SP ENERGY NETWORKS

Glenlee Substation Extension

Design and Access Statement

SP Energy Networks

September 2019

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Design and Access Statement

Prepared by LUC
September 2019

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Preface

This Design and Access Statement has been prepared by LUC on behalf of SP Energy Networks (SPEN) in support of an application for planning permission to construct and operate an extension to the operational Glenlee Substation ('the proposed development'). The site is located in Dumfries and Galloway, approximately 1.5km south-west of St John's Town of Dalry.

The Design and Access Statement accompanies the planning application for the proposed development, which is also supported by an Environmental Impact Assessment (EIA) Report (including a Non-Technical Summary) and a Pre-Application Consultation (PAC) Report.

Electronic copies of all documents can be downloaded free of charge via www.spendgsr.co.uk.

All documents are also available for public inspection at the following locations:

- **Dalry Library:** Main Street, ST. John's Town of Dalry, DG73UP. Tel: 01644 430234. Opening hours: Tuesday 10.30am to 2pm and Friday 11am to 4.30pm.
- **Kirkcudbright Library:** DG Customer Services – Kirkcudbright, Daar Road Offices, Kirkcudbright, DG6 4JG. Tel: 01557 332516. Opening Hours: Monday to Friday 9am to 5pm, Saturday 10am to 1pm.
- **Dumfries Ewart Library:** Catherine Street, Dumfries, DG1 1JB. Tel: 01387 253820. Opening hours: Monday 9am to 6.30pm, Tuesday 9am to 5pm, Wednesday 9am to 6.30pm, Thursday 9am to 6pm, Friday 9am to 5pm, Saturday 10am to 3pm.
- **Dumfries Planning Office:** English Street, Dumfries, DG12HS. Opening hours: Monday to Friday 9am to 5pm.

Electronic copies of the full set of EIA documents, including the Design and Access Statement and Pre-Application Consultation Report are available on USB for £15 and a set of hard copies of all documents may be purchased for £75 by contacting SPEN using the contact details set out below:

- Dedicated freephone number: 0800 157 7353
- Dedicated project email address: dgsr@communityrelations.co.uk
- Freepost address: FREEPOST SPEN DGSR

Any representations to the planning application for the proposed development may be submitted to Dumfries and Galloway Council at:

- https://www.dumgal.gov.uk/article/15337/Comment-on-a-planning-application;
- by email to planningrepresentations@dumgal.gov.uk or;
- by post to Head of Planning and Regulatory Services at Development Management, Kirkbank House, English Street, Dumfries, DG1 2H

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1 Introduction

1.1 This Design and Access Statement has been prepared by LUC on behalf of SP Energy Networks (SPEN) (the Applicant) to accompany an application for planning permission to construct and operate an extension to the operational Glenlee substation. The substation extension and associated temporary works are hereafter referred to as 'the proposed development'. The planning application site boundary encompasses an area of 8.69 hectares (ha) with the actual extension itself covering an area of approximately 0.35 ha. References to 'the site' mean the planning application site unless the context indicates otherwise. The extension will accommodate the new switchgear required to support and operate the wider Kendoon to Tongland 132 kilovolt (kV) Reinforcement Project (the KTR Project) which is described in further detail below. The existing Glenlee substation adjoins the Glenlee hydro power station on the Water of Ken, approximately 1.5km south-west of St John's Town of Dalry as shown in **Figure 1**.

1.2 The substation extension which forms part of the proposed development is a 'national development' as it falls within a category of development set out in Scotland's Third National Planning Framework (NPF3) (Annex A – national developments):

"Development consisting of… new and/or upgraded onshore sub stations directly linked to electricity transmission cabling of or in excess of 132 kilovolts."

1.3 This Design and Access Statement has been prepared to meet the requirements of the Town and Country Planning (Development Management Procedure) Regulations (Scotland) 2013 and the relevant provisions of the Town and Country (Scotland) Act 1997 (as amended). A planning application for development which belongs to the category of 'national development' must be accompanied by a statement explaining the approach to access and in particular how design principles and concepts have been applied, as well as highlighting specific issues which might affect access to the development for disabled people.

1.4 The Design and Access Statement comprises two parts, namely:

- The Design Statement, which describes the proposed development and how it has evolved through the design process.
- The Access Statement, detailing how the site will be accessed during construction and operation.

1.5 The Design and Access Statement should be read in conjunction with the Glenlee Substation Extension Environmental Impact Assessment (EIA) Report (September 2019) which provides further details of the construction and operation of the proposed development.

