SP ENERGY NETWORKS

The Kendoon to Tongland Reinforcement Project

Environmental Impact Assessment: Scoping Report

April 2017

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Kendoon to Tongland Reinforcement Project

Environmental Impact Assessment: Scoping Report

Prepared by LUC
April 2017

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1 Introduction

1.1 This Scoping Report has been prepared on behalf of ScottishPower Energy Networks (SPEN) and relates to proposals to reinforce the 132kV electricity transmission network between Kendoon and Tongland, in the Dumfries and Galloway Region. The reinforcement is referred to as 'the Kendoon to Tongland 132kV Reinforcement Project' (the KTR Project).

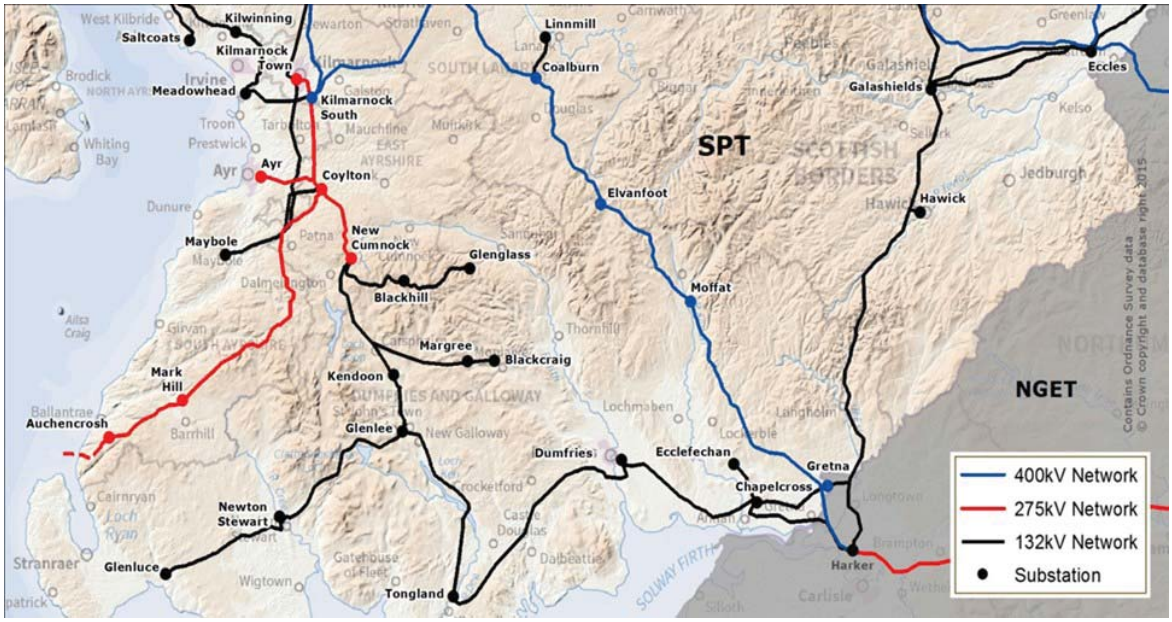
1.2 This Scoping Report accompanies SPEN's request for a Scoping Opinion which is being sought from the Scottish Ministers in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (as amended). Scoping is an early step in the Environmental Impact Assessment (EIA) process, the objective of which is to ensure the assessment process focusses upon the likely significant effects associated with the KTR Project. Scoping also provides an opportunity for consultees to comment on the proposed methodologies for the EIA, identify sources of baseline information and raise any specific issues requiring assessment.

Project Need

1.3 The existing electricity transmission system in the southwest of Scotland was developed between the 1930s and 1970s to supply local customers and to connect the area's hydro generation schemes. It currently serves more than 83,000 customers.

1.4 The system is shown in **Figure 1.1**. A 132kV overhead line runs from Glenluce to Newton Stewart, then on to Glenlee, before heading north towards Dalmellington and south to Tongland. From Tongland, the line heads east via Dumfries towards Gretna, where a 400kV line heads south, across the border into England, connecting to the National Grid substation at Harker, near Carlisle. A separate 275kV transmission line links Auchencrosh in South Ayrshire to Coylton in East Ayrshire.

Figure 1.1: Electricity transmission system in south west Scotland



1.5 Much of this infrastructure is approaching the end of its life and is not fit for purpose. Improving it is essential for the security of supply for existing and future users. Major investment in the network now will serve users for the next 60 to 70 years and also increase its capacity.

1.6 This upgrade of the 132kV electricity transmission network between Polquhanity (about 3km north of Kendoon) and Tongland (a total distance of around 44km) will replace the existing end-of-life 132kV lattice steel tower overhead line and enhance local electricity security of supply. The upgrade will also allow SPEN the opportunity to remove approximately 43km of existing 132kV lattice steel tower overhead line infrastructure ('N' and 'R' routes) that is no longer required.

Background to the KTR Project

1.7 The KTR Project originally comprised an integral part of the larger Dumfries & Galloway Strategic Reinforcement (DGSR) Project. The outputs from the early routeing and consultation stages of the DGSR Project have influenced the KTR Project.

1.8 In the summer of 2015, SPEN carried out a three month stakeholder consultation on the DGSR Project, which included proposals for:

- a new high voltage overhead line (OHL) of up to 400kV from Auchencrosh, in South Ayrshire, through Dumfries and Galloway, to Harker, near Carlisle;
- two new 132kV overhead lines from Kendoon to Glenlee and from Glenlee to Tongland;
- four new high voltage substations at Auchencrosh, Newton Stewart, Glenlee and Dumfries.

1.9 In parallel with the consultation in 2015, SPEN worked with National Grid, in its role as GB Transmission System Operator, to carry out a thorough cost-benefit analysis (CBA) of the DGSR Project to makes sure Dumfries and Galloway's transmission system was developed in the most efficient and economical way.

1.10 The CBA investigated options ranging from the full 400kV Auchencrosh to Harker proposal to a reduced scheme based on the modernisation of existing 132kV infrastructure, and the provision of some additional capacity on the system.

1.11 The results concluded that the 400kV Auchencrosh to Harker proposal did not deliver enough benefit for electricity consumers in Great Britain relative to the cost of the project at the time. The outcome of this work was the identification of a recommended solution, significantly reduced in scope and scale and which partially meets the original project drivers. It was therefore recommended that a 'reduced scheme', which is integral to and forms part of the original project, should be progressed at present.

1.12 This reduced scheme involves the modernisation and increase in capacity of the existing 132kV overhead lines between Kendoon and Glenlee and from Glenlee to Tongland (the KTR Project), as outlined below.

Overview of KTR Project Components

1.13 The KTR Project consists of proposals for:

- a new 132kV double circuit steel tower overhead line, of approximately 2.9km in length, between Polquhanity (approximately 3km north of the existing Kendoon substation) and the existing Kendoon substation;
- a new 132kV double circuit steel tower overhead line, of approximately 7.7km in length, between the existing Kendoon substation and the existing Glenlee substation, which will be extended;
- a new 132kV single circuit wood pole overhead line, of approximately 2.6km in length, between Carsfad and Kendoon;
- a new 132kV single circuit wood pole overhead line, of approximately 1.6km in length, between Earlstoun and Glenlee;

- a new 132kV double circuit overhead line deviation of the existing BG route, at Glenlee substation approximately 1km in length;
- a new 132kV double circuit steel tower overhead line, of approximately 32.5km in length, between Glenlee and Tongland.

1.14 The new overhead line components of the KTR Project also enable the decommissioning and removal of approximately 43km of existing 132kV overhead lines comprising:

- the removal of 2km of existing 132kV steel tower overhead line from Polquhanity to Kendoon ('N' route);
- the removal of approximately 8km of existing 132kV steel tower overhead line between Kendoon, Carsfad, Earlstoun and Glenlee ('R' route);
- the removal of approximately 33km of existing 132kV steel tower overhead line between Glenlee and Tongland ('R' route).

1.15 For the purposes of scoping a 200m wide proposed route for each overhead line connection is being considered as shown on **Figure 1.2**.

Removal of Overhead Line between Tongland and Dumfries

1.16 There is currently 44km of existing 132kV steel tower overhead line between Tongland and Dumfries known as 'S' route (see **Figure 1.2**), which is at the end of its operational life. The KTR Project will provide an opportunity to remove 'S' route although this is not a component of or form part of the KTR Project. The approach to the removal of 'S' route is addressed in detail in the section below.

The Consenting and EIA Process

Consents

1.17 The KTR Project comprises six new overhead lines, with associated extension at Glenlee substation, and the removal of parts of the 'N' and the 'R' route (as outlined above). It is proposed that consent will be sought under section 37 of the Electricity Act 1989 from the Scottish Ministers, to install and keep installed the new overhead electricity lines, with submission currently programmed for the last quarter of 2018. SPEN will also apply for deemed planning permission for the lines and ancillary development works and the removal of 'N' and 'R' routes, under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997.

1.18 The 44km of existing 132kV steel tower overhead line between Tongland and Dumfries ('S' route) is physically remote from the KTR project (as seen in **Figure 1.2**) and, whilst SPEN intend to remove this route following commissioning of the KTR Project, in relation to the EIA for the KTR Project, it's removal is separate and distinct from the wider KTR Project. This is in contrast to the existing sections of 'N' and 'R' routes. The proximity of 'N' route and 'R' route to sections of new 132kV overhead line being constructed means that their removal forms part of the overall mitigation commitments relied on in the EIA for the KTR Project.

1.19 SPEN's view is that the overhead line between Tongland and Dumfries ('S' route) can be removed under permitted development rights available under the Town & Country Planning (General Permitted Development) (Scotland) Order 1992 ("GPDO").

1.20 The removal of 'S' route will therefore be the subject of a separate Screening request to Dumfries and Galloway Council under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011[1]. In the event that the planning authority adopt a positive screening opinion (i.e. that the removal of 'S' route is EIA development), then the removal would be subject to an EIA. This would be undertaken separately to the EIA for the KTR Project. An application

[1] The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 are due to come into force on the 16th May 2017. The screening will be undertaken in the context of the 2017 Regulations.

seeking planning permission for removal of 'S' route would be submitted to Dumfries and Galloway Council under the Town and Country Planning (Scotland) Act 1997.

1.21 On this basis, whilst the presence of 'S' route will be included within the assessment of effects of the KTR Project (as it is existing and therefore present in the baseline and will be in operation during construction of the KTR Project), it does not form part of the KTR Project. The removal of 'S' Route will therefore not be included in application for S37 Consent or covered by the KTR Environmental Statement (ES).

The EIA Process

1.22 With regards to the EIA process; each of the component parts of the project will form a 'single project' for the purposes of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 ('the EIA Regulations')[2]. On this basis it is proposed that all component parts of the KTR project, i.e. each of the six new overhead lines, and the three sections of overhead lines to be removed (comprising 'N' and 'R' routes (R comprising sections north and south of Glenlee substation), will be supported by one ES containing an assessment of each individual overhead line, with an overarching assessment of the combined effects of the KTR Project as a whole.

Structure of the Scoping Report

1.23 The remainder of this report is structured as follows:

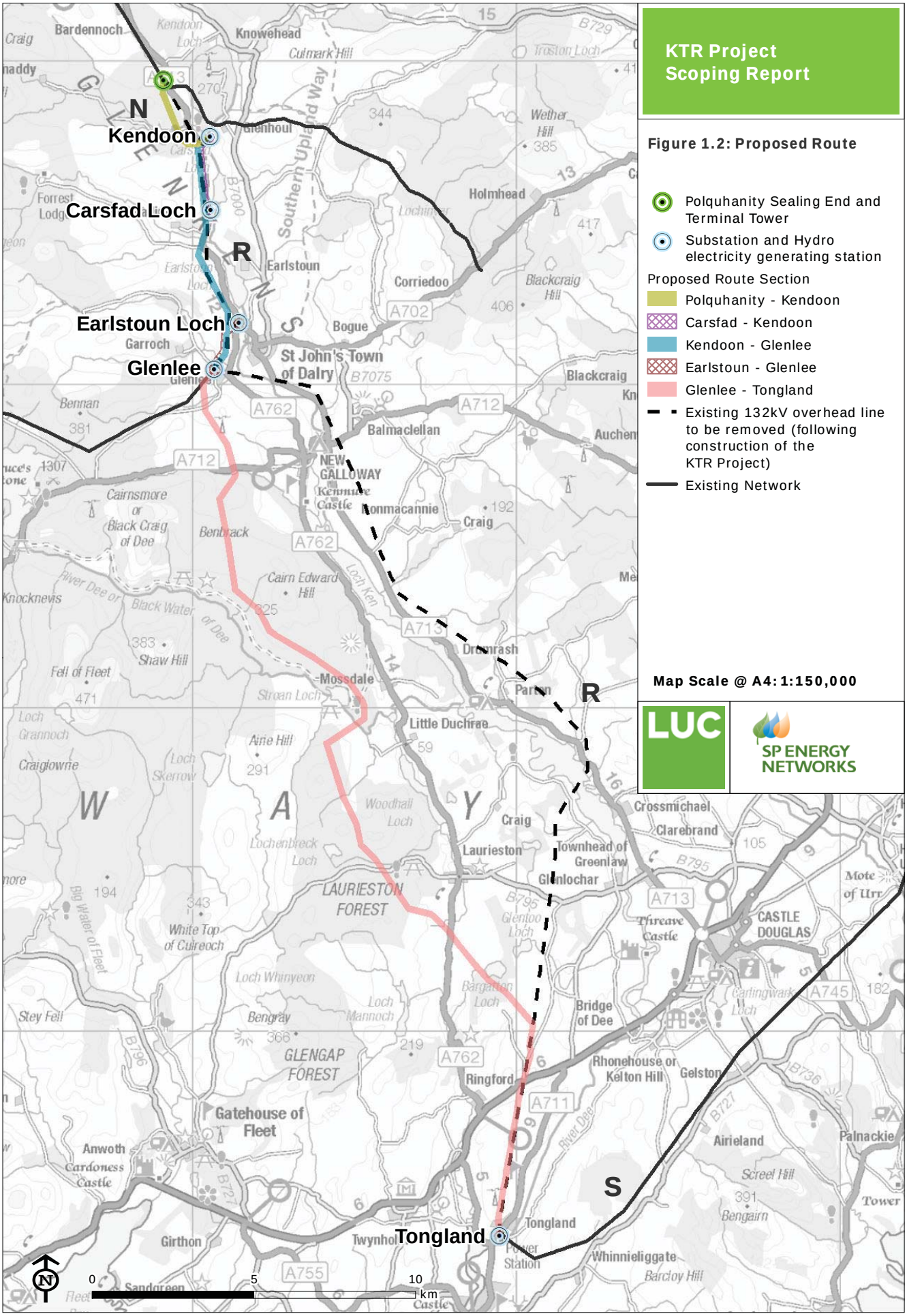
- **Chapter 2** provides a description of the KTR Project including outline construction, operation and decommissioning details;
- **Chapter 3** provides information on the EIA process and considers the information required by the EIA Regulations;
- **Chapter 4** describes the policy and legislation relevant to the KTR Project;
- **Chapters 5-14** outline the topic areas to be considered in the EIA, including an overview of the environmental baseline and a brief description of the likely significant effects of the development; and
- **Chapter 15** outlines the topic areas proposed to be scoped in and scoped out of the ES for each environmental topic for each component connection.

1.24 **Chapters 5 to 14** have been undertaken by the following specialists who will undertake the respective assessments as part of the EIA:

- Chapter 5 - Landscape and Visual Amenity: LUC
- Chapter 6 - Geology, Hydrology, Hydrogeology, Water Resources and Peat: Kaya Consulting Ltd, Fluid Environmental Consulting Ltd and Minerals and Resource Management.
- Chapter 7 – Ecology: LUC.
- Chapter 8 – Ornithology: NRP.
- Chapter 9 – Cultural Heritage: CFA.
- Chapter 10 – Traffic and Transport: Mott McDonald Ltd.
- Chapter 11 – Construction Noise: Hoare Lea.
- Chapter 12 – Forestry: RTS.
- Chapter 13 – Socio Economics, Tourism and Recreation: Peter Brett Associates.
- Chapter 14 – Other Issues: SPEN.

[2] These Regulations will be replaced on 16th May 2017 by The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017; however the KTR Project will be scoped prior to the new Regulations coming into force, therefore the EIA will be undertaken in accordance with the current Regulations.

1.25 In addition, **Appendix 1** provides an outline of the proposed content of the ES and **Appendix 2** details the consultees that will be approached in relation to the scope of the EIA as well as those that will be consulted for information to inform the EIA.



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2 KTR Project Description

Description of the Project Area

2.1 This chapter provides a description of the connection requirements for the KTR Project. The development of the KTR Project will also enable SPEN to rationalise the electricity network through the decommissioning and removal of existing overhead transmission lines within the project area. Further details are provided below.

2.2 The project area is situated wholly within Dumfries and Galloway and covers a linear area, running broadly north to south from Polquhanity (approximately 3km to the north of the existing Kendoon substation), to the existing substation at Tongland (approximately 1.5km to the north of Kirkcudbright).

2.3 The project area is within Glenkens Valley, and includes, amongst others, the villages of St John's Town of Dalry, Mossdale, and Laurieston. The local road network encompasses a section of the A713 from Polquhanity to St John's Town of Dalry the A762 south to Tongland the A711, A713 and the A75 trunk road.

2.4 There are a number of high and low voltage existing overhead lines within the area including the 132kV network running from Polquhanity to Tongland via Glenlee (the 'N' and 'R' routes). **Figure 1.2** shows the location of the existing 132kV network, including the points of connection outlined below and the existing network which will be removed as a result of the KTR Project.

KTR Project Components

Polquhanity to Kendoon

2.5 A new 132kV double circuit overhead line is required between Polquhanity (approximately 3km north of the existing Kendoon substation) and the existing Kendoon substation. This proposed overhead line, of approximately 2.9km in length, will connect to a new consented line which is currently being constructed from Polquhanity to the existing New Cumnock substation, 3km northeast of Dalmellington. The proposed overhead line will be supported on L7 lattice steel towers, which have six cross-arms (three on each side) and have a standard design height of 27m. A photo/graphic showing an existing L7 tower in the landscape is provided as **Figure 2.1a**

Kendoon to Glenlee

2.6 A new 132kV double circuit overhead line, of approximately 7.7km in length, is required between the existing Kendoon substation and the existing Glenlee substation (which will be extended).The overhead line will be supported on L7 lattice steel towers, which have six cross-arms (three on each side) and have a standard design height of 27m.

2.7 An extension (of approximately 90m x 40m) to the existing Glenlee substation will be required to accommodate new switchgear associated with the replacement connections to Kendoon and to Tongland.

Carsfad to Kendoon

2.8 A new 132kV single circuit overhead line, of approximately 2.6km in length, is required between the hydroelectric power station at Carsfad and the existing substation at Kendoon. The overhead line will be supported on a 'trident' design wood pole with a standard design height of 15m. A photo/graphic showing an existing trident wood pole in the landscape is provided as **Figure 2.1b**.

Earlstoun to Glenlee

2.9 A new 132kV single circuit overhead line, of approximately 1.6km in length, is required between the hydroelectric power station at Earlstoun and the existing substation at Glenlee. The overhead line will be supported on a 'trident' design wood pole with a standard design height of 15m. A short section of underground cable will be required to connect into the Glenlee substation.

Deviation of Existing BG Route

2.10 A minor deviation, of approximately 1km in length, is required to the existing route between Glenlee substation and Newton Stewart substation ('BG' route) to allow the first five (to be confirmed during detailed design) existing L4 towers of this route to be used for the new double circuit overhead line between Glenlee substation and Tongland substation. The deviation will be supported on L4 lattice steel towers positioned in a parallel alignment to the northwest of the existing L4 towers, before re-joining the existing BG route approximately 800m southwest of Glenlee substation.

