abbey
Marklach, hut circles and field system 1900m WNW of	Dalton, standing stone 25m WSW of Post Office
Markdhu, hut circle 730m NE of	Dalton, old parish church
Marklach, field clearance cairns 850m NNE of	Woodslee, burial mound 250m SW of
Glenwhilly, hut circle and enclosure 1590m NW of	Seven Brethren, stone circle, Whiteholme Rig
Markdhu, hut circles and field system 100m NE of	The Belt, fort, High Townhead
Glenkitten, hut circle 800m E of	Mullach, fort
Glenwhilly, burnt mound 1190m NW of	Nithside, motte & bailey 450m ESE of
Markdhu, burnt mound 1090m NNE of	Springfieldhill, fort
Markdhu, cairn 1450m NNW of	Maxwelton, motte
Pultadie, farmstead 100m N of	White Cairn, long cairn, Fleuchlarg
Dirniemow, cairn 420m SW of	Lag Tower
Glenwhilly, hut circle and field clearance cairns 1500m NW of	Moatland, motte
Glenwhilly, hut circles and field system 1300m NW of	Rough Island, crannog
Maurs Cairn, enclosure 1100m NNW of	Torhousekie, fort
Pultadie, cairn 470m NW of	Kirkhill Castle
Glenwhilly, burnt mound 1120m NW of	Knockdolian Castle
Pultadie, farmstead 760m ENE of	Woody Castle, fort, Lochbank, Lochmaben
Markdhu, hut circles and field system 1250m NNE of	Barrs Hill, fort

Scheduled Monument Name and Location	
Pultadie, hut circle 1280m E of	Rockhall Mote, motte-and-bailey castle
Glenkitten, clearance cairns 250m NNW of	Torthorwald Castle
Glenkitten, farmstead	Comlongon Castle
Markdhu, hut circle 1370m N of	Amisfield Tower
Dirniemow, cairn 930m SW of	West Gallaberry, Roman camp & native promontory settlement
Quarter Farm, burnt mound and clearance cairns 1340m ENE of	Fourmerkland Tower
Dirniemow, hut circle 1350m SW of	Kennedy Monument
Dirniemow, cairn 1050m SW of	Ardstinchar Castle
Dirniemow, burnt mound 900m NNE of	Dumfries Old Bridge
Dirniemow, cairn 700m SW of	East Hill Farmhouse, stone circle
Marklach, cairn 470m N of	Green Island, fort, Milton Loch
Markdhu, cairn 450m ENE of	McNaugton, fort
Dirniemow, burnt mound 970m NE of	Camp Hill, fort 800m SE of Crochmore
Little Larg, enclosures, cairns and banks 1350m WNW of	Buittle Old Kirk
Little Larg, hut circle and cairns 2050m SW by W of	Craigmuie Moor, Watch Knowe, fort
Little Larg, cairn and field system 1100m W of	Lochrinnie Mote, motte 250m WNW of Craigmuie Lodge
Little Larg, farmstead 1300m NW of	Meikle Cairn, cairn, Upper Minnydow
Marklach, hut circle and field clearance cairns 270m N of	Moat Hill, fort, Margley
Markdhu, hut circle 1020m NE of	Brockcleugh Cottage, cup and ring marked rocks 600m NNE of
Cairnerzean, cairns 300m E of	Camphill Cottage, fort or homestead moat, Whinnieliggate
Polmaddy, medieval and post-medieval settlement	Dungarry, fort
Sundaywell, fort 300m N of	Castle Hill, fort, Castlegower
Brockloch, farmstead and field system 1000m WNW of Fraserford	Dalry, motte

Scheduled Monument Name and Location	
Moat, enclosure 300m NW of	Earlston Castle
Barndennoch, ring ditches 350m N of	White Cairn, cairn, Corriedow Bridge
Woodhead lead mines and smelter, Carsphairn	Little Merkland, fort
Pibble, lead mines	Boreland Mote, motte, Boreland Glen
Napper's Cottage, chambered cairn	Dalarran Holm, standing stone
Craigneil Castle	Balmaclellan Motte
Standing Stones of Glenterrow	Bargatton Farm, cairn 610m S of
Little Larg, burnt mound 1800m SW of	Loch Mannoch, cairn & stone circle N end of
Little Larg, burnt mound 2150m SW of	Edgarton Mote, fort 690m SW of Camelon Bridge
Little Larg, burnt mound 2250m SW of	Little Duchrae, fort
Balneil, burnt mound 650m E of	Kirkland Mote, motte
Cruise, cairn 1250m NE of	Park, stone circle
Hardcroft, cairn 950m SE of	Trostrie Mote, motte
Hardcroft, burnt mound 750m ENE of	Cairn Avel, cairn 800m S of Carsphairn
Cruise, burnt mound 1730m ENE of	Holm of Daltallochan, stone circle & standing stone
Balneil, burnt mound 1000m E of	Braidenoch Hill, cross slabs
Hardcroft, hut circle 1000m ESE of	Holm of Daltallochan, cross slab
Hardcroft, burnt mound 850m ENE of	The Thieves, standing stones, Blair Hill
Hardcroft, burnt mound 950m SSE of	Boreland, chambered cairn
Cruise, cairn 1140m NE of	Creebridge, cairn 400m E of
Littlepark Cairn, cairn	Minnigaff, Old Church
Cairn MacNeilie, cairn	Machars Hill, motte
Cruise, burnt mound 1740m ENE of	Drumwhirn, cairn N of Boreland
Balneil, cairn 1200m ENE of	Skaith Mote, motte 700m SSW of Challoch
Balneil, cairn 560m NE of	Boreland, stone circle 250m S of
Hardcroft, burnt mound 1100m SSE of	White Cairn, cairn 90m S of Boreland
Hardcroft, cairn 1400m ESE of	White Cairn, cairn & Hole Stone 400m N of Crows

Scheduled Monument Name and Location	
Hardcroft, hut circle and field system 220m SE of	Boreland Mote, motte
Hardcroft, burnt mound 1500m SE of	Wells of the Rees, wells 500m NNE of Killgallioch
Hardcroft, hut circles 700m E of	Loch Maberry Castle, crannog
Hardcroft, burnt mounds 1600m SE of	Ballach-a-heathry, cairn
Cruise, burnt mounds 950m ESE of	Bennan of Garvilland, fort
Cruise, burnt mound 1100m NE of	Cairn na Gath, long cairn, Balmurrie Fell
Mid Gleniron, hut circle and cairns 1100m N of	Cascreugh Castle
Galdenoch, farmstead 600m ESE of	Knock Fell, fort
Galdenoch, farmstead 1050m E of	Castle Kennedy
Galdenoch, farmstead 625m E of	Caves of Kilhern, chambered cairn 450m SE of Dranigower Lodge
Mid Gleniron, hut circle 650m N of	Mid Gleniron, chambered cairns and cairns
Hardcroft, farmstead 650m ENE of	Milton of Larg, cairn N of
Mid Gleniron, farmstead and field system 1050m NNW of	Cruise Back Fell, fort
Mid Gleniron, croft 900m NNE of	Lingdowey Cairns, cairns S of Cairnezean
Balneil, field system 1000m NE of	Barlure, cairn
Mid Gleniron, burnt mound 730m N of	Pultadie, cairn 640m SSW of Glenwhilly
Cruise, farmstead 900m SE of	Round Dounan, fort, Dunragit House
Mid Gleniron, rectangular buildings and cairns 1350m NE of	Airyhemming, two cairns 500m & 730m WSW of
Little Larg, burnt mound 1850m SSW of	Airyhemming, two enclosures 370m & 460m NW of
Galdenoch, farmstead 950m ENE of	Long Tom, standing stone, Mildown
Galdenoch, farmstead 500m SE of	Taxing Stone, standing stone 180m NNW of Little Laight
Hardcroft, farmstead 350m ESE of	Picts Knowe, fort
Auchmantle, farmstead 1000m N of	Hall Hill, fort
Mid Gleniron, hut circles and field systems 850m NE of	Doon Hill, Mote of Doon, Doon of Urr

Scheduled Monument Name and Location	
Mains of Larg, burnt mound 1250m SW of	Ernespie, remains of stone circle 200m E of Erne Hill, Castle Douglas
Balneil, farmstead 650m NE of	Trowdale, fort
Cairnerzean, cairn 1850m SW of	Crofts Mote, fort
Little Larg, hut circle 1300m W of	Castlehill, fort, Compstonend
Little Larg, cairns 2150m W of	Arden, fort 320m SW of
Little Larg, cairn 2700m WSW of	Boreland Mote, motte
Little Larg, cairns 1950m W of	Innermessan Mote, motte
Little Larg, burnt mound 1400m WNW of	Cairn Macneilie, cairn, Inch Parks
Little Larg, hut circle and cairns 1300m W of	Twelve Apostles, stone circle
Cairnerzearn, cairn 1700m SW of	Cars Wood, fort
Cairnerzean, farmstead 750m WSW of	Birrens to Broadlee, Roman forts & camps & henge
Cairnerzean, cairns 800m SSW of	Burnswark or Birrenswark Hill, fort & Roman camps
Pularyan, farm buildings and kiln 200m SE of	Carzield, Roman fort
Pularyan, farmstead 180m SSW of	Dalswinton Old House
Cairnerzean, shieling 500m SW of	Lower Ingleston, motte and bailey 400m ENE of
Pularyan, cairns 950m WSW of	Orchard Mote, earthwork
Little Larg, cairns 1600m W of	Cairnderry, chambered cairn
Cairnerzean, cairns 700m NW of	Drumfern, cairn and remains of stone circle
Cairnerzean, cairns 1330m SSW of	King's Cairn, chambered cairn 450m NE of Kirriemore
Cairnerzean, farmstead 1650m WSW of	Redcastle, standing stone 275m ESE of Graham's Wood, Haugh of Urr
Cairnerzean, farmstead 650m SW of	Sheuchan's Cairn, chambered cairn, Highlandman's Rig
Cairnerzean, hut circle 2600m W of	White Cairn, cairn 910m NNE of Bargrennan Cottage
Pularyan, cairns 370m WNW of	White Cairn, chambered cairn 630m W of Glentrool School
Cairnerzean, hut circle 830m SW of	Auld Kirk of Lochroan, fort

Scheduled Monument Name and Location	
Cairnerzean, farmstead 350m S of	Carse Mote, fort
Cairnerzean, hut circle 1200m SSW of	Glenroan (or Glengappock) Mote, fort
Cairnerzean Fell, farmstead and enclosure 1450m SW of	Kirkland, fort NNW of High Kirkland
Cairnerzean, hut circle 1450m SW of	Buittle Castle
Pularyan, hut circle 850m W of	Kirkcormack, motte, Mayfield
Cairnerzean, hut circle 1900m WSW of	Mote of Urr, motte
Pularyan, burnt mound 350m NW of	Auld Wife's Grave, chambered cairn, Cairnscarrow
Cairnerzean, farmstead, cairns and field systems 2100m WSW of	Brockloch, cairn, Cairn Hill
Cairnerzean, cairn 500m SSE of	Cairnhouse, two cairns
Cairnerzean, mound 1300m SW of	Cairn Kenny, chambered cairn
Cairnerzean, hut circle 770m WNW of	High Baltersan, cairn
Cairnerzean, shielings 550m SW of	Middle Bridge of Cree, cairn 110m WNW of
Cairnerzean, farmstead 350m NW of	Deil's Dike, linear earthwork, Hill of Ochiltree
Cairnerzean, hut circle and cairns 1350m SSW of	Teroy Fort, broch, Craigcaffie
Pularyan, shielings 680m SW of	Dinvin, motte
Cairnerzean, shielings and enclosures 950m SW of	Loch Ochiltree, crannogs
Knockiebae, farmstead 850m NE of	Whitespots Cottages, enclosure 120m NE of
Knockiebae, farmstead 1600m NE of	Kirkland, church
Quarter Farm, hut circle 220m WNW of	Camp Hill,cairn 860m SE of Crochmore
Craigbirnoch, burnt mound 1080m SW of	Dundeugh Castle
Craigbirnoch, burnt mound 550m SW of	Craig Hill, fort, Laurieston
Quarter Farm, burnt mound 230m ENE of	Cairntosh Hill, cairn
Knockiebae, hut circle and clearance cairns 1720m N of	Dounan Moor, depopulated village, Corsemalzie Forest
Quarter Farm, cairn 1340m NE of	Maxwellston Hill, fort
Quarter Farm, clearance cairns 770m ENE of	Ballmalloch, chambered cairn

Scheduled Monument Name and Location	
Craigbirnoch, burnt mound 900m W of	Carscreugh Croft, cairn 800m SSE of
Quarter Farm, farmstead 570m NW of	Old Kirkcudbright, church & graveyard, Kirk Holm
Craigbirnoch, burnt mound 900m SW of	Carleton, motte, Little Carleton
Knockiebae, burnt mounds 810m NNE of	Duniewick Camp, dun, Knockdolian
Quarter Farm, farmstead 1050m SSE of	Cairnerzean Fell, cairn
Quarter Farm, burnt mound 530m NE of	Cairnerzean Fell, cairns
Craigiegower, farmstead and clearance cairns	Finnart's Hill, enclosure
Knockiebae, clearance cairns 1100m NNE of	Auchenhay, settlement 1000m S of
Quarter Farm, hut circle 420m NE of	Garlies Castle
Quarter Farm, clearance cairns 1200m NE of	Wood Cairn, cairn, Eldrig Fell
Quarter Farm, burnt mound 920m ENE of	Cairnsmore of Fleet, cairn
Knockiebae, clearance cairns 350m N of	Minnigaff, motte S of Monigaff Parish Church
Quarter Farm, farmstead 1070m NNE of	Dalvaird, cairn 320m NNE of
Knockiebae Lead Mines	Meikle Sypland, fort
Quarter Farm, hut circle 760m NW of	Glenwhan Moor, hut circles 1000m NE of Old Hall Farm
Quarter Farm, enclosure 1380m NE of	Craig, cairn 700m SW of
Knockiebae, burnt mound 880m NNE of	Rowantree tollhouse and inn, 230m S of Laigh Rowantree Bridge
Knockiebae, hut circle and field system 800m NNW of	Old Hall, 480m ENE of Meikle Laight
Quarter Farm, field system 1050m ENE of	High Croach, fermtoun 250m ESE of
Knockiebae, hut circle 700m N of	Fairy Knowes, hut circle 1400m ENE of High Croach
Quarter Farm, field system 950m SE of	High Croach, hut circle 650m E of
Barnshangan, cairn 450m W of	Torhouse Stone Circle
Barnshangan, cairn 600m W of	Ruthwell Cross, cross
Knockiebae, hut circle and enclosure 600m SE of	High Croach, settlement 750m NE of
Barnshangan, enclosures 370m N of	Hurkledale, enclosure 400m SW of

Scheduled Monument Name and Location	
Knockiebae, hut circles 1000m NNE of	Southgate, settlement 350m N of
Knockiebae, burnt mound 470m NNE of	Westhills, altar stone 35m N of
Barnshangan, field system 700m ENE of	Gleningle, enclosure 80m NE of
Craigbirnoch, burnt mound 640m NW of	The Hass, settlement 550m E of, Quhytewoollen Hill
Quarter Farm, burnt mound 1090m NNE of	Woodfield, enclosure 295m NE of
Barnshangan, clearance cairns 850m N of	Blacketlees Cottages, enclosure 75m SSW of
Craigbirnoch, cairn 710m E of	Timpanheck Cottage, cursus 340m WNW of
Craigbirnoch, burnt mound 490m WNW of	Castle of Park, castle, Glenluce
Craigbirnoch, burnt mound 470m WSW of	Calvertsholm, settlement 110m N of
Quarter Farm, burnt mound 1280m NE of	Fairholm, fort 430m NNE of
Craigbirnoch, clearance cairns 600m E of	Broats, enclosure 250m N of
Quarter Farm, farmstead 1130m NNE of	Range Castle, fort
Craigbirnoch, hut circles and field system 650m WSW of	Moss Castle, fort
Craigbirnoch, cairn 1090m SW of	Little Dalton Church
Quarter Farm, burnt mound 1130m N of	Hound Hill, cairn
Craigbirnoch, cairns 710m NE of	Redkirkmill, enclosure 50m WSW of
Craigbirnoch, hut circle and clearance cairns 1200m NE of	Branthat Plantation, enclosed settlement 320m SE of Gill
Craigbirnoch, cairn 1170m NE of	Buckie Bank Cottage, fort 95m SW of
Quarter Farm, burnt mound 1050m NNW of	Hayknowes, settlement 180m NW of
Craigbirnoch, cairn 1050m NE of	Blackyett, cairn 225m E of
Quarter Farm, farmstead 1600m NNW of	Calvertsholm Cottages, cairn 320m NNW of
Little Larg, farmstead and dykes 900m W of	Calvertsholm Cottages, cairn 315m WNW of
Little Larg, burnt mound 800m NW of	Kirkconnel old church and graveyard, 520m WNW of Springkell
Little Larg, burnt mound 1250m NW of	Glenlochar, Roman fort, annexe, road, camps & barrows 50m E of Montford
Craigbirnoch, enclosure 220m NW of	Cairn Kinna, two cairns 900m ESE of Corrafeckloch

Scheduled Monument Name and Location	
Craigbirnoch, farmstead 770m SSE of	Gilnockie Roman Camp, 300m SW of New Woodhead
Little Larg, field system 1100m WNW of	Annan Hill Roman camp
Little Larg, sheilings and burnt mound 900m NW of	Torwood Roman camp, 310m NNE of Lochside
Little Larg, sheiling 1400m NW of	Glenluce Roman camp, 380m W of Corsehead
Drumflower Bridge, enclosures and pit alignments E of	Stab Hill, hut circle 1570m NE of Dalnigap
Finnarts Bridge, cairn 620m SE of	Craigcaffie, palisaded enclosure 280m ESE of
Blarbuie, stone setting 330m NE of	Dalminnoch, enclosure 250m SSE of
Blarbuie, cairn 300m SW of	Braid, farmstead and cultivation remains 1200m ENE of Beoch
Finnarts Bridge, burnt mound 630m SSE of	Conchieton, cairn NE of
Balig, enclosure	Kenmure Castle
Balig, earthwork 530m WSW of	Black Loch, crannog on Heron Isle
Gotterbie Moor, homestead moat	Chlenry, ring-ditches & enclosures 750m S of
Mote Hill, barrow 300m NNW of Coalpots Bridge	Chlenry Cottages, enclosure 420m S of
Shalloch Hill, palisaded enclosure 350m S of Shallochpark	Chlenry, ring-ditches 380m SW of
Garleffin, standing stones and mesolithic settlement	Sheuchan, enclosure 400m S of
Knockinculloch, enclosures on E slope of,600m NW of Glenalla	Castle Kennedy House, fort 630m ESE of
Broadlee Cottages, Roman fortlet	Cults Loch, crannog 770m ESE of Castle Kennedy House
Fairy Knowe, mound	Little Tongue, hut circles 660m NNW of
Mote Knowe, motte, Kilkerran	Pinwherrie Farm, burnt mound 760m NNE of, beside Coburn Burn
Kirkcudbright Castle	Little Tongue, hut circle 410m NNW of
Castledykes, castle earthworks	Little Tongue, hut circle 1390m N of
Murder Loch, Roman fortlet 120m NNW of Ivy Cottage	Meikle Tongue, hut circle 930m N of
Bencallen Hill, chambered cairn	Little Tongue, hut circle 1050m NW of

Scheduled Monument Name and Location	
White Loch, enclosure 250m SE of	Loan Hill, cairn 500m NW of Little Tongue
Glenwhan Moor, hut circle 840m N of Old Hall Farm	Pinwherrie Farm, hut circle 880m N of
New Luce Station, two cairns 690m WNW of	Claywarnies, cairn
Edingham Munitions Factory	Marklach, burnt mound 300m W of
Knockglass Rees, hut circle 1870m ENE of Dalnigap	Glenwhilly, burnt mound 1260m W of
Knockglass Rees, hut circles & field system 1750m ENE of Dalnigap	Glenwhilly, hut circle 1400m W of

Table A2.4: Scheduled Monuments within the Study Area (England)

Scheduled Monument Name / Description	
Hadrian's Wall vallum between the boundaries north of the properties on Whiteclosegate and the field boundary west of Wall Knowe in wall miles 64 and 65	Hadrian's Wall and vallum from A6071 to The Cottage in the case of the Wall, and to the road to Oldwall, for the vallum, in wall miles 57, 58 and 59
Hadrian's Wall between the M6 motorway and the property boundaries to the east of Houghton Road in wall mile 64	The vallum between the road to Laversdale at Oldwall and Baron's Dike in wall miles 59 and 60
Hadrian's Wall between Tarraby and Beech Grove, Knowefield in wall miles 64 and 65	Hadrian's Wall between the road to Laversdale at Oldwall and Baron's Dike in wall miles 59 and 60
Hadrian's Wall vallum between the M6 motorway and Drawdykes Castle in wall mile 64	Hadrian's Wall and vallum between Baron's Dike and Birky Lane at Walby, in wall miles 60, 61 and 62.
Hadrian's Wall between Houghton Road and Tarraby in wall mile 64	Hadrian's Wall vallum between Drawdykes Castle and Whiteclosegate in wall mile 64
Hadrian's Wall and vallum between the field boundary west of Wall Knowe and Scotland Road including the Roman fort at Stanwix in wall mile 65	Hadrian's Wall between the Cam Beck and Newtown Farm in wall miles 56 and 57
Hadrian's Wall and vallum between Birky Lane at Walby and the east side of the M6 in wall miles 62 and 63	The vallum between the field boundary south east of Heads Wood and the A6071 road in wall mile 57
Liddel Strength motte and bailey castle and fortified tower house	A night dummy aerodrome control building, part of a World War II bombing decoy, 610m north east of Walby Cottage
Rockcliffe Cross (335893, 561616)	The Stangate at Crosby Lodge (345344, 559683)
Scots' Dike (336135, 573585)	Moss Side 1 and 2 Roman temporary camps (345671, 560335)
Scaleby Castle moated site (NGR 344906, 562455)	Watchclose Roman temporary camp (NGR 347580, 560192)

Listed Buildings

There are a large number of Grade A, Grade I and Grade II* Listed Buildings within the study area. These are listed in **Table A2.5** and **Table A2.6** below.