Purpose of the Design and Access Statement

1.6 The purpose of this Design and Access Statement is to provide information on the principles and approach that have guided the design process and to demonstrate observance of equal opportunity requirements for access. This Design and Access Statement demonstrates how the site and its surroundings have been fully appraised to ensure that the final design solution achieves a balance across the range of factors which require to be addressed. It describes the starting point for the proposed development's design, the various factors which have driven the design process, and subsequent iterations to the layout that were made in response to the environmental and technical issues that were identified during the EIA process as well as consultation with statutory and non-statutory consultees. Details are also provided on the access arrangements.

Proposed Development

1.7 The layout of the proposed development is illustrated in **Figure 2**. The main permanent components of the proposed development include:

- new electrical switchgear and plant;
- a new 3m steel palisade security fence around the perimeter;
- drainage works including diversion of the existing watercourse that crosses the field into a culvert underneath the substation; and
- removal of existing trees and mitigation planting.

1.8 In addition, the following temporary works will also be required:

- To the north-east, the site boundary extends to the other side of the U2S road to accommodate drainage features and as a reserve water treatment area for discharge from the site.
- A temporary construction compound for initial enabling works (including road improvements and formation of the main construction works compound) will be located on the site of the overflow car park, north-east of the substation on the opposite side of the public road (U2S).
- A number of temporary construction elements will be located to the north-west of the proposed extension site, west of the penstock. This will include the construction access from the U2S, the main temporary construction compound, settlement ponds, and temporary topsoil storage areas.
- South of the site of the proposed extension itself, the site boundary extends to include a temporary vehicle holding area, settlement ponds and material storage areas.
- Passing places are proposed along the A762 from the junction with the A716 and from the junction of the U2S to the new permanent access to the site. The planning application boundary therefore extends along the public road to accommodate these features.

Relationship with the KTR Project

1.1 The KTR Project consists of proposals for the replacement of approximately 46km of 132 kV overhead transmission line which is supported on steel towers between Polquhanity in the north, through Glenlee, and south to the Tongland substation. In addition, two new short sections of 132kV wood pole will be required to facilitate connection of Earlstoun and Carsfad power stations. The transmission line to be replaced currently connects five hydro-electric power stations in Galloway that serve the populations of Galloway, Dumfries and Ayrshire with electricity. Built in the 1930s and running at full capacity, the existing line is at the end of its operational life and is therefore in need of replacement to ensure secure, reliable supplies to existing and future customers. The five new connections comprised in the KTR Project are detailed below. Delivering the five connections will also allow SPEN the opportunity to remove approximately 43km of existing 132kV lattice steel tower overhead line infrastructure (the 'N' and 'R' routes) that is no longer required. The proposed development is required to facilitate this. The five connections comprised in the KTR Project, and the existing infrastructure to be removed, are illustrated on **Figure 3**. The five new connections comprise:

- A new 132kV steel tower overhead line, of approximately 10.6km in length between Polquhanity (approximately 3km north of the existing Kendoon substation) and Glenlee substation, via the existing Kendoon substation (P-G via K).
- A new 132kV wood pole overhead line, of approximately 2.6km in length, between Carsfad and Kendoon (C-K).
- A new 132kV wood pole overhead line, of approximately 1.6km in length, between Earlstoun and Glenlee (E-G).

- A new 132kV steel tower overhead line deviation of the existing BG route, at Glenlee substation approximately 1km in length (BG Deviation).
- A new 132kV steel tower overhead line, of approximately 32.5km in length, between Glenlee and Tongland (G-T).

1.2 Five applications will be submitted to Scottish Ministers seeking consent under section 37 of the Electricity Act 1989 for the overhead lines comprising the KTR Project, as well as deemed planning permission for the overhead lines and the removal of the N and R routes. It is anticipated that the applications will be made in Autumn 2019. The KTR Project is subject to a separate EIA to assess the likely significant environmental effects of the project. This will address the construction and operation of the new overhead lines as well as the removal of N and R routes.

1.3 The substation extension which forms part of the proposed development needs to be operational before the new overhead lines are built. On this basis, SPEN agreed with Dumfries & Galloway Council (D&GC) that, whilst it remains part of the overall KTR Project, a planning application for the proposed development will be lodged in advance of, and progressed separately from, the applications for the KTR Project.