Glenlee to Tongland

2.11 A new 132kV double circuit overhead line, of approximately 32.5km in length, is required between the existing Glenlee substation and the existing Tongland substation. The overhead line will be supported on L4 lattice steel towers, which have six cross-arms (three on each side) and have a standard design height of 26m. A photo/graphic showing an existing L4 tower in the landscape is provided as **Figure 2.2a.**

Decommissioning and Removal of Existing 132kV Overhead Lines

2.12 The above proposals enable SPEN to remove approximately 43km of existing aged network between Polquhanity and Kendoon, Kendoon and Glenlee (including Earlstoun and Carsfad), and Glenlee to Tongland ('N' and 'R' routes).

Overhead Line Infrastructure

2.13 With an overhead line, conductors (or wires) are suspended at a specified height above ground and supported by wooden poles or lattice steel towers, spaced at intervals. Conductors can be made either of aluminium or steel strands. Most overhead lines at 132 kV and above carry two 3-phase circuits, with one circuit strung on each side of a tower. For towers, an earth wire may be required to provide lightning protection. Single circuit lines are used on occasion, and at 132kV, these lines can be supported on wooden poles.

2.14 Conductors are strung from insulators attached to the lower cross-arms or pole steel work and prevent the electric current from crossing to the tower or pole body.

Towers Types

2.15 Towers can be used to carry conductors at 132kV and above. These are generally of a lattice steel construction fabricated from high tensile steel which is assembled using galvanised high tensile steel bolts with nuts and locking devices.

2.16 There are three types of tower:

- Suspension or Line: where the tower is part of a straight line section.
- Tension or Angle: where there is a horizontal or vertical deviation in line direction of a specified number of degrees. There are three main types of angle tower 30 degrees, 60 degrees and 90 degrees.
- Terminal: where the overhead line terminates into a substation or on to an underground cable section via a separate cable sealing end compound or platform.

Tower Heights and Span Lengths

2.17 The section of overhead line between towers is known as the 'span', with the distance between them known as the 'span length'. Span lengths between towers average between 200m and 300m but can be increased if there is a requirement to span something such as a river or a loch.

2.18 Towers are used to regulate the statutory clearances required for conductor height, which is determined by the voltage of the overhead line (the higher the voltage, the greater the safety clearance that will be required) and the span length required between towers.

Tower Colour

2.19 Towers are painted grey. It is not possible to colour towers to camouflage them for all times of day or all seasons. However, the colour of towers can only be recognised from a short distance. Beyond this, the colour is generally not distinguishable from the backdrop, and appears as grades of light and dark. Where towers are viewed against the sky, colour cannot be relied upon to diminish visibility, since the lighting characteristics of the sky vary greatly. Towers will turn a dull grey colour after about 18 months.

Wood Poles Types

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

2.21 There are three types of pole:

- Intermediate: where the pole is part of a straight line section.
- Angle: there is only one type of angle pole which can support changes in direction up to a maximum of 300 degrees. All angle structures will require to be back stayed.
- Terminal: where the overhead line terminates into a substation or on to an underground cable section via a cable sealing end.

Wood Pole Heights and Span Lengths

2.22 Span lengths between poles average between 80m and 120m, with the average height of a wood pole approximately 15m.

Wood Pole Colour

2.23 New wood poles are dark brown in colour and weather over the years to a light grey.

Underground Cables

2.24 A short section of underground cable is required for the Earlstoun connection where it enters the existing Glenlee substation. With an underground cable, the conductors are encased in insulated material and buried in a backfilled trench of suitable depth and width. Whilst the number of cables, and the depth and width of the trench depends on the circuit rating and voltage, the width of the trench can be substantial. This would be dependent on the installation method, environmental issues, ground conditions and access requirements during construction. For example, two 132kV circuits run together, each with two cables/phase, would require a trench greater than 2.4m wide (possibly up to 5m wide) with an adjacent working area of up to 3m wide. Where connected to an overhead line, an underground cable may also involve the creation of a fenced compound for the siting of terminal supports and sealing end compounds above ground.

Construction Process and Maintenance

2.25 The construction of overhead lines and underground cables requires additional temporary infrastructure such as temporary accesses to tower/pole locations and to cable trenches and construction compounds to store materials. All have limited maintenance requirements and all are subject to well-established procedures for dismantling/decommissioning.

Overhead Lines

2.26 Line construction, maintenance and decommissioning usually follow a standard sequence of activities. The duration of these activities for wood pole lines is normally less than for lattice steel tower lines.

2.27 The total duration of construction activity at any single tower site is approximately two weeks for tower foundations, one to two weeks for tower construction, and up to four weeks for conductor erection and stringing depending on the size of the tower and the number of the conductors to be strung. These periods are spread over about four months, with periods of inactivity between, or longer if construction difficulties are experienced elsewhere along the line or ground conditions prevent normal progress. The construction period for wood pole lines is normally less than for tower lines.

2.28 Prior to constructing the overhead line, temporary accesses will be constructed, as necessary, and laydown /storage areas established, usually mid-way along the route. Any trees which may impact on safety clearances will be removed or lopped. Following commissioning of the overhead line, all equipment and temporary access of construction areas will be removed with the land being reinstated to the satisfaction of the landowner.

2.29 The majority of overhead line components are maintenance free, although periodic painting of the tower steelwork may be required and components are regularly inspected for corrosion, wear and deterioration. There is also an ongoing requirement to ensure that any trees within the wayleave corridor do not impact on safety clearances.

2.30 The condition of tower steelwork and foundations is monitored regularly. Towers which have deteriorated significantly may be dismantled carefully and replaced. If a line is decommissioned, towers will be removed with components re-used where possible. Foundations are removed to a general depth of one metre below ground level, the area cleared and the ground reinstated.

Underground Cables

2.31 Open cut trenching is the most frequently used construction method for cable installation. However, in crossing under watercourses or motorways for example, a trenchless technique such as directional drilling may be used. Works at each section commonly consist of the construction of a haul road, the excavation of the cable trench by mechanical excavators, cable laying, the backfilling of the trench with sand and native material and surface reinstatement. A typical cable installation rate is up to 160m per week, depending on the terrain. A temporary construction compound is also required and again this is generally located close to the midpoint of the cable route.

2.32 Annual maintenance checks on foot are commonly required during operation. The cable route will also be kept clear of all but low growing vegetation. In the unlikely event that there is a fault along the cable, the area around the fault is excavated and the fault repaired or a new section of cable inserted as a replacement. If lines are decommissioned, cables can either be left in situ or carefully excavated and removed.

Proposed Felling

2.33 The felling of commercial forestry will be required to construct the overhead lines, and also to maintain the required clearances for safe construction and maintenance of the overhead lines. A clearance wayleave corridor of 80m, comprising 40m either side of the centre line of the overhead line, will be required.

2.34 The felling proposals will be developed by the EIA team, including forestry specialists and landscape architects, in consultation with the relevant landowners and forest managers. The proposals will take account of the Forestry Commission Scotland's statutory remit to deliver forestry management for multiple benefits, including timber production, and will reflect FCS's design guidelines.

2.35 Opportunities for re-planting within the wayleave corridor will be investigated as part of the EIA process and will be incorporated into the felling design plans where appropriate, in consultation with the relevant forestry managers.

2.36 Each relevant EIA topic chapter will include an assessment of the effects of the felling proposed, with potentially significant effects identified.

Micro-siting

2.37 Whilst the route for each connection will be refined through the EIA process to develop a detailed development footprint, the centre line of each connection may be subject to further minor deviation and tower / pole micro-siting to allow for unconfirmed ground conditions and pre-construction confirmation of environmental conditions.

2.38 Micro-siting provides scope for further mitigation of potential effects. The proposed micro-siting 'tolerance' will form part of the applications for Section 37 consent, and it is anticipated that this will also form a condition accompanying each of the consents.

Access

2.39 Access to works will be gained from the existing main road network wherever feasible. The use of certain unclassified roads will also likely be required. The initial preference when taking access is to use low ground pressure vehicles and plant. However, depending on plant requirement and local ground conditions, temporary or permanent tracks, capable of supporting heavy plant safely, will need to be constructed. These tracks will be formed primarily of stone. However, where access is required to be taken through any sensitive areas identified during the EIA process, other less intrusive methods such as temporary steel, or timber roadways may be employed.

Decommissioning of Existing 132kV Overhead Lines

2.40 Following commissioning of the KTR Project, the existing network, comprising 'N' and 'R' routes will be decommissioned and removed. The decommissioning is part of the mitigation associated with the KTR Project and it is anticipated that it will be the subject of a condition attached to a deemed planning permission. It is anticipated that the decommissioning will be completed within one year of commissioning the new overhead line components of the KTR Project.

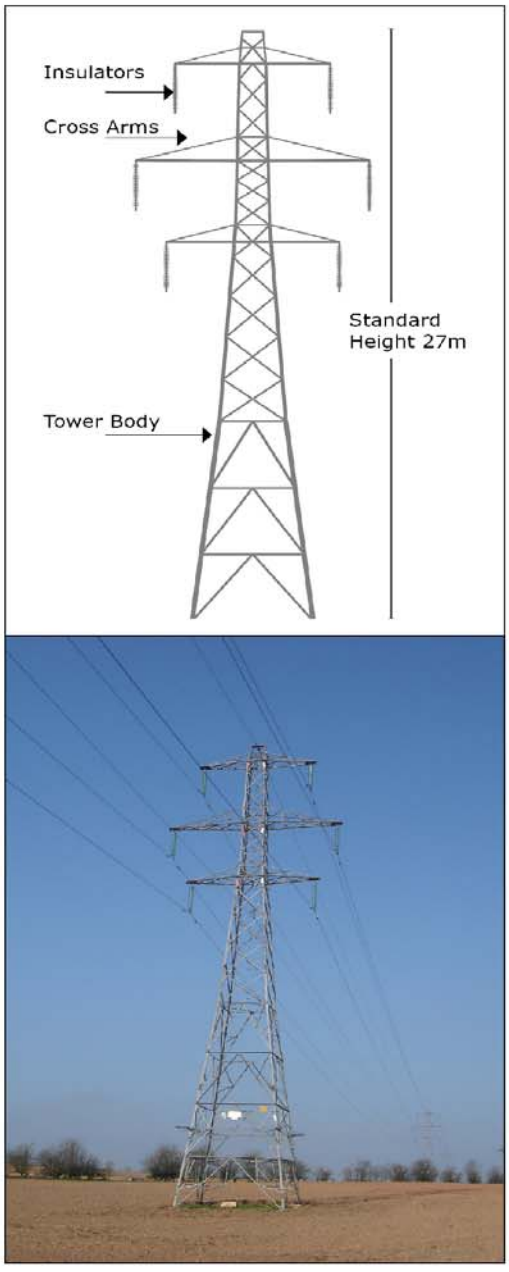
2.41 Towers to be decommissioned will be removed from site with materials being recycled, where possible. Removal of towers will involve attaching a steel bond wire between the earth wire peak and a mobile winch (typically attached to a tractor) after which the steel legs of the tower are cut (using a disc saw) above the concrete foundations. The tractor winch is then used to fell the tower in a controlled manner. Towers are then cut into sections on the ground and removed from site.

2.42 In areas where sensitive conditions exist and it is not possible to fell the tower, the tower would be unbolted and lifted off in sections using a mobile crane. The sections would then be transported off site to be broken down.

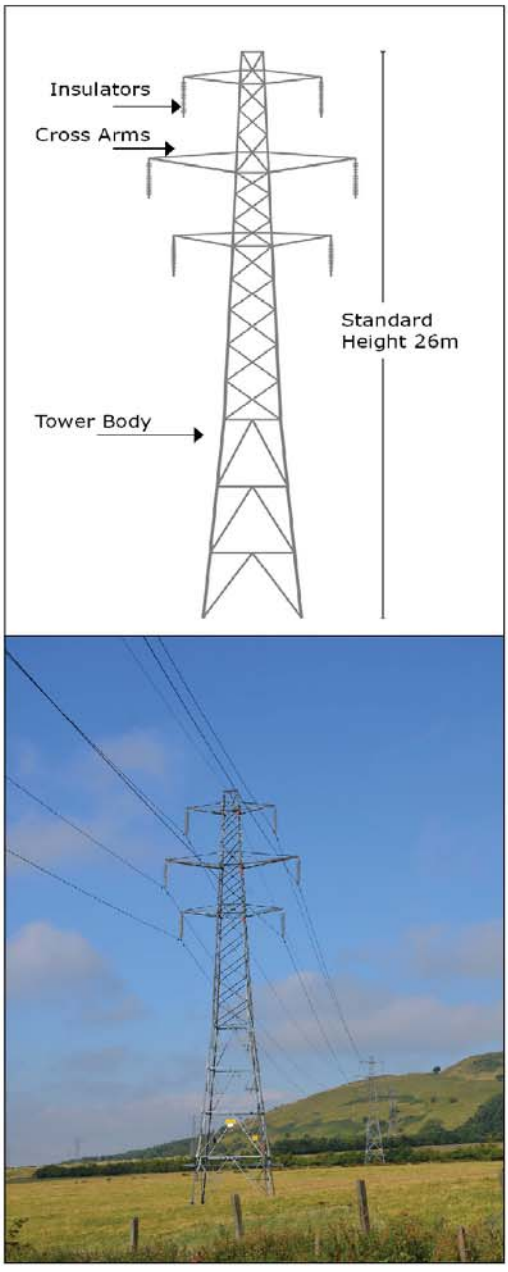
2.43 Foundations are removed to a minimum depth of one metre below ground level, the area cleared and the ground reinstated. This would typically involve the use of a tracked excavator with concrete 'pecker' to break out foundations.

2.44 The above access requirements also apply to decommissioning.

Figure 2.1a: Steel Tower Types



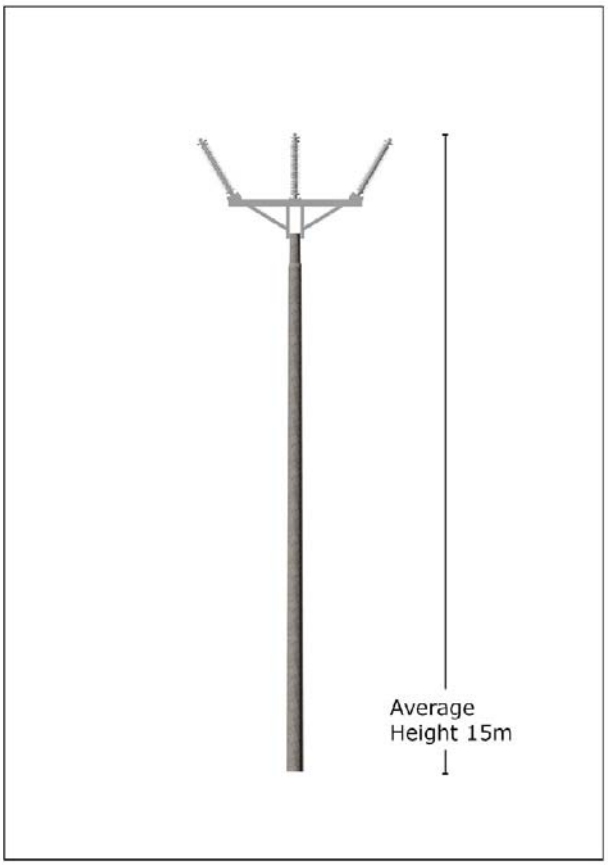
Component parts of 132kV Steel Lattice Tower L7: Polquhanity to Kendoon, and Kendoon to Glenlee.



Component parts of 132kV Steel Lattice Tower L4: Glenlee to Tongland

Source: LUC, SPEN

Figure 2.1b: Wood Pole Type



132kV 'Trident' design Wood Pole
Carsfad to Kendoon and Earlstoun to Glenlee

Source: LUC, SPEN

3 The Environmental Impact Assessment

Introduction

3.1 EIA is the process of systematically compiling, evaluating and presenting all the likely significant environmental effects, both positive and negative, of a proposed development, to assist the determining authority in considering the application for development consent. It enables the significance of these effects, and the scope for reducing negative, or enhancing positive, effects to be clearly understood. The information compiled during the EIA is presented within an Environmental Statement (ES) to accompany the application for development consent. The proposed structure of the ES is provided in **Appendix 1**.

3.2 EIA is an iterative process and runs in tandem with project design. As potential effects are identified, the design of the development, for example the positioning of the towers, will be adjusted to reduce or avoid adverse effects where possible and mitigation measures will be proposed as appropriate.

3.3 The EIA will be conducted in accordance with current government regulations, policy and guidance, with more detail provided on these in **Chapter 4**.

3.4 The following sections outline how the EIA process will be undertaken.

Pre-Scoping Consultation

3.5 A Statutory Stakeholder Liaison Group (SSLG) was formed at the outset of the KTR Project, which consists of statutory consultees comprising Dumfries and Galloway Council (D&GC), Scottish Natural Heritage (SNH), Scottish Environment Protection Agency (SEPA), Historic Environment Scotland (HES) and Forestry Commission Scotland (FCS). Chaired by the Scottish Government Energy Consents and Deployment Unit (ECDU), the SSLG meets as necessary at key milestones throughout the project programme. . This process ensures that all statutory consultees are kept up to date with project progress, and that they have the opportunity to comment on and feed in to the routeing process, proposed approach to scoping, the EIA process and the draft ES. This ongoing consultation negates the need for additional pre-scoping consultation as part of the process of applying for section 37 consent.

Scoping

3.6 The purpose of scoping is to help focus the EIA on the likely significant environmental effects of relevance to the KTR Project. Therefore, on the basis of the work undertaken to date as part of the routeing and consultation stages, feedback from the SSLG, the professional judgement of the assessment team, experience from other similar projects, as well as policy, guidance and standards of relevance, each topic-based section within this report outlines both:

- potentially significant effects associated with the construction and/or operation of the KTR Project, proposed for detailed consideration within the ES;
- effects considered likely to be insignificant, adopting a precautionary approach, which can be 'scoped out' and given only brief treatment unless further investigation suggests otherwise.

3.7 Additional objectives of the Scoping Report are:

- to establish the availability of baseline environmental data;
- to define a survey and assessment framework from which a comprehensive overall assessment can be produced;

- to invite consultees to identify any specific concerns that they might have in relation to the scheme;
- to comment on the proposed methodology;
- to provide and receive information relevant to the scheme;
- to consider the way in which the findings are presented in the ES; and
- to understand and consider any procedural changes relevant to the submission of the ES.

3.8 Each of the topic-based chapters of this report includes a list of consultees who will be contacted as part of the scoping process. The Scoping Report will be made available to all consultees should it be required. A combined list of consultees is provided as **Appendix 2**. The list has been informed by discussion with the ECDU. Additional suggestions of further stakeholders who may have an interest in the development and who may wish to be consulted for information to inform the EIA are likely to be identified during the Scoping process.

Approach to Scoping for Individual Overhead Line Sections

3.9 It is intended that scoping will be applied to each of the six new overhead line developments for which S37 Consent is being sought, (i.e. if the requirement is identified within the Scoping Opinion, for specific ornithology surveys, then this will be a requirement for all the new overhead lines comprising the KTR Project).

3.10 However, a different approach will be applied with regards to the decommissioning of 'N' and 'R' routes. Due to the nature of the decommissioning works i.e. the removal of 'N' and 'R' routes following construction and commissioning of the new overhead lines and the fact it is not anticipated that there will be a many significant effects, it is intended that it would be possible to scope out entire topics for the decommissioning sections of the project. There is therefore a necessity for the Scoping Opinion to differentiate between these two aspects of the project i.e. the construction/operation of new overhead lines and the decommissioning/removal of existing overhead lines. To assist, a table has been produced to identify the topics proposed to be considered as part of the EIA and those matters which are suggested are scoped out, see **Chapter 15**.

Baseline Conditions

3.11 The EIA Regulations require that the aspects of the environment, which are likely to be significantly affected by the development, be defined within the ES. To achieve this, it will be necessary for each of the topic specialists to gather information on the environment, as it currently exists, i.e. 'baseline conditions'. This will be undertaken as the first step in the assembly of data for the ES through a combination of consultation with relevant stakeholders, field survey work and desk based research.