Table A2.5: Grade A Listed Buildings within the Study Area

Grade A Listed Building	
Castle Street, Maclellan`S Castle	Glenlochar Bridge
8 High Street, Blair House And Summer House And Walls To Castle Dykes	Dornock Village, Dornock House, Old Farmhouse And Steading, Including Detached Tall West Block
26, 28, 30 Castle Street	Hensol House, The Lainshaw Sundial
136, 140 High Street/16, 17 Queensberry Square, Former Trades Hall	High Street, Tolbooth, Market Cross And Well
14-24 Castle Street (Even Numbers)	5, 7, 9, 11 Bank Street
Castlemilk	Blackwood House Former Stables
Kirkland Village Glencairn Parish Church	41, 43, 45, 47 Castle Street
29 Irish Street And 92 Whitesands Including Garden And Courtyard Walls, Outbuildings And Gatepiers	Galloway Electric Power Scheme, Tongland Power Station, Surge Tower And Valve House, Including Boundary Walls
Shillahill Bridge	Lochryan Estate, Lochryan House
High Street, Midsteeple	24 Nith Place
Ladyfield West (Formerly Hannayfield)	5, 7, 9 High Street ("Old Academy")
Ruthwell Village Ruthwell Museum Henry Duncan Savings Bank And Museum	Comlongon Castle And Mansion House
Barwhinnock House	Cumstoun House
West Galloberry Farm Steading And Horsemill	Mossknowe House
Kinnel Bridge	St Michael's Churchyard And Main Gate And Holy Cross Churchyard
Douglas Mausoleum, Near To Kelton Parish Church, Railings And Gatepiers	Tongland Bridge
Drumcoltran Tower, And Adjacent Farmhouse	Castlemilk, Driveway Bridge
Hills Tower, Gatehouse And Courtyard Walls	Elshieshields Tower And Adjoining House, Walled Garden, And Gatepiers At South
Dalgonar Bridge Over Cairn Water	Ecclefechan Village, High Street, Arched House Including Carlyle's Birthplace
Crossmichael Church Gordon Memorial	Dunscore Village Dunscore Parish Church And Churchyard

Grade A Listed Building	
Byreburnfoot Bridge And Embankment (A7 Over Byre Burn)	Stapleton Tower
High Street, Town Hall	14-24 Castle Street (Even Numbers)
66 (Wynd End) W. Side Of Close, 68 E. Side Of Close And 70 High Street	Church Crescent, Greyfriars' Church
66 (Wynd End) W. Side Of Close, 68 E. Side Of Close And 70 High Street	25-37 Castle Street (Odd Numbers)
83 Buccleuch Street, Former Methodist Church And Railings	Argrennan House
Loch Doon Castle	Glenluiart House
Castle Of Park	Hoddom Bridge
Craichlaw House	Crossmichael Parish Church And Churchyard (Church Of Scotland)
Lochinch Heritage Estate, Castle Kennedy	Hollows Or Gilnockie Tower
Kirkcowan Village, Kirkcowan Parish Church (C Of S) And Boundary Walls	Riddings Junction Viaduct, Over Liddel Water
Earlstoun Castle	High Street, Tolbooth Including Iron Lamps
Repentance Tower	25-37 Castle Street (Odd Numbers)
12 High Street, With 10 High Street, Broughton House And Walls To Castle Dykes	High Street Annan Parish Church And Churchyard Boundary Walls And Gatepiers, (Church Of Scotland)
25-37 Castle Street (Odd Numbers)	5, 7, 9 High Street ("Old Academy")
27, 29 Bank Street And Gatepiers And Railings	Cumloden House
Mount Kedar Monument To Henry Duncan	Craigcaffie Tower
Terregles Estate Former Stables	Lochryan Estate, Lochryan House
Tinwald House Cottages	Old Bridge Of Urr Mill
Carnsalloch Former Stables	Wyseby, Former Stables With Dovecot
The Crichton, Crichton Memorial Church	The Crichton, Crichton Farm
Bonshaw Tower And House And Courtyard Walls	Brydekirk Village, Brydekirk Bridge
Rammerscales House	Hoddom Castle With Fosse Bridge And Driveway Bridge To South
King Street, Douglas House, Former Douglas School	Threave Castle

Grade A Listed Building	
26, 28, 30 Castle Street	Millhousebridge Village, Millhouse Bridge
Torthorwald Village Cruck Cottage	Church Street, Penninghame Parish Church, St John's (Church_Of Scotland), Boundary Walls And Railings
Tinwald House	8 High Street, Blair House And Summer House And Walls To Castle Dykes.
Tinwald House Cottages	Church Street, Dumfries Museum Observatory
Comlongon Castle And Mansion House	
English Street, Queensberry Column (In Front Of Regional Council Offices)	Hoddom Castle With Fosse Bridge And Driveway Bridge To South
27, 29 Bank Street And Gatepiers And Railings	Barscobe Castle
Haugh Bridge, Bridge Over Urr Water, Near Haugh Of Urr	Cree Bridge
Lochinch Heritage Estate, Lochinch Castle Including Service Range, Bowling Alley, Boundary Walls And Gates	High Street, Lochmaben Parish Church Boundary Wall And Gatepiers (St Magdalene's)
Elshieshields Tower And Adjoining House, Walled Garden, And Gatepiers At South	74 High Street And Cannon`S Close
Shortrig Windmill Tower, Horsemill And Steading Ranges	Monigaff Parish Church Graveyard, Heron Monument
Knocknalling Barn	Carnsalloch House
Springkell House	Carnsalloch Chapel At The Mount
Gelston Castle	Drumcoltran Tower, And Adjacent Farmhouse
Kinmount House And Conservatory, With Office Court And Gateways	Dalton Village, Dalton Old Parish Church, Churchyard And Gatepiers
Priorslynn, Cruck-Framed Building	Rusco Tower
Denbie, Dovecot	Ken Bridge
Springkell House	Kildonan House
Old Bridge Of Dee	Remains Of Former Church
Ellisland Farmhouse And Steading	66 (Wynd End) W. Side Of Close, 68 E. Side Of Close And 70 High Street
Grennan Mill	Penkill Castle
Buittle Old Church	St Michael's Street, St Michael's Church
St Michael's Street, St Michael's Churchyard	56 High Street, Globe Inn

Grade A Listed Building	
Burns' Mausoleum	
Whitesands, Devorgilla Bridge	14-24 Castle Street (Even Numbers)
5, 7, 9, 11 Bank Street	41, 43, 45, 47 Castle Street
24 Burns Street, Robert Burns' House	New Market Street Castle Douglas Cattle Mart
5, 7, 9 High Street ("Old Academy")	Tinwald House Farm Steading (Original 2-Storey L-Plan Block Only)
Goldielea Viaduct	Garlies Castle
Tongland, Old Tongland Bridge	Corsock House, Gates And Gatepiers
Moniaive Village Kilneiss House	Spedlins Tower
Old Windmill, Mill Hill	Crichton Royal Hospital Crichton Hall
Auldgirth Bridge	Greenlaw House
Denbie House	Hensol House
26, 28, 30 Castle Street	High Street, Tolbooth, Market Cross And Well
Annan Bridge (A75 Over River Annan)	Abbey Lane, Lincluden Collegiate Church
Challoch, All Saints Episcopal Church With Boundary Walls And Gatepiers	Shennanton House
Amisfield Tower	Fourmerkland Tower
Millhouse Bridge Village, Millhouse Bridge	Elshieshields Tower And Adjoining House, Walled Garden, And Gatepiers At South
Gilnockie Bridge (A7 Over River Esk)	Halleaths Former Stables (Houses And Sseb Stores And Workshops)
Ironmacannie Mill	The Crichton, Crichton Farm
Kirkpatrick Fleming Parish Churchyard, Graham Of Mossknowe Burial Enclosure	

Table A2.6: Grade I and II* Listed Buildings

Grade I And Ii* Listed Building	
Church Of St Andrew	Kirkandrews Tower
Brackenhill Tower	Netherby Hall
Church Of St Michael	Coop House North West Of Netherby Hall
Churchyard Cross West Of Church Of St Michael	Churchyard Cross, South Of Church Of St Mary
Church Of St Mary	Riddings Junction Viaduct

Grade I And Ii* Listed Building	
Castletown	Scaleby Castle
Brunstock House	Church Of St Cuthbert
Drawdykes Castle	Church Of St Kentigern
Linstock Castle	

Nature Conservation Designations

Table A2.7 lists all of the Ramsar, Special Protection Areas (SPA) and Special Areas of Conservation (SAC) sites designated for nature conservation interest which fall within the study area. **Tables A2.8** and **A2.9** list the National Nature Reserves and the Sites of Special Scientific Interest which are within the study area.

Table A2.7: Ramsar, SPA and SAC Sites within the Study Area

Type of Designation	Name of Site	Qualifying Feature
RAMSAR	Silver Flowe	Bogs (Upland): Blanket Bog
RAMSAR	Castle Loch, Lochmaben	Birds – aggregations of non-breeding birds Pink-footed goose
RAMSAR	Loch Ken and River Dee Marshes	Birds – aggregations of non-breeding birds Greenland white-fronted goose Greylag goose
RAMSAR	Upper Solway Flats and Marshes	Birds – aggregations of non-breeding birds Svalbard Barnacle goose Bar-tailed godwit Knot Pink-footed goose Scaup Oystercatcher Curlew Pintail
RAMSAR	Loch of Inch and Torrs Warren	Birds – aggregations of non-breeding birds Greenland white-fronted goose Supralittoral sediment (Coast): sand dune
SPA	Castle Loch, Lochmaben	Birds – aggregations of non-breeding birds Pink-footed goose
SPA	Glen App and Galloway Moors	Birds – aggregations of non-breeding birds Hen harrier
SPA	Loch Ken and River Dee Marshes	Birds – aggregations of non-breeding birds Greenland white-fronted goose Greylag goose
SPA	Upper Solway Flats and Marshes	Birds – aggregations of non-breeding birds • Knot

Type of Designation	Name of Site	Qualifying Feature
		• Whooper Swan • Ringed Plover • Waterfowl assemblage • Bar-tailed godwit • Dunlin • Great crested grebe • Pink-footed goose • Ringed plover • Svalbard Barnacle goose • Golden plover • Grey plover • Oystercatcher • Scaup • Cormorant • Curlew • Goldeneye • Lapwing • Mallard • Pintail • Redshank • Shelduck
SPA	Loch of Inch and Torrs Warren	Birds – aggregations of non-breeding birds • Hen harrier • Greenland white-fronted goose
SPA	North Pennine Moors	Birds – breeding: • Golden plover • Hen harrier • Merlin • Curlew • Dunlin
SAC	Bolton Fell Moss	Degraded raised bogs still capable of natural regeneration
SAC	River Eden & Tributaries	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) White-clawed crayfish Fish: Sea lamprey, brook lamprey, river lamprey, Atlantic salmon, Bullhead Mammals: otter
SAC	Carsegowan Moss	Bogs (Wetland): Active raised bog and degraded raise bog

Type of Designation	Name of Site	Qualifying Feature
SAC	Galloway Oakwoods	Broad-leaved, mixed and yew woodland: Western acidic woodland
SAC	Flow of Dergoals	Bogs (Upland): Depressions on peat substrates and blanket bog
SAC	Kilhern Moss	Bogs (Upland): Depressions on peat substrates and blanket bog
SAC	Kirkcowan Flow	Bogs (Upland): Depressions on peat substrates and blanket bog
SAC	Lendalfoot Hills Complex	Calcareous grassland (Upland): Species-rich grassland with mat-grass in upland areas Dwarf shrub heath (Upland): Dry heaths and wet heathland with cross-leaved heath Fen, marsh and swamp (Upland): Very wet mires often identified by unstable 'quaking' surface and base-rich fens Inland rock: Grasslands on soils rich in heavy metals
SAC	Merrick Kells	Bogs (Upland): Blanket bog, depressions on peat substrates Dwarf shrub heath (Upland): Dry heaths and wet heathland with cross-leaved heath Inland rock: Acidic scree and plants in crevices on acid rocks Mammals: Otter Montane habitats: Montane acid grasslands Standing open water and canals: Acid peat-stained lakes and ponds, and clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels
SAC	Mochrum Lochs	Bogs (Upland): Depressions on peat substrates and blanket bog
SAC	Solway Mosses North	Bogs(Wetland): Active raised bog and degraded raised bog
SAC	Solway Firth	Fish: River lamprey and Sea lamprey Inshore sublittoral rock (Marine): Reefs and subtidal banks Littoral sediment (Coast): Atlantic salt meadows, and Glasswort and other annuals colonising mud and sand
SAC	Raeburn Flow	Bogs(Wetland): Active raised bog and degraded raised bog

Type of Designation	Name of Site	Qualifying Feature
SAC	River Bladnoch	Fish: Atlantic salmon
SAC	Walton Moss	Active raised bogs Degraded raised bogs still capable of natural regeneration

Table A2.8: National Nature Reserves within the Study Area

National Nature Reserves (NNR)	
Kirkconnell Flow NNR	Silver Flowe NNR
Cairnsmore of Fleet NNR	Walton Moss NNR

Table A2.9: Sites of Special Scientific Interest within the Study Area

Sites of Special Scientific Interest (SSSI)	
Scaleby Moss	Kilhern Moss
Penton Linns	Kenmure Holms
River Eden & Tributaries	Kirkconnell Flow
White Moss, Crosbymoor	Kirkcowan Flow
Bolton Fell Moss	Knockdaw Hill
Lyne Woods	Knockdolian Hill
Jockie's Syke	Laughenghie and Airie Hills
Black Snib	Lea Larks
Airds of Kells Wood	Littleton and Balhamie Hills
Aldons Hill	Loch Doon
Ballantrae Shingle Beach	Lochmaben Lochs
Blood Moss	Longbridge Muir
Bell's Flow	Locharbriggs Quarry
Bennane Head Grasslands	Merrick Kells
Bigholms Burn	Lower River Cree

Sites of Special Scientific Interest (SSSI)	
Black Loch	Millenderdale
Byne Hill	Milton Loch
Cairnbaber	Mochrum Lochs
Cairnsmore of Fleet	Penwhapple Burn
Clatteringshaws Dam Quarry	Ring Moss
Carstramon Wood	Raeburn Flow
Castle Loch	Pinbain Burn to Cairn Hill
Carsegowan Moss	River Dee (Parton to Crossmichael)
Cleugh	Royal Ordnance, Powfoot
Cree Estuary	River Esk, Glencartholm
Cotland Plantation	Sgavoch
Craig Wood	Threave and Carlingwark Loch
Derskelpin Moss	Torrs Moss
Ellergower Moss	Talnotry Mine
Flow of Dergoals	Upper Solway Flats and Marshes
Feoch Meadows	Walton Moss
Girvan to Ballantrae Coast Section	Water of Ken Woods
Glentrool Oakwoods	White Loch – Lochinch
Hannaston Wood	Wood of Cree
Knockormal	Woodhall Loch
Lag Meadow	Penton Linns
Laggan Burn	Glen App and Galloway Moors

Appendix 3: Appraisal of Landscape Capacity to Accommodate Overhead Lines and Substations

Methodology

Landscape capacity[29] is assessed with reference to the existing landscape characteristics and attributes of the landscape. Accordingly, the SNH suite of Landscape Character Assessments (LCA) for Dumfries and Galloway (Report No. 94, Land Use Consultants 1998) and Ayrshire (Report No. 111, Land Use Consultants 1998) together with the Cumbria Landscape Character Guidance and Toolkit (Cumbria County Council, 2011) and The Solway Coast Area of Outstanding Natural Beauty (AONB) Landscape and Seascape Character Assessment (LUC for the Solway Coast AONB Partnership, 2010) have been used as the starting point in determining landscape capacity across the study area. Each Landscape Character Type (LCT) which is potentially affected by a corridor or substation siting area option has been evaluated (on its susceptibility to being changed by overhead line or substation infrastructure of the type proposed) and categorised as having higher, medium or lower landscape capacity to accommodate high voltage overhead lines or the relevant substation design option. The application of professional judgement in the use of SNH LCA also draws on the principles set out in the Holford Rules and Horlock Rules.

Indicators of the relative levels of landscape capacity to accommodate overhead line development and substation infrastructure are shown in the table below.

Indicators of Landscape Capacity

Capacity	Definition
Higher	Landscape character, existing land use, pattern, scale and attributes are robust and tolerant of the change resulting from high voltage overhead lines and/or substation infrastructure. The change could be accommodated without geographically extensive and/ or significant adverse effects (or loss of) key perceptual, physical or aesthetic characteristics.
Medium	Landscape character, existing land use, pattern, scale and attributes able to accommodate some landscape change resulting from high voltage overhead lines and/or substation infrastructure.
Lower	Landscape character, existing land use, pattern, scale and attributes are vulnerable to being changed or lost resulting from the introduction of high voltage overhead lines and/or substation infrastructure. Key perceptual, physical and aesthetic characteristics are vulnerable to change or loss.

For each LCT, the key characteristics are analysed to inform an overall judgement on the LCT's capacity to accommodate high voltage overhead lines and/or substation infrastructure. The following table outlines the rationale for determining landscape capacity in relation to key landscape characteristics:

[29] 'Capacity' in this document means: the (relative) ability of the landscape to accommodate an overhead line.

Characteristics influencing Landscape Capacity

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

Characteristic	Characteristics indicating a higher capacity to accommodate overhead lines and/or substation infrastructure	Characteristics indicating a lower capacity to accommodate overhead lines and/or substation infrastructure
Time depth	• Landscapes which, through human influence, have experienced greater change at a faster pace of evolution (and which look likely to continue in this way)	• Landscapes which are more static, evolving at a slower pace (and which look likely to continue in this way)

In determining landscape capacity, professional judgement is applied alongside an understanding of how the proposed development would affect, or fit in with the landscape, and the degree to which potentially adverse effects could be reduced. This enables a judgement to be made on the landscape capacity of each LCT, which is presented graphically on a series of maps using GIS, and supported by written observations on the key landscape characteristics.

Findings: Route Corridors

The following table presents LUC's appraisal of the landscape's relative capacity to accommodate overhead line development with reference to the Landscape Character Types through which a corridor passes. Reference has also been made to the assessed sensitivity[30] of each LCT from the following reports:

- *Ayrshire Landscape Assessment* (SNH Report No. 111, prepared by LUC, 1998)[i];
- *South Ayrshire Landscape Wind Capacity Study – Main Report* (Carol Anderson Landscape Associates, 2013)[ii];
- *Dumfries and Galloway Landscape Assessment* (SNH Report No. 94, prepared by LUC, 1998)[iii];
- *Dumfries and Galloway Wind farm Landscape Capacity Study – Main Report* (Carol Anderson in association with Alison Grant, Landscape Architects, 2011)[iv];
- *Cumbria Landscape Character Guidance* and Toolkit (Cumbria County Council, 2011)[v];
- *The Solway Coast Area of Outstanding Natural Beauty (AONB) Landscape and Seascape Character Assessment* (LUC for the Solway Coast AONB Partnership, 2010)[vi];
- *Cumbria Wind Energy Supplementary Planning Document, Part 2 Landscape and Visual Considerations* (Coats Associates, 2006)[vii]; and
- *Cumbria County Council Cumulative Impacts of Vertical Infrastructure* (Cumbria County Council, 2014)[viii].

[30] 'Sensitivity' is defined here in accordance with the first component only of Paragraph 3.24 of GLVIA 3 namely: "..the susceptibility of the receptor to the type of change arising from the specific proposal"...

Landscape Character Type (LCT)	Landscape sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[1]	Landscape sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2013)[2]	LUC appraisal: Landscape capacity to accommodate overhead line development
LCT within Ayrshire			
LCT M: Intimate Pastoral Valleys	*'Medium to small scale valleys with steep slopes but relatively flat valley bottoms';* *'Assess any proposals for aerials, masts or other tall structures in terms of their visual and landscape impacts on the small scale nature of the valley landscapes';* *'Encourage any wind power developments to locate away from valley sides';* *'Underground cable solutions should be considered in preference to pylon lines'.* (Para 5.146, Page 154)	Character Type 13[31]: Intimate Pastoral Valleys *'**High-medium** sensitivity in relation to small-medium typology turbines (30–50m).'* (Para 13.2, Page 56)	The intimate scale of the flat bottomed valleys with steep slopes, small scale pattern of fields and broadleaf woodland, and settled nature indicate a **lower** capacity for overhead line development.
LCT N: Upland Glen	*'Glen Tig is particularly remote in character, accessible only on foot though it can be seen from minor roads'. While retaining a 'wild' upland character, it is also quite intimate in scale.'* (Para 5.149, Page 158) *'The intimate scale and distinctive largely undeveloped upland character means that tall structures located either within or visible from these glens would have significant influence on landscape character. They should, therefore, be discouraged.'* (Para 5.155, Page 160)	Character Type 14: Upland Glens *'**High** sensitivity to the Large, Medium and Small-medium typologies (turbines >30m).'* (Para 14.2, Page 61)	These deep U-shaped valleys, with a simple pattern of landcover (rough grassland above improved pasture) and sparse settlement pattern indicate a higher capacity for overhead line development. However the *'wild'* upland character and *'intimate scale'* found in some areas of the LCT somewhat lower this. This LCT is judged to have **medium** capacity to accommodate overhead line development.
LCT R: Plateau Moorland	*'The expansive nature of this landscape*	n/a	This large scale landscape with simple

[31] LCT referencing system differs to that within 1998 Ayrshire Landscape Assessment which uses a lettering system.

Landscape Character Type (LCT)	Landscape sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[1]	Landscape sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2013)[2]	LUC appraisal: Landscape capacity to accommodate overhead line development
	would make any development within it highly visible. The Plateau Moorlands are generally free from masts and other tall structures, but where they do occur (even outside the study area) they can have quite a wide impact.' (Para 5.195, Page 182) *'Assess any proposals for aerials or masts in terms of their visual impact on the landscape';* *'Underground cable solutions should be considered in preference to pylon lines'.* (Para 5.204, Page 186).		landscape pattern (grass moorland), existing presence of tall structures (wind turbines) and sparsely settled nature, indicate a **higher** capacity for overhead line development.
LCT R(b): Plateau Moorland with Forest	*'There is a general lack of elevation which allows the forests to create dark horizons.'* *'The landscape has an exposed and remote character, although enclosure within the forests can be well defined.'* (Para 5.196, Page 182) *'Assess any proposals for aerials or masts in terms of their visual impact on the landscape';* *'Underground cable solutions should be considered in preference to pylon lines'.* (Para 5.195, Page 186).	Character Type 18c: Plateau Moorlands with Forestry and Wind Farms Note: small-medium wind turbine typology not considered for this landscape type.	Large scale landscape, simple landscape pattern (blanket of coniferous woodland), existing presence of tall structures (wind turbines) and sparsely settled nature, indicate a **higher** capacity for overhead development. Coniferous woodland offers opportunities for backclothing and screening vertical and linear development if long straight visually intrusive corridors and wind throw can be avoided.
LCT T: Southern Uplands	*'Modern settlement is absent from these exposed uplands, being concentrated in river valleys and the larger glens.'* (Para 5.223, Page 196) *'medium scale wind power development*	Character Type 20b: Southern Uplands *'There would be a **High** sensitivity to the large and medium typologies (turbines >50m).'* (Para 21.2, Page 32) *'The small-medium typology (30-50m)*	This large scale landscape, with its smooth dome shaped hills, simple land cover (mainly coarse grassland), existing presence of tall structures (wind turbines) and sparsely populated nature, indicate a **higher** capacity for overhead line

Landscape Character Type (LCT)	Landscape sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[1]	Landscape sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2013)[2]	LUC appraisal: Landscape capacity to accommodate overhead line development
	may be suitable in areas where landform can minimise intrusion and away from key skylines.' *'encourage any wind power developments to locate away from key skylines and valleys;'* *'potential siting of wind towers should attempt to use adjacent forested landscapes top aid screening and backclothing;'* (Para 5.228, Page 199).	*would have similar adverse effects on landform, visual amenity and cumulative effects as larger typologies (turbines >50m).'* (Para 21.2.1, Page 32)	development.
LCT T(b): Southern Uplands with Forest	*'discourage development in the upland landscape;'* *'medium scale wind power development may be suitable in areas where landform can minimise intrusion and away from key skylines.'* *'encourage any wind power developments to locate away from key skylines and valleys;'* *'potential siting of wind towers should attempt to use adjacent forested landscapes to aid screening and backclothing;'* (Para 5.228, Page 199).	The LCT is not covered within the capacity study.	This large scale landscape, with its smooth dome shaped hills, simple land cover (coniferous woodland), existing presence of tall structures (wind turbines) and sparsely populated nature, indicate a **higher** capacity for overhead line development. Coniferous woodland offers opportunities for backclothing and screening vertical and linear development if long straight visually intrusive corridors and wind throw can be avoided.

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development
LCT within Dumfries and Galloway			
LCT 2: Coastal Flats	In relation to wind farms, the assessment states: *'Flat or gently undulating nature of this landscape makes it very prone to visual obstruction by vertical structures.' (Page 94)*	Type 2: Coastal Flats Wigtown, Cree/Fleet Fringe, Nith Coastal Fringe and Inner Solway units: *'...overall **High-medium** sensitivity to the small-medium typology (20-50m)'.* (Page 39)	Simple skylines, large scale long distance views across coastal flats and presence of existing overhead lines would indicate a higher capacity for overhead line development. However, 'susceptibility to visual obstruction' and limited opportunities for screening indicate **lower** capacity to overhead line development.
LCT 4: Narrow Wooded Valley	In relation to wind farms, the assessment states: '*Highly intrusive in confined sylvan landscape.'* (Page 69)	Type 4: Narrow Wooded River Valleys *'There would be a **High-medium** sensitivity to the small/medium typology (20–50m).'* (Page 46)	Narrow incised valley, intimate unspoilt nature and dominant broadleaf woodland cover indicate a **lower** capacity for overhead line development.
LCT 5: Intimate Pastoral Valley	In relation to wind farms, the assessment states: '*Highly intrusive in intimate, settled landscape.*' (Page 69)	Type 5: Intimate Pastoral Valley *'There would be a **High-medium** sensitivity to the small-medium typology (20–50m)'.* (Page 50)	Intimate scale flat bottomed valleys with steep slopes, small scale pattern of fields and broadleaf woodland and settled nature indicate a **lower** capacity for overhead line development.
LCT 6: Lower Dale	In relation to wind farms, the assessment states: '*Highly intrusive and obtrusive in open densely developed landscape, extensive visual impact from adjacent landscape types.*' (Page 69)	Type 6: Lower Dale *'the openness and more expansive scale of the broader parts of the dales, as well as those areas which are more industrial in character, offer some opportunity to site the small-medium typology, and the Lower and Middle dales are therefore of a **Medium** sensitivity to*	Large scale, wide, flat and gently undulating sections of major valleys, some industrialised areas, views determined by tree lines and shelter belts indicate a higher capacity to overhead line development. However, this landscape is densely populated. This LCT is judged to have **medium** capacity

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development
		the small-medium typology (20–50m).' (Page 53)	to accommodate overhead line development.
LCT 7: Middle Dale	*'Despite locally diverse topography and some potential for backclothing, this landscape is settled, partially intimate and contains a wealth of cultural heritage. Wind farms would therefore be intrusive within the dale and obtrusive from elevated points in surrounding landscape types.'* (Page 69)	Type 7: Middle Dale *'the openness and more expansive scale of the broader parts of the dales, as well as those areas which are more industrial in character, offer some opportunity to site the small-medium typology, and the Lower and Middle dales are therefore of a* ***Medium*** *sensitivity to the small-medium typology (20–50m).'* (Page 53)	Broad valley with undulating topography, extensive pattern of shelterbelts and simple pattern of landcover (mainly improved pasture) indicate a higher capacity for overhead line development. However, there are numerous settlements and isolated farmsteads. Overall, this LCT is judged to have **medium** capacity to accommodate overhead line development.
LCT 8: Flooded Valley	In relation to wind farms, the assessment states; '*This landscape is particularly scenic as recognised by its designation as a regional scenic area (Loch Ken). It is well used for recreation and highly accessible.*' (Page 69)	Type 8: Flooded Valley *'The overall low relief of the valley, the sensitivity of the loch, the small scale and complexity of the landforms and the adjacent drumlin pasture character results in a* ***High-medium*** *sensitivity to the small-medium typology (20–50m).'* (Page 60)	Shallow V shaped valley with narrow valley floor, complex glacially shaped terrain, diverse landscape pattern including dominance of the loch indicate a **lower** capacity for overhead line development.
LCT 9: Upper Dale	*'The development of wind turbines within the Upper Dale landscapes could be both intrusive and obtrusive unless local topographic variations could provide a backclothing from main viewpoints avoiding skyline silhouettes and disruption of long views down the valley.'* (Page 71)	Type 9: Upper Dales *'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).'* (Page 64)	Wide V shaped valley enclosed by high peaks and moorland which offer backclothing opportunities indicates a higher capacity for overhead line development. However, the open nature allows long views down the valley. Overall, this LCT is judged to have **medium** capacity to accommodate overhead line development.