The Applicant

1.4 SPEN owns and operates the electricity transmission and distribution networks in central and southern Scotland through its wholly-owned subsidiaries SP Transmission plc (SPT) and SP Distribution plc (SPD). Its transmission network is the backbone of the electricity system in its area, carrying large amounts of electricity at high voltages from generating sources such as windfarms and power stations across long distances. The transmission network includes more than 4,000km of overhead lines and more than 360km of underground cables. The electricity is then delivered via the distribution system serving two million customers. In Dumfries and Galloway, SPEN serves approximately 83,000 customers through six Grid Supply Points (GSPs), namely (from east to west) Chapelcross, Dumfries, Tongland, Glenlee, Newton Stewart and Glenluce.

1.5 As a transmission licence holder for central and 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.

1.6 SPEN also has the following obligations pursuant to its licence conditions:

- To provide for new electricity generators wishing to connect to the transmission system in its licence area. SPEN is also obliged to ensure that the system is fit for purpose through appropriate reinforcements to accommodate the contracted capacity.
- To plan and develop its transmission system in accordance with the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS) and in so doing take account of National Grid's obligations as system operator, to co-ordinate and direct the flow of electricity on, to and over the transmission system in Great Britain.

1.7 In response to statutory and licence obligations upon it, SPEN therefore requires to ensure that the transmission system is developed and maintained in an economic, coordinated and efficient manner in the interests of existing and future customers.

1.8 Section 38 and Schedule 9 of the Electricity Act 1989 imposes a further statutory duty on SPEN to take account of the following factors in formulating any relevant proposals:

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

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

1.9 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 for new substations and overhead lines.

2 The Design Statement

The Site and its Surroundings

2.1 The existing Glenlee substation adjoins the Glenlee hydro power station on the Water of Ken, approximately 1.5km south-west of St John's Town of Dalry. The site of the substation extension which forms part of the proposed development is bounded to the north by the existing Glenlee substation, hydro power station and local road (the U2S), to the east by residential properties and a local road (the U3S), to the south by undeveloped greenfield land, and to the west by the penstock of the Glenlee hydro power station and undeveloped greenfield land. In the wider area, there is an overflow car park located directly across the U2s from the existing substation and the rest of the surrounding land is currently mainly agricultural, and is used for grazing livestock.

2.2 The Glenlee substation, which is owned and operated by SPEN, converts the 11kV electricity output from the hydro power station up to a grid voltage of 132kV.

2.3 Glenlee Hill to the south-west of the site has a peak elevation of approximately 270m which slopes steeply in a north-easterly direction, levelling out close to the site. Areas to the north and north-east of the site and local road are relatively flat and vary in elevation from approximately 53m Above Ordnance Datum (AOD) to 50m AOD. This low-lying area likely represents the historic floodplain of the Coom Burn prior to its realignment and the construction of the power station.

Site Selection and Alternative Options

2.4 Public consultation is a key component of the development process and SPEN has undertaken extensive consultation with local communities on the proposals for the proposed development, both as part of the wider KTR Project, and in isolation. The consultation that was undertaken has been fundamental to the selection of the final location and design of the proposed development. Full details of the consultation undertaken are detailed in the PAC Report which accompanies the planning application.

2.5 Throughout the development of the final design for the substation extension, a number of alternative options were considered, including several which were raised through the consultation process. Four alternative options were considered in detail as described below and illustrated on **Figure 4**.

Option 1: Extension of the Existing Substation Site

2.1 This option, (which has been taken forward to EIA and for which an application for planning permission is being submitted), involves extending the existing substation directly adjacent to the south-west. The development footprint includes gantries (i.e. end point of the overhead line) connecting to the first terminal tower on the proposed realignment of the existing BG overhead line route as part of the wider KTR Project. The development footprint for the substation extension itself is approximately 0.69 hectares (including the access and changes to ground levels). The existing control building would also require a minor extension.

Option 2: Retain the Existing Substation and Relocate the Proposed Extension to the Opposite side of Glenlee Power Station

2.2 This option involves locating the proposed substation extension behind the existing Glenlee hydro power station as an entirely new substation site. The development footprint for the substation extension is approximately 1.83 hectares (including the access and changes to ground levels).

Option 3: Move Entire Substation (Proposed and Existing) to the Opposite side of Glenlee Power Station as an Air Insulated Substation (AIS)

2.3 This option would involve moving the whole substation (i.e. existing Glenlee substation plus new extension) as an AIS (with most equipment outdoors, as for the existing substation). This option would allow the existing substation to be demolished and the site restored. The development footprint for the substation extension is approximately 1.78 hectares (including the access and changes to ground levels).