Assessment of Effects (including Cumulative Effects)

3.12 The assessment of the likely significant effects, using a range of appropriate methodologies, will take into account the construction and operation of the KTR Project in relation to the study area and its environs. The baseline, will include other similar developments i.e. infrastructure projects which are at the following stages in the development process:

- operational;
- under construction; and
- consented.

3.13 In addition, an assessment will be made of the likely significant cumulative effects of the development in combination with other infrastructure developments including:

- developments which are the subject of applications for consent and which have been submitted to the relevant determining authorities but not yet determined (or are the subject of a valid appeal);
- any other developments deemed relevant by the ECDU and/or D&GC.

3.14 The presence of the existing 132kV overhead line network in the vicinity of the KTR Project, which is subject to removal following commissioning of the KTR Project i.e. 'N', 'R' and 'S' routes, will be present within the baseline for the construction and up to one year of operation. However, as 'N' and 'R' routes are due to be decommissioned and removed within one year of commissioning of the KTR Project, and their removal forms part of the mitigation and application for deemed planning, they will be assumed to not be present within the long-term baseline for the operational assessment of the KTR Project.

3.15 SPEN propose to remove 'S' route under permitted development rights available under the Town & Country Planning (General Permitted Development) (Scotland) Order 1992 ("GPDO"). This is predicated upon SPEN obtaining a negative screening opinion from Dumfries and Galloway Council i.e. that it is not EIA development. The removal of 'S' Route does not form committed mitigation for the KTR Project and nor is its removal going to form part of the application for deemed planning permission as part of it. 'S' route will be assumed to be present in the operational baseline of the KTR Project and as such the EIA process will be made even more robust.

3.16 The study area for each discipline will be defined separately to reflect the potential extent of likely significant effects associated with the KTR Project. The study area for each discipline is not necessarily defined by the site boundary, with some survey areas being smaller and some larger depending on the nature of effects and taking into account advice and best practice. Therefore, study areas will be defined separately for each topic assessed in the EIA to reflect the likely extent of potential effects. For example, with an overhead line development, predicted effects associated with operational noise extend over a more localised area than visual effects.

3.17 In the interests of producing a focussed and concise report, which highlights clearly those issues of particular relevance to the KTR Project, the specialist topic area assessment methodologies are not presented in detail within this report as these are now generally well established and widely understood. Current guidance, standards and legislation will be adhered to in all specialist assessments.

Mitigation

3.18 The most effective form of avoiding and/or mitigating potentially significant environmental effects associated with overhead lines is through careful routeing, as has been undertaken for the KTR Project during the routeing process.[3]

3.19 Subsequent to the routeing process and informed by the emerging findings of the EIA, the detailed design process and programming of construction activities provides another opportunity to further mitigate potentially significant effects. Given the prior experience of SPEN in implementing accepted good practice during the construction and operation of schemes such as this, and within the current regulatory context, such mitigation measures are considered to be embedded as part of the design/construction process. Embedded mitigation measures are considered as effective mitigation and will be taken into account prior to the assessment of the likely effects of the development.

3.20 Further tailored mitigation measures will then be proposed prior to determining the likely significance of residual effects in accordance with Part 1(4) of Schedule 4 of the EIA Regulations which notes that the ES should include "a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment." These measures will be termed mitigation measures and will be included for each topic area, where appropriate.

[3] The findings of the routeing process for the KTR Project are presented in The KTR Project: Routeing and Consultation Document (October 2016).

3.21 The EIA will identify and assess potentially significant effects prior to mitigation, and, where mitigation measures are proposed, their likely effectiveness will be examined and the significance of the 'residual' effect then assessed. SPEN will be committed to implementing all the mitigation measures identified in the ES and where appropriate, the mitigation measures implemented will be monitored for effectiveness.

3.22 Where there are opportunities for offsetting and/or positively enhancing effects, these will be identified through the EIA process.

4 Planning Policy Context

Introduction

4.1 This section presents a hierarchical overview of the legislative energy and planning policy context for the KTR Project. A more detailed review of relevant policies will be included in a chapter within the ES. The chapter will not, however, assess whether the KTR Project will comply with the identified policies, or the weight to be given to the material considerations. This will be undertaken in a separate Planning Statement which will accompany the application/s for Consent.

4.2 The KTR Project is located within Dumfries & Galloway. As outlined in **Chapter 1**, the application/s will be determined by Scottish Ministers under Section 37 of the Electricity Act 1989. Dumfries & Galloway Council is a statutory consultee for the applications. SPEN will also apply for deemed planning permission for the lines and associated works under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997.

4.3 An overview of the relevant planning policy and guidance, from a strategic to local level, which will be considered as part of the EIA process, is provided below.

National Planning Policy

National Planning Framework 3

4.4 The third National Planning Framework for Scotland (NPF3)[4], published in June 2014, represents a spatial expression of the Scottish Government's aspirations for sustainable economic growth in Scotland over the next 20-30 years. It sets out the Scottish Government's long term strategy for development and includes proposals identified as schemes of national importance. NPF3 will form a material consideration when determining applications for development consent and, as such, will be a consideration in determining the application for the KTR Project.

4.5 A High Voltage Electricity Transmission Network throughout Scotland is identified within NPF3 under a 'Statement of Need', which notes that developments are required to support the delivery of an enhanced high voltage electricity transmission grid. This is highlighted in being vital in meeting national targets for electricity generation, statutory climate change targets, and security of energy supplies. Developments required included the following:

- 'new and/or upgraded onshore electricity transmission cabling of or in excess of 132 kilovolts, and supporting pylons.
- new and/or upgraded onshore sub stations directly linked to electricity transmission cabling of or in excess of 132 kilovolts.
- new and/or upgraded onshore converter stations directly linked to onshore and/or offshore electricity transmission cable(s) of or in excess of 132 kilovolts.
- new and/or upgraded offshore electricity transmission cabling of or exceeding 132 kilovolts.'

Scottish Planning Policy (SPP)

4.6 Scottish Planning Policy (SPP)[5] was updated in June 2014 along with NPF3 and is a statement of Scottish Government policy on land use planning. It emphasises the merits of sustainable

[4] The Scottish Government, (2014), 'Scotland's Third National Planning Framework', available [online] at: http://www.gov.scot/Resource/0045/00453683.pdf. Last accessed 13/03/2017.

[5] The Scottish Government, (2014), 'Scottish Planning Policy', available [online] at: http://www.gov.scot/Resource/0045/00453827.pdf. Last accessed 13/03/2017.

development and the need to deliver heat and electricity in a low carbon manner through supportive policies in Development Plans.

4.7 For example, paragraph 156 of SPP states that strategic development plans should support national priorities for the construction or improvement of strategic energy infrastructure, including generation, storage, transmission and distribution networks, addressing cross-boundary issues, promoting an approach to electricity and heat that supports the transition to a low carbon economy.

4.8 SPP and NPF3 are material considerations when determining applications such as for the KTR Project.

Planning Advice Notes (PANs)

4.9 Planning Advice Notes (PANs) and Specific Advice Sheets set out detailed advice from the Scottish Government in relation to a number of planning issues. Relevant PANs and Specific Advice Sheets, not being statements of policy, are referenced in the topic chapters and include the following:

- PAN 1/2013 Environmental Impact Assessment;
- PAN 60 Planning for Natural Heritage;
- PAN 68 Design Statements;
- PAN 75 Planning for Transport;
- PAN 79 Water and Drainage;
- PAN 3/10 Community Engagement;
- PAN 1/2011 Planning and Noise and accompanying Technical Advice Note; and
- PAN 2/2011 Planning and Archaeology.

Local Planning Policy

4.10 As the development is situated within the Dumfries & Galloway administrative area, the relevant Development Plan for the site comprises the Dumfries & Galloway Council Local Development Plan (2014). As this LDP is reviewed every five years preparation of Local Development Plan 2 (LDP2) is underway, with the Main Issues report currently being consulted on.

4.11 The LDP highlights the importance of having sufficient infrastructure in place, prior to the progression of development, with paragraph 4.86 stating *'the delivery of supporting infrastructure is important in mitigating the impact of development and helping create balanced and sustainable communities. The provision of infrastructure is fundamental to the deliverability of a development proposal and in many circumstances will not be allowed to proceed if the infrastructure and service improvement requirements cannot be met.'*

5 Landscape and Visual Amenity

Introduction

5.1 This chapter sets out the proposed approach to the assessment of the potentially significant effects of the KTR Project on landscape and visual amenity (including the visual amenity of residents), including a consideration of the implications for designated landscapes, and cumulative effects.

5.2 During the routeing stage a desk-based review of existing information was undertaken, including Ordnance Survey (OS) maps, the relevant Local Development Plan, and the Dumfries and Galloway Landscape Character Assessment. This was supplemented by field work and further informed by feedback received from stakeholders, including Dumfries and Galloway Council, SNH and the public.

Existing Conditions

Visual Amenity

5.3 Informed by the type and scale of steel lattice tower (standard height of approximately 27m) and trident wood pole (average height of 15m) overhead line infrastructure proposed, a study area of 5km radius from the KTR Project is proposed for the LVIA. **Figure 5.1** illustrates the study area for the LVIA. The extent of the study area has been informed by the ZTV and professional judgement, and defined on the basis that at distances greater than 5km significant effects on landscape character and visual amenity are unlikely to occur for towers of approximately 27m in height.

5.4 An initial bare ground Zone of Theoretical Visibility (ZTV) has been prepared for the KTR Project, shown on **Figure 5.2**. The ZTV has been prepared based on the centre line position and minimum average spacing along the proposed route of the steel lattice tower routes (250m spacing). The theoretical visibility of individual towers has been limited to a maximum distance of 10km, as beyond this distance the type and scale of towers proposed are likely to be imperceptible in most instances. No separate ZTVs were prepared for the trident wood pole connections between Carsfad and Kendoon, or Earlstoun and Glenlee, as any theoretical visibility of this infrastructure will be seen within the context of the proposed steel lattice tower connection between Kendoon and Glenlee.

5.5 The ZTV indicates that theoretical visibility will generally be concentrated within 5km of the KTR Project and limited beyond this distance by topography to the east and west, which results in visibility being largely contained within the Glenkens Valley.

Designated Landscapes

5.6 Designated landscapes, within the 5km radius study area are shown on **Figure 5.3**. There are no nationally designated landscapes (National Parks or National Scenic Areas) located within the study area.

5.7 Locally valued landscapes within Dumfries and Galloway have been designated as Regional Scenic Areas (RSAs), as detailed in the *Identification of Regional Scenic Areas Technical Paper No. 6* (1999) which accompanied the Dumfries and Galloway Structure Plan (1999).

5.8 The Galloway Hills RSA is the largest locally designated landscape in Dumfries and Galloway, and covers a large part of the study area. The RSA extends from the Cairnsmore of Carsphairn range of hills in the north to the Fleet Valley in the south, and encapsulates the Glenkens Valley from Carsphairn to Crossmichael. The existing Kendoon and Glenlee substations, and the Earlstoun and Carsfad hydroelectric power stations and the existing 132kV overhead lines between these are

located predominantly within the Galloway Hills RSA, and as consequence a substantial proportion of the new overhead line components of the KTR Project are located within the RSA and could not be avoided during routeing.

5.9 At the southern extent of the study area the proposed Solway Coast RSA includes the existing Tongland substation, and as such this RSA was unavoidable during routeing. The RSA extends east and west along the coastal fringe extending from Gatehouse of Fleet in the west to beyond Dumfries in the east.

Wild Land

5.10 There are no Wild Land Areas (WLAs) located within the proposed 5km radius study area.

The Galloway Forest Park

5.11 Part of the KTR Project is located within the Galloway Forest Park. Although a non-statutory designation, forest parks are extensive areas of forest managed for multiple benefits with particular emphasis on recreation and are managed by the Forestry Commission Scotland.

Landscape Character

5.12 The assessment will draw on published Landscape Character Assessments (LCAs), and other information provided by consultees. Baseline sources of information will include the following:

- Land Use Consultants (1998) *Dumfries and Galloway Landscape Assessment* (SNH Report No. 94); and
- Carol Anderson in association with Alison Grant, Landscape Architects (2011) *Dumfries and Galloway Wind farm Landscape Capacity Study*.

5.13 The study area is covered by the Dumfries and Galloway Landscape Assessment (1998). The relevant Landscape Character Types (LCTs), and specific Landscape Character Units (LCUs) were considered during the routeing process, including consideration of the capacity of specific landscapes to accommodate the type and scale of development proposed. The relevant LCTs located within the study area as shown on **Figure 5.3**:

- Peninsula LCT (1);
- Narrow Wooded Valley LCT (4);
- Flooded Valley LCT (8);
- Upper Dale (Valley) LCT (9);
- Drumlin Pastures LCT (13);
- Upland Fringe LCT (16);
- Foothills LCT (18);
- Foothills with Forest LCT (18a);
- Southern Uplands LCT (19);
- Southern Uplands with Forest LCT (19a)
- Coastal Granite Uplands LCT (20);
- Rugged Granite Uplands LCT (21); and
- Rugged Granite Uplands with Forest LCT (21a).

5.14 The key characteristics of the relevant LCUs within the above LCTs, as detailed within the *Dumfries and Galloway Landscape Assessment*, will be considered in the assessment of landscape effects.

Existing Transmission Infrastructure

5.15 Approximately 43km of existing 132kV overhead lines ('N' and 'R' routes), supported on steel lattice towers, are located between Polquhanity and Kendoon, Kendoon and Glenlee and from Glenlee to Tongland. A double circuit 132kV overhead line runs west from Glenlee substation through the Galloway Forest Park towards Newton Stewart. A further 132kV overhead line, supported on steel lattice towers, is located at the southern extent of the study area providing a single circuit connection between Tongland and Dumfries 'S' route.

5.16 At the northern extent of the study area the overhead line components of the KTR Project will connect into the South West Scotland Connections Project 132kV overhead line at Polquhanity,

which is currently under construction. A further 132kV overhead line supported on wood pole infrastructure is currently being constructed between Polquhanity and Blackcraig Wind Farm, and will cross the Glenkens Valley north of Kendoon.

5.17 Other existing overhead grid infrastructure within the study area is limited predominantly to 11kV wood pole overhead lines providing localised electricity distribution to residential properties and 33kV wood pole overhead lines connecting small settlements.

Q: Are there additional sources of baseline information which should be referred to inform the LVIA?

Q: Is the proposed 5km study area appropriate for the assessment of potentially significant landscape and visual effects?

Methodology

5.18 Following the approach to the EIA set out in **Chapter 3**, the Landscape and Visual Impact Assessment (LVIA), Cumulative LVIA (CLVIA), and presentation of landscape and visual effects will be carried out in line with relevant legislation and standards, as well as the following guidelines, in so far as they are relevant to the KTR Project:

- Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) *Guidelines for Landscape and Visual Impact Assessment – 3rd Edition* (GLVIA3);
- Scottish Natural Heritage (2012) *Assessing the cumulative impact of onshore wind energy developments*[6];
- Scottish Natural Heritage (2011) *A Handbook on Environmental Impact Assessment, Appendix 1: Landscape and Visual Impact Assessment*;
- Landscape Institute (2011) *Advice Note 01/11 Photography and photomontage in landscape and visual impact assessment*;
- Landscape Institute (2017) Technical Guidance Note 02/17 *Visual representation of development proposals*; and
- Scottish Natural Heritage (2017) *Visual Representation of Wind Farms – Version 2.2*.[7]

5.19 Landscape and visual assessments are distinct, but interconnected, processes and the assessment will describe potential landscape and visual effects separately. The LVIA will consider potential effects on:

- Landscape as a resource in its own right (caused by changes to the constituent elements of the landscape, its specific aesthetic or perceptual qualities and the character of the landscape); and
- Views and visual amenity as experienced by people (caused by changes in the appearance of the landscape).

5.20 Judging the significance of landscape and visual effects requires consideration of the nature of the receptor and the nature of the effect on the receptor. GLVIA3 states that the nature of receptors, commonly referred to as their sensitivity, should be assessed in terms of the susceptibility of the receptor to the type of change proposed, and the value attached to the receptor. The nature of the effect on each receptor, commonly referred to as its magnitude, should be assessed in terms of size and scale; geographical extent; duration and reversibility.

5.21 Judgements of sensitivity and magnitude are then combined to form a judgement regarding the overall significance of effect. The following sections set out the methodology used to evaluate the components of landscape sensitivity and magnitude of effect.

[6] Although the guidance concentrates on the particular issue of assessing the cumulative effects of wind energy development, the methods are also useful when considering the cumulative landscape and visual effect of other forms of development.

[7] Although the guidance relates to the production of visualisations of wind farm development, elements of the methodology and approach are applicable for other types of development.

5.22 A detailed methodology for the LVIA and CLVIA has not been included within this Scoping Report but can be provided to consultees on request, however an overview of the key receptors and outline method in relation to visual amenity, sequential views and cumulative assessment are provided below to inform consultee responses to Scoping.

Q: Is there any additional guidance which should be referred to in preparing and conducting the LVIA?

Visual Amenity

5.23 The initial ZTV shown on **Figure 5.2** illustrates the likely maximum extent of theoretical visibility across the study area. The ZTV, in conjunction with extensive fieldwork and feedback from stakeholders during the routeing process has been used to inform the selection of representative assessment viewpoints to be considered in the LVIA. Viewpoints have been identified to represent a range of receptors (people), distances and viewing experiences.

5.24 The proposed viewpoint locations are listed in **Table 5.1** below and are illustrated on **Figure 5.2**.

Table 5.1 Proposed Assessment Viewpoint Locations

VP	Description	Grid reference		Reason for selection
1	Layby on A713 near Polquhanity	259325	589045	Represents road users travelling on the Galloway Tourist Route, and similar views experienced from nearby residential properties.
2	Dundeugh at access to Polmaddie	259848	588016	Represents views experienced from residential properties within Dundeugh and views experienced from the Bardennoch Trail Core Path.
3	Footbridge access to Kendoon	260325	587600	Represents views experienced by receptors/residents accessing Kendoon via the public footpath and footbridge east of the A713.
4	B7000 west of Glenhoul Hill	261375	586905	Represents open views westwards across the Upper Glenkens Valley experienced by road users travelling on the B7000 and views experienced from nearby residential properties.
5	Layby on A713 near Knocknalling Wood	260500	584948	Represents road users travelling on the Galloway Tourist Route.
6	Southern Upland Way near Waterside Hill	260805	582050	Representative of views experienced by recreational users of the Southern Upland Way long distance footpath.
7	Southern Upland Way near St John's Town of Dalry	261760	581335	Representative of views experienced by recreational users of the Southern Upland Way long distance footpath, and similar views across the Glenkens Valley from the settlement of St John's Town of Dalry.

VP	Description	Grid reference		Reason for selection
8	A762 north of Glenlee	261205	580635	Represents road users on the A762 and the nearby Glenlee Core Path.
9	Unclassified road (US3) southwest of Glenlee	260590	579615	Represents road users on this unclassified road and nearby residential properties at Bucks Linn.
10	A712/The Queen's Way	260920	577305	Represents road users travelling on the A712 which crosses the Galloway Forest Park, forming part of the Robert the Bruce Trail and Galloway Kite Trail (extended summer trail).
11	Core path near Tannoch Flow	260850	574365	Representing views experienced by recreational users of the Raiders Road to Kenmuir Link Core Path within the Galloway Forest Park.
12	Core Path near Bennan Moss	264745	571110	Representing views experienced by recreational users of the Cairn Edward Hill Core Path within the Galloway Forest Park.
13	Stroan Viaduct	264588	570014	Representative of elevated views experienced from the Mossdale to Gatehouse Station Railway Core Path across Stroan Viaduct.
14	Mossdale	265915	570390	Represents views from the small settlement of Mossdale and the route of the Mossdale to Gatehouse Station Railway Core Path.
15	Kennick Burn picnic area	266100	564985	Represents views experienced from the Kennick Burn picnic area and retreat Wood Core Path, located within the Galloway Forest Park.
16	A762 south of Laurieston	267915	563157	Represents road users travelling on the A762.
17	Barstobrick Hill (Neilson's Monument)	268765	560680	Represents elevated panoramic views across the Lower Glenkens Valley experienced from the local landmark and monument atop Barstobrick Hill.
18	A75, junction with unclassified road (C45S)	270130	558380	Located on the busy A75 trunk road between Dumfries and Stranraer, representing views experienced by road users.
19	Unclassified road (U43S) near Argrennan	269970	556610	Representing views experienced from nearby residential properties and their

VP	Description	Grid reference		Reason for selection
	Mains			curtilages.
20	A711 north of Tongland substation	269575	553758	Representing views experienced by road users of the A711 and nearby residential properties near Tongland substation.