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development
LCT 10: Upland Glens	*'The topography and special 'wild land' characteristics of these glens are such that any vertical development would appear highly intrusive within this confined landscape. Wind farms would be detrimental to the landscape character and are therefore not desirable.'* (Page 138)	Type 10: Upland Glens *'The narrowness of some of the valleys, the sensitivity of the encircling ridgelines and the sculptural shape of some of the higher landforms also results in a* ***High-medium*** *sensitivity to the small/medium typology (20–50m).'* (Page 68)	Deep U shaped valley, simple pattern of landcover (rough grassland above improved pasture) and sparse settlement pattern indicate a higher capacity for overhead line development. However, wild land characteristics somewhat lower this. Overall, this LCT is judged to have **medium** capacity to accommodate overhead line development.
LCT 12: Drumlin Pasture in Moss and Moor Lowland	*'The isolated nature and scale of the drumlins would not allow the integration of wind turbines without causing significant visual impact and incongruity within the landscape.'* (Page 69)	Type 12: Drumlin Pasture in Moss and Moor Lowland *'The small scale of the landform and the pattern of land cover and settlement, as well as the sensitivity of the smooth rhythm of the drumlin tops also results in a* ***Medium*** *sensitivity to the small-medium typology (20–50m).'* (Page 75)	Generally flat landscape, with settlement pattern of isolated farmstead indicates a higher capacity for overhead line development. However, contrasting landscape pattern and scale of prominent drumlin features lowers this areas capacity. Overall, this LCT is judged to have **medium** capacity to accommodate overhead line development.
LCT 13: Drumlin Pastures	*'The integrity of the landform is essential to the landscape character of drumlin pastures. Any development that would disrupt this unity would therefore be detrimental to the landscape character.'* (Page 70)	Type 13: Drumlin Pastures *'The small scale of the landform and the pattern of land cover and settlement, as well as the sensitivity of the smooth rhythm of the drumlin tops also results in a* ***High-medium*** *sensitivity to the small-medium typology. (20–50m).'* (Page 79)	Distinctive and undulating landscape with smooth convex drumlins; pattern of improved pasture and copses of deciduous woodland; and settled nature indicate a **medium** capacity for overhead line development.
LCT 14: Coastal Plateau	*'The flat and open nature of this landscape makes any vertical development highly visible from adjoining areas.'* (Page 152)	Type 14: Coastal Plateau *'The well-settled nature of these landscapes increases sensitivity to larger typologies in general while additional sensitivities are also*	Simple skylines, flat/ gently rolling topography and simple landscape pattern (predominantly improved pasture) indicate a higher capacity for overhead line

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development
		associated with the more natural mosses, coastal edge and woodlands and also the presence of existing wind farm development in the nearby 'Annandale' Foothills (18).' *'there is an overall **Medium** sensitivity to the small-medium typology (20–50m).'* (Page 83)	development. However, open nature allowing long views and evenly dispersed pattern of properties lowers this areas capacity. Overall this LCT is judged to have **medium** capacity to accommodate overhead line development.
LCT 15: Flow Plateau	*'The flat and elevated nature of this landscape can make vertical structures very obtrusive with few opportunities for screening. However, this land is largely uninhabited with a moorland hinterland making it more suitable for some limited wind power development.'* (Page 155)	Type 15: Flow Plateau *'The well-settled nature of these landscapes increases sensitivity to larger typologies in general while additional sensitivities are also associated with the more natural mosses, coastal edge and woodlands and also the presence of existing wind farm development in the nearby 'Annandale' Foothills (18).'* *'there is an overall **Medium** sensitivity to the small-medium typology (20–50m).'* (Page 83)	Characteristics very similar to LCT 14: Coastal Plateau however, Flow Plateau is also very marshy. Overall, this LCT is judged to have **medium** capacity to accommodate overhead line development.
LCT 16: Upland Fringe	*'There is limited potential for wind farm development in this landscape type due to its high visibility from surrounding settled lowlands. Opportunities for small scale developments may exist above and behind main visual horizons in local depressions where maximum backclothing and screening effect could be gained.'* (Page 158)	Type 16: Upland Fringe Dunscore, Ward Law, Terregles and Torthorwald units: *'These 'stand alone' and relatively low ridges are important in the scenic backdrop they provide to the settled dales and the Nith Estuary. They feature complex interlocking hills and valleys and elongated rolling ridges.'* *'**High-medium** sensitivity to the small-medium Typology (20–50m).'* (Page 87)	Opportunities for backclothing and utilising woodland cover for screening exist. However, this is a transitional landscape which is highly visible from the surrounding settled lowlands. Overall, this LCT is judged to have **medium** capacity to accommodate overhead line development.

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development
		Glentrool, Cairnharrow, Cairn, units: *'Some of the landscape units within the type merge gradually with adjacent larger scale and less settled foothills and plateau moorland landscapes and these 'transitional' areas at the boundary between character types would generally be less sensitive to the small-medium typology with an overall* ***Medium*** *sensitivity assessed for this smaller typology. (20–50m).'* (Page 89)	
LCT 17: Plateau Moorland	*'Plateau landscapes can be technically suited to wind farm development. Their flatness, however, makes any vertical structures very obtrusive in the landscape.'* and *'It should be possible to locate towers in the least accessible parts of the plateau thereby minimising the impact on other landscape types.'* (Page 162)	LCT 17: Plateau Moorland *'The landscape of the Plateau Moorland character type has an overall Medium sensitivity to the large typology and a* ***Medium-low*** *sensitivity to the medium typology, reflecting the greater scope to accommodate the medium typology to minimise impacts on 'wildland' qualities, landmark archaeological features and adjoining landscapes.'* (Page 94)	This large scale landscape with simple landscape pattern (grass moorland) and topography, the existing presence of tall structures (wind turbines) and sparsely settled nature, indicate a **higher** capacity for overhead line development.
LCT 17a: Plateau Moorland with Forest	*'Large scale open areas within forest dominated landscapes may be suited to wind power development, this should depend on inter-visibility with adjacent landscape types which should be minimised.'* (Page 165)	Type 17a: Plateau Moorland with Forest No landscape sensitivity judgement provided for most units in relation to small-medium typology.	Large scale landscape, simple landscape pattern (blanket of coniferous woodland) and sparsely settled nature indicate a **higher** capacity for overhead line development. Coniferous woodland offers opportunities for backclothing and screening vertical and linear development if long straight visually intrusive corridors and wind throw can be avoided.

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development
LCT 18: Foothills	*'In foothills landscape type, `wild land' values and experience can be very important locally and wind towers may compromise this.'* *'The more extensive foothill landscapes are likely to hold greater potential for visual containment within plateaux, depressions and valleys where their influence could be limited within the Foothills landscape type i .e. not perceptible from valley or other lowland areas. Siting below hills and ridges should also seek to achieve maximum backclothing effect from hill roads and isolated settlements / farmsteads.'* (Page 168)	Type 18: Foothills No landscape sensitivity judgement provided for most units in relation to small-medium typology. Annandale unit: (Landscape Sensitivity) *'...would be **Medium** for the small-medium typology (20–50m).'* (Page 119)	Gently undulating land with rounded peaks, simple land cover of semi improved pasture, lower density settlement pattern and somewhat contained nature of views indicate a **higher** capacity for overhead line development. However, routeing should seek to avoid the areas of highest ground to maximise screening and back clothing.
LCT 18a: Foothills With Forest	*'Forested foothills may provide opportunities for topographic screening and backclothing with the added benefits of peripheral tree screens.'* *'The most suitable locations would be in the middle area of these landscapes below ridge lines, in depressions, basins or valleys where their influence on Scottish Uplands and Upland Fringe (and Lowland) landscapes would be minimised.'* (Page 172)	Type 18a: Foothills With Forest Cairnsmore unit: No landscape sensitivity judgement provided for most units in relation to small-medium typology. *'The small/medium typology would have similar effects on the often rugged irregular landform of this landscape unit, the smaller scale of more dramatically contained sections of the glen and on areas of notably mature, naturalistic forest cover. There is scope however to locate this typology on broader open, lower hill slopes where it could relate to the scale of larger enclosed pastures and*	Similar in character to LCT 18: Foothills but with extensive coniferous woodland cover indicating a **higher** capacity for overhead line development. Coniferous woodland offers opportunities for backclothing and screening vertical and linear development if long straight visually intrusive corridors and wind throw can be avoided.

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development
		smaller woodlands.' (Page 124)	
LCT 19: Southern Uplands	*'This landscape type satisfies most of the technical requirements for wind power generation. The scale of relief may also allow wind turbines to be accommodated without significant visual impact.'* *'The general principles for location within this type should be to avoid breaking the skyline, avoid locations which are most visible from the main valleys and their roads, and be sited so as to follow the contours where possible.'* (Page 174)	Type 19: Southern Uplands No landscape sensitivity judgement provided for most units in relation to small-medium typology. *'Small-medium typologies would be likely to have similar adverse effects as larger typologies on dramatic landform, openness, landscape context and wildland qualities. Small typologies would appear trivial in relation to the predominantly large scale of these uplands, especially if sited on ridges and summits.'* (Page 140)	A large scale landscape of smooth dome shaped hills, simple land cover (predominantly grass covered) and sparsely populated nature indicate a **higher** capacity for overhead line development. Coniferous woodland in adjacent landscape character types offer opportunities for backclothing and screening vertical and linear development if located at the periphery of this landscape character type.
LCT 19a: Southern Uplands with Forest	*'The large scale topography of this landscape type should be able to accommodate the scale of wind turbines. This would, however, require siting below ridge and summit lines in positions which provide backclothing from main viewpoints.'* (Page 180)	Type 19a: Southern Uplands with Forest Carsphairn unit: No landscape sensitivity judgement provided for most units in relation to small-medium typology. *'The key characteristics of the Southern Uplands Type with Forest of a predominantly expansive, gently undulating landform and simple extensive commercially managed forest cover reduces sensitivity wind farm development.'* (Page 147). *'Smaller typologies could appear 'trivial' within these large scale landscapes and should be located in association with existing settlement on lower hills at the transition*	Large scale landscape of smooth dome shaped hills, simple land cover (coniferous woodland) and sparsely populated nature indicate a **higher** capacity for overhead line development. Coniferous woodland offers opportunities for backclothing and screening vertical and linear development if long straight visually intrusive corridors and wind throw can be avoided.

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development
		with the Narrow Wooded Valleys (4) and Upland Glens (10).' (Page 148)	
LCT 20: Coastal Granite Uplands	*'Introduction of new wind farms is likely to detract from enjoyment of these unspoilt landscapes and should not generally be accepted.'* (Page 183)	Type 20: Coastal Granite Uplands Dalbeattie Coastal Granite unit: *'The Dalbeattie landscape unit of the Coastal Granite Uplands comprises a large scale upland core of shapely hills covered with forestry and moorland, but also smaller scale, rolling craggy hills often featuring an intricate pattern of small enclosed pastures, scrub and woodlands.'* *'**Medium*** (landscape sensitivity) *for the small-medium typologies (20–50m).'* (Page 153)	Large scale, sparsely populated nature indicates a higher capacity for overhead line development. However, varied landcover and complex topography lower this areas capacity. Overall, this LCT is judged to have **medium** capacity to accommodate overhead line development.
LCT 21: Rugged Granite Uplands	*'The Rugged Granite Uplands are recognised as one of Scotland's most important 'wildland' areas, difficult to access and containing elements of highland drama. The introduction of wind farms (even if technically possible) would be of great detriment to this landscape.'* (Page 187)	Type 21: Rugged Granite Uplands No landscape sensitivity judgement provided for most units in relation to small-medium typology. *'While the scale of this character type could relate to larger wind farm typologies, the complex landform and land cover, the distinctive backdrop these hills provide to more settled, lowland areas and the strong sense of remoteness and naturalness associated with these uplands are key constraints.'* *'Smaller typologies would appear trivial in relation to the predominantly large scale of these uplands. They would also have similar*	Complex topography and wild land characteristics indicate a **lower** capacity for overhead line development.

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development
		effects on complex landform, land cover and on the appreciation of wildland character as larger typologies. Opportunities may exist on the fringes of this character type, on smoother less complex lower hill slopes at the transition with more settled valleys where smaller turbines could relate to existing buildings, providing they did not intrude on key views to the hills.' (Page 156). *'There is no scope for larger typologies and the small-medium typology to be sited within this character type without incurring significant impacts on a number of key characteristics.'* (Page 157)	
LCT 21a: Rugged Granite Upland with Forest	*'The potential for wind power development is extremely limited within this landscape type.* *Opportunities may only exist for small to medium scale developments which can be sited in areas of smoother relief and where they would not influence the character of the adjacent Rugged Granite Uplands type.'* (Page 190)	Type 21a: Rugged Granite Upland with Forest No landscape sensitivity judgement provided for most units in relation to small-medium typology. Merrick and Glentrool unit: *'Smaller typologies would appear trivial in relation to the medium to large scale of more expansive hill slopes and the interior valley of the 'Merrick' unit. They would also have similar effects on occasional areas of complex landform and on the appreciation of wildland character as larger typologies. Opportunities may exist however to associate the small typology with gentler smoother lower hill slopes…'* (Page 159).	Very similar characteristics to LCT 21: Rugged Granite Uplands but with extensive coniferous woodland. Coniferous woodland offers opportunities for backclothing and screening vertical and linear development if long straight visually intrusive corridors and wind throw can be avoided. This LCT is judged to have **medium** capacity to accommodate overhead line development.

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (1998)[iii]	Landscape Sensitivity findings (in relation to wind farms) from Landscape Capacity Study (2011)[iv]	LUC Appraisal – Landscape Capacity to Overhead Line Development
		Cairn Edward unit: *'Smaller typologies would appear trivial in relation to the scale of* *more expansive hill slopes and tops but could relate to the smaller scale of occasional blocks of pasture carved out of the forest or on lower hill slopes close to the Dee valley.'* (Page 161)	

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (2011)[v] and Landscape and Seascape Character Assessment (2010)[vi]	Landscape Capacity findings (in relation to wind farms) from Landscape Capacity Study (2006)[vii] and Cumulative Impacts of Vertical Infrastructure Study (2014)[viii]	LUC Appraisal – Landscape Capacity to Overhead Line Development
LCT within Cumbria			
LCT 1a: Intertidal Flats	*'Development pressures include major infrastructure and energy infrastructure proposals, which can be highly intrusive particularly as the waters-edge naturally attracts attention and is a focal point.'* (Page 29)[v] *'Encourage the deep burial of cables to reduce the need for vertical structures both in this and adjacent seascapes that form the backdrop to this type, especially the Solway Coast and Arnside and Silverdale AONBs, and the Hadrian's Wall buffer zone.'* (Page 30)[v]	***Low capacity*** *'Any type of turbine development would have the potential to impinge on the natural character and strong sense of remoteness, tranquillity and wildness for which this landscape is valued.'* (Page 42)[vii] *'The largely undeveloped horizons, naturalness and tranquillity of the wide open seas and mudflats contribute to its sensitivity;* *Energy infrastructure proposals could have significant effects on natural coastal processes, habitats and the open seascape character.'* (Page 3)[viii] Sensitivity is considered **high** (1a) to small-scale infrastructure (up to 50m)[viii]	The open seascape character, important coastal features and processes, and the highly visible and undeveloped nature of this LCT indicate a **lower** capacity to overhead line development.
LCT 1b: Coastal Marsh	*'Energy infrastructure including tidal, large scale wind and pylons could be considered in the adjacent estuary and bay areas. These could have significant effects on natural coastal processes, habitats and the open seascape character.'* (Page 33)[v]	***Low capacity*** *'Any type of turbine development would have the potential to impinge on the natural character and strong sense of remoteness, tranquillity and wildness for which this landscape is valued.'* (Page 42)[vii] *'The open and undeveloped nature makes them sensitive to development and significant changes to the largely undeveloped horizon;* *Expansive backdrop of the seas and*	The open seascape character, highly visible nature and undeveloped nature indicate a **lower** capacity to overhead line development.

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (2011)[v] and Landscape and Seascape Character Assessment (2010)[vi]	Landscape Capacity findings (in relation to wind farms) from Landscape Capacity Study (2006)[vii] and Cumulative Impacts of Vertical Infrastructure Study (2014)[viii]	LUC Appraisal – Landscape Capacity to Overhead Line Development
		Lakeland and Scottish fells could be sensitive to significant infrastructure development.' (Page 3)[viii] Sensitivity is considered **great** (1b-4) to small-scale infrastructure (up to 50m)[viii]	
LCT 2b: Coastal Mosses	*'The introduction of energy infrastructure and associated tall and vertical structures such as pylons and large scale wind turbines can impact greatly on the character of these expansive open areas. The introduction of pylons with regard to the grid upgrade could act as an incentive to developers looking to site tall structures which could obscure important views.'* (Page 41)[v]	**Low/moderate capacity** *'Potential is limited by the overall moderate/high sensitivity of its variable landscape character, moderate/high to high landscape value of parts recognised by LoCI and Solway Coast AONB designation, rarity of dunes and mosses and strong ecological and historical interests.'* (Page 45)[vii] *'The introduction of energy infrastructure and associated tall and vertical structures such as pylons and large scale wind turbines can impact greatly on the character of these expansive open areas. The introduction of pylons with regard to the grid upgrade could act as an incentive to developers looking to site tall structures which could obscure important views.'* (Page 7)[viii] Sensitivity is considered **moderate** (2b-1) to small-scale infrastructure (up to 50m)[viii]	The open character, sense of remoteness and tranquillity and rich diversity of landcover indicate a **lower** capacity for overhead line development.
LCT 2c: Coastal Plain / LCT E: Coastal Plain	*'Minimise the impact of major developments such as large scale wind energy, roads, pylons, masts*	**Low/moderate capacity**	This is a large scale landscape of predominantly pastoral land cover. The

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (2011)[v] and Landscape and Seascape Character Assessment (2010)[vi]	Landscape Capacity findings (in relation to wind farms) from Landscape Capacity Study (2006)[vii] and Cumulative Impacts of Vertical Infrastructure Study (2014)[viii]	LUC Appraisal – Landscape Capacity to Overhead Line Development
	and infrastructure linked to offshore developments by careful siting to maximise screening from public view and high standards of design and landscape treatment. Open and exposed sites and those that affect key views should be avoided, especially where development would become the dominant feature.' (Page 45)[v] *'Pressures for renewable energy development including onshore and offshore wind farms, tidal energy schemes, electricity grid infrastructure and other large scale development which may change the views from the coastal plains, particularly extension of developed skylines along open and undeveloped land or sea horizons.'* (Page 104)[vi]	As above. *'Energy infrastructure including tidal, large scale wind and pylons could be considered in the adjacent estuary and bay areas. These could have significant effects on the open seascape character.'* (Page 9)[viii] Sensitivity is considered **moderate** (2c-1) to small-scale infrastructure (up to 50m)[viii]	landscape has been altered by major developments such as roads and pylons. Overall this LCT is judged to have **medium** capacity to accommodate overhead line development.
LCT 5b: Low Farmland	*'Energy infrastructure including nuclear and large scale wind energy generation, pylons and substations should be carefully sited and designed to prevent this sub type becoming an energy landscape. Prominent locations should be avoided and appropriate mitigation should be included to minimise adverse effects.'* (Page 74)[v] *'Minimise the impact of infrastructure by careful siting avoiding open valley floors and obstruction of corridor views.* *Large scale wind energy schemes should avoid small enclosed valleys and valley tops where they could appear dominant.'* (Page 107)[vi]	**Moderate capacity** *'This reflects moderate sensitivity overall and moderate value as a largely undesignated landscape.'* (Page 54)[vii] *'Pylons and telegraph poles are generally subtle elements, but pylons can sometimes dominate, especially where there is more than one line of them.'* *Upgrades to the national grid to provide energy security and support new power generation could result in larger pylons and sub stations.'* (Page 21)[viii] Sensitivity is considered **moderate** (5b-1+2) to small-scale infrastructure (up to 50m)[viii]	The undulating topography, intensely farmed landscape, patchy woodland cover and varied settlement pattern indicate a **medium** capacity to overhead line development. This landscape has already been altered by energy infrastructure.

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (2011)[v] and Landscape and Seascape Character Assessment (2010)[vi]	Landscape Capacity findings (in relation to wind farms) from Landscape Capacity Study (2006)[vii] and Cumulative Impacts of Vertical Infrastructure Study (2014)[viii]	LUC Appraisal – Landscape Capacity to Overhead Line Development
LCT 5d: Urban Fringe	*'This is a busy area where modern development dominates the pastoral character. The towns can be seen as progressively encroaching and areas have an air of neglect. The more agricultural areas and parts where woodland and open green spaces remain are important green lungs close to the towns and cities which provide respite from the busy areas and a connection to the wider countryside.'* (Page 80)[v] *Wooded valleys, restored woodland, some semi urbanised woodland, and the intact field patterns of farmland reinforced by hedges and hedgerow trees are sensitive to changes in land management and settlement expansion. Open green spaces and fields close to settlement edges are sensitive to unsympathetic development.'* (Page 80)[v] *'Careful siting of any new development in nonprominent locations.'* (Page 81)[v]	**Moderate capacity** *'This reflects moderate sensitivity overall and moderate value as a largely undesignated landscape.'* (Page 54)[vii] *'Careful siting of any new development in non-prominent locations;* *'wind energy development could be accommodated provided it does not impinge on the site or setting of valued historic features; Greatest potential occurs in the open flatter areas and broad ridge tops where small or, in exceptional circumstances, large turbine groups could relate to the medium to large scale landform without dominating;* *In the more sheltered and enclosed valleys or undulating fringes turbine development would feel over dominant.'* (Page 25)[viii] Sensitivity is considered **slight** (5d) to small-scale infrastructure (up to 50m)[viii]	The presence of energy infrastructure and other built development located within and close to this LCT has an influence on its existing character. Overall, this LCT is judged to have **medium** capacity to accommodate overhead line development.
LCT 8b: Broad Valleys	*'Minimise the impact of infrastructure by careful siting avoiding open valley floors and obstruction of corridor views and relating them to existing development.* *Large scale wind energy schemes should avoid small enclosed valleys and valley tops where they could appear dominant.'* (Page 107)[v]	**Low/moderate capacity** *'Potential is limited by the overall moderate/high sensitivity of the valleys landscape character and because of their moderate/high or high landscape value recognised by LoCI and North Pennines AONB designation, and strong historic and*	This is a medium scale, wide deep valley, mainly of pastoral land cover with pockets of woodland and coniferous plantations which indicate a higher capacity for overhead line development. However, historic settlement pattern and landscape features somewhat lower this

Landscape Character Type (LCT)	Landscape Sensitivity findings (in relation to tall structures, wind farms etc.) from Landscape Character Assessment (2011)[v] and Landscape and Seascape Character Assessment (2010)[vi]	Landscape Capacity findings (in relation to wind farms) from Landscape Capacity Study (2006)[vii] and Cumulative Impacts of Vertical Infrastructure Study (2014)[viii]	LUC Appraisal – Landscape Capacity to Overhead Line Development
		ecological interests and cultural associations.' (Page 63)[vii] *'Road and rail improvements and energy infrastructure such as, large scale wind turbines could erode the rural character and affect adjacent landscapes.* *Potential for visual intrusion and dominance is also a major issue due to the pattern of frequent small scale settlements and concentration of route ways and tourist facilities in the valleys.'* (Page 34)[viii] Sensitivity is considered **moderate** (8b-2) / **high** (8b-3) to small-scale infrastructure (up to 50m)[viii]	areas capacity. Overall, this LCT is judged to have **medium** capacity to accommodate overhead line development.

Findings: Substation Siting Areas

The following table presents LUC's appraisal of the relative capacity of each substation siting area[32] to accommodate substation infrastructure. For each siting area, reference is made to the relevant landscape character type(s). The following documents are referenced in the appraisal:

- *Ayrshire Landscape Assessment* (SNH Report No. 111, prepared by LUC, 1998)[i];
- *South Ayrshire Landscape Wind Capacity Study – Main Report* (Carol Anderson Landscape Associates, 2013)[ii];
- *Dumfries and Galloway Landscape Assessment* (SNH Report No. 94, prepared by LUC, 1998)[iii];
- *Dumfries and Galloway Wind farm Landscape Capacity Study – Main Report* (Carol Anderson in association with Alison Grant, Landscape Architects, 2011)[iv];
- *Cumbria Landscape Character Guidance* and Toolkit (Cumbria County Council, 2011)[v];
- *The Solway Coast Area of Outstanding Natural Beauty (AONB) Landscape and Seascape Character Assessment* (LUC for the Solway Coast AONB Partnership, 2010)[vi];
- *Cumbria Wind Energy Supplementary Planning Document, Part 2 Landscape and Visual Considerations (Coats Associates, 2006)[vii]; and*
- *Cumbria County Council Cumulative Impacts of Vertical Infrastructure* (Cumbria County Council, 2014)[viii].

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
Auchencrosh Substation Search Area			
A 1	LCT R: Plateau Moorland LCT T: Southern Uplands	LCT R: Plateau Moorland (Higher) The Plateau Moorland LCT is judged to have a higher relative capacity to accommodate substation infrastructure due to the large scale and simple landscape pattern (grass moorland), and its sparsely settled nature. *'The expansive nature of this landscape would make any development within it highly visible.'* (Para 5.195, Page 182)[i] LCT T: Southern Uplands (Higher) The Southern Uplands is also a large scale landscape, with simple land cover (coarse grassland), the presence of existing wind farm and transmission network infrastructure, and is	Due to the large scale and simple nature of the Plateau Moorland and Southern Uplands landscape, the lack of settlement and the presence of the existing Auchencrosh substation, this siting area is judged to have a **higher** relative capacity to accommodate substation infrastructure, with opportunities for screening by existing woodland within its north-eastern extent.

[32] Substation Siting Areas are individual broad geographical areas located within the Substation Search Areas – large enough to accommodate each substation design option in a number of locations.