Option 4: Move Entire Substation (Proposed and Existing) to the Opposite Side of Glenlee Power Station as a Gas Insulated Substation (GIS)

2.4 This option would involve moving the whole substation as a GIS (with the GIS switchgear contained inside a building). This option would allow the existing substation to be demolished and restored. The development footprint for the substation extension is approximately 1.1 hectares (including the access and changes to ground levels).

Key Site Selection and Design Considerations

2.5 A number of economic, technical and environmental considerations were identified through desk and field work and consultation during the EIA, to inform the final decision on which of the four options detailed above should be taken forward.

Economic Considerations

2.6 The proposed development is considerably cheaper to develop than the other options, all of which have all been calculated as at least twice as expensive (based on 2018 estimates of plant and civil engineering costs). In terms of economics, Option 1 is the most economic and efficient option.

Technical Considerations

2.7 Efforts have been made to produce the smallest footprint. By extending the existing site, outages to existing customers can be effectively managed, and existing plant and equipment can be reused.

Environmental Considerations

2.8 The environmental effects of the proposed development are considered in detail within the EIA Report, however in summary the following considerations were taken into account in the appraisal of the four options detailed above:

- Habitats are common and widespread across each of the sites considered and potential effects on protected species would be unlikely for all options. No bird species of note were identified during surveys that were undertaken for the KTR Project. Potential effects on ecology are considered in **Chapter 8: Ecology** of the EIA Report. Potential effects on ornithology have been scoped out of detailed assessment as set out in **Chapter 2: Approach to the EIA** of the EIA Report. The option taken forward will require a diversion to an existing watercourse and electrofishing surveys confirmed that no fish or crayfish are present.
- The options appraisal identified that for the option taken forward, test pitting/trial trenching will require to be undertaken to confirm the presence of any features of cultural heritage importance as past surveys have identified the presence of metal working debris which suggests the possible presence of a metal working site in the area. The visual impact of the extension on the setting of nearby cultural heritage assets was considered for each of the options and is considered to be minimal. Potential effects on cultural heritage are considered in **Chapter 9: Cultural Heritage** of the EIA Report.
- Construction activities are predicted to result in noise levels above recommended thresholds at some of the adjacent properties during certain periods of the construction programme for option 1. The increased distance from the residential properties would negate this requirement for the other options considered. Therefore, to mitigate this noise, a noise fence is proposed to be installed between the site and the residential properties which would provide acoustic screening, bringing all activities within required thresholds at the receiver locations. Noise levels from vehicle movements adjacent to the nearest noises sensitive properties would also be within the set threshold. Potential effects on noise and details of the mitigation proposed are set out in **Chapter 10: Construction Noise** of the EIA Report.

- Through extending the existing substation, the transmission infrastructure will be contained to one side of the penstock and not substantially increase its influence over a wider area when compared with the other options. Whilst substantial cut and fill will be required, there are opportunities for screening of the substation and landscape planting has been considered to reduce visibility from nearby properties in particular. The proposed alignments of the overhead lines connecting into the existing and proposed substation extension site will contain the presence of transmission infrastructure within an area already occupied by existing infrastructure when compared with the other options considered, thus avoiding the potential for extending landscape and visual effects over a wider area. Potential effects on landscape and visual amenity are considered in **Chapter 6: Landscape and Visual Amenity** of the EIA Report.
- This option is at low risk of flooding but will require diversion of the unnamed watercourse and extension/realignment of the existing culvert which runs under the existing Glenlee Substation and which was constructed at the same time and is undersized to convey the 1 in 2-year flow. This is discussed further in **Chapter 7: Hydrology and Water Resources** of the EIA Report. A review of the drift geology mapping and the SNH carbon and peatland map 2016 indicates that no peat is present and the habitats present do not suggest the presence of peat for any of the options.
- Peak Heavy Goods Vehicle (HGV) movements have been calculated to last a maximum of three months on the A713 north of A762, A713 south of A762, A762 between A713 and U2S, and the U2S, a considerably shorter time period than the other options considered. Potential effects relating to access, traffic and transport are considered in **Chapter 11: Access, Traffic and Transport** of the EIA Report.

2.9 Based on the above, the chosen option was identified for the following reasons:

- It is considerably cheaper to develop than the other options, all of which have all been calculated as at least twice as expensive.
- By extending the existing site, outages to existing customers can be effectively managed, and existing plant and equipment can be reused.