5.25 The final assessment viewpoint locations will be confirmed following the detailed design of the route alignments and will be subject to micrositing in the field to take account of the presence of screening. Each viewpoint will be visited and 360 degree photography from each of the viewpoints and will be undertaken in accordance with guidance published by SNH and the Landscape Institute to illustrate the existing characteristics of the view. These characteristics will be detailed in the baseline description, prior to undertaking the assessment of visual effects.

5.26 Visualisations will be prepared to illustrate the existing views from each viewpoint. Each viewpoint will include baseline photography and wireline visualisations, and a selection of key viewpoints will be illustrated with photomontage visualisations to provide a photorealistic illustration of the change in views.

Q: Is the list of proposed representative assessment viewpoints appropriate to inform the visual assessment?

Q: Are there additional representative viewpoint locations which should be considered to inform the visual assessment? (If so, please provide details, including 12 figure grid reference and reason for its proposition)

Q: Does the referenced guidance provide relevant context for the preparation of visualisations for the KTR Project?

Sequential Views

5.27 Potential effects on views experienced sequentially from routes (e.g. roads, promoted trails and recreational routes, cycle routes and Core Paths) within the study area will be considered in the LVIA. Informed by the initial ZTV and observations made during fieldwork, routes considered in the assessment will focus on those likely to experience potentially significant visual effects, as follows:

- A713 (inc. Galloway Tourist Route);
- A712/The Queen's Way (inc. Robert the Bruce Trail and Galloway Kite Trail);
- A762;
- A75;
- Other minor/unclassified roads within close proximity of the KTR Project;
- Southern Upland Way long distance footpath;
- Raiders Road Forest Drive;
- Walkers and cyclists on selective Core Paths, cycle routes, promoted tourist and/or recreational routes, tracks and footpaths within the study area (including those within the Galloway Forest Park).

5.28 While there is some potential for intermittent visibility of the KTR Project from short sections of other local A and B roads, it is unlikely to result in significant visual effects due to a combination of the relatively limited visibility and distance, therefore effects on these roads will not be considered within the LVIA.

Residential Visual Amenity

5.29 The routeing process sought to avoid potential effects on the views and visual amenity of residential receptors wherever possible, informed by observations made during fieldwork which considered the orientation of properties, the likely availability of views from the property and its

curtilage and the presence of intervening screening (e.g. localised landform, woodland, forestry and vegetation, built form and other landscape features).

5.30 Potential effects on views from residential properties located within close proximity to the proposed route will continue to be considered in the detailed design of the Proposed Development, and where necessary the LVIA will consider effects on views from residential properties.

Cumulative Assessment

5.31 There is the potential for cumulative effects to arise throughout the study area from the addition of the overhead line components of the KTR Project alongside other developments which are either operational, under construction, consented or the subject of a valid application for consent (proposed).

5.32 Existing developments, such as wind farms and other vertical infrastructure (e.g. overhead lines and telecommunications masts) form part of the existing baseline environment and will be considered in the LVIA.

5.33 No other overhead transmission line projects are currently the subject of applications for consent in the study area, however, it is noted that the South West Scotland Connections Project and the Blackcraig and Margree Grid Connection are currently under construction therefore these developments will be considered in the existing baseline for the LVIA.

5.34 The cumulative LVIA (CLVIA) will also consider the likelihood for significant cumulative landscape and/or visual effects with other types of development, however, developments will be limited to those which are likely to result in a similar type, scale and extent of landscape and visual effects as the KTR Project. SPEN will seek to agree a list of developments to be considered in the CLVIA with consultees through the EIA process.

5.35 It is considered that the addition of the proposed 132kV overhead line connections may have the potential to give rise to significant cumulative landscape or visual effects. As such, consideration will be given to the addition of the KTR Project in conjunction with other similar developments.

Q: Is the proposed approach to the identification and assessment of cumulative landscape and visual effects appropriate?

Q: Are there specific developments which should be considered in the cumulative assessment?

Likely Significant and Non-Significant Effects

5.36 Adopting a precautionary approach, at this preliminary stage, potential landscape and visual effects associated with the construction and/or operation of the KTR Project include:

Landscape Effects

- effects during construction on existing landscape character, landscape features and landcover;
- effects during operation on landscape character and locally designated landscapes; and
- cumulative effects during operation on landscape character and locally designated landscapes with other existing or proposed developments.

Visual Effects

- effects on the views and visual amenity of residential receptors (people);
- effects on views experienced by users on roads within the study area, and in close proximity to the KTR Project including: A713, A762, A712, A75, A711 and other minor/unclassified roads in close proximity to the KTR Project; and
- effects on views experienced by walkers and cyclists using Core Paths, cycle routes, promoted tourist and/or recreational routes (including but not limited to the Galloway Tourist Route,

Southern Upland Way, Galloway Kite Trail, Robert the Bruce Trail, Raiders Road Forest Drive), tracks and footpaths within close proximity of the KTR Project; and

- cumulative visual effects associated with the KTR Project seen in combined, successive or sequential views with other existing or proposed developments.

Q: Please advise whether the potential landscape and visual effects, including cumulative effects, proposed to be included within the assessment are acceptable?

Decommissioning of the Existing 132kV Overhead Lines

5.37 The decommissioning and removal of the existing network ('N' route and 'R' route) is unlikely to result in significant adverse effects on landscape and visual receptors, and may result in significant positive effects in some locations. A desk study will be undertaken, using readily available information to confirm this.

5.38 Any potential short term landscape and visual effects could be dealt with through management of the work at a site level, e.g. the implementation of a decommissioning management plan. Such a plan would outline an appropriate approach to the decommissioning of the existing infrastructure, which seeks to avoid or minimise potential disturbance of landscape features (e.g. hedgerows or field boundary walls to facilitate access) and ensure the location of any temporary access or compound facilities are sited to avoid or minimise effects on views, most notably those experienced from residential properties.

5.39 Subject to the provision of an appropriate decommissioning management plan it is considered that the short-term effects associated with decommissioning the existing network can be scoped out of the assessment of landscape and visual effects.

Approach to Mitigation

5.40 The mitigation of potential landscape and visual effects has been approached through the routeing, siting and design of the proposed routes, and substation works. The LVIA will inform modifications and refinements to the detailed design of the KTR Project, including consideration of individual tower and pole locations during the design and assessment process, and the identification of any further appropriate mitigation measures to reduce potential residual effects.

5.41 The following guidelines will be used to inform the siting and design process, to minimise potential landscape and visual effects:

- *The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines* (with National Grid Company plc (NGC) 1992 and Scottish Hydro-Electric Transmission plc (SHETL) 2003 Notes); and
- *The Horlock Rules: NGC Substations and the Environment: Guidelines on Siting and Design* (2006).

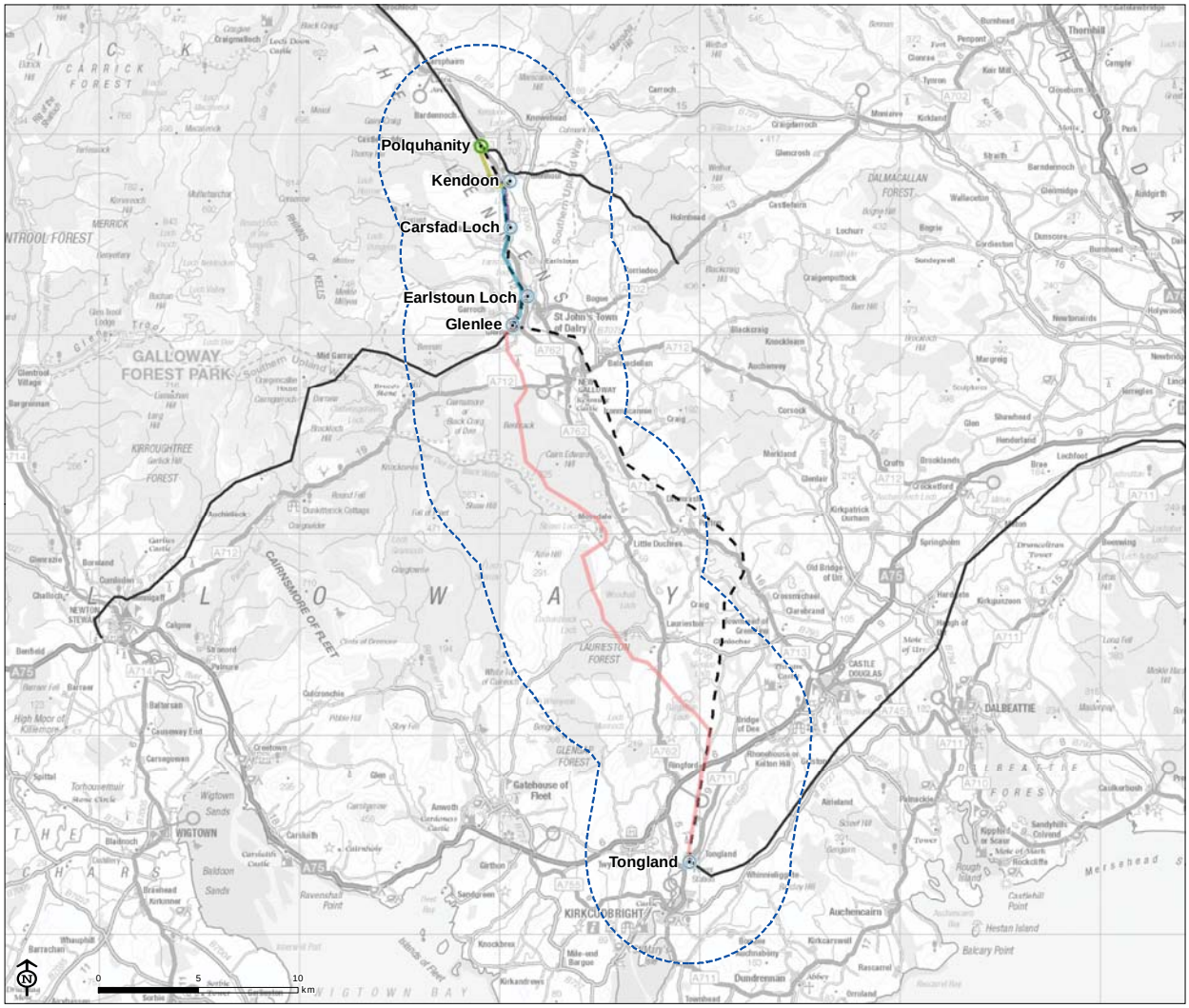
5.42 Notwithstanding the application of the principles outlined in the Holford Rules and Horlock Rules, given the intrinsic characteristics of overhead line infrastructure, some significant adverse landscape and visual effects will be unavoidable.

Consultation

5.43 The consultees below have been approached for information to inform the EIA. A number of these consultees may also be contacted by the Scottish Government regarding the scope of the EIA:

- Scottish Natural Heritage (SNH);
- Dumfries and Galloway Council (DGC) landscape architect; and
- Forest Commission Scotland (FCS) landscape architect.

Q: Are there further relevant consultees who should be consulted about the proposed approach to the LVIA?



KTR Project Scoping Report

Figure 5.1: Study Area for LVIA

- Polquhanity Sealing End and Terminal Tower
- Substation and Hydro electricity generating station

Proposed Route Section

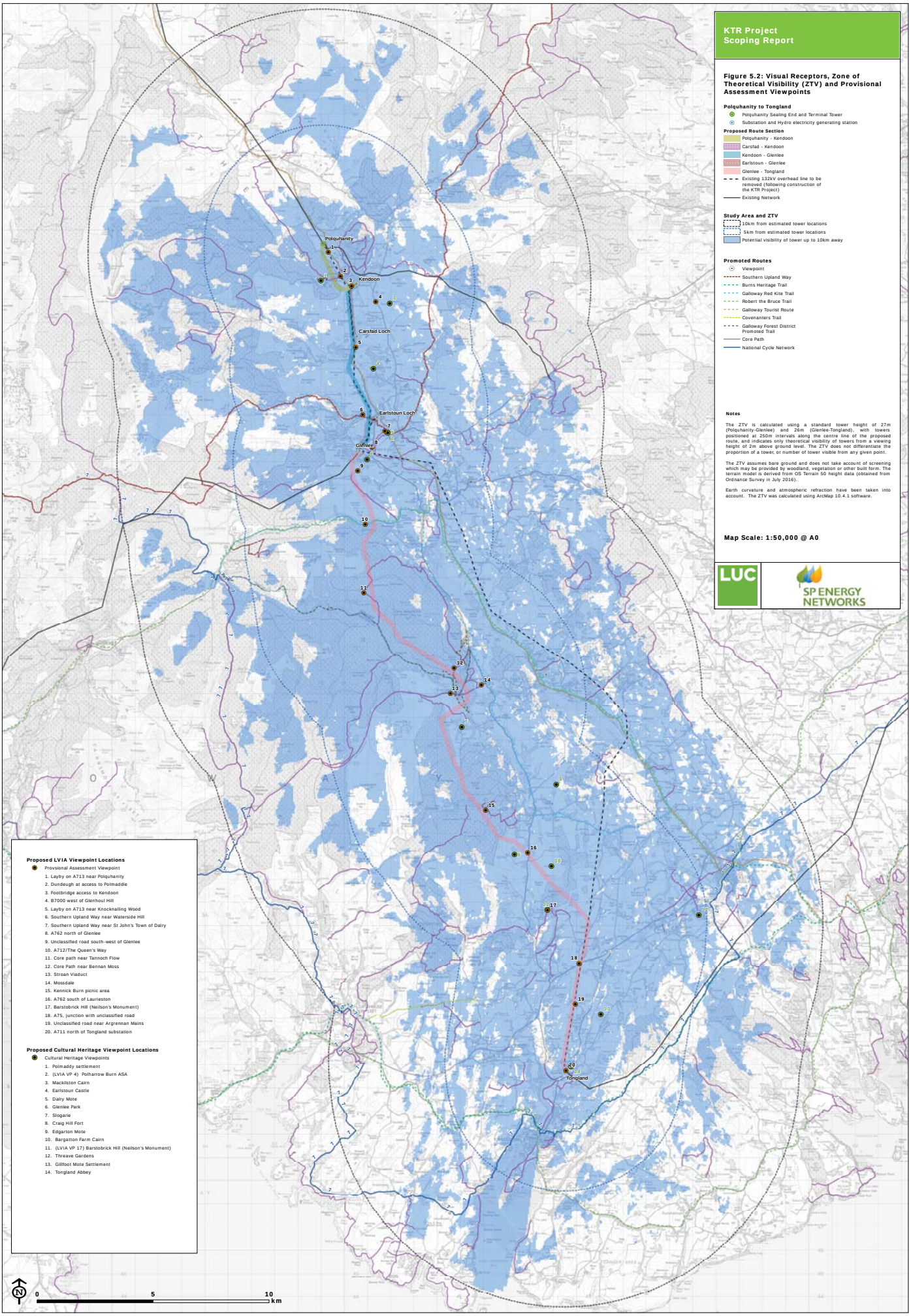
- Polquhanity - Kendoon
- Carsfad - Kendoon
- Kendoon - Glenlee
- Earlstoun - Glenlee
- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network
- Proposed 5km LVIA Study Area

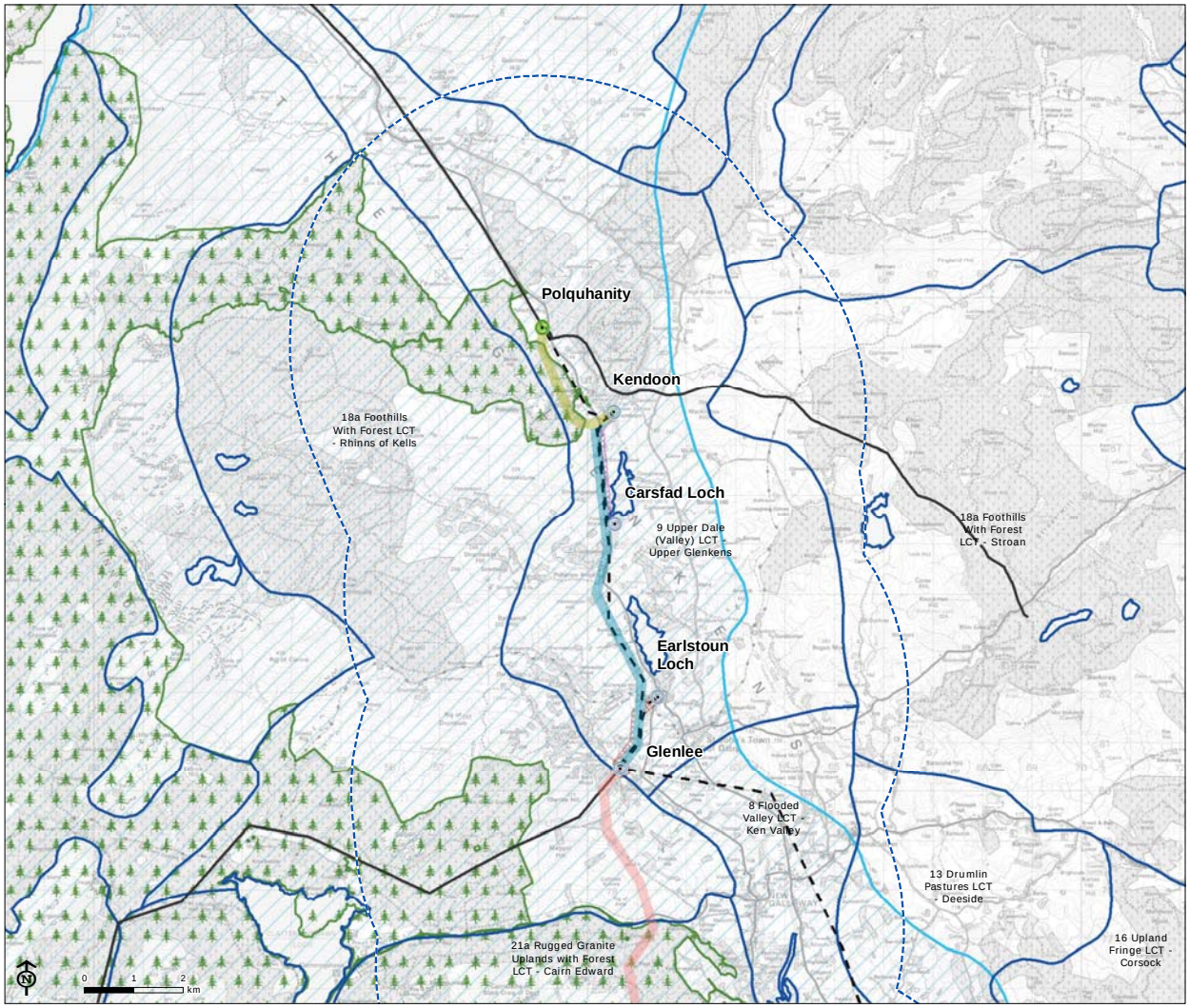
Map Scale @ A3: 1:185,000

LUC

SP ENERGY NETWORKS

CB:JN EB:robertson_s LUCGLA FIG05-01_6109-102-r0_KTR_StudyAreaLVIA_A3 19/04/2017





KTR Project Scoping Report

Figure 5.3a: Landscape Character Types & Units

Polquhanity - Glenlee

- Polquhanity Sealing End and Terminal Tower
- Substation and Hydro electricity generating station