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
		sparsely populated. The LCT is judged to have a higher relative capacity to accommodate substation infrastructure. *'Modern settlement is absent from these exposed uplands, being concentrated in river valleys and the larger glens.'* (Para 5.223, Page 196)[i]	
A 2	LCT R: Plateau Moorland LCT T: Southern Uplands	LCT R: Plateau Moorland (Higher) LCT T: Southern Uplands (Higher)	The large scale and simple landscape of the Plateau Moorland and Southern Uplands landscape which makes up this substation siting area, coupled with the lack of settlement and its location on the edge of the more elevated interior of the Southern Uplands, leads to a **higher** relative capacity to accommodate substation infrastructure, with opportunities for screening by existing woodland within its south-eastern extent.
A 3	LCT N: Upland Glen LCT R: Plateau Moorland LCT R(b): Plateau Moorland with Forest	LCT N: Upland Glen (Medium) The Upland Glen LCT is judged to have medium relative capacity to accommodate substation infrastructure due to the lack of existing modern development within the narrow, steep sided glen, which is often remote in character. *'Glen Tig is particularly remote in character, accessible only on foot though it can be seen from minor roads'. While retaining a 'wild' upland character, it is also quite intimate in scale.'* (Para 5.149, Page 158)[i] *'The intimate scale and distinctive largely undeveloped upland character means that tall structures located either within or visible from these glens would have significant influence on landscape character. They should, therefore, be discouraged.'* (Para 5.155, Page 160)[i] LCT R: Plateau Moorland (Higher)	Opportunities exist to avoid the Upland Glen LCT within this siting area, locating substation infrastructure within the large scale and simple landscape of the Plateau Moorland and Plateau Moorland with Forest which may also offer screening opportunities, despite the likely necessity for removal of coniferous woodland. This siting area is judged to have a **higher** relative capacity overall to accommodate substation infrastructure.

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
		LCT R(b): Plateau Moorland with Forest (Higher) The Plateau Moorland with Forest LCT is judged to have a higher relative capacity to accommodate substation infrastructure due to the large scale, simple landscape pattern (blanket coniferous woodland), presence of existing wind farm and transmission network infrastructure and sparsely settled nature of this LCT. *'There is a general lack of elevation which allows the forests to create dark horizons.'* *'The landscape has an exposed and remote character, although enclosure within the forests can be well defined.'* (Para 5.196, Page 182)[i]	
Newton Stewart Substation Search Area			
NS 1	LCT 4: Narrow Wooded Valley LCT 16: Upland Fringe	LCT 4: Narrow Wooded Valley (Lower) The intimate, small scale landscape of the Narrow Wooded Valley LCT, with narrow incised valleys and broadleaf woodland cover, indicates a lower relative capacity to accommodate substation infrastructure. *'Lush trough-shaped river valleys with pasture/arable floors enclosed by deciduous wooded slopes'* (Page 109)[iii] LCT 16: Upland Fringe (Medium) This LCT represents a transitional landscape between the often wooded foothills and the lower valleys and pastures. Higher, gently rolling pastures with locally uneven topography, minor valleys, ridges and hollows. Landcover is predominantly rough and improved grassland with small scale coniferous plantations which enclose landform. Opportunities for backclothing and utilising woodland cover	The siting area demonstrates rolling pasture of the Upland Fringe which occupies a proportion of the eastern extent of the siting area, with medium capacity for accommodating substation infrastructure. The presence of broadleaf woodland of the Narrow Wood Valley reduces the overall capacity of the siting area. Overall, this siting area is judged to have a **lower** relative capacity to accommodate substation infrastructure.

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
		for screening exist. However, this is a transitional landscape which is highly visible from the surrounding settled lowlands. Overall, the relative capacity of this LCT to accommodate substation infrastructure is judged to be medium. *'Pasture dominates the land cover with a mix of both rough and improved grassland. Small scale coniferous plantations create dark horizons and reinforce the enclosure formed by the landform. Plantations in squared block patterns are typical of this landscape.'* (Page 156)[iii] *'Contrast between wide open areas and more intimate landform'*; *'Panoramic views over valley lowlands'* (Page 157)[iii]	
NS 2	LCT 12: Drumlin Pasture in Moss and Moor Lowland	LCT 12: Drumlin Pasture in Moss and Moor Lowland (Medium) Medium to small scale landscape of gently undulating distinctive drumlin features, with contrasting pasture and moss/moor land cover. Sparsely populated landscape with scattered shelter belts of broadleaf woodland. This relative capacity of this LCT to accommodate substation infrastructure is judged to be medium. *'The land here is essentially flat or gently undulating, with prominent whale-backed drumlins scattered frequently throughout the area.'* (Page 143)[iii]	The distinctive smooth drumlin features associated with the Drumlin Pasture in Moss and Moor Lowland LCT are evident. However, in some locations the simple landcover pattern of improved pasture, with clusters and shelter belts of broadleaf woodland, offers opportunities for the siting of substation sites within the siting which avoids the distinctive drumlin features. This siting area is considered to be of **medium** relative capacity to substation infrastructure.
NS 3	LCT 12: Drumlin Pasture in Moss and Moor Lowland	LCT 12: Drumlin Pasture in Moss and Moor Lowland (Medium)	This siting area encapsulates the area surrounding the existing Newton Stewart substation. The presence of existing transmission network infrastructure, dispersed settlement and built development, coupled with the simple, flat landscape less characteristic of the Drumlin Pasture in Moss and Moor Lowland landscape, and landcover pattern of enclosed pasture and rough grazing indicate this siting area has a **higher** relative capacity to accommodate substation

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
			infrastructure.
NS 4	LCT 12: Drumlin Pasture in Moss and Moor Lowland	LCT 12: Drumlin Pasture in Moss and Moor Lowland (Medium)	Distinctive smooth drumlin features of the Drumlin Pasture in Moss and Moor Lowland LCT evident across some areas of the siting area, which predominantly consists of flat, simple landscape pattern of enclosed pasture and rough grazing, and isolated farmsteads. Shelter belts of deciduous and coniferous woodland are dispersed across the siting area, and offer potential for screening and containment of substation sites. Opportunities exist to avoid sensitive landscape features within the siting area, therefore overall the siting area indicates a **higher** relative capacity to accommodate substation infrastructure.
NS 5	LCT 12: Drumlin Pasture in Moss and Moor Lowland LCT 17a: Plateau Moorland with Forest	LCT 12: Drumlin Pasture in Moss and Moor Lowland (Medium) LCT 17a: Plateau Moorland with Forest (Higher) The Plateau Moorland with Forest LCT is a flat or gently undulating, large scale landscape, with a consistent landcover of coniferous forestry, which is sparsely populated and often remote in nature. The LCT has also been subject to the development of wind farm and transmission network infrastructure in recent times. Overall, the LCT indicates a higher relative capacity to accommodate substation infrastructure. *'Consistent blanket of dark green, super-imposed on plateau moorland'* (Page 164)[iii]	Opportunities exist to avoid the distinctive smooth drumlin features of the Drumlin Pasture in Moss and Moor Lowland LCT which are evident across a proportion of this siting area. The simple landcover pattern of enclosed pasture and dispersed farmsteads, indicate a high capacity. Areas of coniferous forestry exist to the north and west of the siting area and offer opportunities for screening and containment of potential substation sites. Overall, the siting area indicates a **higher** relative capacity to accommodate substation infrastructure.
Glenlee Substation Search Area			
G 1	LCT 9: Upper Dale	LCT 9: Upper Dale (Medium)	G 1 is located within the broad valley floor of the Upper Dale LCT adjacent to the Water of Ken,

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
		Simple broad V shaped valley, with some flat areas across the valley floor. Upland peaks and moorland form the horizons which backdrop this LCT. Improved pasture across the valley floor with rougher grazing and woodland found on the valley sides, and some remnants of industrial activity (e.g. mining). Remote settlements and scattered farmsteads, coupled with the presence of existing substation and transmission network infrastructure indicates that overall, the relative capacity of this LCT to accommodate substation infrastructure is judged to be medium. *'Wide V shaped valley enclosed by high peaks and moorland'* and *'Medium to large scale forestry plantations on the valley sides and extending over horizons from higher ground'* (Page 132)[iii]	where opportunities exist to site substations within the existing pattern of enclosed pasture and broadleaf woodland, with development back clothed against the valley sides. Overall, the siting area is judged to have a **medium** relative capacity to accommodate substation infrastructure.
G 2	LCT 8: Flooded Valley LCT 9: Upper Dale	LCT 8: Flooded Valley (Medium) The Flooded Valley LCT consists of a shallow V shaped valley with narrow valley floor, complex glacially shaped terrain, and diverse landscape pattern including dominance of Loch Ken. Small broadleaf woodlands and shelterbelts are found sporadically across the LCT. Overall, the relative capacity of this LCT to accommodate substation infrastructure is judged to be medium. *'Glacially shaped terrain: drumlins, roche moutonees, rocky ridges and eroded slopes'* (Page 128)[iii] iii LCT 9: Upper Dale (Medium)	This siting area demonstrates the key characteristics of the underlying Flooded Valley and Upper Dale landscapes. Localised complex glacial topography and features may be avoided through strategic siting of substation sites. The presence of broadleaf woodland may offer opportunities for screening and backclothing, while the sparse settled nature of the area lowers its sensitivity. Overall, the siting area is judged to have a **medium** capacity to accommodate substation infrastructure.
G 3	LCT 8: Flooded Valley LCT 13: Drumlin Pastures	LCT 8: Flooded Valley (Medium) LCT 13: Drumlin Pastures (Lower) The distinctive and undulating landscape of the Drumlin Pastures LCT, with smooth convex drumlins; pattern of improved pasture and copses of deciduous woodland; and settled nature indicate a lower relative capacity to	Settlement and scattered properties near to this siting area suggest a lower capacity to accommodate substation infrastructure, however the presence of coniferous and broadleaf woodland blocks within the Flooded Valley LCT and the relatively simple landcover pattern of enclosed pasture and rough grazing offer

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
		accommodate substation infrastructure. *'Medium scale fields with prominent wall and hedgerow patters accentuating topography'* (page 147)[iii] *'The distinctive landforms of this landscape retain a high degree of integrity. The overall strategy should be to conserve this character.'* (Page 148)[iii]	opportunities for siting substations within this siting area. The siting area is judged to have a **medium** capacity to accommodate substation infrastructure.
G 4	LCT 8: Flooded Valley	LCT 8: Flooded Valley (Medium)	The location of the siting area within the lower lying valley bottom and lower slopes of the Flooded Valley landscape avoids the more complex and diverse landscape pattern found elsewhere (i.e. Loch Ken). The presence of shelterbelts and woodland along the river valley offer opportunities to contain potential substation sites. Overall, the siting area is judged to have a **medium** capacity to accommodate substation infrastructure.
G 5	LCT 8: Flooded Valley LCT 18a: Foothills With Forest LCT 21a: Rugged Granite Upland with Forest	LCT 8: Flooded Valley (Medium) LCT 18a: Foothills With Forest (Higher) The Foothills with Forest LCT has gently undulating land with rounded peaks, simple land cover of semi improved pasture, lower density settlement pattern and somewhat contained nature of views. Simple undulating landscape with opportunity for backclothing against woodland indicates a higher relative capacity to accommodate substation infrastructure. *'Dark green blanket of forest covering undulating foothills'* (Page 171)[iii] *'Forested foothills may provide opportunities for topographic screening and backclothing with the added benefits of peripheral tree screens.'* (Page 172)[iii]	Avoiding the more sensitive and prominent areas of the Rugged Granite Uplands LCT, this siting area is judged to possess opportunities to locate substation sites within the less sensitive Foothills with Forestry landscape maximising backclothing and screening opportunities. The siting area is judged to have a **medium** capacity to accommodate substation infrastructure.

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
		LCT 21a: Rugged Granite Upland with Forest (Medium) The complex topography and wild land characteristics of the Rugged Granite Upland with Forest LCT are offset by the presence of coniferous forestry. Overall, the relative capacity of this LCT to accommodate substation infrastructure is judged to be medium. *'dark green Sitka dominated forests on lower slopes of rugged granite uplands, forest cover reflecting the large scale topographic changes beneath'* (Page 189)[iii]	
G 6	LCT 8: Flooded Valley LCT 9: Upper Dale	LCT 8: Flooded Valley (Medium) LCT 9: Upper Dale (Medium)	This small siting area is located alongside the Water of Ken, predominantly within the simple lower lying landscape of the Flooded Valley LCT, and consists of regular shaped enclosed pasture. The siting area is currently undeveloped aside from the existing overhead line infrastructure which crosses the valley east-west and is visible from the surrounding elevated landscapes. Overall, the siting area demonstrates a **medium** capacity to accommodate substation infrastructure.
Dumfries Substation Search Area			
D 1	LCT 6: Lower Dale	LCT 6: Lower Dale (Higher) Large scale, wide, with generally flat or gently undulating sections of major valleys, some industrialised areas, and some open views determined by tree lines and shelter belts. Much of this landscape is covered with improved pasture and arable fields of medium to large scale. *'This is a settled landscape which contains some of the region's most developed areas. It has an extensive network of roads, both*	The simple landform and large scale of the Lower Dale landscape offers opportunities to site substation infrastructure within the existing pattern of large scale improved pasture and arable fields, and the broadleaf woodland blocks and scattered farmsteads dispersed across it. Overall, the siting area is judged to have a **higher** relative capacity to accommodate substation

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
		minor and as part of strategic links.' *'Patterns of medium scale coniferous plantations are common features of the upper slopes and form horizon features from the valley floor.'* (Page 118)[iii] The large scale and simple landform of this landscape, along with presence of existing development indicate a higher relative capacity to accommodate substation infrastructure.	infrastructure.
D 2	LCT 6: Lower Dale LCT 7: Middle Dale LCT 16: Upland Fringe	LCT 6: Lower Dale (Higher) LCT 7: Middle Dale (Higher) Broad valley with undulating topography, extensive pattern of shelterbelts and simple pattern of landcover (mainly improved pasture). Slightly more complex than the Lower Dale with moraine landforms often present in the valley floor. *'Broad valley with complex undulating topography and locally narrow sections'* and *'Extensive pattern of shelterbelts and farm woodlands with semi-natural woodlands on bluff slopes'.* (Page 123)[iii] This gently undulating and broad valley landscape is judged to have a higher relative capacity to accommodate substation infrastructure. LCT 16: Upland Fringe (Medium)	The simple landcover pattern of large scale improved pasture and arable fields across this siting area is typical of the Lower and Middle Dale LCTs and offers opportunities for the siting of substation infrastructure away from farmsteads and isolated properties. The lack of existing broadleaf woodland across this siting area allows open views from the surrounding landscape into this siting area. Overall, the siting area is judged to have a **higher** relative capacity to accommodate substation infrastructure.
D 3	LCT 6: Lower Dale LCT 16: Upland Fringe	LCT 6: Lower Dale (Higher) LCT 16: Upland Fringe (Medium)	This siting area lies to the east of Dumfries within an area typical of the Lowe Dale landscape. Large scale enclosed areas of improved pasture and some arable landcover are adjoined by broadleaf woodland to the west along Lochar Water. The blocks of coniferous plantation and broadleaf woodland of the Upland Fringe landscape offer opportunities for screening and backclothing of

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
			substation infrastructure. Overall, the siting area is judged to have a **higher** relative capacity to accommodate substation infrastructure.
D 4	LCT 2: Coastal Flats LCT 6: Lower Dale	LCT 2: Coastal Flats (Medium) Simple skylines, large scale long distance views across coastal flats and the presence of coniferous plantations and sparse settlement across the Coastal Moss areas are features of this LCT. *'Much of the land is exposed, with long views across coastal flats as they merge into the waters of the Solway.'* (Page 91)[iii] *'Very flat, dominated by coniferous plantations, creating dark green bands on the skyline'* (Page 101)[iii] The relative capacity of this LCT to substation infrastructure is judged to be medium due to the lower lying and simple nature of the landform, and the presence of coniferous plantations which offer opportunities for screening and backclothing. LCT 6: Lower Dale (Higher)	This siting area is typical of the Lower Dale and Coastal Flats landscapes with a simple landcover pattern of improved pasture and coniferous plantations offering opportunities for the siting of substation infrastructure backclothed and screened by existing landscape features, with few scattered farmsteads and isolated properties. Overall, the siting area is judged to have a **higher** relative capacity to accommodate substation infrastructure.
D 5	LCT 2: Coastal Flats LCT 6: Lower Dale LCT 16: Upland Fringe	LCT 2: Coastal Flats (Medium) LCT 6: Lower Dale (Higher) LCT 16: Upland Fringe (Medium)	This siting area exhibits the characteristics of the Lower Dale landscape, with its lower lying and simple landform and pattern of simple landcover (mainly improved pasture) with broadleaf shelterbelts and scattered farmsteads. The presence of large agricultural buildings and existing overhead line infrastructure increases its capacity somewhat. Overall, the siting area is judged to have a **higher** relative capacity to accommodate substation infrastructure.

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
Harker Substation Search Area			
H 1	LCT 2c: Coastal Plain LCT 5b: lower Farmland LCT LCT 5d: Urban Fringe LCT	LCT 2c: Coastal Plain (Medium) The Coastal Plain LCT consists of lower lying, flat and slightly undulating land, with regular patterned pasture and some arable agricultural land use. The LCT is largely devoid of large scale development, however existing transmission line infrastructure is evident across the eastern areas. The relative capacity of this LCT to accommodate substation infrastructure is judged to be medium. *'This area could be affected by an upgrade to the national grid resulting in new pylons. These are needed to support future energy infrastructure and provide a stable and secure energy supply in Cumbria.'* (Page 44)[v] LCT 5b: lower Farmland LCT (Lower) The undulating and rolling topography of the lower Farmland LCT predominantly consists of intensely farmed pasture with areas of woodland, and hedgerow and tree lined field boundaries, and indicates a lower relative capacity to accommodate substation infrastructure. *'Upgrades to the national grid to provide energy security and support new power generation could result in larger pylons and sub stations.'* (Page 73)[v] LCT 5d: Urban Fringe LCT (Lower) The Urban Fringe LCT is found around the northern edge of the settlement of Carlisle where the influence of urban expansion on the surrounding agricultural land is evident, and wooded valleys and intact field patterns of farmland are sensitive to further change and the introduction of built development. *'In Carlisle there is a ring of semi-urbanised lower farmland*	This siting area encircles the existing Harker substation. The lower lying nature of the lower Farmland landscape offers opportunities to contain development, and site infrastructure within the existing land use pattern of enclosed pasture. The presence of existing overhead line transmission infrastructure, industrial estates and the M6 motorway corridor reduce the sensitivity of this siting area. Enclosed pasture fields exist to the north, east and east of the existing Harker substation site and blocks of mixed woodland to the west offer opportunities for screening development within this area. The relative capacity of this siting area to accommodate substation infrastructure is judged to be **higher**.

Siting Area	Landscape Character Type(s) (LCTs)	LUC's Appraisal of Relative Capacity to accommodate Substation Infrastructure, informed by Landscape Character Assessments	LUC's Appraisal of Relative Capacity of Substation Siting Areas to accommodate Substation Infrastructure
		around the city. Large development such as large industrial estates, the racecourse and golf courses sit alongside small modern settlements linked to traditional farmsteads. Large modern agricultural buildings are also common.' (Page 79)[v] Large scale buildings and industrial estates are common and the existing Harker substation is located in this LCT, which indicates a lower relative capacity to accommodate substation infrastructure.	

References

[i] *Ayrshire Landscape Assessment* (SNH Report No. 111, prepared by LUC, 1998).

[ii] *South Ayrshire Landscape Wind Capacity Study – Main Report (Carol Anderson Landscape Associates, 2013).*

[iii] *Dumfries and Galloway Landscape Assessment* (SNH Report No. 94, prepared by LUC, 1998).

[iv] *Dumfries and Galloway Wind farm Landscape Capacity Study – Main Report (Carol Anderson in association with Alison Grant, Landscape Architects, 2011).*

[v] *Cumbria Landscape Character Guidance and Toolkit* (Cumbria County Council, 2011).

[vi] *The Solway Coast Area of Outstanding Natural Beauty (AONB) Landscape and Seascape Character Assessment* (LUC for the Solway Coast AONB Partnership, 2010).

[vii] *Cumbria Wind Energy Supplementary Planning Document, Part 2 Landscape and Visual Considerations* (Coats Associates, 2006).

[viii] *Cumbria County Council Cumulative Impacts of Vertical Infrastructure - Appendix 3: Landscape Character Tables* (Cumbria County Council, 2014).

Appendix 4: Corridor and Substation Appraisal Tables

Substation Siting Area Appraisal: Auchencrosh

CRITERION	Sub-Criteria	Substation Siting Area A 1	Substation Siting Area A 2	Substation Siting Area A 3	Preference
Biodiversity and Geological Conservation	Special Protection Areas (SPA)	A1 includes part of the Glen App and Galloway Moors SPA and the habitat within the non-designated area may be used by hen harrier for foraging[1].	A2 is immediately adjacent to the Glen App and Galloway Moors SPA and some potentially suitable hen harrier foraging habitat exists within the substation siting area.	A3, is not located within the SPA and is beyond the core foraging range of hen harriers breeding within the SPA.	A3 is preferred as it is furthest from the Glenapp and Galloway Moors SPA and SSSI.
Landscape and Visual Amenity	Scenic Area (South Ayrshire) (SA)	Both of these siting areas are located in the SA which cannot be avoided in siting a substation.		The northern extent of this siting area is located partially in the SA, however substation sites may exist within this siting area which could avoid this designated landscape.	A3 is preferred on the basis that there are opportunities to site the substation outwith the SA.
	Landscape Capacity	Due to the large scale and simple nature of the Plateau Moorland and Southern Uplands landscape, the lack of settlement and the presence of the existing Auchencrosh substation, this siting area is judged to have a higher capacity to accommodate substation infrastructure, with opportunities for screening by existing woodland within its north-eastern extent.	The large scale and simple landscape of the Plateau Moorland and Southern Uplands landscape which makes up this substation siting area, coupled with the lack of settlement and its location on the edge of the more elevated interior of the Southern Uplands, leads to a higher capacity to accommodate substation infrastructure, with opportunities for screening by existing woodland within its south-eastern extent.	The Upland Glen Landscape Character Type (LCT) within this siting area could be avoided by locating substation infrastructure within the large scale and simple landscape of the Plateau Moorland and Plateau Moorland with Forest which may also offer screening opportunities, despite the likely necessity for removal of coniferous woodland. This siting area is judged to have a higher capacity overall to accommodate substation infrastructure.	
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes, and Galloway Forest Park.	This siting area is located away from densely settled areas, however a small number of scattered farmsteads and properties are located to the northern extent, which could be avoided through substation siting. The presence of coniferous forestry along the south-western extent of the siting area contain views from the A77, however more open views across the siting area are available from a short section of this road to the north of Auchencrosh Burn.	This siting area is located away from densely settled areas, however a small cluster of properties are located on the A77 at Smyrton Hill to the west, with some affording views east across the siting area. A small number of farmsteads are located to the north-west with potential for views south, south-east across the siting area. Blocks of coniferous forestry within the siting area offer opportunities to screen potential views from these receptors during substation siting.	The siting area is predominantly covered by sparsely populated coniferous forestry and open moorland. A small number of farmsteads are located within the northern extent of the siting area, to the north of Water of Tig. The presence of coniferous forestry across much of the siting area offers potential opportunities to contain views of potential substation sites during substation siting.	
Cultural Heritage	Inventory Gardens and Designed Landscapes (GDL)	Glenapp GDL, is located within 2km of the substation siting area. The GDL comprises principally of woodland/forestry providing a sheltered setting for Glenapp Castle and is therefore unlikely to result in a setting issue.		There are no GDLs within 2km of the substation siting area.	No preference
Flood Risk	1 in 200 year Flood Zones and in 1 in 1000 year Flood Zones	Not applicable.		The siting area includes the 1/200yr flood risk zone of the Water of Tig. However, given the size of the substation siting area, it could be possible to avoid the flood risk zone in siting the substation.	No preference.
Land Use	Woodland	There are 22 ha of woodlands within the substation siting area of which 7ha is Ancient woodland.	There are 55 ha of woodland within the substation siting area of which 9.7ha is Ancient woodland.	There are 272 ha of woodland within the siting area of which 0.8ha is Ancient woodland.	A1 on the basis that it is likely that woodland felling could be avoided.
Preference	Substation Siting Area A3 is preferred as it avoids proximity to the SPA, SSSI and GDL (Holford Rule 1) as well as being located outwith the SA (Holford Rule 2). However, felling of woodland may be required to accommodate the substation (Holford Rule 4 and 5).				

[1] The Glenapp and Galloway Moors also forms a SSSI which is designated for its ornithological interest.

Corridor Appraisal: Auchencrosh – Newton Stewart

** For the purposes of appraisal the corridor is assumed to commence from the most westerly possible point i.e. substation search area A1.

CRITERION	Sub-Criteria	Corridor A/NS 1**	Corridor A/NS 2**	Preference
Approximate Length of Corridor (km)		28	23.5	A/NS 2 is preferred as this is the shorter corridor.
Biodiversity and Geological Conservation	Special Protection Areas (SPA)	The Glen App and Galloway Moors SPA is partially located within the north-western extent of both corridors. The corridors include potential foraging areas for the SPA's qualifying species (hen harrier). However, the SPA and potential hen harrier foraging areas adjacent to the SPA could be avoided during routeing.		A/NS 2 is preferred on the basis that it avoids the RSPB Reserve (Holford Rule 2).
	Special Areas of Conservation (SAC)	Not applicable.	The River Bladnoch SAC is located within this corridor. However, it can be spanned at its widest point and therefore could avoided during routeing.	
	Sites of Special Scientific Interest (SSSI)	The Glen App and Galloway Moors SSSI, designated for its breeding hen harrier population is partially located within both corridors. However, due to the size and geographic location of this SSSI it could be avoided during routeing. Craig Wood SSSI, designated for its upland oak woodland, is located within both corridors. Due to the size and geographic location of this SSSI it could be avoided during routeing.		
	RSPB Reserves	The RSPB Wood of Cree Reserve is located within this corridor which cannot be avoided during routeing.	Not applicable.	
	Ornithological 'sensitive areas'	Not applicable.	The corridor includes part of Loch Ochiltree, which holds nationally important numbers of pink-footed geese in the winter. However, this Loch could be avoided through routeing.	
Landscape and Visual Amenity	Wild Land	The area of Wild Land centred on Merrick is approximately 7km to the north-east at its nearest point.	The area of Wild Land centred on Merrick is approximately 10km to the north-east at its nearest point.	A/NS 2 is preferred as it is located further away from the Wild Land area (Holford Rule 1) and also avoids the Ayrshire SA and Galloway Hills RSA (Holford Rule 2), and LCT with lower and medium capacity to accommodate OHL development. Furthermore, and in terms of visual amenity, much of this corridor passes through sparsely populated areas of coniferous woodland and avoids the Galloway Forest Park and avoids the A714 road and associated longer sections of Heritage Trails.
	Regional Scenic Area (Dumfries and Galloway) (RSA)	This corridor passes through the Galloway Hills RSA (located to the east of the A714) which cannot be avoided during routeing.	This corridor passes through a small area of the south- western fringes of the Galloway Hills RSA, which could be avoided during routeing.	
	Scenic Area (South Ayrshire) (SA)	At its northern extent this corridor passes through the Ayrshire SA which cannot be avoided during routeing.	At its northern extent this corridor passes through the Ayrshire SA which could be avoided during routeing.	
	Landscape Capacity	[2] · Intimate Pastoral Valleys (Lower); · Upland Glen (Medium); · Plateau Moorland (Higher);	· Intimate Pastoral Valleys (Lower); · Upland Glen (Medium); · Plateau Moorland (Higher); and	

[2] Each corridor passes through the following LCTs from west to east (landscape capacity to accommodate OHL development).