2.10 The environmental considerations are extensively explored in the EIA Report.

Design of the Proposed Development

2.11 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[1]. The substation extension location was primarily determined by its proximity to the existing substation and the requirement to connect existing/replacement OHLs as part of the KTR Project as detailed above, and the form of the substation extension forming part of the proposed development is governed by its function. Notwithstanding this, the following substation design principles have been adopted for the proposed development:

- the use of high quality construction materials appropriate to the locality;
- Landscape planting using appropriate species to provide screening. This will help integrate the site into the wider rural landscape in longer distance views experienced from elevated positions including Waterside Hill to the north and Mulloch Hill to the east. Native broadleaf trees and shrubs are proposed adjacent to the north-western and south-eastern edges of the site beyond the extent of platform excavations; this was agreed in consultation with D&GC's Landscape Architect in August 2017.

[1] The Horlock Rules were devised in 2003 and updated in 2006 by National Grid Company (NGC) plc.

3 The Access Statement

Access to the Site

3.1 Access to the site will be undertaken via the A713, which runs broadly north-south between Ayr and Castle Douglas. From the A713, traffic will then access the A762 before turning west at Coom Bridge on to the U2S which is the existing access to the Glenlee substation and Glenlee hydro power station. From the U2S there is an existing bellmouth and access located to the rear of the Carville property. This will be widened and extended to form a permanent access behind the properties of Tummel and Rannoch before continuing further south to the temporary construction vehicle holding area described above. In addition, a temporary access will be required off the A762 to the north of the Glenlee hydro power station which will extend to the temporary construction site compound.

3.2 It is assumed that site personnel, during the construction and operational phases, will be transported to and from the site by car, mini-bus or van; all classed as Light Goods Vehicle (LGV). It is not intended that these vehicles will be restricted to specific site access routes.

3.3 It should be noted that the site is unmanned and is therefore not a permanent place of work. The site is proposed as an operational area and will therefore only be accessible to those who are authorised to work on or adjacent to the SPEN network. Due to this, any staff or contractors working in the area must be able to exit site rapidly in the event of an emergency. On that basis, no disabled access is proposed as part of the development.

Access for Formal and Informal Recreation Activity

3.4 In accordance with standard practice, as is the case with the existing Glenlee substation, the substation as extended will not be accessible by the public and the site will be secured by security fencing and warning notices will be displayed about possible dangers.

3.5 Dumfries and Galloway Core Path 30 ('Glenlee'[2]) is the closest core path to the proposed development and is located to the north/north-east of the existing Glenlee substation and at its closest point runs adjacent to the Coom Burn and joins on to the U2S public road which will be used for all traffic accessing the site during construction. During construction, a Construction Traffic Management Plan (CTMP) will be in place to manage traffic into and out of the site. Furthermore, signage, way markers and, if required, banksmen, will be deployed to assist walkers using the path and any localised diversion considered necessary to ensure that there will be no effects on walkers using this path whilst works are ongoing.

[2] The Core Path is described on the Dumfries and Galloway Council Core Path Map as: *"A very pretty riverside walk leading to the elegant architecture of the Glenlee Hydro Power Station. This walk can be combined with minor roads to provide a figure-of-eight route from Dalry where there is free parking, WC, shops and eateries."* (https://info.dumgal.gov.uk/mapviewers/pathsmap.aspx).

Glenlee Substation Extension Design and Access Statement

Figure 1: Glenlee Substation Extension Location

- Planning application boundary
- Substation extension
- Temporary compound and access for main works
- Temporary construction vehicle holding area
- Passing place

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CB:JN EB:robertson_s LUCGLA FIG01-00_6118-002_Glenlee_Substation_Location 27/08/2019

Map Scale @ A3: 7,500

Glenlee Substation Extension Design and Access Statement

Figure 2: Glenlee Substation Extension Layout and Temporary Construction Works

- Planning application boundary
- Substation extension
- Temporary compound and access for main works
- Temporary construction vehicle holding area
- Drainage ditch diversion
- Indicative temporary soil storage
- Temporary compound for enabling works

Temporary compound for main works

Temporary compound for enabling works

Substation extension

Drainage ditch diversion

Temporary construction vehicle holding area

54m

Drain

Court Hill

FB

Spreads

Issues

Pipelines

Drum

Sinks

North Lodge

0 100 200 m

Map Scale @ A3: 2,000

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CB:JN EB:robertson_s LUCGLA FIG03-00_6118-001_Glenlee_Substation_Layout_detailed 29/08/2019