Proposed Route Section

- Polquhanity - Kendoon
- Carsfad - Kendoon
- Kendoon - Glenlee
- Earlstoun - Glenlee
- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network

- Proposed 5km LVIA Study Area

Landscape Character Types

- Dumfries and Galloway LCA

Landscape Designations

- Galloway Hills Regional Scenic Area (RSA)
- Galloway Forest Park

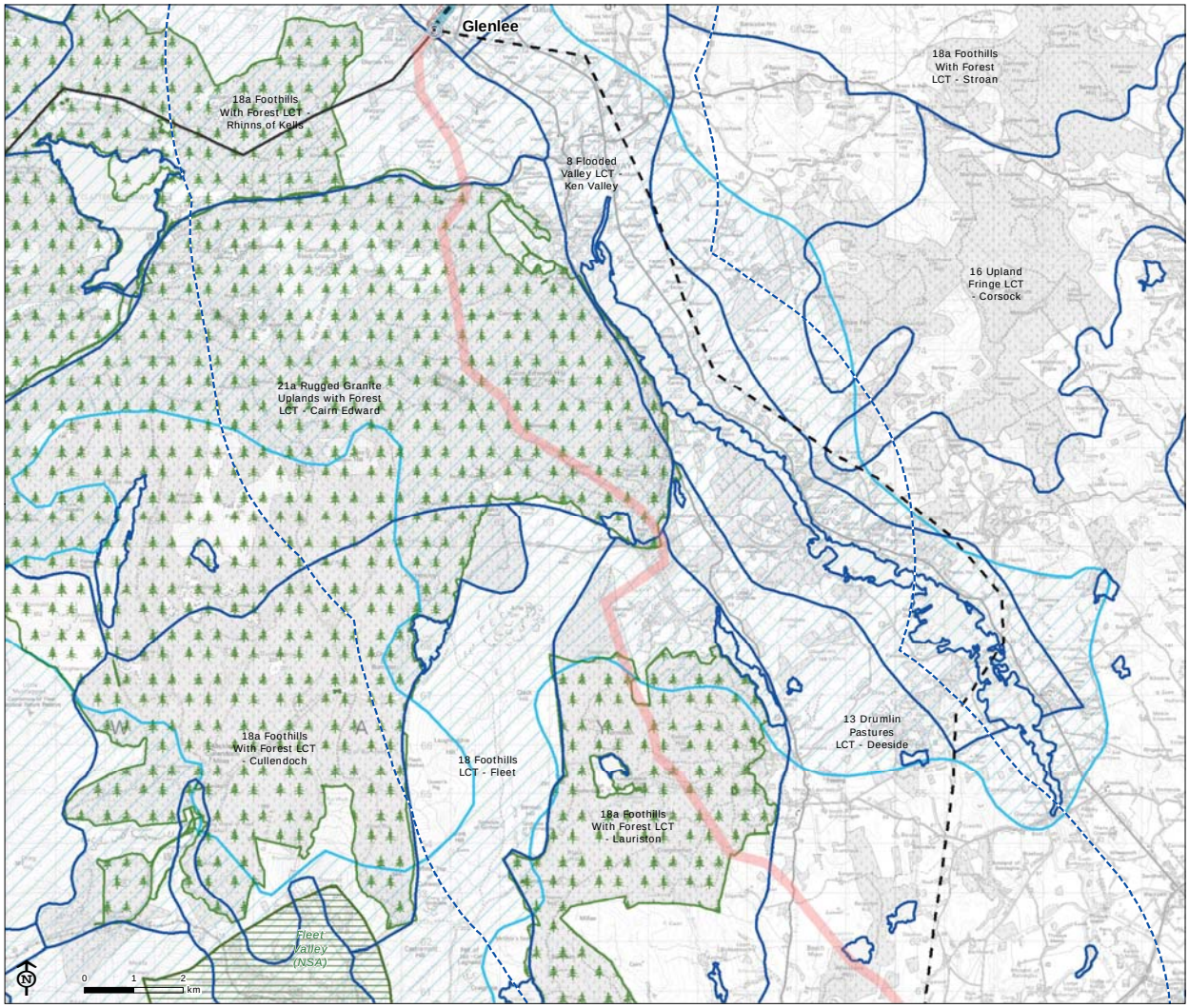
Map Scale @ A3: 1:75,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG05-3_6109-103-r0_KTR_LandscapeCirteria_INDEX 20/04/2017

Source: SNH, South Ayrshire, Dumfries and Galloway Local Authorities



KTR Project Scoping Report

Figure 5.3b: Landscape Character Types & Units

Glenlee - Tongland

- Substation and Hydro electricity generating station

Proposed Route Section

- Kendoon - Glenlee
- Earlstoun - Glenlee
- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network
- Proposed 5km LVIA Study Area

Landscape Character Types

- Dumfries and Galloway LCA

Landscape Designations

- National Scenic Area (NSA) (Scotland)
- Galloway Hills Regional Scenic Area (RSA)
- Galloway Forest Park

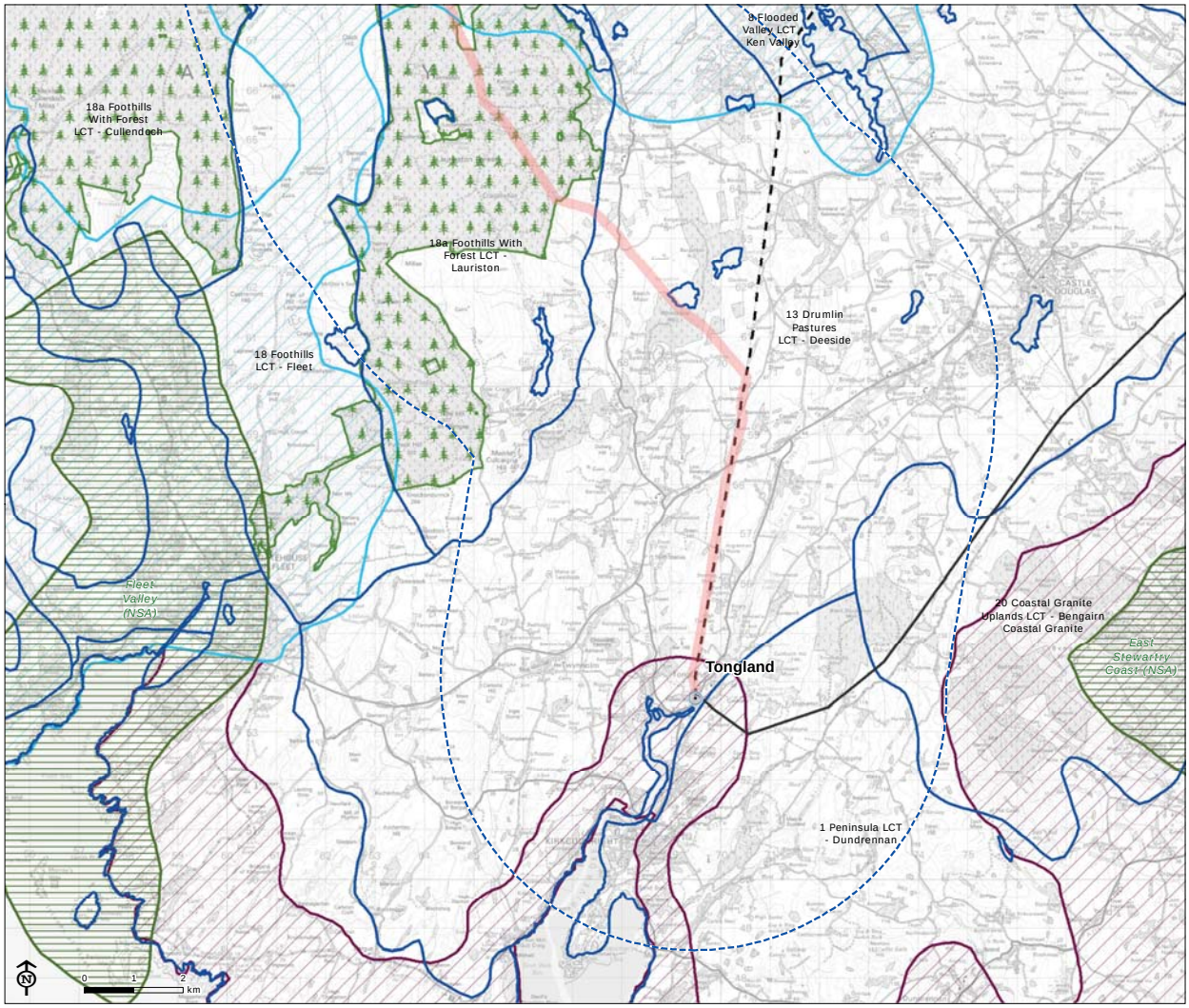
Map Scale @ A3: 1:75,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG05-3_6109-103-r0_KTR_LandscapeCirteria_INDEX 20/04/2017

Source: SNH, South Ayrshire, Dumfries and Galloway Local Authorities



KTR Project Scoping Report

Figure 5.3c: Landscape Character Types & Units

Glenlee - Tongland

- Substation and Hydro electricity generating station

Proposed Route Section

- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network
- Proposed 5km LVIA Study Area

Landscape Character Types

- Dumfries and Galloway LCA

Landscape Designations

- National Scenic Area (NSA) (Scotland)
- Galloway Hills Regional Scenic Area (RSA)
- Solway Coast Regional Scenic Area (RSA)
- Galloway Forest Park

Map Scale @ A3: 1:75,000

LUC

SP ENERGY NETWORKS

Source: SNH, South Ayrshire, Dumfries and Galloway Local Authorities

CB:SR EB:robertson_s LUCGLA FIG05-3_6109-103-r0_KTR_LandscapeCirteria_INDEX 20/04/2017

6 Geology, Hydrology, Hydrogeology, Water Resources and Peat

Introduction

6.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the KTR Project on geology, hydrology, hydrogeology, water resources and peat during construction and operation of the KTR Project.

6.2 Following the approach to assessment set out in **Chapter 3**, the assessment will be carried out in line with relevant legislation and standards, as well as the following guidance:

- The Scottish Environment Protection Agency (SEPA)'s Pollution Prevention Guidelines;
- Scottish Government Planning Advice Notes (PANs) and Guidance, including PAN 51 Planning, Environmental Protection and Regulation; PAN 1/2013 Environmental Impact Assessment; PAN 69 Planning and Buildings Standards Advice on Flooding; and PAN 79 Water and Drainage;
- Technical Flood Risk Guidance for Stakeholders (SEPA, June 2015);
- Additional SEPA Guidance (e.g. Water Environment (Controlled Activities) (Scotland) Regulations 2011 – A Practical Guide, July 2016; and Engineering in the Water Environment Good Practice Guides);
- Forestry Commission (2011) Forests and Water Guidelines, Fifth Edition;
- Scottish Water standards and policies, including Sewers for Scotland 3rd edition, 2015 and Water for Scotland 3rd edition, 2015;
- Regulatory Position Statement Developments on Peat (SEPA, 2010);
- Good Practice During Wind Farm Construction, Version 3 (SNH, 2015)[8]; and
- Developments on Peatland: Site Surveys SNH, SEPA, Scottish Government and The James Hutton Institute 2014.

Q: Should any other guidance be considered for the KTR Projec?

Existing Conditions

6.3 **Figures 6.1a-c** show the existing Geology, Hydrology, Hydrogeology, Water Resources and Peat conditions within the study area.

6.4 A desk based review of 1:10,000 and 1:25,000 scale Ordnance Survey maps, 1:250,000 scale British Geological Survey Geology maps and 1:250,000 scale Soils Scotland has been undertaken to identify watercourses and ground conditions within the vicinity of the KTR Project. The SNH Carbon and Peatland mapping (2016) indicates that carbon-rich soils, deep peat and priority peatland habitat are likely to be present in localised areas.

6.5 A review of SEPA Flood Maps indicate that there are some areas that are identified to be at risk of flooding in a 1/200 year event close to (and within) the route of the KTR Project. Avoidance of

[8] This document provides good, recent and relevant guidance of the requirements and considerations for constructing infrastructure in remote and rural locations with a variety of land uses including forestry and peatland. Considerable experience has been gained during the construction and operation of more than sixty windfarms already operating in Scotland. The purpose of this guidance is to share that experience amongst the industry, planning authorities and those more broadly involved in the planning and development of windfarms. It is focused on pollution prevention, nature conservation, landscape, hydrological and related issues. It is aimed at the post consent, pre-construction planning phase of development.

flood risk areas was a key factor in the routeing process and crossing of floodplains has been minimised. Flood risk areas will be identified within in the baseline of the ES.

6.6 The KTR Project is located within the Water of Ken/River Dee catchment area. The KTR Project passes over several major tributaries of the River Dee including the Water of Deugh, Water of Ken, Coom Burn and the Kenick Burn, as well as numerous other smaller watercourses.

6.7 The KTR Project is located mainly on Ordovician and Silurian Meta-greywacke bedrock (Gala, Shinnel and Hawick Formations) with a section between New Galloway and Mossdale located on a Late Silurian to Early Devonian felsic igneous intrusion.

6.8 The majority of the KTR Project is not located on superficial geology deposits, however in places glacial till, fluvio-glacial deposits, localised peat and alluvium deposits are shown. Areas of peat deposits shown from north to south along the proposed route are located: around the Benbrack summit, near Mossdale, south of Stroan Loch, to the east of Woodhall Loch and south of Lauriston village.

Methodology

6.9 In addition to the desk based surveys, consultation with Dumfries & Galloway Council, Scottish Water and SEPA will be undertaken to obtain relevant flood information and water supply information, including abstractions. Relevant flow and water quality data will also be obtained from SEPA.

6.10 A walkover hydrological survey of the KTR Project will be carried out to supplement the desk based work and data collection to identify the existing baseline conditions, including identifying and documenting watercourse crossings (proposed and existing), identification of other water features such as wetlands and springs, ground-truthing private water supply data, undertaking an overview assessment of areas identified as floodplain within the SEPA Flood Maps and providing a general overview of landscape and land cover of importance to hydrology.

6.11 The findings of the survey work and baseline assessment will contribute to environmental constraints mapping and will provide input and feedback into design iterations.

6.12 The presence of small areas of SNH Class 1 or Class 2 soils within the KTR Project area does not mean that carbon rich soils, deep peat and priority peatland habitat will be adversely affected. The quality of peatland tends to be highly variable across a project area and a detailed assessment is required to identify the actual location and extent of peatlands and effects of the KTR Project. Peat depth surveys are proposed along the proposed route where peat deposits are shown on the geological, soil and SNH carbon and peatland mapping to delineate the spatial coverage and depth of peat within the study area. The infrastructure components will then be designed to avoid deep peat and priority peatland habitats where possible.

6.13 Peat probing will be undertaken systematically along the length of the KTR Project where peat is anticipated (approx. 23km based on the review of British Geological Survey Superficial Geology maps, Soils Scotland Mapping and SHN Carbon and Peatland Mapping). Where probing locates peat more extensive probing will be undertaken.

6.14 The proposed frequency for probing and coring is:

- Probe the route on a 40m spacing to determine potential peat depth.
- When a probe of >0.5m depth of penetration occurs the presence of peat will be checked with a corer. The cores will be undertaken to verify the actual peat depth, the thickness of the acrotelm, determine the mineral soil characteristics and allow for Von Post tests to be undertaken on the catotelm.
- If peat is confirmed, probes will then be taken at 20m spacing both along the centre line of the overhead line or access track and either side at 15m and 30m offsets. This will provide a corridor of 60m for potential location adjustment.
- Probing will continue 20m further along in the same 60m wide corridor until peat is no longer identified.

- The cores will be undertaken to verify the actual peat depth, the thickness of the acrotelm, determine the mineral soil characteristics and allow for Von Post tests to be undertaken on the catotelm.

6.15 The data obtained from the site investigations will be used to produce maps of peat depths along the route including contoured peat depths within the corridor. In Scotland deep peat is classified at >1.0m and a shaded contour interval of 0-0.5m, >0.5m-1m, >1m – 1.5m, >1.5m-2m, >2m-3m, etc. will be used to demonstrate the occurrence of peat across the site and the avoidance of peat in the area of proposed infrastructure, on the ES figures.

Q: Confirmation that proposed targeted peat depth surveys are appropriate?

6.16 In relation to minerals, in addition to the minerals information gathered during the routeing stage, ongoing consultation will be undertaken with quarry owners/managers in the vicinity of the KTR Project to seek to avoid/minimise disruption to minerals operations.

Likely Significant and Non-Significant Effects

6.17 Potential effects on geology, hydrology, hydrogeology, water resources and peat will be assessed as part of the EIA process. This will include the identification of both generic effects of construction (e.g. sediment release, pollution, fuel spills etc.) and effects on specific locations, such as sensitive habitats, private water supplies (PWS) or watercourse crossings, which are sensitive to pollution risk and / or disturbance from required engineering works.

6.18 Potentially significant effects are considered more likely during the construction phase. SPEN is committed to implementing good practice construction methods and has extensive working knowledge of construction methods due to constructing a number of similar overhead line projects in Scotland.

6.19 Taking account of the findings of the work undertaken to date, and professional experience, whilst still adopting a precautionary approach at this preliminary stage, potential effects associated with the construction and/or operation of the KTR Project include:

- pollution of surface water, including public/private drinking water supplies caused by releases of sediment to watercourses from excavated/stockpiled material during construction, or as a result of stream crossings or works near streams;
- pollution of surface water and groundwater, including drinking water supplies, through operation of machinery (e.g. spillage of fuels, oils etc.) during site preparation and construction;
- modifications to natural drainage patterns, changes to runoff rates and volumes and a consequent increase in flood risk during construction and operation;
- damage to river banks or changes in channel form due to the operation of machinery during construction and operation;
- localised flooding and watercourse bank erosion caused by impediments to flow, particularly in conditions of high discharge;
- direct and indirect disturbance of peat by land take, removal, excavations, relocation, storage, vehicle loading, vegetation disturbance, drainage changes, oxidation, erosion and loss of carbon storage;
- effects on mineral resources (e.g. sand, gravel and hard rock) within the study area.

6.20 On the basis of the work undertaken to date, the professional judgement of the assessment team and experience from other similar projects, it is considered likely that the following effects can be scoped out:

- effects on bedrock geology during both construction and operation;
- changes to public/private water supply yield as a consequence of changes to run off rates and volumes during both construction and operation;
- pollution of surface water and groundwater during operation;

- increased flood risk caused by impediments to flow in watercourses during operation;
- cumulative effects with other development proposals and installations.

6.21 However, it is important to emphasise that following further work, the predicted significance of the identified effects could change and their coverage in the ES will be amended accordingly.

Q: Are the proposed list of effects, which are scoped in and out, appropriate?

Approach to Mitigation

6.22 In addition to the careful siting of infrastructure components, given SPEN's commitment to, and prior experience of, implementing accepted good practice during construction and operation, and the current regulatory context, many potential effects on the water environment can be avoided or reduced. With respect to the current regulatory context, since the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended 2013) (CAR) came into force, CAR authorisation will be required in relation to several activities e.g. engineering works in inland waters and wetlands. Consultation with SEPA throughout the EIA process will be undertaken in relation to those activities for which a licence or registration is required (e.g. watercourse crossings, sediment management etc.) and general binding rules will be followed where applicable.

6.23 As a consequence, a number of measures are not considered to be mitigation as such, but rather an integral part of the design/construction process; and it is proposed that these will be taken into account prior to assessing the likely effects of the connection. However, where appropriate, more tailored mitigation measures will be identified prior to determining the likely significance of residual effects.