CRITERION	Sub-Criteria	Corridor A/NS 1**	Corridor A/NS 2**	Preference
		· Plateau Moorland with Forest (Higher); · Narrow Wooded Valley (Lower); and · Upland Fringe (Medium). Landscapes of lower and medium capacity (Intimate Pastoral Valleys, Upland Glen and Narrow Wooded Valley Landscape Character Type (LCT)) could be avoided through routeing. However, the corridor would have to pass through the medium capacity Upland Fringe LCT.	· Plateau Moorland with Forest (Higher). Landscapes of lower and medium capacity (Intimate Pastoral Valleys and Upland Glen LCT) could be avoided through routeing.	
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes, and Galloway Forest Park.	The corridor crosses the Southern Upland Way (SUW) long distance footpath and a National Cycle Network (NCN) near Glenvernoch Fell. The corridor also follows the alignment of the Burns Heritage and Robert Bruce Trail for a section along the A714. Whilst much of this corridor passes through sparsely populated areas of coniferous forest the eastern end of this corridor follows the alignment of the A714 which has a number of scattered properties and includes the small village of Bargrennan. The settlement of Colmonell is also located within the north-western area of the corridor however; it could be avoided during routeing. The southern extent of the corridor is located within the Galloway Forest Park which cannot be avoided during routeing.	The corridor crosses the SUW long distance footpath near Glenvernoch Fell. A short section on the Burns Heritage and Robert Bruce Trail passes through the eastern extents of this corridor. Much of this corridor passes through sparsely populated areas of coniferous woodland. The settlement of Colmonell is located within the north-western area of the corridor however; it could be avoided during routeing.	
Cultural Heritage	Scheduled Monuments (SM)	There are ten SMs within the corridor and a further 11 within 2km of it which could be avoided during routeing. Within the corridor there are four SMs (particularly prehistoric burial cairns in open farmland areas and medieval Craigneil Castle located south of Colmonell) that may have wide aspects and may form key considerations in relation to potential effects on their settings. Within 2km there are a further five SMs (primarily prehistoric features) which stand in open areas and may have wide aspects and may form key considerations in relation to potential effects on settings.	There are five SMs within the corridor and a further 15 within 2km of it which could be avoided during routeing. Within the corridor there is one SMs (medieval Craigneil Castle) located south of Colmonell that may have wide aspects and is likely to form a key consideration in relation to potential effects on its setting. Within 2km there are a further three SMs (prehistoric monuments) which may have wide aspects and are likely to form key consideration in relation to potential effects on their settings.	On balance the preferred corridor is A/NS2. This is due to the relatively lower number and density of SMs (Holford Rule 1) within the corridor and avoidance of the Coldstream ASA (Holford Rule 2).
	Inventory Gardens and Designed Landscapes (GDL)	The Glenapp Inventory GDL lies within 2km of both corridors.		
	A Listed Buildings	There is one A Listed Building within the corridor which could be avoided during routeing. There are two A Listed Buildings (a wind mill and a castle) within 2km of the corridor that may have extensive aspects and may form a key consideration in relation to potential effects on their settings.	There is one A Listed Building within the corridor which could be avoided during routeing. There are two A Listed Buildings (a wind mill and church) within 2km of the corridor which may have extensive aspects and may form a key consideration in relation to potential effects on their settings.	

CRITERION	Sub-Criteria	Corridor A/NS 1**	Corridor A/NS 2**	Preference
	Conservation Areas (CA)	One CA, Colmonell, lies within the corridor; however this could be avoided during routeing. There are two further CAs within 2km of the corridor, Newton Stewart and Ballantrae.	One CA, Colmonell, lies within the corridor; however this could be avoided during routeing. There is one further CA within 2km of the corridor, Ballantrae.	
	Archaeologically Sensitive Areas (ASA)	The corridor includes one ASA, Coldstream, which encompasses the only known group of good quality early prehistoric monuments in the Cree valley, which survive in an open landscape setting. The ASA cannot be avoided during routeing.	Not applicable.	
Land Use[3]	Woodland	There is 6460 ha (46% of the corridor) of woodland within the corridor, of which approximately 70% is commercial conifer forest. There are 717 ha of Ancient woodlands which are scattered throughout the corridor. It is possible to avoid woodland all together, including Ancient woodland.	There is 8,333 ha (54% of the corridor) of woodland within the corridor, of which approximately 80% is commercial conifer forest. There are 745 ha of Ancient woodland which are scattered throughout the corridor. It may not be possible to avoid woodland all together, other than Ancient woodland.	The preference is corridor A/NS 1 as this has a relatively smaller area of woodland cover and also offers a relatively greater opportunity to reduce woodland felling during the routeing stage.
Preferred Corridor	On balance, corridor A/NS2 is preferred as it has a lower density of SMs in relation to setting (Holford Rule 1) and avoids the ASA (Holford Rule 2) and the RSPB Reserve (Holford Rule 2). A/NS2 is a greater distance from the Wild Land (Holford Rule 1), avoids the Ayrshire SA and Dumfries and Galloway RSA (Holford Rule 2) and is likely to result in fewer effects on visual amenity whilst also providing an opportunity to avoid landscapes with medium and lower capacity to accommodate overhead line development. A/NS2 is also the shortest corridor (Holford Rule 3). However, A/NS2 is likely to result in a greater loss of woodland (Holford Rule 4 and 5).			

[3] Flood Risk has been appraised and was not considered to represent a constraint and therefore has not been included within this appraisal table.

Substation Siting Area Appraisal: Newton Stewart

CRITERION	Sub-Criteria	Substation Siting Area NS 1	Substation Siting Area NS 2	Substation Siting Area NS 3	Substation Siting Area NS 4	Substation Siting Area NS 5	Preference
Landscape and Visual Amenity[4]	Regional Scenic Area (Dumfries and Galloway) (RSA)	This siting area is partly located within the western fringe of the Galloway Hills RSA. However a substation site can be identified which could avoid the designated landscape.	Not applicable.				NS4/NS5 are preferred as they avoid the RSA, and have a higher capacity to accommodate substation in the landscape. The siting areas have relatively less visibility from the settlement of Newton Stewart and offer opportunities for the screening of views from scattered properties during substation siting.
	Landscape Capacity	The siting area demonstrates rolling pasture of the Upland Fringe which occupies a proportion of the eastern extent of the siting area, with medium capacity for accommodating substation infrastructure. The presence of broadleaf woodland of the Narrow Wood Valley reduces the overall capacity of the siting area. However, overall this siting area is judged to have a lower capacity to accommodate substation infrastructure.	The distinctive smooth drumlin features associated with the Drumlin Pasture in Moss and Moor Lowland Landscape Character Type (LCT) are evident. However, in some locations the simple landcover pattern of improved pasture, with clusters and shelter belts of broadleaf woodland, offers opportunities for the siting of substation sites within the siting which avoids the distinctive drumlin features. This siting area is considered to be of medium capacity to substation infrastructure.	This siting area encapsulates the area surrounding the existing Newton Stewart substation. The presence of existing transmission network infrastructure, dispersed settlement and built development, coupled with the simple, flat landscape less characteristic of the Drumlin Pasture in Moss and Moor Lowland landscape, and landcover pattern of enclosed pasture and rough grazing indicate this siting area has a higher capacity to accommodate substation infrastructure.	Distinctive smooth drumlin features of the Drumlin Pasture in Moss and Moor Lowland LCT evident across some areas of the siting area, which predominantly consists of flat, simple landscape pattern of enclosed pasture and rough grazing, and isolated farmsteads. Shelter belts of deciduous and coniferous woodland are dispersed across the siting area, and offer potential for screening and containment of substation sites. Opportunities exist to avoid sensitive landscape features within the siting area, therefore overall the siting area indicates a higher capacity to accommodate substation infrastructure.	Smooth drumlin features of the Drumlin Pasture in Moss and Moor Lowland LCT which are evident across a proportion of this siting area could be avoided. While the simple landcover pattern of enclosed pasture and dispersed farmsteads, indicate a higher capacity. Areas of coniferous forestry exist to the north and west of the siting area and offer opportunities for screening and containment of potential substation sites. Overall the siting area indicates a higher capacity to accommodate substation infrastructure.	
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes, and Galloway Forest Park.	The National Cycle Network (NCN) route 7 passes north-south through this siting area. The siting area is located away from the settlement of Newton Stewart, however a number of scattered farmsteads and properties are located within the siting area with open views across much of the siting area. More distant views towards the	This siting area is located on the northern fringe of the settlement of Newton Stewart, from where views north across the siting area may be possible from some residential properties. Views are possible from the A714 (and associated Burns Heritage and Robert Bruce Trails) to the east and north, and the minor road to the west of the siting area for receptors travelling north and south adjacent to the siting area.	The siting area surrounds the existing Newton Stewart substation, with open views across the siting area available from the A75 and the minor road which dissects the siting area north-south. Views from residential properties adjacent to the siting area and from scattered farmsteads located within the siting area will be possible with little opportunity to screen infrastructure using existing landscape features.	There will be no views of the siting area from the settlement of Newton Stewart. Individual farmsteads and residential properties are scattered along the western and southern boundary of the siting area, with some affording views across the siting area. The siting area is dissected north-south by the	There will be no views of the siting area from the settlement of Newton Stewart. A small number of scattered farmsteads are located within the siting area, which are afforded limited views across parts of the siting area, with wider views contained by blocks of mixed woodland scattered across the siting area. The	

[4] Biodiversity and Geological Conservation has been appraised and was not considered to represent a constraint and therefore has not been included within this appraisal table.

CRITERION	Sub-Criteria	Substation Siting Area NS 1	Substation Siting Area NS 2	Substation Siting Area NS 3	Substation Siting Area NS 4	Substation Siting Area NS 5	Preference
		siting area are possible across the Cree Valley from the A714 to the west.			Old Military Road which offers views across the siting area from several locations. The presence of mixed woodland blocks and local variations in topography offer opportunities to screen views from residential receptors and road users.	siting area is dissected by the B7027 and the Old Military Road where opportunities exist for views across the siting area from some sections of the routes.	
Cultural Heritage	Scheduled Monuments (SM)	One SM, a prehistoric burial cairn lies within 150m from the substation siting area and this may have an extensive aspect particularly to the south overlooking the Cree River valley.	Four SMs lie within 2km of the substation siting area. The majority are sited within the town of Newton Stewart and will therefore have limited intervisibility.	Four SMs lie within 2km of the substation siting area. The majority are sited within the town of Newton Stewart and will therefore have limited intervisibility.	One SM, a medieval motte site lies within 80m of the substation siting area and may have a localised setting that extends into the substation area.	Two SMs lie within 2km of the substation siting area. The burial cairn may have an extensive aspect overlooking the Cree River valley taking in the substation search area. In addition, the medieval moat site may have a localised setting that may extend into the substation area.	There are no preference between NS2/NS3 and NS5.
	A Listed Buildings	There are five A Listed Buildings within 2km of the substation siting area. The majority of these are located in Newton Stewart Conservation Area (CA).	There are six A Listed Buildings within 2km of the substation siting area. The majority of these are located in Newton Stewart CA.	There are four A Listed Buildings within 2km of the substation siting area. The majority of these are located in Newton Stewart CA.	There are four A Listed Buildings within 2km of the substation siting area. The majority of these are located in Newton Stewart CA	There is one A Listed Building within 2km of the substation siting area - a church which lies c.250m away. The building is primarily listed for its complete and fine interior furnishings and is therefore likely to have a localised setting.	
	Conservation Areas	One CA, Newton Stewart, lies within 2km of Substation siting Areas NS 1, 2, 3 and 4.				Not applicable.	
	Archaeologically Sensitive Areas (ASA)	The substation siting area lies within the southern end of Coldstream Burn ASA. The ASA includes the only known group of good quality early prehistoric monuments in the Cree valley which survive in an open landscape setting.	Not applicable.				
Flood Risk	1 in 200 year and 1 in 1000 year Flood Zones	This siting area is located on the eastern valley side of the River Cree. The western part is located within the 1/200 and 1/1000 year flood risk zone of the Cree.	Not applicable.		This siting area is located in the upper catchment of the Challoch Burn and its tributaries dissect the area. A small section of the eastern part of the siting area is within the 1/200yr and 1/	This siting area is located to the west of the River Cree 1/200 yr flood risk zone. The 1 /1000 year flood risk zone of the river extends into the area along a tributary watercourse.	No preference

CRITERION	Sub-Criteria	Substation Siting Area NS 1	Substation Siting Area NS 2	Substation Siting Area NS 3	Substation Siting Area NS 4	Substation Siting Area NS 5	Preference
					1000yr flood risk zones.		
Land Use	Existing and Committed Development	Not applicable.		An area of committed development for business and industry as identified in the Proposed Dumfries and Galloway Local Development Plan is located within the siting area.	Not applicable.		The preference is for substation siting area NS 3 on the basis that there is an allocation for business and & industrial use[5].
	Woodland	There is 14 ha of woodlands within the substation siting area, of which 0.8ha is Ancient woodland. Woodland could be avoided in substation siting.	There is 8ha of woodlands within the substation siting area, of which 0ha is Ancient woodland. Woodland could be avoided in substation siting.	There is 0.2 ha of woodlands within the substation siting area, of which 0ha is Ancient woodland. Woodland could be avoided in substation siting.	There is 18 ha of woodlands within the substation siting area, of which 1.2ha is Ancient woodland. Woodland could be avoided in substation siting.	There is 15 ha of woodlands within the substation siting area, of which 2.18ha is Ancient woodland. Woodland could be avoided in substation siting.	
Preference	NS5 is preferred as it is located outwith the 'trigger for consideration zone' of the Conservation Area (Holford Rule 1) avoids the RSA (Holford Rule 2) and has a relatively higher landscape capacity to accommodate a substation, as well being likely to have less effect on visual amenity.						

[5] Considered to be a positive factor based on the nature of the development proposed.

Corridor Appraisal: Newton Stewart – Glenlee

CRITERION	Sub-Criteria	Corridor NS/G 1	Corridor NS/G 2	Corridor NS/G 3	Corridor NS/G 4	Corridor NS/G 5	Preference
Approximate Length of Corridor (km)		24.5	24.5	27	35.5	39	NS/G 1, NS/G2 or NS/G3.
Biodiversity and Geological Conservation	Special Protection Areas (SPA)	Not applicable.		The corridors are within the 2km 'trigger for consideration' zone of the Loch Ken and River Dee Marshes SPA and in respect of the qualifying species, may include foraging sites and areas where flight activity is relatively high. The 2km 'trigger for consideration zone' for the SPA could be avoided during routeing.		The corridors are within the 2km 'trigger for consideration' zone of the Loch Ken and River Dee Marshes SPA and in respect of the qualifying species, may include foraging sites and areas where flight activity is relatively high. The 2km 'trigger for consideration zone' for the SPA cannot be avoided through routeing.	Corridors NS/G 1 and NS/G 2 as they avoid the Loch Ken and River Dee Marshes Ramsar/SPA/SSSI and wider 'trigger for consideration zones'.
	Sites of Special Scientific Interest (SSSI)	Not applicable.	The Clatteringhaws Dam quarry SSSI is partly located in the northern periphery of the corridor. This area could be avoided through routeing.	Not applicable.	The corridors are partly within the 1km 'trigger for consideration zones' of the Cree Estuary SSSI and Laughenghie and Airie Hills SSSI. Both corridors may include foraging areas or areas of relatively high flight activity (Cree Estuary SSSI) and breeding and foraging areas (Laughenghie and Airie Hills SSSI) in respect of qualifying bird species. However, these 1km 'trigger for consideration zones' could be avoided through routeing.		
Landscape and Visual Amenity	National Scenic Area (NSA)	Not applicable.			Located 1km north of Fleet Valley NSA.		NS/G 1 is preferred as it provides opportunities to avoid the landscapes with lower capacity (Narrow Wooded Valley) and maximise routeing opportunities through the landscapes of higher capacity (Foothills with Forest/ Southern Uplands with Forest). In relation to visual amenity, this corridor maximises routeing opportunities through the most sparsely populated land away from major roads and associated trails. Whilst it is acknowledged that this corridor is in closest proximity to the Wild Land and crosses the Southern Upland Way the existing 132kV OHL has altered the character of the landscape in this corridor which has assimilated to the presence of an OHL.
	Wild Land	The area of Wild Land centred on Merrick is approximately 4km to the north-west at its nearest point.	The area of Wild Land centred on Merrick is approximately 7km to the north-west at its nearest point.	The area of Wild Land centred on Merrick is approximately 7km to the north-west at its nearest point.	Not applicable		
	Regional Scenic Area (RSA)	All corridors pass through the Galloway Hills RSA which cannot be avoided during routeing.					
	Landscape Capacity	• Upland Fringe (Medium); • Narrow Wooded Valley (Lower); • Foothills with Forest (Higher); • Rugged Granite Uplands (Lower) • Southern Uplands with Forest (Higher); • Rugged Granite Uplands with Forest (Medium); and • Foothills with Forest	· Upland Fringe (Medium); · Narrow Wooded Valley (Lower); · Foothills with Forest (Higher); · Southern Uplands with Forest (Higher); · Rugged Granite Uplands with Forest (Medium); and · Foothills with Forest (Higher).	· Upland Fringe (Medium); · Narrow Wooded Valley (Lower); · Foothills with Forest (Higher); · Southern Uplands with Forest (Higher); and · Rugged Granite Uplands with Forest (Medium). The LCT of lower capacity (Narrow Wooded Valley) cannot be avoided during	· Upland Fringe (Medium); · Narrow Wooded Valley (Lower); · Foothills with Forest (Higher); · Narrow Wooded River Valley (Lower); · Foothills with Forest (Higher); · Upland Fringe (Medium); · Narrow Wooded River Valley (Lower): · Foothills (Higher); · Foothills with Forest (Higher);	· Upland Fringe (Medium); · Narrow Wooded Valley (Lower); · Foothills with Forest (Higher); · Narrow Wooded River Valley (Lower); · Foothills with Forest (Higher); · Upland Fringe (Medium); · Narrow Wooded River Valley (Lower): · Foothills (Higher); · Foothills with Forest (Higher); · Narrow Wooded River Valley (Lower);	

CRITERION	Sub-Criteria	Corridor NS/G 1	Corridor NS/G 2	Corridor NS/G 3	Corridor NS/G 4	Corridor NS/G 5	Preference
		(Higher). This corridor follows the alignment of the existing 132kV OHL, which locally increases the capacity of the landscape to accommodate OHL development. Landscapes with lower capacity (Rugged Granite Uplands and Narrow Wooded Valley) could be avoided through routeing.	At its eastern extent the corridor follows the same alignment as the existing 132kV OHL. The Landscape Character Type (LCT) of lower capacity (Narrow Wooded Valley) cannot be avoided during routeing.	routeing.	· Narrow Wooded River Valley (Lower); and · Rugged Granite Upland with Forest (Medium); Three landscapes of lower capacity (Narrow Wooded Valley) cannot be avoided during routeing.	· Rugged Granite Upland with Forest (Medium); and · Flooded Valley (Lower). Four landscapes of lower capacity (three Narrow Wooded Valley and the Flooded Valley) cannot be avoided during routeing.	
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes, and Galloway Forest Park.	The corridor crosses the Southern Upland Way twice (as does the existing 132kV OHL) and crosses a National Cycle Network (NCN). In terms of spread of residential receptors most of the corridor passes through the Galloway Hills, away from the road network through sparsely populated land. The corridor also passes through the Galloway Forest park, which cannot be avoided during routeing.	The corridor crosses an NCN. This corridor also follows the alignment of the A712 (and associated Robert Bruce Trail), a major road linking Newton Stewart to Glenlee. In terms of spread of residential receptors most of the corridor passes through the sparsely populated Galloway Hills. The corridor also passes through the Galloway Forest park, which cannot be avoided during routeing.	The corridor crosses a NCN. The western half of the corridor also follows the alignment of the A712 (and associated Robert Bruce Trail). In terms of spread of residential receptors most of the corridor passes through the sparsely populated Galloway Hills. The corridor also passes through the Galloway Forest park, which cannot be avoided during routeing.	The corridor crosses the Robert Bruce Trail and an NCN twice. In terms of spread of residential receptors the eastern half of the corridor passes through the sparsely populated Galloway Hills. The western half of the corridor passes through more densely populated land, on the lower lying ground south-west of Cairnsmore of Fleet, and includes the settlement of Stronard. The corridor also follows the alignment of the A75 in its western extent. The corridor also passes through the Galloway Forest park, which cannot be avoided during routeing.	The corridor crosses the Robert Bruce Trail and an NCN twice. The corridor crosses the Dumfries and Galloway Tourist Route and there is a recognised viewpoint near Balmaclellan. The western and eastern extents of the corridor are more densely populated (including the settlements of Stronard, and Balmaclellan) and include sections and crossings of major roads (A75, A762 and A712). The corridor also passes through the Galloway Forest park, which cannot be avoided during routeing.	
Cultural Heritage	Scheduled Monuments (SMs)	There are two SMs within the corridor which could be avoided during routeing. One of these SMs, Garlies Castle may have wide aspects and may be a key consideration in relation to effects on its setting.	There is one SM within the corridor which could be avoided during routeing		There are three SMs within the corridor which could be avoided during routeing.		No preference
		There are an additional six SMs within 2km of the corridor. The majority of the SMs are prehistoric cairns or castles which may have wide aspects and are likely to be key	There are an additional nine SMs within 2km of the corridor. The majority of the SMs are prehistoric cairns or castles which may have wide aspects and are likely to be key	There are an additional ten SMs within 2km of the corridor. The majority of the SMs are prehistoric cairns or castles which may have wide aspects and are likely to be	There are an additional nine SMs within 2km of the corridor. The majority of the SMs are prehistoric cairns, castles, stone-circles and mottes which may have wide aspects and are likely to be key consideration in relation to the	There are an additional ten SMs within 2km of the corridor.	

CRITERION	Sub-Criteria	Corridor NS/G 1	Corridor NS/G 2	Corridor NS/G 3	Corridor NS/G 4	Corridor NS/G 5	Preference
		consideration in relation to the effects on their settings, particularly Drumwhirn cairn and Kenmure Castle which stand just outside the corridor boundary.	consideration in relation to the effects on their settings, particularly Garlies Castle, which stands just outside the corridor and which is also an A Listed Building, and Drumwhirn cairn and Kenmure Castle which stand just outside the corridor boundary.	key consideration in relation to the effects on their settings, particularly Garlies Castle (which is also A Listed), Drumwhirn cairn and Kenmure Castle (which is also B Listed) which stand just outside the corridor.	effects on their settings, particularly Garlies Castle Drumwhirn cairn and Kenmure Castle which stand just outside the corridor.		
	A Listed Buildings	There are two A Listed Buildings within the corridor. Two of these A Listed Buildings (Cumloden House (and its associated buildings) and Garlies Castle, which is also scheduled) may have wide aspects and may be a key consideration in relation to effects on their settings. There are an additional five A Listed Buildings within 2kms of the corridor	There is one A Listed Buildings within the corridor. This A Listed Building (Cumloden House (and its associated buildings) may have wide aspects and are likely to be a key consideration in relation to effects on their settings.	There is one A Listed Buildings within the corridor, Cumloden Castle (and its associated buildings) and which may have wide aspects and is likely to be a key consideration in relation to effects on its settings.	There is one A Listed Buildings within these corridors. This building, Cumloden Castle (and its associated buildings) may have wide aspects and is likely to be a key consideration in relation to effects on its settings.	The majority of the SMs are prehistoric cairns, castles, stone-circles and mottes which may have wide aspects and are likely to be key consideration in relation to the effects on their settings, particularly Garlies Castle Drumwhirn cairn and Kenmure Castle which stand just outside the corridor.	
			There are an additional seven within 2kms of the corridor.	There are an additional seven A Listed Buildings within 2kms of the corridor. One of these, Garlies Castle (which is also Scheduled) may have wide aspects is and is likely to be a key consideration in relation to effects on its settings.	There are an additional seven A Listed Buildings within 2km of the corridor. All of these may have wide aspects and may be key considerations in relation to effects on their settings.	There are an additional ten A Listed Buildings within 2km of the corridor. Two of these, Ironmacannie Mill and Barscobe Castle may have wide aspects and are likely to be key considerations in relation to effects on their settings.	
	Conservation Areas (CA)	Not applicable.					
		There are two CAs within 2km of the corridor.			There are three CAs within 2km of the corridor.		
	Archaeologically Sensitive Areas (ASA)	A small part of the southern edge of the ASA is encompassed in the corridor. The ASA could be avoided during routeing.					
Flood Risk	1 in 200 year Flood Zones	Not applicable.				Loch Ken highlighting a 1/200 year flood risk zone is within the corridor and is of an extent which is a 'trigger for consideration' with a minimum span of approximately 550m. This flood risk zone cannot be avoided	Corridor NS/G 1 – NS/G 4 are preferred as they do not contain any 1/200 year flood risk zones which cannot be avoided during routeing.