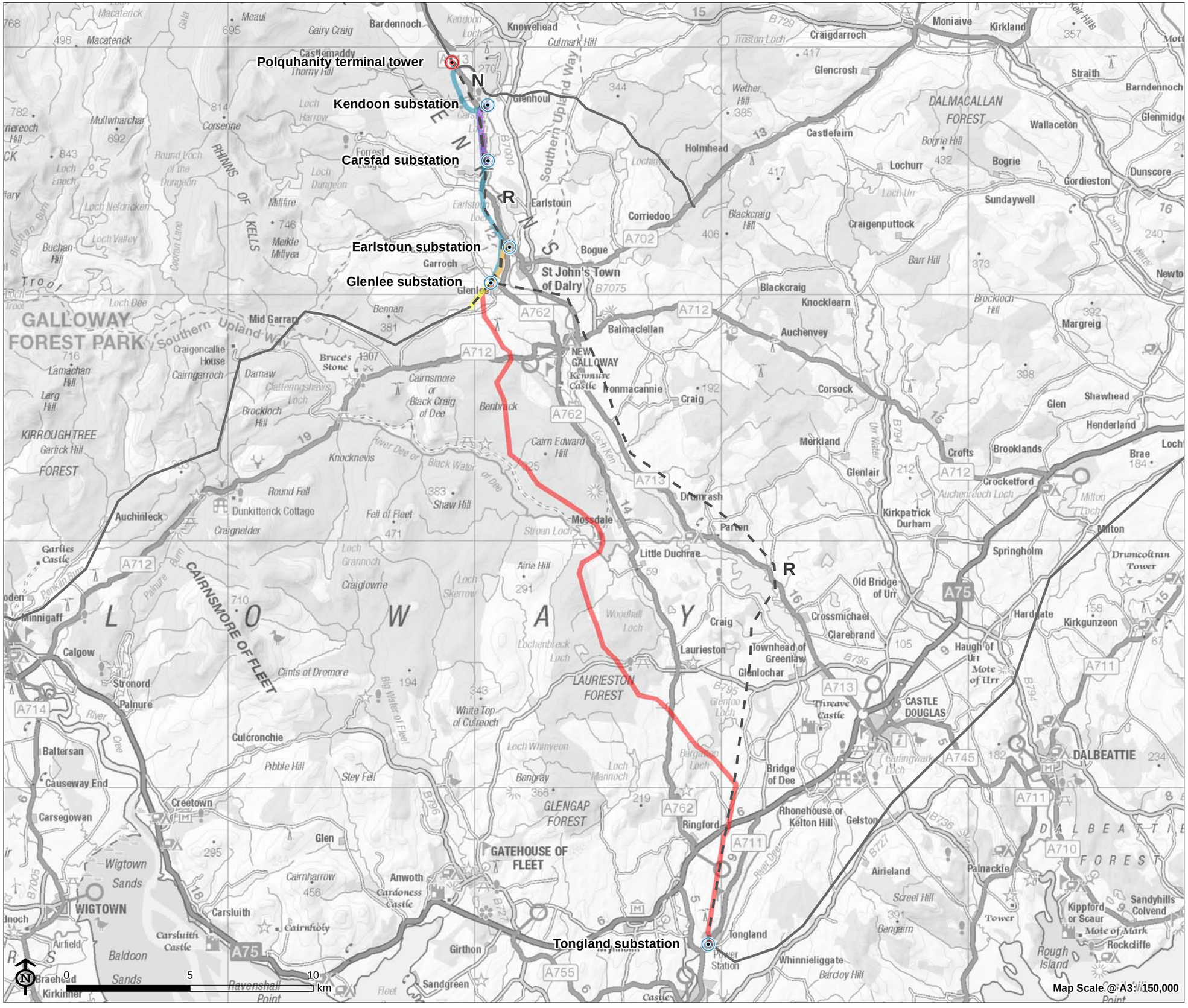

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Figure 3: The Five Connections of the KTR Project

The KTR Project

- Polquhanity sealing end and terminal tower
- Substation and hydro electricity generating station
- Polquhanity to Glenlee via Kendoon
- Carsfad to Kendoon
- Earlstoun to Glenlee
- BG route deviation
- Glenlee to Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing network

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