Decommissioning of the Existing 132kV Overhead Lines

6.24 A number of the existing steel towers along the 'N' and 'R' routes are located in proximity to watercourses and within the predicted fluvial floodplain of the watercourses. Removal of infrastructure to 1m below ground level could cause increased erosion and sediment entering the nearby watercourses.

6.25 Survey work will focus on any steel towers that are located within or close to watercourses. In addition, proposed access tracks close to watercourses and any watercourse crossings would also be surveyed in the field.

6.26 SEPA Controlled Activity Regulations (CAR) will have to be followed and depending on the nature of work and the proximity of the watercourse a SEPA CAR License or Registration may be required for the works.

6.27 With implementation of adequate construction management, including sediment and runoff control measures and standard pollution management measures (e.g. fuel spills) it is unlikely that the works will cause significant effects to the water environment. Therefore effects on hydrology are proposed to be scoped out.

6.28 With regards to the removal of the existing overhead lines, potential effects on peatland will need to be considered on the basis that ground removed and reinstated could alter the localised hydrogeological conditions if peatland is present and the decommissioning process will involve vehicles (tractor, crane, winch and material removal) accessing the area for removal of the existing steel towers and foundations. Heavy vehicles have the potential to disturb peatland by disturbing the surface layers and / or sinking into the peatland.

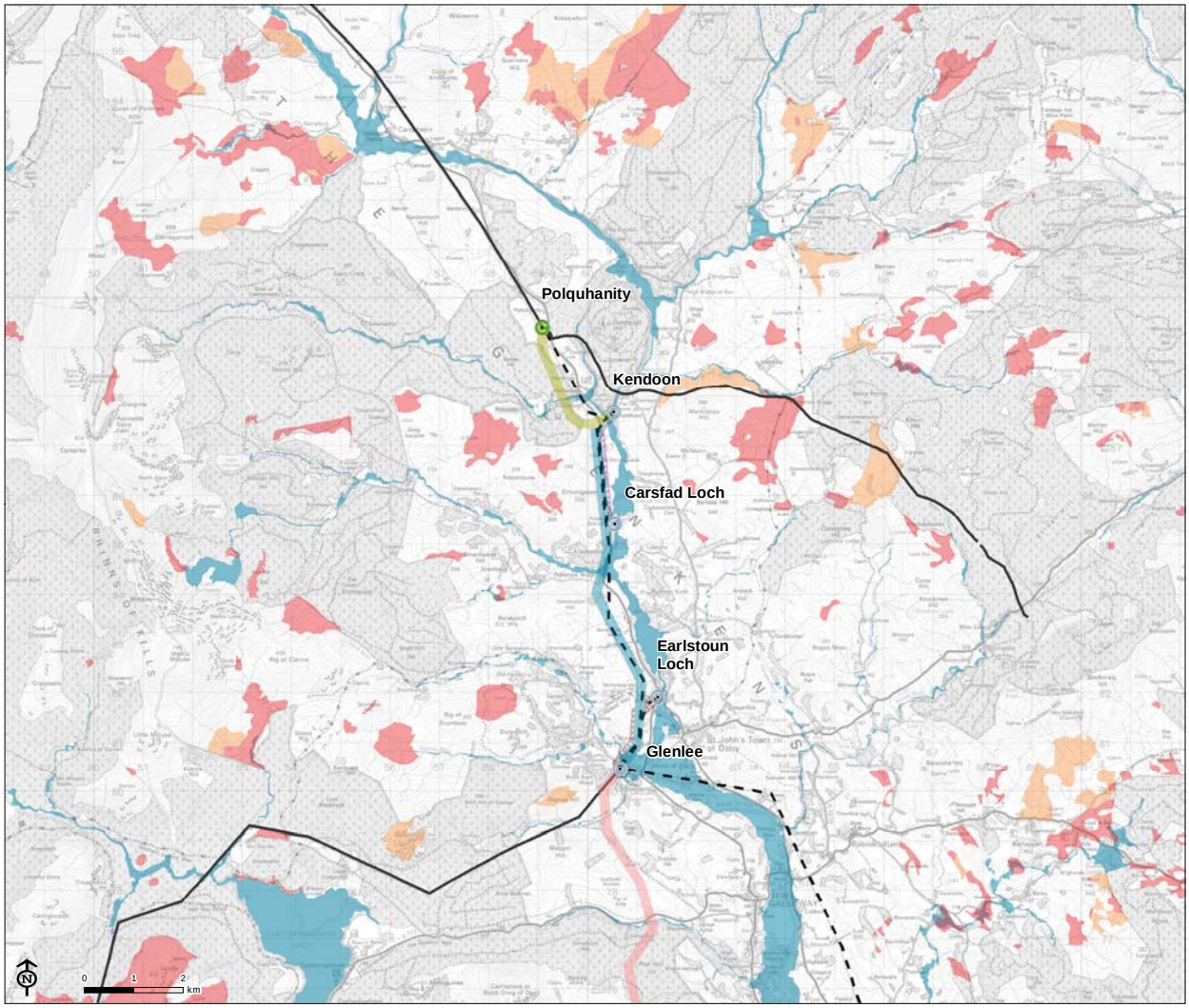
6.29 Targeted peat surveys will be undertaken to establish the presence of peat within proximity to the existing towers or proposed access tracks/working areas etc. However, on the basis that peat is unlikely to be present in notable volumes and will have been previously disturbed during construction of the overhead lines, significant effects on peatlands are not anticipated and are proposed to be scoped out.

Consultation

6.30 The consultees below have been approached for information to inform the EIA. A number of these consultees may also be contacted by the Scottish Government regarding the scope of the EIA:

- SEPA;
- Scottish Water;
- Marine Scotland Science;
- Galloway Fisheries Trust;
- Dumfries & Galloway Council;
- SNH; and
- The Forestry Commission.

Q: Should any other organisations be consulted to inform the EIA?



KTR Project
Scoping Report

Figure 6.1a: Geology, Hydrology, Hydrogeology, Water Resources and Peat Existing Conditions

Polquhanity - Glenlee

- Polquhanity Sealing End and Terminal Tower
- Substation and Hydro electricity generating station

Proposed Route Section

- Polquhanity - Kendoon
- Carsfad - Kendoon
- Kendoon - Glenlee
- Earlstoun - Glenlee
- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network

Geology, Hydrology, Hydrogeology, Water Resources and Peat Existing Conditions

Flood Risk

- Flood Risk (1 in 200 years)

Priority Peatland Habitats

- Class 1
- Class 2

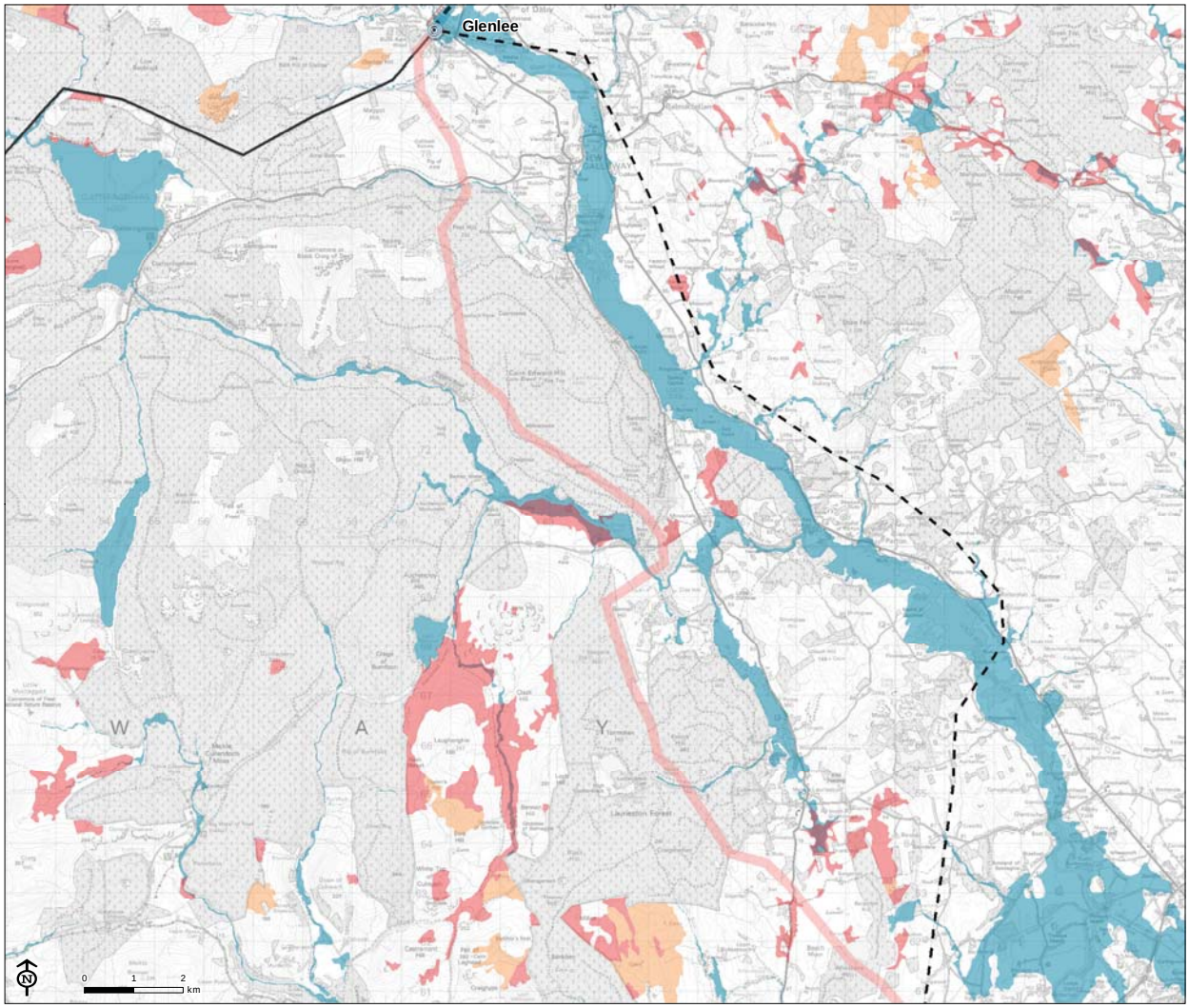
Map Scale @ A3: 1:75,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG06-1_6109-105-r0_KTR_Hydrology_INDEX 19/04/2017

Source: National Grid, SEPA, SNH, South Ayrshire, Dumfries and Galloway Local Authorities



KTR Project Scoping Report

Figure 6.1b: Geology, Hydrology, Hydrogeology, Water Resources and Peat Existing Conditions

Glenlee - Tongland

Substation and Hydro electricity generating station

Proposed Route Section

Kendoon - Glenlee

Earlstoun - Glenlee

Glenlee - Tongland

Existing 132kV overhead line to be removed (following construction of the KTR Project)

Existing Network

Geology, Hydrology, Hydrogeology, Water Resources and Peat Existing Conditions

Flood Risk

Flood Risk (1 in 200 years)

Priority Peatland Habitats

Class 1

Class 2

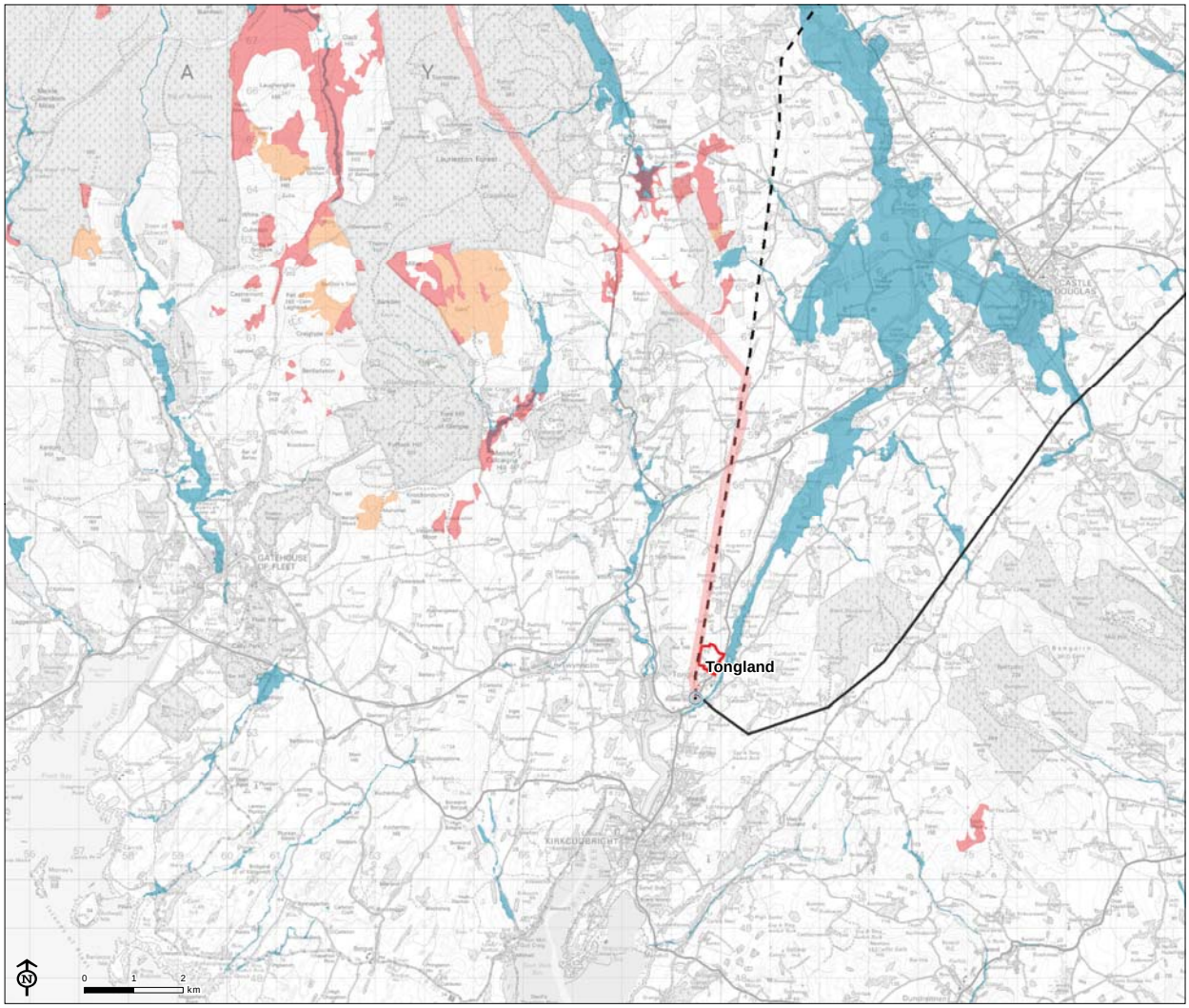
Map Scale @ A3: 1:75,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG06-1_6109-105-r0_KTR_Hydrology_INDEX 19/04/2017

Source: National Grid, SEPA, SNH, South Ayrshire, Dumfries and Galloway Local Authorities



KTR Project Scoping Report

Figure 6.1c: Geology, Hydrology, Hydrogeology, Water Resources and Peat Existing Conditions

Glenlee - Tongland

Substation and Hydro electricity generating station

Proposed Route Section

Glenlee - Tongland

Existing 132kV overhead line to be removed (following construction of the KTR Project)

Existing Network

Geology, Hydrology, Hydrogeology, Water Resources and Peat Existing Conditions

Flood Risk

Flood Risk (1 in 200 years)

Priority Peatland Habitats

Class 1

Class 2

Mineral Resources

Mineral Extraction Zone

Map Scale @ A3: 1:75,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG06-1_6109-105-r0_KTR_Hydrology_INDEX 19/04/2017

Source: National Grid, SEPA, SNH, South Ayrshire, Dumfries and Galloway Local Authorities

7 Ecology

Introduction

7.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the construction and operation of KTR Project on flora and fauna. Potential effects on birds are considered separately as detailed within **Chapter 8: Ornithology**.

7.2 Following the approach to assessment set out in **Chapter 3**, the ecological assessment will be carried out in line with relevant legislation and standards, as well as having regard to the following guidance:

- Chartered Institute of Ecology and Environmental Management (CIEEM), (2016), Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (second edition);
- Scottish Natural Heritage, Series on Species Advice Notes for Developers[9];
- Scottish Natural Heritage and West Lothian Council, (2014), Planning for Nature: Development Management and Wildlife Supplementary Guidance; and
- Scottish Natural Heritage, (2013), A Handbook on Environmental Impact Assessment[10].

Existing Conditions

7.3 In addition to the desk based information collated during the routeing stage and informed by feedback received from key stakeholders during the routeing stage, an initial site reconnaissance visit was undertaken on 4th April 2017 to inform the scope of the field surveys.

7.4 The majority of the habitats apparent include coniferous forestry plantation and open farmland (primarily livestock grazing), punctuated by gorse scrub and large areas of bracken.

7.5 Informed by this information, and following consultation with SNH undertaken in March 2017 in relation to survey proposals and methods, field surveys are due to commence in April 2017.

7.6 The field survey approach will be informed by further desk studies, which include the identification and mapping of statutory and non-statutory designated sites and the acquisition of existing protected species records. The desk study is currently in progress, though based on information already received and on remote sensing data publically available, the majority of the protected species expected to be present can be surmised, as follows:

- Badger;
- Bats;
- Otter;
- Pine marten;
- Red squirrel; and
- Water vole.

7.7 Amphibians and reptiles are also expected to be found in the area. Additionally, great crested newt presence cannot be ruled out at this time as historic records of this species have been provided for the wider area.

[9] Available online, at: http://www.snh.gov.uk/protecting-scotlands-nature/protected-species/your-responsibilities/developers-and-builders/
[10] Available online, at: http://www.snh.gov.uk/docs/A1198363.pdf

7.8 **Figures 7.1a-c** show the existing biodiversity related designated sites within the study area.

Q: Are there any records of key species not already provided through the DGERC which may require targeted survey or consideration?

Methodology

7.9 Considering the above, the initial field surveys comprise an extended Phase 1 Habitat Survey of the entire KTR Project, plus appropriate buffers (i.e. up to 250 m along water courses and out to 50 m for all other sections) within April/May 2017. The survey area will be rapidly classified and mapped in accordance with Phase 1 Habitat Survey methods; however where notable habitats are encountered (e.g. GWDTEs or Annex I) the area will be surveyed to NVC classification. The habitat survey will be extended to include an assessment of suitable habitat for any protected species, as well as a search for field signs of such species.

7.10 Once the initial survey is complete and the component habitats present along the route are known, the detailed survey strategy will be finalised and SNH will be consulted to agree specific methods for targeted protected species and/or further habitat surveys. All surveys will be carried out in accordance with published good practice guidelines, as provided on the CIEEM webpage Sources of Survey Methods (SoSM)[11].

Likely Significant and Non-Significant Effects

7.11 Taking account of the desk based information and consultation feedback obtained during the routeing stage, whilst still adopting a precautionary approach at this preliminary stage, potential effects associated with the construction and/or operation of the KTR Project include:

- permanent loss and/or damage to terrestrial habitats, including priority habitats, during construction. This will include GWDTEs, if found, which will be assessed in conjunction with the hydrology assessment;
- indirect effects on statutory and non-statutory sites of nature conservation;
- habitat fragmentation/isolation as a consequence of linear development;
- direct or indirect temporary or permanent loss of/damage to habitats for protected species or those of high conservation value as a result of construction, including felling activity.

7.12 On the basis of the professional judgement of the ecology team and experience from other similar projects, it is considered likely that the following effects can be scoped out:

- direct effects on statutory sites of nature conservation (on the basis that these have been avoided during routeing);
- operational effects on habitats or protected species, as all effects are expected to occur during the construction of the overhead line; and
- Cumulative effects, on the basis that the habitat loss, and subsequent effects on protected species associated with the KTR Project will be limited, it is considered unlikely that significant effects will occur cumulatively with other developments.

Approach to Mitigation

7.13 SPEN is committed to implementing accepted good practice during construction and operation of the KTR Project, thereby ensuring that many potential effects on ecology can be avoided or reduced.