CRITERION	Sub-Criteria	Corridor NS/G 1	Corridor NS/G 2	Corridor NS/G 3	Corridor NS/G 4	Corridor NS/G 5	Preference
						during routeing.	
Land Use	Woodland	There is 3018.4ha (64% of the corridor) of woodland within the corridor, of which approximately 60% is commercial conifer forest. There are 154 ha of Ancient woodland which are scattered throughout the corridor. It may not be possible to avoid woodland all together, including Ancient woodland.	There is 2543ha (61% of the corridor) of woodland within the corridor, of which approximately 70% is commercial conifer forest. There are 178 ha of Ancient woodland which are scattered throughout the corridor. It may not be possible to avoid woodland all together, including Ancient woodland.	There is 3267ha (70% of the corridor) of woodland within the corridor, of which approximately 65% is commercial conifer forest. There are 216ha of Ancient woodland which are scattered throughout the corridor. It may not be possible to avoid woodland all together, including Ancient woodland.	There is 4725ha (60% of the corridor) of woodland within the corridor, of which approximately 70% is commercial conifer forest. There are 514 ha of Ancient woodland which are scattered throughout the corridor. It may not be possible to avoid woodland all together, including Ancient woodland	There is 4295ha (52% of the corridor) of woodland within the corridor, of which approximately 66% is commercial conifer forest. There are 518 ha of Ancient woodland which are scattered throughout the corridor. It may not be possible to avoid woodland all together, including Ancient woodland	NS/G1 is preferred as it could avoid woodland, including Ancient Woodlands, although felling of woodland cannot be avoided altogether.
Preference	Overall the preferred corridor is NS/G1 on the basis that it avoids the 'trigger for consideration zone' of the Loch Ken and River Dee Marshes Ramsar/SPA/SSSI, provides greater offset from the NSA, and is the shortest corridor (Holford Rule 3). The presence of the existing 132kV OHL within the corridor is also recognised (Note on Holford Rule 1). NS/G1 could avoid landscapes with lower capacity to accommodate an OHL as well as avoiding the more populated areas along main roads in relation to visual amenity. However, as with all the corridors the presence of SMs and LBs may form a consideration at the line routeing stage in relation to setting (Holford Rule 1), the RSA (Holford Rule 2) cannot be avoided and there will be a requirement for felling of woodland (Holford Rule 4 and 5).						

Substation Siting Area Appraisal: Glenlee

CRITERION	Sub-Criteria	Substation Siting Area G 1	Substation Siting Area G 2	Substation Siting Area G 3	Substation Siting Area G 4	Substation Siting Area G 5	Substation Siting Area G 6	Preference
Biodiversity and Geological Conservation	Special Protection Area (SPA)	Not applicable.		This substation siting areas is within the 2km 'trigger for consideration zone' of the Loch Ken and River Dee Marshes SPA, and hence is situated within potential foraging areas or areas of relatively high flight activity by qualifying species.			Not applicable.	Substation siting areas G1, G2 and G6 are preferred as they are outwith the 'trigger for consideration' area of the Loch Ken and River Dee Marshes SPA and avoid the Water of Ken SSSI.
	Site of Special Scientific Interest (SSSI)	Not applicable.			The Water of Ken Woods SSSI is partly located within this siting area. However, this can be avoided at siting.	Not applicable.		
Landscape and Visual Amenity	Regional Scenic Area (RSA)	Siting area is located within the Galloway Hills RSA	Not applicable.	Southern extent of siting area located within the Galloway Hills RSA, which could be avoided.	These siting areas are located within the Galloway Hills RSA.			G 2 / G 3 are preferred on the basis that there are opportunities to site a substation outwith the Galloway Hills RSA. Both siting areas offer opportunities for screening of potential substation sites during substation siting.
	Landscape Capacity	G 1 is located within the broad valley floor of the Upper Dale Landscape Character Type (LCT) adjacent to the Water of Ken, where opportunities exist to site substations within the existing pattern of enclosed pasture and broadleaf woodland, with development back clothed against the valley sides. Overall the siting area is judged to have a medium capacity to accommodate substation infrastructure.	This siting area demonstrates the key characteristics of the underlying Flooded Valley and Upper Dale landscapes. Localised complex glacial topography and features could be avoided through strategic siting of substation sites. The presence of broadleaf woodland may offer opportunities for screening and backclothing, while the sparse settled nature of the area lowers its sensitivity. Overall the siting area is judged to have a medium capacity to accommodate substation infrastructure.	Settlement and scattered properties near to this siting area suggest a lower capacity to accommodate substation infrastructure, however the presence of coniferous and broadleaf woodland blocks within the Flooded Valley LCT and the relatively simple landcover pattern of enclosed pasture and rough grazing offer opportunities for siting substations within this siting area. The siting area is judged to have a medium capacity to accommodate substation infrastructure	The location of the siting area within the lower lying valley bottom and lower slopes of the Flooded Valley landscape could avoid the more complex and diverse landscape pattern found elsewhere (i.e. Loch Ken). The presence of shelterbelts and woodland along the river valley offer opportunities to contain potential substation sites. Overall the siting area is judged to have a medium capacity to accommodate substation infrastructure.	Avoiding the more sensitive and prominent areas of the Rugged Granite Uplands LCT, this siting area is judged to possess opportunities to locate substation sites within the less sensitive Foothills with Forestry landscape maximising backclothing and screening opportunities. The siting area is judged to have a medium capacity to accommodate substation infrastructure.	This small siting area located alongside the Water of Ken, predominantly within the simple lower lying landscape of the Flooded Valley LCT, and consists of regular shaped enclosed pasture. The siting area is currently undeveloped aside from the existing OHL infrastructure which crosses the valley east-west and is visible from the surrounding elevated landscapes. Overall the siting area demonstrates a medium capacity to accommodate substation infrastructure.	
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas,	The Southern Upland Way long distance footpath and Dumfries and Galloway Tourist	The Southern Upland Way passes within 1km of the siting area.	There is a recognised viewpoint located adjacent to the siting area near	The Dumfries and Galloway Tourist Route crosses the siting area and there is a	Views across the siting area may be possible from the northern fringe of the settlement of New	This siting area is potentially visible in views across the Glen Ken valley from the	

CRITERION	Sub-Criteria	Substation Siting Area G 1	Substation Siting Area G 2	Substation Siting Area G 3	Substation Siting Area G 4	Substation Siting Area G 5	Substation Siting Area G 6	Preference
	population, major roads/recreational routes.	Route cross the siting area. Views are possible west across the siting area from the settlement of St John's Town of Dalry. A small number of residential properties are located within the northern and southern extents of the siting area and open views across the siting area are possible from the A762 which dissects it north-south.	Views are possible across the siting area from a small number of scattered farmsteads, and from the route of the A702 to the south of the siting area. However, the siting area also offers opportunities to contain visibility with localised topography and the presence of woodland blocks during substation siting.	Balmaclellan. Residential properties on the northern fringe of Balmaclellan afford views north across the siting area. A small number of scattered farmsteads are located to the east of the siting area which have similar open views across the siting area. Blocks of woodland offer opportunities to contain visibility during substation siting.	recognised viewpoint near at Balmaclellan. Scattered residential properties and farmsteads are located within and directly adjacent to the siting area, with views across the Water of Ken. The A713 dissects the siting area north-south with views across the siting area from several sections of the route.	Galloway. A small number of scattered farmsteads are located to the western and eastern edge of the siting area, with view possible across the interior of the siting area. The A712 dissects the southern extent of the siting area (along which the Robert Bruce Trail also passes), however views north across the siting area are limited by the presence of deciduous woodland and localised topography.	settlement of St John's Town of Dalry to the north. Views from the A762 to the west are partially screened by the presence of deciduous woodland.	
Cultural Heritage	Scheduled Monuments (SMs)	Not applicable.		There is one SM, Balmaclennan, motte within the substation siting area. This asset could be avoided during substation siting. Balmaclennan motte may have a wide aspect overlooking the substation siting area and could form a key consideration in relation to potential effects on its setting.	There is one SM, Dalarran Holmes, standing stones, within the substation siting area. This asset could be avoided during substation siting. Dalarran Holmes, standing stone may have a wide aspect and is could form a key consideration in relation to potential effects on its setting.	Not applicable.		G6 is preferred, primarily as there are no SMs or Listed Buildings located within the siting area and no Listed Buildings or CAs within 2km.
		There is one SM, Dalry, motte, that stands within 2km of the substation siting area and this may have a wide aspect overlooking the Water of Ken and the substation siting area, and is likely to form a key consideration in relation to potential effects on its setting, particularly for SS G1 which lies directly west of the motte on the opposite side of the Water of Ken.		There is one additional SM within 2km of the substation siting area, Dalarran Holmes, standing stone, which may have a wide aspect overlooking the substation search area and is likely to form a key consideration in relation to potential effects on its setting.	There is an additional SM within 2km of the substation siting area, Balmaclennan, motte, which may have a wide aspect overlooking the substation siting area and is likely to form a key consideration in relation to potential effects on its setting.	There are two SMs within 2km of the substation search area, Kenmure Castle, and Dalarran Holmes, standing stones. Both may have wide aspects overlooking the substation siting area and are likely to be a key consideration in relation to potential effects on their settings.	There is one SM, Dalry, motte, that stands within 2km of the substation siting area, and this may have a wide aspect overlooking the Water of Ken and the substation search area, and is likely to form a key consideration in relation to potential effects on its setting.	

CRITERION	Sub-Criteria	Substation Siting Area G 1	Substation Siting Area G 2	Substation Siting Area G 3	Substation Siting Area G 4	Substation Siting Area G 5	Substation Siting Area G 6	Preference
	A Listed Buildings	Not applicable.	There are two A Listed Buildings within 2km of the substation siting area The A Listed Building, Barscobe Castle may have wide aspects overlooking the substation siting area and is likely to form a key consideration in relation to potential effects on its setting.	Not applicable	There are three A Listed Buildings within 2km of the substation siting area. The A Listed Barscobe Castle, Grennan Mill and Ken Bridge may have wide aspects overlooking the substation siting area and are likely to form key considerations in relation to potential effects on their settings	There is one A Listed Building within 2km of the substation siting area.	Not applicable.	
	Conservation Areas (CAs)	Not applicable.						
		Not applicable.		One CA, New Galloway, lies within 2km of the substation siting areas.		Not applicable.		
Flood Risk	1 in 200 year Flood Zones and in 1 in 1000 year Flood Zones	This siting area contains the 1/1000 year and 1/200 year flood risk zones of the Water of Ken which cover a large part along its eastern boundary. It could be possible to avoid the flood risk zones, by siting the substation on higher elevation land west of the A762.	This siting area contains some 1/200yr and 1/1000yr flood risk zones associated with the Trolane Burn and its tributaries. However, it could be possible to avoid the flood risk areas in siting the substation.	Not applicable.	This siting area is within the 1/ 1000yr and 1 /200 year flood risk zones of the Water of Ken and Garple Burn. However, it could be possible to avoid the flood risk zones in siting the substation.	Not applicable.	The siting area is almost entirely within the 1/200 year flood risk zone of the Water of Ken which cannot be avoided in siting the substation.	G3 and G5 are preferred options in terms of flood risk.
Land Use	Woodland	There is 4.9 ha of woodlands within this substation siting area, of which 0.1ha is Ancient woodland. Woodland could be avoided in substation siting.	There is 2.8 ha of woodlands within this substation siting area, none of which is Ancient woodland. Woodland could be avoided in substation siting.	There is 6.8 ha of woodland within this substation siting area, none of which is Ancient woodland Woodland could be avoided in substation siting.	There is 13.25 ha of woodlands within this substation siting area, of which 2.7ha is Ancient woodland. Woodland could be avoided in substation siting.	There are 3.2 ha of woodlands within this substation siting area, none of which is Ancient woodland Woodland could be avoided in substation siting.	There is 1.8 ha of woodlands within this substation siting area, none of which is Ancient woodland. Woodland could be avoided in substation siting.	No preference as felling of woodland can be avoided in all siting areas.
Preference	Overall preference is for G2 on the basis that it avoids the trigger for consideration zone associated with the Loch Ken and River Dee Marshes Ramsar/SPA/SSSI (Holford Rule 1). There are also no cultural heritage constraints within the siting area (Holford Rule 1) and it avoids the RSA (Holford Rule 2). G2 has a medium landscape capacity and offers potential for minimising visual amenity effects when compared to other siting areas.							

Corridor Appraisal: Kendoon – Glenlee

CRITERION	Sub-Criteria	Corridor K/G 1
Approximate Length of Corridor (km)		7
Biodiversity and Geological Conservation	Sites of Special Scientific Interest (SSSI)	This corridor contains Cleugh SSSI which could be avoided during routeing.
Landscape and Visual Amenity	Regional Scenic Area (RSA)	This corridor is located within the Galloway Hills RSA which cannot be avoided during routeing.
	Landscape Capacity	This corridor is located within the Upper Dale Landscape Character Type (LCT) which has a medium capacity to accommodate OHL development. It should also be noted that the existing 132kV OHL (which travels north from Glenlee) passes through this corridor and has altered the character of the valley.
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes, and Galloway Forest Park.	The Dumfries and Galloway Tourist Route (along a section of the A713) passes through this corridor. The Kendoon Valley is sparsely populated, with scattered settlements focused around the road network. The far northern extents of the corridor are within the Galloway Forest Park which could be avoided during routeing.
Cultural Heritage	Scheduled Monuments (SM)	There is one SM within the corridor, which stands in forestry just west of Dundeugh and could be avoided during routeing. Four additional SMs lie within 2km of the corridor, which could be avoided. Three of these assets, Polmaddy medieval and post-medieval settlement, Earlston Castle (which is also A Listed) and Dalry motte may have wide aspects and may form a key consideration in relation to potential effects on their setting.
	A Listed Buildings	There are two A Listed Buildings within the corridor. There is an additional A Listed Building within 2kms of the corridor. Earlston Castle may have extensive views across the corridor area and may form a key consideration in relation to potential effect on its setting.
	Archaeologically Sensitive Areas (ASA)	The parts of two ASAs lie within the corridor. Only the southern tip of Bardennoch – Garryhorn ASA is within the corridor and this could be avoided during routeing. The other ASA, Polharrow Burn ASA, which covers a large area to the west of Carsfad Loch, could be avoided during routeing.
Land Use [6]	Woodland	There is 551 ha (25% of the corridor) of woodland within the corridor, of which approximately 61% is commercial conifer forest. There are 181 ha of Ancient woodlands which are scattered throughout the corridor. It is possible to avoid woodland all together, including Ancient woodland.
Preferred Corridor	Please note that this is the only corridor option.	

[6] Flood Risk has been appraised and was not considered to represent a constraint and therefore has not been included within this appraisal table.

Corridor Appraisal: Glenlee – Tongland

CRITERION	Sub-Criteria	Corridor G/T 1	Corridor G/T 2	Corridor G/T 3	Corridor G/T 4	Preference
Approximate Length of Corridor (km)		29.5	25.5	26	28	The preferred corridor is G/T 2 as this is the shortest corridor.
Biodiversity and Geological Conservation	Special Protection Areas (SPA)	The 2km 'trigger for consideration zone' around the Loch Ken and River Dee Marshes SPA is partially located within this corridor, and includes a small area (<50ha) of potentially important foraging habitat where relatively high flight activity by the SPA's qualifying interest may occur. This zone could be avoided during routeing.		The 2km 'trigger for consideration zone' around the Loch Ken and River Dee Marshes SPA is located within the northern part of this corridor. Relatively high flight activity in the non-breeding season by wildfowl comprising the SPA's qualifying interest is likely to occur. This zone cannot be avoided during routeing.	The Loch Ken and River Dee Marshes SPA, designated for its non-breeding wildfowl populations and water-bird assemblage, is partially located within this corridor. There is potential for collision risk to the SPA's qualifying interest during migration periods and during other periods of the year when the site is occupied by qualifying species. An existing 132kV OHL runs adjacent to the Loch Ken and River Dee Marshes SPA. There is no evidence that this line has had any adverse impact on the SPA's qualifying interest. However, this is an active feeding area for Greenland white fronted geese and should be avoided on this basis. The 2km 'trigger for consideration zone' around the Loch Ken and River Dee Marshes SPA is located within this corridor. Relatively high flight activity in the non-breeding season by wildfowl comprising the SPA's qualifying interest is likely to occur. This zone could not be avoided during routeing.	G/T 2 is preferred. Although the 2km 'trigger for consideration zone' around the Loch Ken and River Dee Marshes SPA and Ramsar is partially located within this corridor, flight activity by the qualifying interest is unlikely to be particularly high in this area. The corridor is within the 1km trigger for consideration zone around the Laughenghie and Airie Hills SSSI, but mainly includes forested habitats, which should be of relatively low importance for the qualifying interest.
	Sites of Special Scientific Interest (SSSI)	A 1km 'trigger for consideration zone' around the Laughenghie and Airie Hills SSSI, designated for its upland bird assemblage is located within this corridor and the site's qualifying interest may make use of habitats in this area, particularly open ground habitats. This zone and the areas of open ground habitat cannot be avoided during routeing.			See SPA for River Dee (Parton to Crossmichael) SSSI which could be avoided during routeing. This corridor also contains the Airds of Kells Wood SSSI and which could be avoided during routeing. A very small part of the 1km 'trigger for	

CRITERION	Sub-Criteria	Corridor G/T 1	Corridor G/T 2	Corridor G/T 3	Corridor G/T 4	Preference
					consideration zone' around the Threave and Carlingwark Loch SSSI is within the corridor, however this could be avoided during routeing.	
Landscape and Visual Amenity	National Scenic Area (NSA)	The Fleet Valley NSA is adjacent to the south-western section of the corridor. The East Stewartry Coast NSA is located approximately 4km to the east.	The Fleet Valley NSA is approximately 6km to the west of the corridor and the East Stewartry Coast NSA is located approximately 4km to the east.			On balance G/T 2 is preferred as it avoids proximity to the NSA. In terms of visual amenity it avoids the more sensitive receptors around the Loch Ken area (recognised viewpoint's, a tourist route and the Galloway Kite Trail). This corridor also avoids the landscapes with lowest capacity to OHL development (Flooded Valley LCT). However, as with all corridors, the RSA cannot be avoided.
	Regional Scenic Area (RSA)	This corridor routes through the Galloway Hills RSA which cannot be avoided during routeing.				
	Landscape Capacity	• [7]Rugged Granite Upland with Forest (Medium); • Foothills with Forest (Higher); • Foothills (Higher); • Foothills with Forest (Higher); and • Drumlin Pastures (Medium). This corridor passes through no landscape Character Type (LCT) with lower landscape capacity to OHL development.	• Rugged Granite Uplands with Forest (Medium); • Foothills with Forest (Higher); and • Drumlin Pastures (Medium). This corridor passes through no LCT with lower landscape capacity to OHL development.	• Drumlin Pastures (Medium); • Flooded Valley (Lower); • Drumlin Pastures (Medium); • Foothills with Forest (Medium); and • Drumlin Pastures (Medium). This corridor follows the alignment of the existing 132kV OHL in its northern extents, which locally increases the capacity of the landscape to accommodate OHL development. However, the LCT with lower capacity (Flooded Valley) cannot be avoided during routeing.	• Drumlin Pastures (Medium); • Flooded Valley (Lower); and Drumlin Pastures (Medium); This corridor follows the alignment of the existing 132kV OHL, which locally increases the capacity of the landscape to accommodate OHL development. However, the LCT with lower capacity (Flooded Valley) cannot be avoided during routeing.	
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes, and Galloway Forest Park.	The northern half of this corridor crosses the Robert Bruce Trail and passes through sparsely populated coniferous forest in the Galloway Hills. Population density generally increases with proximity to Tongland and the corridor includes the settlement of Twynholm. The corridor also crosses the A75, a major coastal route through Dumfries and Galloway.	The corridor passes to the west of two recognised viewpoints on Bennan Hill however, views from here are focused to the south-east towards Loch Ken. The northern half of this corridor crosses the Robert Bruce Trail and passes through sparsely populated coniferous forest in the Galloway Hills. Population density generally increases with proximity to	At its northern extent this corridor crosses the Dumfries and Galloway Tourist Route (A713), Robert Bruce Trail and Galloway Kite Trail. The corridor passes to the west of two recognised viewpoints on Bennan Hill however, views from here are focused to the	At its northern extents this corridor follows and crosses the Dumfries and Galloway Tourist Route (A713), Robert Bruce Trail and Galloway Kite Trail. There are three recognised viewpoints on the corridor fringes around the highly scenic Loch Ken area (two on Bennan Hill and one near	

[7] Each corridor passes through the following LCT from north to south (landscape capacity to accommodate OHL development)

CRITERION	Sub-Criteria	Corridor G/T 1	Corridor G/T 2	Corridor G/T 3	Corridor G/T 4	Preference
		This corridor also passes through the Galloway Forest Park which cannot be avoided during routeing.	Tongland. The southern half of the corridor follows the alignment of the A762, a major road into Kirkcudbright and crosses the A75. This corridor also passes through the Galloway Forest Park which cannot be avoided during routeing.	south-east towards Loch Ken. The northern end (around the Kendoon Valley) and southern end (on the approach to Tongland) of the corridor are more densely populated. This corridor also crosses/ includes sections of the A712, A762 and A75. This corridor also passes through the Galloway Forest Park which cannot be avoided during routeing.	Boreland). The corridor is more densely populated as it routes through the lower lying ground east of the Galloway Hills. This corridor also crosses/ includes sections of the A712, A762 and A75. The western fringes of this corridor pass through the Galloway Forest Park which could be avoided during routeing.	
Cultural Heritage	Scheduled Monuments (SM)	There are six SMs within the corridor which could be avoided during routeing.			There are seven SMs within the corridor which could be avoided during routeing.	On balance G/T2 is preferred as there are relatively few cultural heritage assets within the corridor and the corridor avoids proximity to Conservation Areas (CA). *Please note:* One SM, Edgarton Mote, fort lies within both GT/2 and GT/3 corridor and this may have wide aspects and is likely to be a key consideration in relation to potential for effects on its setting. It is therefore recommended that the OHL route should be sited as far from the monument as possible.
		There are an additional 11 SMs within the 2km of the corridor. These scheduled forts, cairns, motte remains and stone circles may have wide aspects and are likely to be a key consideration in relation to potential for effects on their setting.	There are an additional 12 SMs within 2km of the corridor. These scheduled forts, mottes, castles and stone circles may have wide aspects and are likely to be a key consideration in relation to potential for effects on their settings.	There are an additional 13 SMs within 2km of the corridor. These scheduled forts, mottes, castles and stone circles may have wide aspects and are likely to be a key consideration in relation to potential for effects on their settings.	There are an additional 21 SMs within 2km of the corridor. These scheduled forts, mottes, castles and stone circles may have wide aspects and are likely to be a key consideration in relation to potential for effects on their settings.	
	Inventory Gardens and Designed Landscapes	There is one Inventory GDL within 2km of the corridors.				
	A Listed Buildings	There are five A Listed Buildings within the corridor. One A Listed Building, Agrennan House may have wide aspects overlooking the corridor and may be a key consideration in relation to potential for effects on their settings.	There are four A Listed Buildings within the corridor. One A Listed Building, Agrennan House may have wide aspects overlooking the corridor and may be a key consideration in relation to potential for effects on their settings.	There are four A Listed Buildings within the corridor.	There are eight A Listed Buildings within the corridor. One A Listed Building, Agrennan House may have wide aspects overlooking the corridor and may be a key consideration in relation to potential for effects on their settings.	

CRITERION	Sub-Criteria	Corridor G/T 1	Corridor G/T 2	Corridor G/T 3	Corridor G/T 4	Preference
		There is an additional one A Listed Buildings within 2km of the corridor. This A Listed Building, Cumstoun House, may have wide aspects overlooking the corridor and may be a key consideration in relation to potential for effects on their settings.	There are an additional three A Listed Buildings within 2km of the corridor. Two of these A Listed Buildings, Cumstoun House and Kirkcormack House, may have wide aspects overlooking the corridor and may be a key consideration in relation to potential for effects on their settings.	There are an additional 12 A Listed Buildings with 2km of the corridor. Three of these A Listed Buildings, Barscobe House, Cumstoun House and Hensol House, may have wide aspects overlooking the corridor and may be a key consideration in relation to potential for effects on their settings.	There are an additional 12 Listed Buildings within 2km of the corridor. Four A Listed Buildings, Barscobe House, Cumstoun House, Hensol House may have wide aspects overlooking the corridor and may be a key consideration in relation to potential for effects on their settings.	
	Conservation Areas (CA)	There are three CAs within 2km of the corridor.	There are two CAs within 2km of the corridor.			
	Archaeologically Sensitive Areas	One ASA is encompassed by the corridor and cannot be avoided.	The north-eastern edge of one ASA lies within the corridor. This could be avoided during routeing.		Not applicable.	
Flood Risk	1 in 200 year Flood Zones	Not applicable.		Loch Ken highlighting a 1/200 year flood risk is within the corridor and is of an extent which is a 'trigger for consideration' with a minimum span of approximately 550m. This flood risk zone cannot be avoided during routeing.	Loch Ken and River Dee highlighting a 1/200 yr flood risk are located within the corridor and are of an extent which is a 'trigger for consideration', with minimum span of approximately 275m. This flood risk zone cannot be avoided.	Corridor G/T 1 and G/T2 are preferred as they do not contain any 1/200 year flood risk zone which cannot be avoided during routeing.
Land Use	Existing and Committed Development	An area of committed development (minerals) is located to the north of the Tongland substation which can be avoided during line routeing.	An area of committed development (minerals) is located to the north of the Tongland substation which can be avoided during line routeing. An area of committed development (minerals) is located to the south of Laurieston which can be avoided during line routeing.	An area of committed development (minerals) is located to the north of the Tongland substation which can be avoided during line routeing. An area of committed development (minerals) is located to the south of Laurieston which can be avoided during line routeing.	An area of committed development (minerals) is located to the north of the Tongland substation which can be avoided during line routeing. An area of committed development (minerals) is located to the south of Laurieston which can be avoided during line routeing.	G/T 4 is preferred as it offers more opportunity to avoid/minimise loss of woodland.