[11] CIEEM (accessed March 2017) *Sources of Survey Methods* reference page. http://www.cieem.net/sources-of-survey-methods-sosm-

7.14 Following implementation of good practice measures, where likely significant effects on ecology are identified, specific measures to prevent, reduce and where possible offset these adverse effects will be proposed. Although, mitigation considerations at this stage are indicative given that surveys have not yet been undertaken, measures likely to be utilised include:

- adherence to Pollution Prevention Guidance;
- implementation of water quality protection measures;
- reinstatement of habitats to pre-construction conditions where possible; and
- careful timing of activities and other construction measures such as ramping of trenches and installation of dry culverts to avoid effects on protected species.

7.15 In addition to the above, Species Protection Plans will be drafted where appropriate, which may include the rigors of species licencing process which will require detailed and targeted mitigation, and if necessary biodiversity compensation.

Decommissioning of the Existing 132kV Overhead Lines

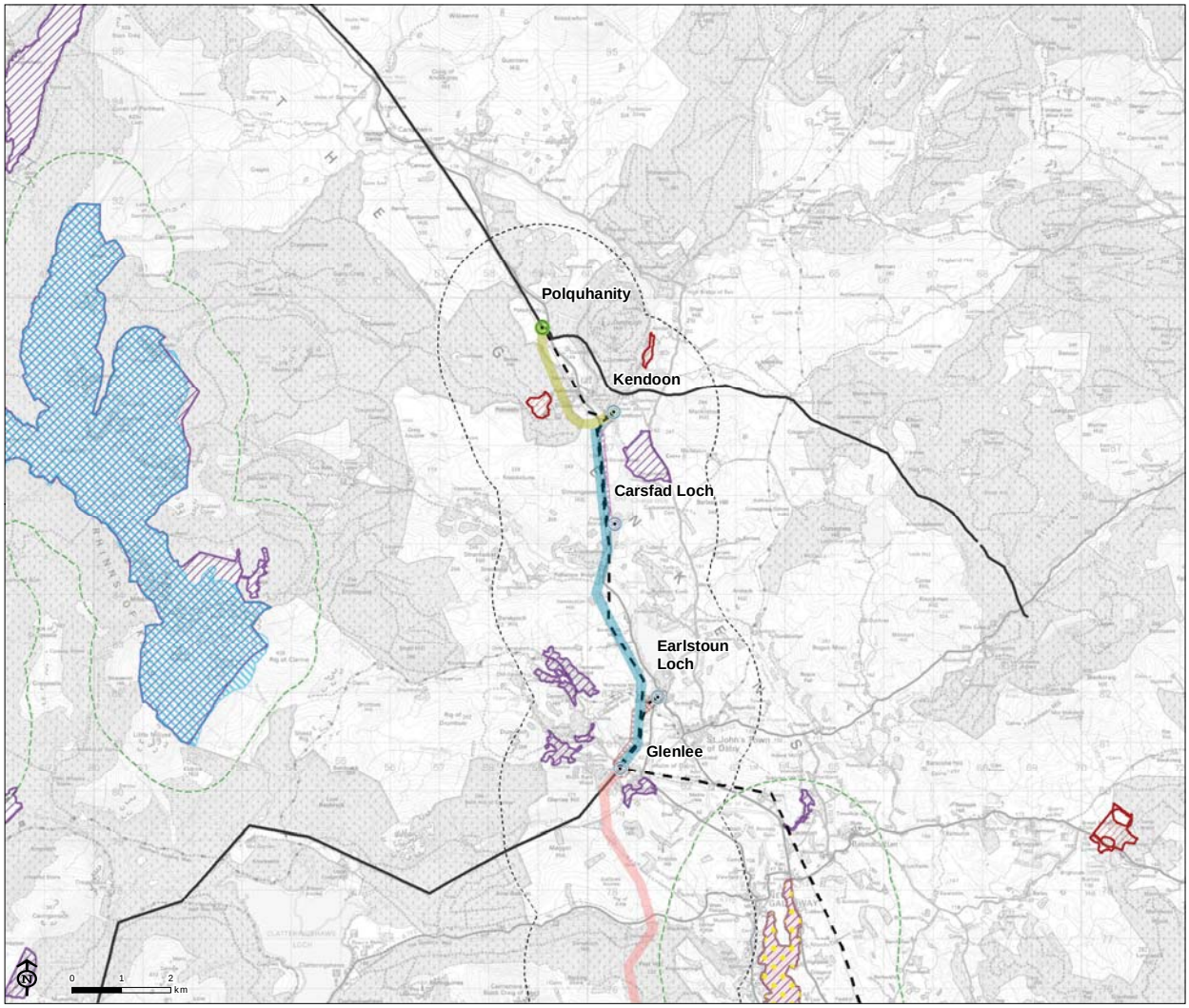
7.16 Targeted extended Phase 1 habitat surveys will be undertaken along the N and R routes to identify potentially sensitive locations e.g. GWDTEs, which may be affected by the decommissioning of the overhead lines. Informed by the findings of the survey, a number of detailed surveys could be scoped out due to avoidance of potential effects (e.g. bats), but disturbance of shelters must be considered for other species (e.g. badgers or red squirrel) if the habitat is considered suitable. The ecological assessment will only apply to the period of the decommissioning works as once the infrastructure is removed, on the basis that the habitat is reinstated appropriately, operational effects are not considered likely.

Consultation

7.17 The consultees below have been approached for information to inform the EIA. A number of these consultees may also be contacted by the Scottish Government regarding the scope of the EIA:

- Forestry Commission Scotland;
- Dumfries and Galloway Environmental Resources Centre;
- Dumfries & Galloway Council (Biodiversity Officer);
- SNH;
- The Scottish Wildlife Trust;
- The Association of Salmon Fishery Boards;
- Gatehouse Squirrel Group;
- Saving Scotland's Red Squirrels;
- The Scottish Badgers Group; and
- The National Trust for Scotland (in relation to Threave Bat Reserve).

Q: Should any other organisations be consulted to inform the EIA?



KTR Project Scoping Report

Figure 7.1a: Biodiversity Existing Conditions

Polquhanity - Glenlee

- Polquhanity Sealing End and Terminal Tower
- Substation and Hydro electricity generating station

Proposed Route Section

- Polquhanity - Kendoon
- Carsfad - Kendoon
- Kendoon - Glenlee
- Earlstoun - Glenlee
- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network

Biodiversity Criteria

- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Ramsar Site (R)
- Local Wildlife Site
- Sensitive Bird Area 'trigger for consideration'
- 2km

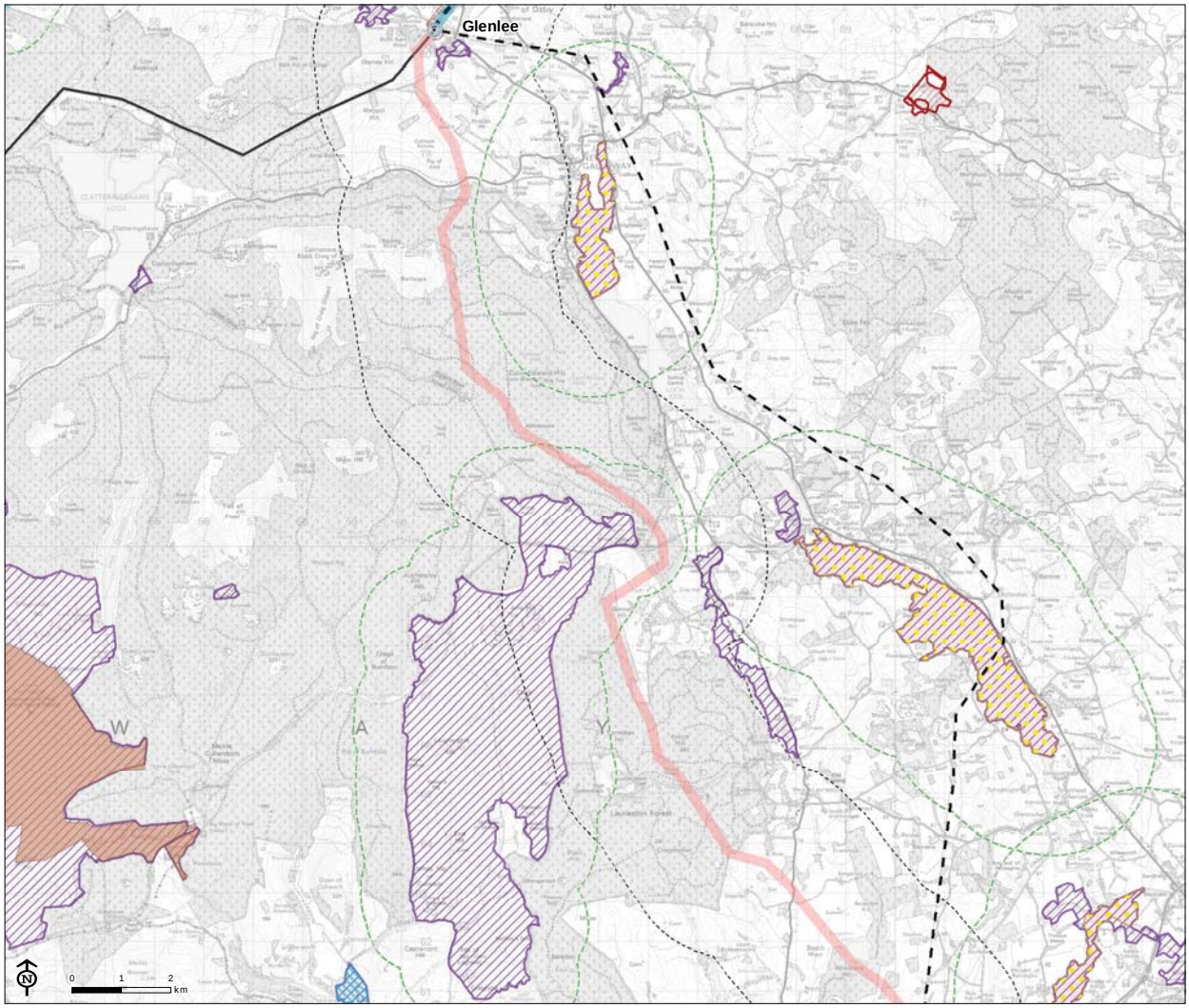
Map Scale @ A3: 1:75,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-1_6109-108-r1_KTR_Biodiversity_INDEX 20/04/2017

Source: SNH, HS



KTR Project Scoping Report

Figure 7.1b: Biodiversity Existing Conditions

Glenlee - Tongland

Substation and Hydro electricity generating station

Proposed Route Section

- Kendoon - Glenlee
- Earlstoun - Glenlee
- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network

Biodiversity Criteria

- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)
- Ramsar Site (R)
- Local Wildlife Site
- Sensitive Bird Area 'trigger for consideration'
- 2km

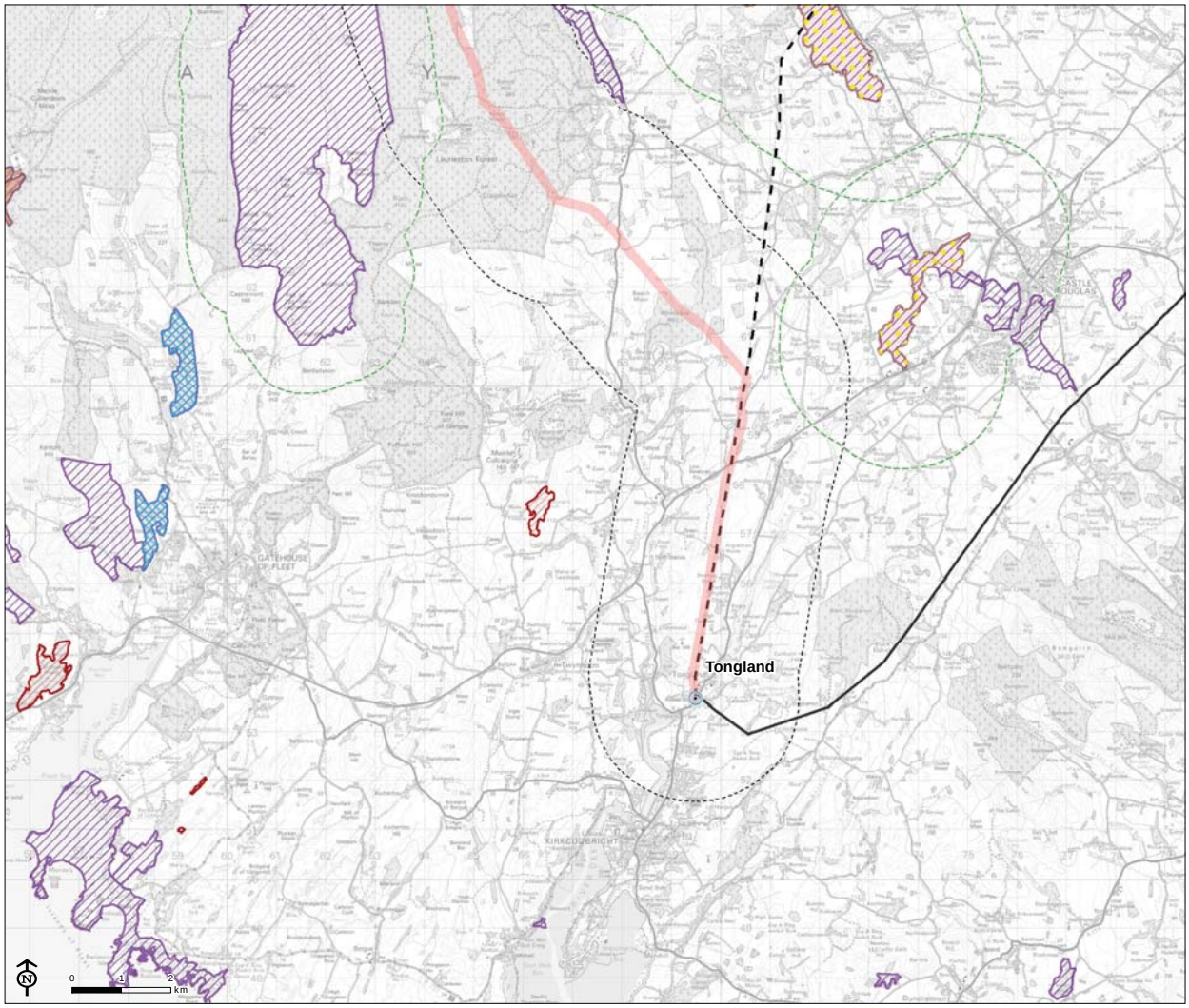
Map Scale @ A3: 1:75,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-1_6109-108-r1_KTR_Biodiversity_INDEX 20/04/2017

Source: SNH, HS



KTR Project Scoping Report

Figure 7.1c: Biodiversity Existing Conditions

Glenlee - Tongland

Substation and Hydro electricity generating station

Proposed Route Section

Glenlee - Tongland

Existing 132kV overhead line to be removed (following construction of the KTR Project)

Existing Network

Biodiversity Criteria

Special Protection Area (SPA)

Special Area of Conservation (SAC)

Site of Special Scientific Interest (SSSI)

National Nature Reserve (NNR)

Ramsar Site (R)

Local Wildlife Site

Sensitive Bird Area 'trigger for consideration'

2km

Map Scale @ A3: 1:75,000

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG07-1_6109-108-r1_KTR_Biodiversity_INDEX 20/04/2017

Source: SNH, HS

8 Ornithology

Introduction

8.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the construction and operation of the KTR Project on ornithological interest within the study area. Following the approach set out in **Chapter 3**, the assessment of effects on ornithology will be carried out in line with relevant legislation and standards, as well as having regard to the following guidance:

- Scottish Natural Heritage (SNH) Guidance: Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds (SNH 2015);
- SNH: Guidance. Assessing Connectivity with Special Protection Areas (SPAs). Version 3 – June 2016. (SNH 2016);
- SNH Guidance: Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH 2014)[12]; and
- SNH Guidance: Assessing the Significance of Impacts from Onshore Windfarms on Birds outwith Designated Areas (SNH 2006)[13].

Existing Conditions

8.2 The new overhead line components forming part of the KTR Project do not intersect with any site that is statutorily designated at international or national level for ornithological interests.

8.3 The nearest internationally designated ornithological site is the Loch Ken and River Dee Marshes Special Protection Area (SPA) and Ramsar Site, which at its closest is situated around 2.2km east of the proposed route. This is designated for its wintering Greenland white-fronted goose and greylag goose populations. Owing to its proximity to the new overhead line components of the KTR Project, it is anticipated that the competent authority will be required to undertake an Appropriate Assessment as part of a Habitats Regulations Appraisal (HRA) in respect of this SPA. Otherwise, the next nearest site is the Upper Solway Flats and Marshes SPA and Ramsar Site 20km to the east. A proposed SPA, the Solway Firth pSPA, lies approximately 11km to the south.

8.4 The nearest nationally designated site which cites ornithological features is the Laughenghie and Airie Hills Site of Special Scientific Interest (SSSI), which at its closest is around 0.1km from the KTR Project. This is designated for its breeding bird assemblage and its non-breeding hen harrier population. In addition, the River Dee (Parton to Crossmichael) SSSI and the Threave and Carlingwark Loch SSSI, both of which form part of the Loch Ken and River Dee Marshes SPA, lie within 3km of the proposed route.

8.5 Wildfowl (geese and swans) that winter in the region and at sites to the south of the KTR Project use airspace over the KTR Project mainly during their migration periods in the autumn and spring. The main species of interest are whooper swan, Greenland white-fronted goose, pink-footed goose, greylag goose and barnacle goose. Although individuals from different migratory populations pass through the region on a broad front, populations using the adjacent designated sites may follow habitual flight lines close to the proposed route.

8.6 A number of raptor species of conservation concern are also known to use habitats in the vicinity of the KTR Project for nesting, roosting or foraging. These include osprey, golden eagle, red kite,

[12] SNH recommend that surveys to allow the assessment of effects of powerline developments on birds should follow this guidance.

[13] SNH recommend that determining the significance of effects on birds arising from powerline developments should follow this guidance.

hen harrier, goshawk and peregrine; all these species are protected under Schedule 1 of the Wildlife and Countryside Act 1981.

8.7 A number of other species of conservation concern are known to use habitats in the vicinity of the KTR Project, including black grouse, nightjar and waders, e.g. curlew and lapwing.

8.8 **Figures 7.1a-c** show the existing biodiversity conditions in relation to designated sites.

Methodology

8.9 Desk studies, consultations (undertaken during the routeing stage and ongoing) and an ongoing programme of targeted field surveys have identified the presence of a number of bird populations that could be susceptible to adverse effects as a result of the construction and/or operation of the KTR Project. These include populations associated with the designated sites listed above and populations where individuals breed, roost or forage at distances of up to 2km from the KTR Project.

8.10 SNH's 2015 guidance on ornithological survey, assessment and mitigation requirements relating to overhead lines (OHLs) has been followed and the scope of the survey programme has been agreed with SNH[14]. Baseline surveys commenced in October 2016 and at least one full year of surveys will be undertaken, with a requirement for further work dependant on the results from the first year, to be determined in consultation with SNH and other relevant stakeholders.

8.11 Due to the presence of wintering wildfowl, targeted flight activity surveys from five vantage points (VPs) are being undertaken during the two migration periods. From each VP, 36 hours of watches are being undertaken in each migration period, aiming to record movements by the Loch Ken and River Dee Marshes SPA's qualifying species. To date, relativity little migratory flight activity has been recorded over the KTR Project. In addition, during the winter months, twice-weekly, 2-hour VP watches from two VPs are gathering data on flight activity by Greenland white-fronted geese and greylag geese at current or historic feeding and roosting areas in the vicinity of the proposed route. It is anticipated that the information provided by these surveys will be required by the competent authority to undertake an Appropriate Assessment as part of a HRA in respect of the Loch Ken and River Dee Marshes SPA.