CRITERION	Sub-Criteria	Corridor G/T 1	Corridor G/T 2	Corridor G/T 3	Corridor G/T 4	Preference
	Windfarms: operational, construction and consented.	There is an application for 7 x turbines at Knockendurrick which occupies a large section of this corridor; however there are opportunities to avoid this windfarm during routeing.	Not applicable.			
	Woodland	There is 3736ha (41% of the corridor) of woodland within the corridor, of which approximately 61% is commercial conifer forest. There are 229 ha of Ancient woodland which are scattered throughout the corridor. It may not be possible to avoid woodland all together, other than Ancient woodland	There is 4725ha (60% of the corridor) of woodland within the corridor, of which approximately 70% is commercial conifer forest. There are 514 ha of Ancient woodland which are scattered throughout the corridor. It may not be possible to avoid woodland all together, other than Ancient woodland	There is 1607ha (23% of the corridor) of woodland within the corridor, of which approximately 57% is commercial conifer forest. There are 340ha of Ancient woodland which are scattered throughout the corridor. It may not be possible to avoid woodland all together, other than Ancient woodland	There is 2132ha (18% of the corridor) of woodland within the corridor, of which approximately 44% is commercial conifer forest. There are 484ha of Ancient woodland which are scattered throughout the corridor. It may not be possible to avoid woodland all together, including Ancient woodland	
Preference	Overall there is a preference for G/T2 as it avoids proximity to the NSA (Holford Rule 1) and in relation to visual amenity it avoids the more sensitive receptors around the Loch Ken area (viewpoints and tourist route). The corridor also avoids landscapes with lowest capacity for overhead line development, however, as with the other corridors, the RSA cannot be avoided (Holford Rule 2). G/T2 is also preferred on biodiversity grounds, primarily ornithology. In relation to cultural heritage G/T2 avoids the ASA and has a relatively lower density of cultural heritage assets. G/T2 is also the shortest corridor (Holford Rule 3) and avoids the 1/200yr flood risk zones. However, felling of woodland will be required to accommodate the overhead line (Holford Rule 4 and 5).					

Corridor Appraisal: Glenlee – Dumfries

CRITERION	Sub-Criteria	Corridor G/D 1	Corridor G/D 2	Corridor G/D 3	Corridor G/D 4	Corridor G/D 5	Corridor G/D 6	Preference
Approximate Length of Corridor (km)		32	34	30.5	30	30.5	33.5	G/D 3 is preferred as this is the shortest corridor.
Biodiversity and Geological Conservation	Special Protection Areas (SPA)	Not applicable.		The corridors are within the 2km 'trigger for consideration' zone of the Loch Ken and River Dee Marshes SPA and in respect of the qualifying species, may include foraging sites and areas where flight activity is relatively high, however this could be avoided during routeing.				Corridors GD/1 and GD/2 are preferred as neither supports any designated sites or 'trigger for consideration zones'.
	Site of Special Scientific Interest (SSSI)	Not applicable.				These corridors contain the Milton Loch SSSI which could be avoided during routeing.		
Landscape & Visual Amenity	National Scenic Area (NSA)	Not applicable.	Within 10km of the Nith Estuary NSA.	Not applicable.	Within 10km of the Nith Estuary NSA.	Within 10km of the Nith Estuary NSA.	Within 10km of the Nith Estuary NSA and East Stewartry Coast NSA.	On balance G/D 3 is preferred as it is greater than 10km from the NSA and avoids the RSAs.
	Regional Scenic Area (RSA)	This corridor passes through the southern edge of the Thornhill Uplands RSA which cannot be avoided during routeing.	This corridor passes through the southern edge of the Thornhill Uplands RSA and the Terregles Ridge RSA's. Both RSA cannot be avoided during routeing.	The Thornhill Uplands RSA is within this corridor but routeing opportunities exist to avoid this.	This corridor passes through the Terregles Ridge RSA which cannot be avoided during routeing.	This corridor passes through the Terregles Ridge RSA which cannot be avoided during routeing. However, the existing 132kV OHL also passes through the RSA within this corridor.	The Galloway Hills RSA is within this corridor but routeing opportunities exit to avoid this. This corridor also passes through the Terregles Ridge RSA which cannot be avoided during routeing. However, the existing 132kV OHL also passes through the Terregles Ridge RSA within this corridor.	
	Landscape Capacity	· Foothills with Forest (Higher); · Foothills (Higher); · Upland Glens (Medium); · Intimate Pastoral Valley (Lower); · Upland Fringe (Medium); and · Middle Dale (Medium). The Landscape Character Type (LCT) of lower	· Foothills with Forest (Higher); · Foothills (Higher); · Upland Glens (Medium); · Intimate Pastoral Valley (Lower); · Upland Fringe (Medium); and · Lower Dale (Medium).	· Drumlin Pastures (Medium); · Upland Fringe (Medium); · Foothills with Forest (Higher); · Foothills (High); · Upland Fringe (Medium); · Intimate Pastoral Valley (Lower); · Upland Fringe (Medium); and	· Drumlin Pastures (Medium); · Upland Fringe (Medium) · Foothills with Forest (Higher); · Foothills (Higher); · Upland Fringe (Medium); · Intimate Pastoral Valley (Lower); · Upland Fringe	· Drumlin Pastures (Medium); · Foothills with Forest (Higher); · Upland Fringe (Medium); · Drumlin Pastures (Medium); · Narrow Wooded Valley (Lower); · Drumlin Pastures (Medium); and · Upland Fringe (Medium) The LCT of lower capacity (Narrow Wooded Valley) cannot be avoided during routeing.	· Flooded Valley (Lower) · Drumlin Pastures (Medium); · Upland Fringe (Medium); · Drumlin Pastures (Medium); · Narrow Wooded Valley (Lower); · Drumlin Pastures (Medium); and	

CRITERION	Sub-Criteria	Corridor G/D 1	Corridor G/D 2	Corridor G/D 3	Corridor G/D 4	Corridor G/D 5	Corridor G/D 6	Preference
		capacity (Intimate Pastoral Valley) cannot be avoided during routeing.	The LCT of lower capacity (Intimate Pastoral Valley) cannot be avoided during routeing.	· Middle Dale (Medium). The LCT of lower capacity (Intimate Pastoral Valley) cannot be avoided during routeing.	(Medium); and · Lower Dale (Medium). The LCT of lower capacity (Intimate Pastoral Valley) cannot be avoided during routeing.		· Upland Fringe (Medium). In terms of the landscapes of lower capacity the Flooded Valley could be avoided during routeing, but the Narrow Wooded Valley cannot.	
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes, and Galloway Forest Park.	In terms of spread of residential receptors the western half of the corridor (where the corridor passes through the Foothills and Foothills with Forest Landscape Character Type (LCT)) is sparsely populated. The eastern half of the corridor is more densely populated (on the lower lying ground around the Nith Valley and the outskirts of Dumfries). The corridor follows the alignment of the A702 in the western half. The A76 (and associated Burns Heritage Trail) crosses into the far eastern extents of this corridor.	In terms of spread of residential receptors the western half of the corridor (where the corridor passes through the Foothills and Foothills with Forest LCT) is sparsely populated. The eastern half of the corridor is more densely populated (on the lower lying ground around the Nith Valley and the outskirts of Dumfries). The corridor follows the alignment of the A702 in the western half.	In its western extent there is a recognised viewpoint (near Balmaclellan). In terms of spread of residential receptors the western half of the corridor (where the corridor passes through the Foothills and Foothills with Forest LCT) is sparsely populated. The eastern half of the corridor is more densely populated (on the lower lying ground around the Nith Valley and the outskirts of Dumfries). The A76 (and associated Burns Heritage Trail) crosses into the far eastern extents of this corridor.	In its western extent there is a recognised viewpoint (near Balmaclellan). In terms of spread of residential receptors the western half of the corridor (where the corridor passes through the Foothills and Foothills with Forest LCT) is sparsely populated. The eastern half of the corridor is more densely populated (on the lower lying ground around the Nith Valley and the outskirts of Dumfries).	In its western extent there is a recognised viewpoint (near Balmaclellan). A National Cycle Network (NCN) also skirts the southern fringes of the corridor in the eastern half. In terms of spread of residential receptors the corridor mainly passes through more densely populated, lower lying land south of the high ground at Darngarroch Hill (and includes the settlement of Springholm). The eastern half of the corridor also follows the alignment of the A75 (and associated Robert Bruce Trail), a major route into Dumfries.	In its western extent there is a recognised viewpoint (near Balmaclellan). An NCN also skirts the southern fringes of the corridor in the eastern half. In terms of spread of residential receptors the corridor mainly passes through more densely populated, lower lying land south of the high ground at Darngarroch Hill (an includes the settlement of Springholm). The eastern half of the corridor also follows the alignment of the A75 (and associated Robert Bruce Trail), a major route into Dumfries.	
Cultural Heritage	Scheduled Monuments (SM)	There are 11 SMs within the corridor which could be avoided during routeing. A number of scheduled Roman fort cropmark sites are present at Dalswinton/Bankfoot and these form part of a	There are ten SMs within the corridor which could be avoided during routeing. There are an additional 14 SMs within 2kms of the corridor.	There are nine SMs within the corridor which could be avoided during routeing. A number of scheduled Roman fort cropmark sites are present at Dalswinton/Bankfoot and these form part of a	There are six SMs within the corridor which could be avoided during routeing. There are an additional 12 SMs within 2kms of the corridor	There are three SMs within the corridor which could be avoided during routeing. There are an additional seven SMs within 2kms of the corridor.	There are seven SMs within the corridor which could be avoided during routeing. There are a cluster of scheduled fort and motte sites within this corridor which lie	There is not much difference between the corridors as the cultural heritage within each corridor is generally low density. Taking into consideration the number of SMs and A Listed Buildings present within in each corridor the preferred corridor

CRITERION	Sub-Criteria	Corridor G/D 1	Corridor G/D 2	Corridor G/D 3	Corridor G/D 4	Corridor G/D 5	Corridor G/D 6	Preference
		Roman landscape, which will form a consideration for routeing in this area. There are an additional 21 SMs within 2kms of the corridor.		Roman landscape, which will form a consideration for routeing in this area. There are an additional 18 SMs within 2kms of the corridor.			in close proximity to each other and may have intervisiblity between each of the monument, Impacts on the setting of these scheduled monuments is likely to form a consideration for routeing. There is one additional SM within 2kms of the corridor.	would be G/D5.
	Inventory Gardens and Designed Landscapes	There are three Inventory GDLs within 2km of the corridors.		There are two Inventory GDLs within 2km of the corridors.		There is one Inventory GDL within 2km of the corridors.		
	A Listed Buildings	There are two A Listed Buildings within the corridor. There is one A Listed castle, Barscobe Castle, which may have wide aspects and may be a key consideration in relation to the effects on its setting. There are an additional ten A Listed Buildings within 2km of the corridor. Some of them form part of Inventory GDLs. These may have wide aspects and may be a key consideration in relation to the effects on their settings.	There are four A Listed Buildings within the corridor. The A Listed Barscobe Castle and Fourmerkland Tower which may have wide aspects and maybe key considerations in relation to the effect on their settings. There are an additional six A Listed Buildings within 2kms of the corridor. Some of them form part of Inventory GDLs. These may have wide aspects and may be a key consideration in relation to the effects on their settings.	There are three A Listed Buildings within the corridor. The A Listed Barscobe Castle and Fourmerkland Tower, which may have wide aspects a may be a key consideration in relation to the effect on their settings. There are an additional eight A Listed Buildings within 2kms of the corridor. Some of them form part of Inventory GDLs. These may have wide aspects and are may be a key consideration in relation to the effects on their settings.	There are two A Listed Buildings within the corridor. The A Listed Barscobe Castle and Fourmerkland Tower, which may have wide aspects and may be a key consideration in relation to the effect on their settings. There are an additional five within 2kms of the corridor. Some of them form part of Inventory GDLs. These may have wide aspects and are may be a key consideration in relation to the effects on their settings.	There are two A Listed Buildings within the corridor. Corsock House (A Listed) may be key a consideration in relation to the effects on its setting. There are an additional five within 2km of the corridor. Some of them form part of Inventory GDLs. These may have wide aspects and may be key considerations in relation to the effects on their settings.	There are three A Listed Buildings within the corridor. These may have wide aspects. They may be key considerations in relation to their effect on their settings. There are an additional eight A Listed Buildings within 2km of the corridor. These may have wide aspects and may be a key consideration in relation to the effects on their settings.	
	Conservation Areas (CA)	There is one CA within 2km of the corridors.		There are two CAs within 2km of the corridors.		There are three CAs within 2km of the corridor.	There are two CAs within 2km of the corridor.	

CRITERION	Sub-Criteria	Corridor G/D 1	Corridor G/D 2	Corridor G/D 3	Corridor G/D 4	Corridor G/D 5	Corridor G/D 6	Preference
Land Use[8]	Existing and Committed Development	Not applicable.	An area of committed development (minerals) is located partially within the corridor near Newtonairds which can be avoided during line routeing.	Not applicable.	An area of committed development (minerals) is located partially within the corridor near Newtonairds which can be avoided during line routeing.	Not applicable.	Not applicable.	G/D 1, G/D 3 & G/D 5 are preferred on the basis that Ancient woodland can be avoided.
	Woodland	There is 1645 ha (23% of the corridor) of woodland within the corridor, of which approximately 70% is commercial conifer forest. There are 347 ha of Ancient woodlands which are scattered throughout the corridor. It is possible to avoid woodland all together, including Ancient woodland.	There is 1909 ha (23% of the corridor) of woodland within the corridor, of which approximately 65% is commercial conifer forest. There are 554 ha of Ancient woodlands which are scattered throughout the corridor. It is not possible to avoid woodland all together.	There is 2206 ha (26% of the corridor) of woodland within the corridor, of which approximately 68% is commercial conifer forest. There are 243 ha of Ancient woodlands which are scattered throughout the corridor. It is not possible to avoid woodland all together, other than Ancient woodland.	There is 2411 ha (26% of the corridor) of woodland within the corridor, of which approximately 63% is commercial conifer forest. There are 410ha of Ancient woodlands which are scattered throughout the corridor. It is not possible to avoid woodland all together, including Ancient woodland.	There is 1607 ha (16% of the corridor) of woodland within the corridor, of which approximately 60% is commercial conifer forest. There are 385 ha of Ancient woodlands which are scattered throughout the corridor. It is not possible to avoid woodland all together, other than Ancient woodland.	There is 2113 ha (16% of the corridor) of woodland within the corridor, of which approximately 60% is commercial conifer forest. There are 273ha of Ancient woodlands which are scattered throughout the corridor. It is not possible to avoid woodland all together, other than Ancient woodland.	
Preference	Overall the preference is for G/D3 on the basis that it provides greater offset from the NSA (Holford Rule 1) and avoids the RSA (Holford Rule 2). G/D 3 is also one of the shortest corridors (Holford Rule 3). Whilst part of the corridor is located within the 2km 'trigger for consideration' zone of the SPA, this could be avoided at routeing (Holford Rule 1). However, Scheduled Monuments and Listed Buildings will form a consideration at the routeing stage (Holford Rule 1) and felling of woodland cannot be avoided (Holford Rule 4 and 5).							

[8] Flood Risk has been appraised and was not considered to represent a constraint and therefore has not been included within this appraisal table.

Substation Siting Area Appraisal: Dumfries

CRITERION	Sub-Criteria	Substation Siting Area D 1	Substation Siting Area D 2	Substation Siting Area D 3	Substation Siting Area D 4	Substation Siting Area D 5	Preference
Landscape and Visual Amenity[9]	Regional Scenic Area (RSA)	Siting area located within 1km of Terregles Ridge RSA.	Siting area located within 1.5km of Terregles Ridge RSA.	Eastern extent of siting area located within Torthorwald Ridge RSA.	Siting area located within 1km of Torthorwald Ridge RSA.	Eastern extent of siting area located within Torthorwald Ridge RSA.	D1, D2 or D4 as they avoid the RSA.
	Landscape Capacity	The simple landform and large scale of the Lower Dale landscape offers opportunities to site substation infrastructure within the existing pattern of large scale improved pasture and arable fields, and the broadleaf woodland blocks and scattered farmsteads dispersed across it. Overall the siting area is judged to have a higher capacity to accommodate substation infrastructure.	The simple landcover pattern of large scale improved pasture and arable fields across this siting area are typical of the Lower and Middle Dale LCT and offer opportunities for the siting of substation infrastructure away from farmsteads and isolated properties. The lack of existing broadleaf woodland across this siting area allows open views from the surrounding landscape into this siting area. Overall the siting area is judged to have a higher capacity to accommodate substation infrastructure.	This siting area lies to the east of Dumfries within an area typical of the Lower Dale landscape. Large scale enclose of improved pasture and some arable landcover is adjoined by broadleaf woodland to the west along Lochar Water. The blocks of coniferous plantation and broadleaf woodland of the Upland Fringe landscape offer opportunities for screening and backclothing of substation infrastructure. Overall the siting area is judged to have a higher capacity to accommodate substation infrastructure	This siting area is typical of the Lower Dale and Coastal Flats landscapes with a simple landcover pattern of improved pasture and coniferous plantations offering opportunities for the siting of substation infrastructure backclothed and screened by existing landscape features, with few scattered farmsteads and isolated properties. Overall the siting area is judged to have a higher capacity to accommodate substation infrastructure.	This siting area exhibits the characteristics of the Lower Dale landscape, with its lower lying and simple landform and pattern of simple landcover (mainly improved pasture) with broadleaf shelterbelts and scattered farmsteads. The presence of large agricultural buildings and existing OHL infrastructure increases its capacity somewhat. Overall the siting area is judged to have a higher capacity to accommodate substation infrastructure.	
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes.	This siting area is sparsely populated with clusters of properties located along Nunwood Road which dissects the siting area. Views of the eastern extent of the siting area may be possible from the western edge of the settlement of Dumfries and residential properties located along	Scattered farmsteads and residential properties are located across this siting area, generally concentrated along the A76 (and associated Burns Heritage Trail) which dissects the siting area north-south. The presence of woodland blocks across the eastern extent of the siting area offer opportunities to screen substations during detailing siting.	This siting area is located east of Locharbriggs. Views from the eastern edge of Locharbriggs are possible across much of the siting area. A number of scattered farmsteads are located within the siting area, with few opportunities existing to screen potential substation sites during siting.	The Dumfries and Galloway Tourist Route (A75) passes close to the northern edge of the siting area. Scattered farmsteads are located across the northern extent of the siting area with limited opportunities to utilise existing screening for potential substation sites. The extent of the siting area south of the B724 consists of	A small number of scattered farmsteads are located within and directly adjacent to this siting area which is dissected north-south by the B724, with open views across the siting area.	

[9] Biodiversity and Geological Conservation has been appraised and was not considered to represent a constraint and therefore has not been included within this appraisal table.

CRITERION	Sub-Criteria	Substation Siting Area D 1	Substation Siting Area D 2	Substation Siting Area D 3	Substation Siting Area D 4	Substation Siting Area D 5	Preference
		Hardthorn Road to the south. Scattered farmsteads and residential properties are also located to the north, however views to the interior of the siting area are limited by localised topography.			predominantly coniferous forestry which offers potential screening opportunities during substation siting.		
Cultural Heritage	Scheduled Monuments (SM)	There are no SMs within the substation siting area. There are five SMs within 2kms of the substation siting area. One SM, Twelve Apostles, stone circle may have key views overlooking the substation siting area and may form a key consideration in relation to potential effects on its setting.	There is one SM within the substation siting area which could be avoided during siting. There are an additional eight SMs within 2km of the substation siting area. One SM, Twelve Apostles, stone circle may have key views overlooking the substation siting area and may form a key consideration in relation to potential effects on its setting.	There are no SMs within the substation siting area. There is one Scheduled Monument within 2km of the substation siting area. One SM Thorthorwald Castle may have wide views out to the surrounding landscape and overlooking the substation siting area and maybe a key consideration in relation to potential effects on its setting.	There are no SMs within the substation siting area. There are two SMs within 2km of the substation siting area. One SM, Rockhall Mote, motte and bailey, has extensive views over substation siting area, and maybe a key consideration in relation to potential effects on its setting.	There are no SMs within the substation siting area or within 2km of the substation siting area.	D4 is the preferred corridor as there are no SMs or Listed Buildings located within the siting area and the siting area is greater than 2km from the GDLs and CAs.
	Inventory Gardens and Designed Landscapes	There are no Inventory GDLs within the substation siting area or within 2km of the substation siting area.	There are no Inventory GDLs within the substation siting area. There are two GDLs within 2km of the substation area, Dalswinton and Cowhill Tower.	Not applicable.			
	A Listed Buildings	There are no A Listed Building within the substation siting area. There are an additional two A Listed Buildings within 2km of the substation siting area. These A Listed Buildings, Lincluden Collegiate Church and Terregles House, may have wide	There are no A Listed Buildings within the substation siting area. There are an additional six A Listed Buildings within 2km. One A Listed Building, Carnsalloch may have wide aspects overlooking the substation search area and may form a key	There are three A Listed Buildings within the substation siting area – Tinwald House and associated structures which may have wide aspects overlooking the substation siting area and are likely to form a key consideration in relation to potential effects on their settings.	Not applicable.	There is one A Listed Building, Mount Keder Monument, within the substation siting area. This feature could be avoided during siting. It is advised that the immediate environs of Category A Listed Mount Keder Monument should be avoided.	

CRITERION	Sub-Criteria	Substation Siting Area D 1	Substation Siting Area D 2	Substation Siting Area D 3	Substation Siting Area D 4	Substation Siting Area D 5	Preference
		aspects overlooking the substation siting area and may form key considerations in relation to potential effects on their settings.	consideration in relation to potential effects on their settings.	There is one additional A Listed Building within 2km of the substation siting area.		There are no Listed Buildings within 2km of the substation siting area:	
	Conservation Areas (CA)	One CA is located just outside the substation siting area and its setting may extend into the substation siting area. One of these, East & West Cluden, lies just outside the boundary of the substation siting area (c.40m) and its setting may extend into the substation siting area.	Two CAs are located within 2km of the substation siting area. One of these, East & West Cluden, lies just outside the boundary of the substation siting area (c.40m) and its setting may extend into the substation siting area.	Not applicable.			
Flood Risk	1 in 200 and 1 in 1000 year Flood Zones.	Not applicable.		There are small areas of 1/200 and 1/1000 year flood risk zones within the area associated with the Lochar Water which can be avoiding during siting of the substation.	There is a narrow flood risk zone associated with the Wath Burn, which bisects area D4 and also an area of flood risk (1/200 and 1/1000 year) associated with the Shaw Burn which could be avoided during siting of the substation.	Not applicable.	No preference
Land Use	Existing and Committed Development	Not applicable.		An area of committed development (minerals) is located within the substation siting area to the south-west of the B724 which could be avoided during substation siting.	Not applicable.		D4 is preferred on the basis of the appraisal, however siting the substation will require either loss of prime agricultural land or forestry.
	Land Capability for Agriculture	The substation siting area comprises 210ha of prime agricultural land which cannot be	The substation siting area comprises 544ha of prime agricultural land which cannot be	The substation siting area comprises 357ha of prime agricultural land which	The substation siting comprises 227ha of prime agricultural land. This is located in	The substation comprises 139ha of prime agricultural land. It is unlikely that this	

CRITERION	Sub-Criteria	Substation Siting Area D 1	Substation Siting Area D 2	Substation Siting Area D 3	Substation Siting Area D 4	Substation Siting Area D 5	Preference
		avoided.	avoided.	cannot be avoided.	the northern section of the area and could be avoided.	could be avoided.	
	Woodland	Not applicable.	There is 40.2 ha of woodlands within the substation siting area, of which 5.9ha is Ancient woodland. Woodland could be avoided in substation siting.	There is 23.2ha of woodlands within the substation siting area, of which 4.63ha is Ancient woodland. Woodland could be avoided in substation siting.	There is 113.1ha of woodlands within the substation siting area and no Ancient woodland. Woodland could be avoided in substation siting.	There is 1.18ha of woodlands within the substation siting area and no ancient Woodland. Woodland could be avoided in substation siting.	
Preference	On balance, D4 is preferred as there are no SM or A Listed Buildings within the siting area and it is greater than 2km from the CA and GDL (Holford Rule 1). It also avoids the RSA (Holford Rule 2), however it is located in proximity to the A75 tourist route in relation to visual amenity and will result in loss of either prime agricultural land (Horlock Rule 6) or woodland (Holford Rule 4 and 5).						

Corridor Appraisal: Dumfries – Harker

CRITERION	Sub-Criteria	Corridor D/H 1	Corridor D/H 2	Corridor D/H 3	Corridor D/H 4	Preference
Approximate Length of Corridor (km)		42.5	36	39.5	30	D/H4 is preferred as this is the shortest corridor.
Biodiversity and Geological Constraints	Special Protection Area (SPA)	Not applicable.	This corridor includes a small part of the Upper Solway Flats and Marshes SPA at its eastern extent[10]. The corridor also includes areas within the 2km 'trigger for consideration' of the SPA and may include foraging sites for qualifying species and areas where flight activity is relatively high. However, the SPA and the 2km 'trigger for consideration zone' of the SPA could be avoided during routeing.	This corridor includes small areas within the 2km 'trigger for consideration zone' of the Upper Solway Flats and Marshes SPA and, may include foraging sites for qualifying species and areas where flight activity is relatively high. However, the 2km 'trigger for consideration zone' of the SPA could be avoided during routeing.	This corridor includes a small part of the Upper Solway Flats and Marshes SPA at its eastern extent. The corridor also includes areas within the 2km 'trigger for consideration zone' of the SPA and hence, may include foraging sites for qualifying species and areas where flight activity is relatively high. However, the SPA and the 2km 'trigger for consideration zone' of the SPA could be avoided during routeing.	Corridor D/H 1 is preferred since it is furthest from the Upper Solway Flats and Marshes SPA, Ramsar Site and SSSI, as well as the Solway Firth SAC.
	Special Areas of Conservation (SAC)	Not applicable.	This corridor contains a small part of the Solway Firth SAC which can be avoided during routeing.	Not applicable.	This corridor contains two small sections of the Solway Firth SAC which can be avoided during routeing.	
	Sites of Special Scientific Interest (SSSI)	The Black Snib and Lyne Woods SSSIs are within this corridor but could be avoided during routeing.	See SPA above.	The Black Snib and Lyne Woods SSSIs are within this corridor but could be avoided during routeing.	See SPA above.	
Landscape and Visual Amenity	National Scenic Area (NSA)	All corridors are within 2km of the Nith Estuary NSA in their western extents.				On balance D/H 1 is preferable as it avoids the Solway Coast AONB and provides routeing opportunities to avoid the lower capacity Narrow Wooded Valley LCT plus maximising routeing out of the lower capacity Coastal Flats and Coastal Moss LCT. D/H1 does route through a large area of the Landscape of County Importance. In relation to visual amenity, it maximises routeing opportunities away from the more densely populated coastal margins and their associated transport routes and tourist/ heritage trails.
	Area of Outstanding Natural Beauty (AONB)	This corridor is within 10km of the Solway Coast AONB.	This corridor contains part of the Solway Coast AONB to north-west of Harker, but could be avoided during routeing.	This corridor is within 10km of the Solway Coast AONB.	This corridor contains part of the Solway Coast AONB to north-west of Harker, but could be avoided during routeing.	
	Regional Scenic Area (RSA)and Landscape of County Importance	The Western extents of all corridors are partly within Torthorwald Ridge RSA, although this could be avoided during routeing. All corridors pass through Landscapes of County Importance in Cumbria, with D/H1 and D/H3 passing through a large extent, although these could be avoided during routeing.				
	Landscape Capacity	• Upland Fringe (Medium); • Coastal Plateau (Medium); • Lower Dale (Medium); • Upland Fringe (Medium);	· Upland Fringe (Medium); · Coastal Plateau (Medium); · Lower Dale (Medium); · Upland Fringe (Medium);	• Upland Fringe (Medium); • Coastal Plateau (Medium); • Lower Dale (Medium); • Coastal Flats (Lower);	· Upland Fringe (Medium); · Coastal Plateau (Medium); · Lower Dale (Medium); · Coastal Flats (Lower);	

[10] The Solway Flats and Marshes also comprises a RAMSAR designation which shares the same footprint as the SPA.

CRITERION	Sub-Criteria	Corridor D/H 1	Corridor D/H 2	Corridor D/H 3	Corridor D/H 4	Preference
		• Narrow Wooded Valley (Lower); • Flow Plateau (Medium); • Coastal Flats (Lower); • Low Farmland (Medium); • Broad Valley (Medium); and • Low Farmland (Medium). This corridor follows the alignment of the existing 400kV OHL between Middlebie and Gretna, which locally increases the capacity of the landscape to accommodate OHL development. The Landscape Character Type (LCT) with lower capacity could be avoided during routeing, (Narrow Wooded Valley) but not the Coastal Flats LCT.	· Narrow Wooded Valley (Lower); · Flow Plateau (Medium); · Coastal Flats (Lower); and · Coastal Moss (Lower); · Coastal Plain (Medium); and · Low Farmland (Medium). This corridor follows the alignment of the existing 400kV OHL between Middlebie and Harker and the existing 132kV OHL south of Gretna, which locally increases the capacity of the landscape to accommodate OHL development. The low capacity could be avoided during routeing, Narrow Wooded Valley LCT could be avoided during routeing, but not the Coastal Flat and Coastal Moss LCT.	• Coastal Plateau (Medium); • Narrow Wooded Valley (Lower); • Flow Plateau (Medium); • Coastal Flats (Lower); • Low Farmland (Medium); • Broad Valley (Medium); and • Low Farmland (Medium). This corridor follows the alignment of the existing 132kV OHL between Dumfries and Gretna, which locally increases the capacity of the landscape to accommodate OHL development. Routeing through the LCT with lower capacity (Narrow Wooded Valley and Coastal Flats) cannot be avoided.	· Coastal Plateau (Medium); · Narrow Wooded Valley (Lower); · Flow Plateau (Medium); · Coastal Flats (Lower); · Coastal Moss (Lower); · Coastal Plain (Medium); and · Low Farmland (Medium). This corridor follows the alignment of the existing 132kV OHL between Dumfries and Gretna, which locally increases the capacity of the landscape to accommodate OHL development. Routeing through the LCT with lower capacity (Narrow Wooded Valley, Coastal Flats and Coastal Moss) is unavoidable.	
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes.	This corridor crosses the Dumfries and Galloway Tourist Route, Robert Bruce Trail, Annandale Way and Telford Trail in its western Half. There are also two National Cycle Networks (NCN) crossings within the corridor. In terms of spread of residential receptors population density generally decreases with distance from the coastal edge as the land rises towards the foothills to the north. This corridor also crosses the M74 and A7.	This corridor crosses the Dumfries and Galloway Tourist Route, Robert Bruce Trail, Annandale Way and Telford Trail in its western half. There are also three NCN crossings within the corridor. In terms of spread of residential receptors population density generally decreases with distance from the coastal edge. This corridor also crosses the M74 and follows the alignment of the M6 on the eastern extent .	This corridor includes a section of the Dumfries and Galloway Tourist Route between Dumfries and Gretna. The corridor also includes sections of the Robert Bruce, Burns Heritage and Telford Trail and crosses the Annandale Way. There are also two NCN crossings within the corridor. In terms of spread of residential receptors population density generally increases with proximity to the coast. The western end of the corridor follows the alignment of the A75 (a major coastal route into Dumfries) and the eastern extent of the corridor also crosses the M74 and A7.	This corridor includes a section of the Dumfries and Galloway Tourist Route between Dumfries and Gretna. The corridor also includes sections of the Robert Bruce, Burns Heritage and Telford Trail and crosses the Annandale Way. There are also three NCN crossings within the corridor. In terms of spread of residential receptors population density generally increases with proximity to the coast and the corridor includes the settlement of Gretna. The western end of the corridor follows the alignment of the A75 (a major coastal route into Dumfries) and the eastern extent of the corridor also follows the alignment of the M74/ M6.	
Cultural Heritage	Scheduled Monuments (SM)	There are nine (SMs) within the corridor which could be avoided during routeing.		There are 20 SMs within the corridor which could be avoided during routeing.	There are 22 SMs within the corridor which could be avoided during routeing.	D/H 1 is preferred with regards to statutory designated cultural heritage assets, as it avoids the WHS 'trigger for consideration zone' and the Kinmount GDL
		There are an additional 24 SMs within 2km of the corridor including Kirkconnel Churchyard which may have wide aspects and is likely to be a key consideration in relation to effects on its setting.	There are an additional 23 SMs within 2km of the corridor including Kirkconnel Churchyard which may have wide aspects and is likely to be a key consideration in relation to effects on its setting.	There are an additional 24 SMs within 2km of the corridor.	There are an additional 20 SMs within 2km of the corridor	

CRITERION	Sub-Criteria	Corridor D/H 1	Corridor D/H 2	Corridor D/H 3	Corridor D/H 4	Preference
	World Heritage Sites (WHS)	Not applicable.	A small part of the northern edge of the 'trigger for consideration zone' for Hadrian's Wall lies within the corridor. The WHS 'trigger for consideration zone' could be avoided during routeing.	Not applicable.	A small part of the northern edge of the 'trigger for consideration zone' for Hadrian's Wall lies within the corridor. The WHS 'trigger for consideration zone' could be avoided during routeing.	
	Inventory Gardens and Designed Landscapes (GDL)	There is one Inventory GDL within 2km of the corridor, Kinmount, see D/H3 and D/H4.		There is one Inventory GDL within the corridor, Kinmount, which is extensive in area but which could be avoided during routeing. However, this GDL may have wide aspects and may be a key consideration in relation to the effects on its settings.		
	A or Grade I/II* Listed Buildings	There are four A and 5 Grade II* Listed Buildings within the corridor. There are an additional ten A and three Grade II* Listed Buildings within 2km of the corridor.	There are five A Listed Buildings within the corridor. There are an additional nine A, one Grade I and four Grade II* Listed Buildings within 2km of the corridor.	There are eight A and five Grade II* Listed Buildings within the corridor. There are an additional fourteen A and three Grade II* Listed Buildings within 2km of the corridor.	There are eight A Listed Buildings within the corridor. There are an additional 13 A, one Grade I and four Grade II* Listed Buildings within 2km of the corridor.	
	Battlefields	One Historic Battlefield, Solway Moss, lies within 2km of the corridor. [Note: There is one candidate Inventory Historic Battlefield, Sark Battlefield – the battlefield area encompasses land just south of Gretna, between the town and the River Esk. This candidate battlefield lies within the corridor for D/H4 and D/H2.]				
Flood Risk	1 in 200 year Flood Zones	The corridor contains a number of 1/200yr flood risk zones including the River Annan, Water of Milk, Middlebie Burn, Mein Water and Kirtle Water. The River Sark and Back Sark Beck Burn, and River Lynne. These flood risk zones could be avoided or easily spanned. However the minimum width of the River Esk flood risk zone is >700m which cannot be spanned. An existing 132kV OHL is located within this flood risk zone. These widths are based on the Environment Agency (EA) 'flood alert' theme.	The corridor contains a number of 1/200yr flood risk zones, including the River Annan and its tributary, the Water of Milk, the Middlebie Burn, Mein Water and Kirtle Water, River Sark and Back Sark. These flood risk zones could be avoided or spanned. However, the corridor contains a large area of EA 'flood alert' zone, which is at risk from fluvial (River Esk) and coastal flooding. The flood risk zone with a minimum crossing width of >750m cannot be spanned. However there are existing 132kV and 275/400kV OHL located within the flood risk zones.	The corridor contains a number of 1/200yr flood risk zones including the River Annan, Kirtle Water, River Sark, Back Sark, Beck Burn, and River Lyne which could be avoided or spanned. However, the minimum width of the River Esk is >700m and cannot be spanned. An existing 132kV OHL is located within this flood risk zone. These widths are based on the EA 'flood alert' theme.	The corridor contains a number of 1/200yr flood risk zones, including the River Annan, Kirtle Water, River Sark and Back Sark which could be avoided or spanned. However the corridor contains a large area of EA 'flood alert' zone, which is at risk from fluvial (River Esk) and coastal flooding. The flood risk zone with a minimum crossing width of >750m. Cannot be spanned. However there are existing 132kV and 275/400kV OHL located within the flood risk zones.	All corridors include 1/200yr flood risk risk zones which cannot be spanned, associated with the River Esk. Corridor D/H1 and D/H3 are preferred as they cross the River Esk further upstream (i.e. smaller flood risk zone width)
Land Use	Existing and Committed Development	An area of committed development (LDP business and industry) is located north of Ecclefechan adjacent to the A74(M). An area of committed development (LDP primary employment area) is located south of Longtown adjacent to the A6071. An area of committed development (LDP housing) is located to the south of the	An area of committed development (LDP business and industry) is located north of Ecclefechan adjacent to the A74(M). An area of committed development (LDP primary employment area) is located south-west of the M6 at Harker. An area of committed development (LDP housing) is located to the south of the Harker substation siting area. These areas can be avoided during line	An area of committed development (minerals) is located near Kinmount House. An area of committed development (minerals) is located west of Creca adjacent to the B722. Three areas of committed development (LDP business and industry) are located south-west of Creca and South of the A75 at Annan. An area of committed development (minerals) is located	An area of committed development (minerals) is located near Kinmount House. An area of committed development (minerals) is located west of Creca adjacent to the B722. Three areas of committed development (LDP business and industry) are located south-west of Creca and South of the A75 at Annan. An area of committed development (minerals) is located	On balance D/H1 is the preferred corridor as it avoids the ex-MoD existing area of committed development and provides more opportunities to avoid other areas of committed development.

CRITERION	Sub-Criteria	Corridor D/H 1	Corridor D/H 2	Corridor D/H 3	Corridor D/H 4	Preference
		Harker substation siting area. These areas can be avoided during line routeing.	routeing. The site of the ex-Ministry of Defence (MoD) Longtown munition storage unit is located within this corridor which is proposed for re-development and will be difficult to avoid during line routeing.	adjacent to the A74(M) and Hollee and two areas of committed development (LDP business and industry) are located either side of junction 21 of the A74(M). An area of committed development (LDP primary employment area) is located south of Longtown adjacent to the A6071. An area of committed development (LDP housing) is located to the south of the Harker substation siting area. These areas can be avoided during line routeing.	adjacent to the A74(M) and Hollee and two areas of committed development (LDP business and industry) are located either side of junction 21 of the A74(M). An area of committed development (LDP primary employment area) is located south-west of the M6 at Harker. An area of committed development (LDP housing) is located to the south of the Harker substation siting area. These areas can be avoided during line routeing. The site of the ex-Ministry of Defence (MoD) Longtown munition storage unit is located within this corridor which is proposed for re-development and will be difficult to avoid during line routeing.	
	Woodland	There is 982 ha (7% of the corridor) of woodland within the corridor, of which approximately 54% is commercial conifer forest. There are 543 ha of Ancient woodlands which are scattered throughout the corridor. It is possible to avoid woodland all together, including Ancient woodland.	There is 985 ha (8% of the corridor) of woodland within the corridor, of which approximately 53% is commercial conifer forest. There are 543 ha of Ancient woodlands which are scattered throughout the corridor. It may not be possible to avoid woodland all together, including Ancient woodland.	There is 1032 ha (6% of the corridor) of woodland within the corridor, of which approximately 42% is commercial conifer forest. There are 746 ha of Ancient woodlands which are scattered throughout the corridor. It may not be possible to avoid woodland all together, including Ancient woodland	There is 1055 ha (7% of the corridor) of woodland within the corridor, of which approximately 42% is commercial conifer forest. There are 762 ha of Ancient woodlands which are scattered throughout the corridor. It may not be possible to avoid woodland all together, including Ancient woodland.	
Preferred Corridor	Overall there is a preference for corridor D/H1 as this is located furthest from the Upper Solway Flats and Marshes, Ramsar/SPA and SSSI reducing the bird collision risk of qualifying species (Holford Rule 1). The corridor is also located the greatest distance from the NSA and AONB and provides greatest opportunity to avoid landscapes with lower capacity to accommodate OHLs, however it does route through a large extent of a Landscape of Country Importance. D/H1 also offers greatest opportunity to minimise effects on visual amenity associated with the road network and population. In relation to cultural heritage, the corridor avoids the Hadrians Wall WHS 'trigger for consideration zone' and the Kinmount GDL, including 2km 'trigger for consideration zone' as well as the Candidate Historic Battlefield (Holford Rule 1). The corridor also crosses the 1/200yr flood risk zone of the River Esk at its narrowest point and avoids the committed development at Longtown. However, D/H1 is the longest corridor (Holford Rule 3) and as with all corridors, it may not be possible to avoid felling woodland (Holford Rule 4 and 5).					

Substation Siting Area Appraisal: Harker

CRITERION	Sub-Criteria	Substation Siting Area H 1
Landscape and Visual Amenity[11]	Landscape Capacity	This siting area encircles the existing Harker substation. The lower lying nature of the Lower Farmland landscape offers opportunities to contain development, and site infrastructure within the existing land use pattern of enclosed pasture. The presence of existing OHL transmission infrastructure, industrial estates and the M6 motorway corridor reduce the sensitivity of this siting area. Enclosed pasture fields exist to the north, east and east of the existing Harker substation site and blocks of mixed woodland to the west offer opportunities for screening development within this area. The relative capacity of this siting area to accommodate substation infrastructure is judged to be higher.
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes.	National Cycle Network (NCN) route 7passes to the north and west, from which the existing Harker substation forms a feature in views. Scattered farmsteads and properties are located along the corridor of the A7 to the east of the siting area, affording views west across the siting area, where the existing Harker substation is often visible. Views from the M6 corridor west of the siting area are limited by the presence of intervening screening form mixed woodland and existing substation and OHL infrastructure.
Flood Risk[12]	1 in 200 year Flood Zones and 1 in 1000 year Flood Zones	The northern part of the siting area lies within the 1/1000 yr flood risk zone of Rockcliffe Beck. However, this can be avoided during substation siting.
Land Use	Land Capability for Agriculture	The substation siting area of 958ha is located on Agricultural Land Classification (ACL) (England) 3 which cannot be avoided through substation siting. The existing Harker 400kV substation and associated OHL infrastructure is also located on this grade of agricultural land.
	Woodland	There are two small blocks of woodland within the substation siting area totalling approximately 5.75ha which can be avoided during substation siting. None of this is Ancient woodland,
Preference	There is only one siting option at this location.	

[11] Biodiversity and Geological Conservation has been appraised and was not considered to represent a constraint and therefore has not been included within this appraisal table

[12] Cultural Heritage has been appraised and was not considered to represent a constraint and therefore has not been included within this appraisal table

Corridor Appraisal: Dumfries North and South

CRITERION	Sub-Criteria	Corridor Dumfries North	Corridor Dumfries South	Preference
Approximate Length of Corridor (km)		22km	26km	Dumfries North is preferred as it is shorter.
Biodiversity and Geological Conservation	Special Protection Areas (SPA)	Not applicable.	The corridor is within the 2km 'trigger for consideration' zone of the Upper Solway Flats and Marshes SPA and in respect of the qualifying species, may include foraging sites and areas where flight activity is relatively high. This could not be avoided during routeing.	Dumfries North is preferred since it is outwith the 'trigger for consideration zone' of the Upper Solway Flats and Marshes SPA, Ramsar Site and SSSI..
	Ramsar site	Not applicable.	The corridor is within 2km of the Upper Solway Flats and Marshes Ramsar Site. There is potential for collision risk to the Ramsar Site's qualifying interest (non-breeding wildfowl and waders) during migratory flights to and from the site. This could not be avoided during routeing.	
	Special Areas of Conservation (SAC)	Not applicable		
	Sites of Special Scientific Interest (SSSI)	Not applicable.	The corridor is within 2km of the Upper Solway Flats and Marshes SSSI. There is potential for collision risk to the SSSI's avian qualifying interest (non-breeding wildfowl and waders) during migratory flights to and from the site.	
	RSPB Reserves	Not applicable		
Landscape and Visual Amenity	National Scenic Area (NSA)	Within 10km of Nith Estuary NSA.	Within 10km of Nith Estuary NSA, this corridor passes along the northern edge of this designation.	Dumfries North is preferred as it avoids proximity to the NSA and provides routeing opportunities to avoid the RSA and the LCT of lowest landscape capacity (Coastal Flats). This corridor also involves fewer crossings of tourist trails.
	Wild Land	Not applicable.		
	Regional Scenic Area (Dumfries and Galloway)	This corridor passes through the Torthorwald Ridge and Terregles Ridge RSA but routeing opportunities exist to avoid these designations.	This corridor passes through the Terregles Ridge, Solway Coast and Torthorwald Ridge RSA. Opportunities exist to avoid the Torthorwald Ridge RSA during line routeing but not the other two designated areas. However, the existing 132kV OHL also passes through the Solway Coast/ Terregles Ridge RSA within this corridor and as such the capacity of this area to accommodate OHL development is raised.	
	Landscape Capacity	• Upland Fringe (Medium); • Lower Dale (Medium); • Coastal Flats (Lower); and	• Lower Dale (Medium); • Upland Fringe (Medium); • Lower Dale (Medium);	

CRITERION	Sub-Criteria	Corridor Dumfries North	Corridor Dumfries South	Preference
		• Upland Fringe (Medium). The LCT of low capacity (Coastal Flats) can be avoided during routeing.	• Coastal Flats (Lower); and • Upland Fringe (Medium). The LCT of low capacity (Coastal Flats) cannot be avoided during routeing.	
	Visual Amenity e.g. recognised mapped viewpoints, tourist routes, important vistas, population, major roads/recreational routes, and Galloway Forest Park.	In terms of the spread of residential receptors; the western half of the corridor, as it skirts the north eastern fringes of Dumfries and Locharbriggs, is relatively densely populated. Residential density reduces in the east of the corridor. The corridor crosses then follows the alignment of the A75 (Galloway Tourist Route) to the east of Dumfries. The corridor also crosses the Burns Heritage Trail and Robert Bruce Trail to the north of Dumfries.	In terms of spread of residential receptors; the western half of the corridor, as it skirts the south western fringes of Dumfries and Cargenbridge, is relatively densely populated. Residential density reduces in the east of the corridor. The corridor crosses the A75 (Galloway Tourist Route) to the west of Dumfries and follows the alignment of this route to the east of Dumfries. The corridor also crosses the Burns Heritage Trail (twice), the Robert Bruce Trail and Solway Heritage Trail (twice). Furthermore the corridor also crosses NCN Route 7 twice near Dumfries.	
Cultural Heritage	Scheduled Monuments (SM)	There are seven SMs within the corridor which could be avoided during routeing. Two of the SMs, Twelve Apostles Stone Circle and Thortherwald Castle Remains, which may have wide aspects and may be key considerations in relation to the effects on their settings. There are an additional 28 SMs within 2km of the corridor	There are three SMs within the corridor which could be avoided during routeing. One of the SMs, Picts Knowe, fort, could have wide aspects and may be a key consideration in relation to the effects on its setting. There are an additional 27 SMs within 2km of the corridor.	Dumfries South is the preferred corridor as there are fewer statuary designated cultural heritage features within this corridor and they are well dispersed throughout the landscape.
	Inventory Gardens and Designed Landscapes (GDL)	The Cowhill Tower GDL lies within the corridor which could be avoided during routeing. The Inventory of Gardens and Designed Landscapes (HS) considers that views to the east, from the house, overlooking the River Nith and the hills beyond are important, and views to the wider landscape surrounding the GDL may be a key consideration in relation to the effects on their settings. There are two GDLs within 2km of the corridor, Dalswinton and Castlehill.	No GDLs lie within the corridor. There are two GDLs within 2km of the corridor. Cowhill Tower and Dalswinton.	
	A Listed Buildings	There are nine A Listed Buildings within the corridor which could be avoided during routeing. Several of these A Listed Buildings, for instance Carnsallach farmhouse and Tinwald house stand in small designed landscapes with associated	There are three A Listed Buildings within the corridor which could be avoided during routeing. These are all single structures, including Terregles Estate former stables, Goldielea viaduct and Mount Keder Monument which can be	

CRITERION	Sub-Criteria	Corridor Dumfries North	Corridor Dumfries South	Preference
		(listed) buildings, and these may have wide aspects which are likely to form a key consideration in relation to potential effects on their settings. Other small single structures such as Mount Keder Monument, Carnsalloch Chapel and West Galloberry Farmhouse, can be avoided during routeing. It is advised that the immediate environs of such assets need to be avoided. There are 17 A Listed Buildings within 2km of the corridor that may have extensive aspects and may form a key consideration in relation to potential effects on their settings.	avoided during routeing. It is advised that the immediate environs of Mount Keder Monument and Terregles former stables need to be avoided. There are 16 A Listed Buildings within 2km of the corridor that may have extensive aspects and may form a key consideration in relation to potential effects on their settings.	
	Conservation Areas (CA)	Two CAs, East & West Cluden and Kirkton, lie within the corridor; however these are small CAs and could be avoided during routeing.	One CA, East & West Cluden, lies within the corridor; however this is a small CA and could be avoided during routeing.	
	Archaeologically Sensitive Areas (ASA)	Not applicable.		
Flood Risk	1 in 200 Year Flood Zones	A flood plain associated with the River Nith highlights a 1/200 year flood risk zone within the corridor and is of an extent which is a 'trigger for consideration' with a minimum span of approximately 1200m. This flood risk zone cannot be avoided during routeing. There are flood risk zones associated with a number of other watercourses e.g. the Lochar Water however these can be avoided/spanned during routeing.	The River Nith is tidal (coastal) in this corridor and the 1/200 year flood plain associated with the River Nith is within this corridor, with a minimum span width of approximately 900m. This flood risk zone cannot be avoided during routeing. There are flood risk zones associated with a number of other watercourses e.g. the Crooks Pow however these can be avoided/spanned during routeing.	No preference, as both corridors include flood risk zones which cannot be spanned during routeing.
Land Use	Existing and Committed Development	There are areas of existing and committed development (minerals) extending over large areas of the corridor to the east of Locharbriggs which will be difficult to avoid at line routeing.	Not applicable.	Overall there is a preference for Dumfries South as this avoids areas of existing and committed development (minerals).

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	Woodland	There is approximately 645 (10 % of the corridor) of woodland within the corridor, of which approximately 2.4% is commercial conifer forest. There are 174 ha of Ancient woodlands which are scattered throughout the corridor. It is possible to avoid woodland all together, including Ancient woodland.	There is approximately 1433 ha (21% of the corridor) of woodland within the corridor, of which approximately 39.7% is commercial conifer forest. There are 257 ha of Ancient woodlands which are scattered throughout the corridor. It may not be possible to avoid woodland all together, although Ancient Woodland is likely to be avoidable.	
Preferred Corridor	Overall the preference is for Dumfries North on the basis that it is located outwith the 'trigger for consideration' zone of the Upper Solway Flats and Marshes SPA, Ramsar Site and SSSI (Holford Rule 1), is a relatively greater distance from the NSA (Holford Rule 1) and provides opportunities to avoid the RSA (Holford Rule 2) and landscapes with lower capacity to accommodation overhead lines. The Dumfries North corridor is also shorter than Dumfries South (Holford Rule 3). However existing and committed development (minerals) and cultural heritage features may form a key consideration at the routeing stage.			