8.12 Targeted surveys are being undertaken to determine the presence, distribution, flight activity and ranging behaviour of certain key raptor species. The fieldwork programme includes systematic, year-round VP watches totalling 24 hours per month around the Laughenghie and Airie Hills SSSI, a monthly roost watch at this SSSI in the non-breeding season and 136 hours of surveys to determine raptor breeding status in the vicinity of the KTR Project. This aspect of the work is being undertaken in close liaison with the Dumfries and Galloway Raptor Study Group (DGRSG) and RSPB.

8.13 Targeted surveys are also being undertaken for species including black grouse, nightjar and waders e.g. curlew and lapwing. In total, around 185 hours of walkover surveys will be undertaken to determine these species' presence and distribution adjacent to the KTR Project.

Q: Confirmation of the appropriateness of the survey scope and methods, including the proposal to consult with SNH and others after collation of the first year's results to determine the need for a further year of baseline data.?

Q: Is there any other baseline information available, that should be collated to allow an assessment to be undertaken?

Likely Significant and Non-Significant Effects

8.14 Taking account of the findings of the desk and field survey work undertaken to date in combination with the extensive consultation undertaken as part of the routeing stage (and

[14] Email correspondence from SNH on 18/11/16 and 21/11/16.

ongoing), whilst still adopting a precautionary approach at this preliminary stage, potential effects on ornithology associated with the construction and/or operation of the KTR Project include:

- a short-term reduction in breeding or wintering bird populations due to construction disturbance;
- a long-term/permanent reduction in breeding or wintering populations due to direct loss of critical habitats;
- a long-term/permanent reduction in breeding or wintering populations due to disturbance displacement resulting from maintenance activities or birds' perceived reductions in suitability of adjacent habitats;
- a long-term/permanent reduction in breeding or wintering bird populations due to collision mortality (if collision risk is identified as a concern, predicted collision rates may be estimated through a combination of theoretical collision risk modelling and professional judgement);
- a permanent reduction in breeding or wintering bird populations due to the loss of habitat critical for nesting or feeding.
- a long-term/permanent reduction in breeding or wintering bird populations due to electrocution mortality (of relevance to the two wood pole connections only); and
- cumulative effects with other nearby development proposals that are constructed during the same period, and/or with other developments which pose a potential mortality risk.

8.15 On the basis of the work undertaken to date, the professional judgement of the ornithology team and experience from other similar projects it is considered unlikely that any of the identified potential effects will be scoped out of the assessment.

Q: Confirmation of the requirement to provide data to allow the competent authority to undertake an appropriate assessment as part of a HRA in respect of the Loch Ken and River Dee Marshes SPA?

Q: Confirmation that HRA will not be undertaken in respect of other SPAs?

Approach to Mitigation

8.16 In addition to careful siting of infrastructure, SPEN is committed to implementing accepted good practice during construction and operation of the KTR Project, thereby ensuring that many potential effects on ornithology can be avoided or reduced.

8.17 Possible additional mitigation measures may include:

- phased construction in sensitive locations to avoid effects on breeding birds, in particular those listed on Wildlife and Countryside Act 1981;
- engineering solutions to eliminate/ minimise the risk of electrocution to susceptible perching birds (for wood pole connections only); and
- the use of bird deflecting devices on the overhead line during operation in areas used by geese, swans and other identified susceptible species if required.

8.18 Any requirement for mitigation following assessment of effects will be discussed with SNH and other relevant ornithological organisations during the EIA process.

Decommissioning of the Existing 132kV Overhead Lines

8.19 The decommissioning and removal of the existing 'N' and 'R' routes are unlikely to result in significant adverse ornithological effects. A desk study will be undertaken, using readily available information to inform the initial appraisal of likelihood for significant effects. It is considered that any potential effects will be avoided/mitigated through management of the work at a site level, e.g. the implementation of a decommissioning management plan which would remove/reduce the risk of disturbance to sensitive bird sites. There is also a commitment to avoid disturbance to

Schedule 1 species during the breeding season, (as required by law) and hence, adverse effects in the breeding season are considered unlikely.

8.20 In relation to the southern section of 'R' route which currently crosses the SPA, the known winter distribution of Greenland white-fronted geese at Loch Ken, which are a qualifying feature of the Loch Ken and River Dee Marshes SPA, is, spatially, relatively limited and potential adverse effects as a result of decommissioning activities are considered to be limited to parts of the route within approximately 500m of these areas. This constitutes an approximate 2.6km length of the route with approximately ten associated pylons.

8.21 Decommissioning and removal activities along the remainder of the N and R routes in the non-breeding (winter) period are not considered likely to result in adverse ornithological effects.

Consultation

8.22 The consultees below have been approached for information to inform the EIA. A number of these consultees may also be contacted by the Scottish Government regarding the scope of the EIA:

- SNH;
- Forestry Commission Scotland;
- RSPB;
- Dumfries and Galloway Raptor Study Group; and
- Wildfowl and Wetlands Trust.

Q: Should any other organisations be consulted to inform the EIA?

9 Cultural Heritage

Introduction

9.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the KTR Project on cultural heritage assets within the study area, during construction and operation. The cultural heritage of an area comprises archaeological sites, historic buildings and other historic environment features, gardens and designed landscapes and other sites, features or places in the landscape that have the capacity to provide information about past human activity, or which have cultural relevance due to associations with folklore or historic events. Sites of cultural heritage interest can also be informed by their 'setting'.

9.2 Following the general approach set out in **Chapter 3**, the assessment of effects on cultural heritage will be carried out in line with relevant cultural heritage protection legislation and planning policy, and the following standards and guidance:

- Historic Environment Scotland Policy Statement (HESPS) (2016);
- Historic Environment Scotland (2016) 'Managing Change in the Historic Environment Guidance Notes – Setting';
- The Chartered Institute for Archaeologists (2014) 'Code of Conduct'; and
- The Chartered Institute for Archaeologists (2017) 'Standard and guidance for historic environment desk-based assessment'.

Existing Conditions

9.3 Preliminary appraisal, informed by desk based work undertaken during the routeing stage, indicates that there are four cultural heritage assets with statutory designations within the 200m wide proposed route (comprising the KTR Project study area). These are all Category B Listed Buildings: Carsfad Power Station; Polharrow Bridge; Earlstoun Power Station and Bridge; and Glenlee Power Station and Bridge.

9.4 There are no Scheduled Monuments within the KTR Project study area and no part of the KTR Project lies within or passes through a World Heritage Site, Conservation Area, Inventory status Garden and Designed Landscape or Inventory status Historic Battlefield.

9.5 Within the KTR Project study area there are 38 non-statutory designated cultural heritage assets. They, include: two Archaeologically Sensitive Areas (ASAs), Polharrow Burn and Grobdale; two Non-Inventory Designed Landscapes (NIDLs), Knocknalling and Glenlee Park; and, 34 known heritage assets recorded within the Dumfries and Galloway Historic Environment Record (HER). These known heritage assets include: find-spots of prehistoric (Mesolithic to Bronze Age) artefacts, particularly clustered around Kendoon, and a possible metal working site at Glenlee; prehistoric settlement and burial remains, including a cainfield at Culcrae, a burnt mound at Camelon Bridge and a burial cairn at Balannan; and, remains of medieval/post-medieval farmsteads and associated field systems, at Stroangassel Hill, Carsfad, Knocknalling Wood, Airie, Darsalloch and Stroan Hill. The farmstead and field system at Stroan Hill is a constituent part of the Grobdale ASA and an unscheduled monument of national importance.

9.6 Preliminary appraisal also indicates that there are 423 heritage assets with statutory and non-statutory designations within the 5km Zone of Theoretical Visibility (ZTV) for the KTR Project.

9.7 **Table 9.1** (below) provides a summary list of the statutory and no-statutory designated sites within the 200m wide KTR Project study area and the 5km ZTV.

Table 9.1: Summary of Statutory and Non – Statutory Designated Heritage Assets

Statutory and non-statutory designated asset type	No of assets within the 200m wide KTR Project study area	No of assets within wider 5km ZTV area
Scheduled Monument	0	37
Category A Listed Building	0	21
Category B Listed Building	4	156
Category C Listed Building	0	142
Conservation Area	0	2
Inventory status Garden and Designed Landscape	0	2
Historic Battlefield	0	0
Archaeological Sensitive Area (ASA)	2 (intersected by the 200m wide KTR Project study area)	5 (2 of which are intersected by 200m wide KTR Project study area)
Non-Inventory Designed Landscape (NIDL)	2 (intersected by the 200m wide KTR Project study area)	23 (2 of are intersected by 200m wide KTR Project study area)
Unscheduled Monuments of National Importance	1	35

9.8 There are no World Heritage Sites or Inventory status Historic Battlefields within the 5km ZTV study area.

9.9 Consultation with Historic Environment Scotland and Dumfries and Galloway Council during the routeing stage highlighted a number of heritage assets (including assets with statutory and non-statutory designations) within 2km of the KTR Project that were considered as sensitive assets in relation to the potential effect of the KTR Project on their 'settings'. These are shown on **Figures 9.1a-c**, and listed below:

Scheduled Monuments

- Polmaddy medieval and post-medieval settlement (SM5391)
- Earlstoun Castle (SM5391), which is also a Category A Listed Building (LB3624)
- Dalry Mote (SM1117)
- Edgarton Mote (SM1119)
- Bargatton Farm Cairn (SM1002)

Category A Listed Buildings

- Earlstoun Castle (LB3624)
- Tongland Old Bridge (LB17123)
- Tongland Bridge (LB17125)

Category B Listed Buildings

- Tongland Abbey (LB17124)

Archaeologically Sensitive Areas (ASA)

- Polharrow Burn ASA

Non-Inventory Designed Landscapes (NIDL)

- Knocknalling
- Garroch
- Glenlee Park
- Kenmure Castle
- Slogarie
- Hensol House
- Lauriston Hall
- Argrennan House

Unscheduled Assets of National Importance

- Mackilston Cairn (MDG3865)
- The Score (MDG12802)
- Dalry Fundamental Bench Mark (MDG25521)
- Dinnace Cairn (MDG8405)
- Bargatton Cairn (MDG3770)
- Neilson's Monument (MDG3772)
- Barstobrick Hill Fort (MDG3780)
- Gillfoot Mote Settlement (MDG4102)
- Netherthird Settlement (MDG4100)
- Hell's Hole Settlement (MDG3695)

Heritage Trails

- Raiders Road Forest Drive

9.10 **Figures 9.1a-e** show the existing cultural heritage conditions.

Q: Are there any other heritage assets, in addition to those listed, which should be specifically considered for assessment of effects on setting?

Methodology

9.11 A desk-based assessment and walkover field survey will be conducted for the 200m wide KTR Project study area to identify all known heritage assets, designated or otherwise, to identify potential direct effects on cultural heritage assets and to inform an assessment of the archaeological potential of the KTR Project.

9.12 For assessment of effects on the setting of cultural heritage assets, the 5km study area adopted for the LVIA will be used.

9.13 Sources to be consulted for the collation of data will include:

- The Dumfries and Galloway Council Historic Environment Record (HER).
- Historic Environment Scotland's (HES) on-line GIS Data Warehouse.
- Inventory of Gardens and Designed Landscapes.
- Conservation Areas designations.

- Canmore (HES National Monuments of Scotland Record Database).
- Ordnance Survey maps (principally 1st and 2nd Editions) and other published historic maps held in the Map Library of the National Library of Scotland.
- Aerial Photographs – RCAHMS collections (oblique, vertical) and GoogleEarthTM.
- Available reports from other recent archaeological work undertaken in the area.
- The Scottish Palaeoecological Archive Database.
- Early Parish accounts (including Statistical Accounts).
- Local archives, societies and libraries, if recommended by Dumfries and Galloway Council.

9.14 The desk-based assessment results will be collated to form:

- A gazetteer of all known cultural heritage assets within the 200m wide KTR Project study area, detailing for each site: the site type, site description, and importance/sensitivity of the asset.
- A gazetteer listing details of all designated heritage assets and non-designated assets of national importance, recorded within the Dumfries and Galloway Council HER, that have predicted visibility of the KTR Project. Detailed descriptions and background information will be collated for those sites that Historic Environment Scotland and Dumfries and Galloway Council, through consultation, consider potentially sensitive to the KTR Project.
- Site Location mapping (using GIS).

9.15 These gazetteers and mapping will then inform and aid the fieldwork.

9.16 A RCAHMS Level 1 Field Survey (Royal Commission on the Ancient and Historic Monuments of Scotland Corporate Plan 2004-9, Survey and Recording) will be conducted of 200m wide KTR Project study area. Field survey will be undertaken to:

- locate all visible cultural heritage assets, both identified during the desk-based assessment and previously unrecognised, and record their character, extent and current condition.
- identify areas with the potential to contain unrecorded, buried archaeological remains, taking into account factors such as topography, geomorphology and ground conditions.
- inform the assessment of the possible direct effects of the KTR Project on these features.

9.17 The survey will also include visits to key cultural heritage assets within the wider study area (5km wide ZTV area), in as far as access is possible, to assess whether the KTR Project would affect their settings. Site visits will focus on heritage assets most likely to receive appreciable effects on their settings (i.e. those closest to the KTR Project and/or those specifically identified as requiring assessment by Historic Environment Scotland and/or Dumfries and Galloway Council). Where access is difficult or denied, publicly accessible locations as close as possible to the asset will be sought as a basis for assessment.

9.18 A candidate list of sites for the cultural heritage assessment of effects on setting has been produced taking into consideration the list of potentially sensitive cultural heritage assets highlighted by Historic Environment Scotland and Dumfries and Galloway Council during the routeing stage and the initial ZTV (**Figure 5.2**) produced for the KTR Project. The viewpoints have been selected to represent a range of viewing receptors, distance and experiences. Indicative viewpoint locations are listed in **Table 9.2** below.

Table 9.2: Candidate Cultural Heritage Viewpoint List

No	Asset Name	Asset No	Status	Approx. Grid Ref	Approx. Distance from proposed Development	Photomontage/Wireline
CH1	Polmaddy settlement	SM5391	Scheduled Monument/	259006, 587830	0.1km	Photomontage

No	Asset Name	Asset No	Status	Approx. Grid Ref	Approx. Distance from proposed Development	Photomontage/Wireline
			Promoted Heritage Site			
CH2 / LVIA VP 4	Polharrow Burn ASA	-	ASA	-	-	3rd place viewpoint looking back at ASA from opposite side of Carsfad Loch, showing proposed development passing through ASA
CH3	Mackilston Cairn	MDG3865	Unscheduled Asset of National Importance	261971, 586827	1.6km	Wireline
CH4	Earlstoun Castle	SM5391/ LB3624	Scheduled Monument, Cat A Listed & NIDL	261273, 584028	0.9km	Photomontage
CH5	Dalry Mote	SM1117	Scheduled Monument	261884, 581266	0.7km	Wireline (& cross ref to LVIA VP 7)
CH6	Glenlee Park	-	NIDL	260993, 580119	0.1km	Wireline
CH7	Slogarie	-	NIDL	265071, 568582	0.5km	Wireline
CH8	Craig Hill Fort	SM2891	Scheduled Monument	269143, 566080	3.2km	Wireline
CH9	Edgarton Mote	SM1119	Scheduled Monument	267343, 563072	0.3km	Photomontage (& cross ref to LVIA VP 16)
CH10	Bargatton Farm Cairn	SM1002	Scheduled Monument	268938, 562580	0.4km	Photomontage
CH11 / LVIA VP 17	Barstobrick Hill (Neilson's Monument)	MDG3772	Unscheduled Asset of National Importance	-	-	Cross reference to LVIA VP17
CH12	Threave Gardens	-	Garden and Designed Landscape/ National Trust	275288, 560473	4.6km	Wireline

No	Asset Name	Asset No	Status	Approx. Grid Ref	Approx. Distance from proposed Development	Photomontage/Wireline
			Property			
CH13	Gillfoot Mote Settlement	MDG4102	Unscheduled Asset of National Importance	271069, 556182	1.2km	Wireline
CH14	Tongland Abbey	LB17124	Cat B Listed	269786, 553925	0.2km	Wireline (& cross ref to LVIA VP 20)

Q: Can you confirm that the cultural heritage study areas are considered appropriate for the assessment?

Q: Can you confirm that the proposed viewpoints are acceptable, and if there is any additional cultural heritage assets which you would wish to see visualisations (photomontages/wirelines) for in the EIA?

Likely Significant and Non-Significant Effects

9.19 Taking account of the findings of the desk studies and consultation undertaken to date, whilst still adopting a precautionary approach at this preliminary stage, potential effects on cultural heritage associated with the construction and/or operation of the KTR Project include:

- direct (physical) effects on assets of national, regional and local cultural heritage value;
- physical disturbance of undiscovered sites or features, including unforeseen buried remains of archaeological interest (partial or total removal, including severance of linear features);
- effects on the settings of cultural heritage assets, principally resulting from intervisibility between the asset and the KTR Project [15]; and
- cumulative effects on setting with other developments.

9.20 On the basis of the work undertaken to date, the professional judgement of the cultural heritage team, and experience from other similar projects, it is considered likely that the following effects can be scoped out:

- Indirect effects on sites or features of national, regional or local cultural heritage value as a consequence of vibration, dewatering or changes in hydrology.

9.21 However, it is important to emphasise that, following further work, the predicted significance of identified effects could change and coverage in the ES will be amended accordingly.

Approach to Mitigation

9.22 In addition to careful siting of infrastructure to seek to avoid direct effects on cultural heritage features, SPEN is committed to implementing accepted good practice during the construction and operation of the connection, thereby ensuring that many potential effects on cultural heritage assets can be avoided or reduced.

[15] Guidance issued by Historic Scotland (2016, Key Issues) notes that the setting of a heritage asset often extends beyond the property boundary or 'curtilage' of an individual historic asset into a broader landscape context. Both tangible and less tangible elements can be important in understanding the setting. Less tangible elements may include function, sensory perceptions or the historical, artistic, literary and scenic associations of places or landscapes. These will be considered within the assessment.

9.23 Where adverse effects on cultural heritage assets are identified, measures to prevent, reduce, and/or where possible offset these effects will be proposed. Measures which may be adopted include:

- The fencing off or marking out of sites or features of cultural heritage importance in proximity to working areas.
- An archaeological watching brief, if required, during construction activities in, or in proximity to, areas of particular concern.
- Implementation of a working protocol should unrecorded archaeological features be discovered.
- Archaeological recording in advance of construction activities where avoidance of sites or features is not feasible.

Decommissioning of the Existing 132kV Overhead Lines

9.24 It is possible that direct effects could arise pre-mitigation from any groundbreaking works associated with the decommissioning and removal of existing tower foundations of 'N' and 'R' route, where these are located in close proximity to cultural heritage assets, and from construction of proposed temporary access routes where these might intersect with cultural heritage assets. However, any such potential effects can be avoided, reduced or offset through mitigation, principally through avoidance of important assets or through monitoring of ground works at potentially affected assets.

9.25 It is proposed that a cultural heritage assessment of direct effects, arising from decommissioning and removal of the existing overhead lines, can be scoped out of the EIA for the KTR Project on the basis that a commitment is made in the ES to undertake a cultural heritage assessment of the existing overhead line routes and proposed access track routes prior to the commencement of decommissioning works, and appropriate mitigation applied.

9.26 The cultural heritage assessment would consist of:

- A high level desk-based audit for a narrow study corridor focussed on the existing overhead line tower positions and the proposed access routes, to identify known cultural heritage assets within close proximity to existing towers and along, or close, to proposed access routes.
- Targeted sites visits to particularly sensitive areas or assets present in close proximity to existing towers and proposed access routes, to record their current baseline condition and to identify assets or locations where mitigation may be required.
- Recommendations for asset specific mitigation measures (where appropriate).

9.27 Removal of the existing overhead lines and towers would be beneficial in terms of operational effects on the settings of cultural heritage assets within the surrounding landscape; particularly so for those that are located in close proximity to the existing overhead lines.

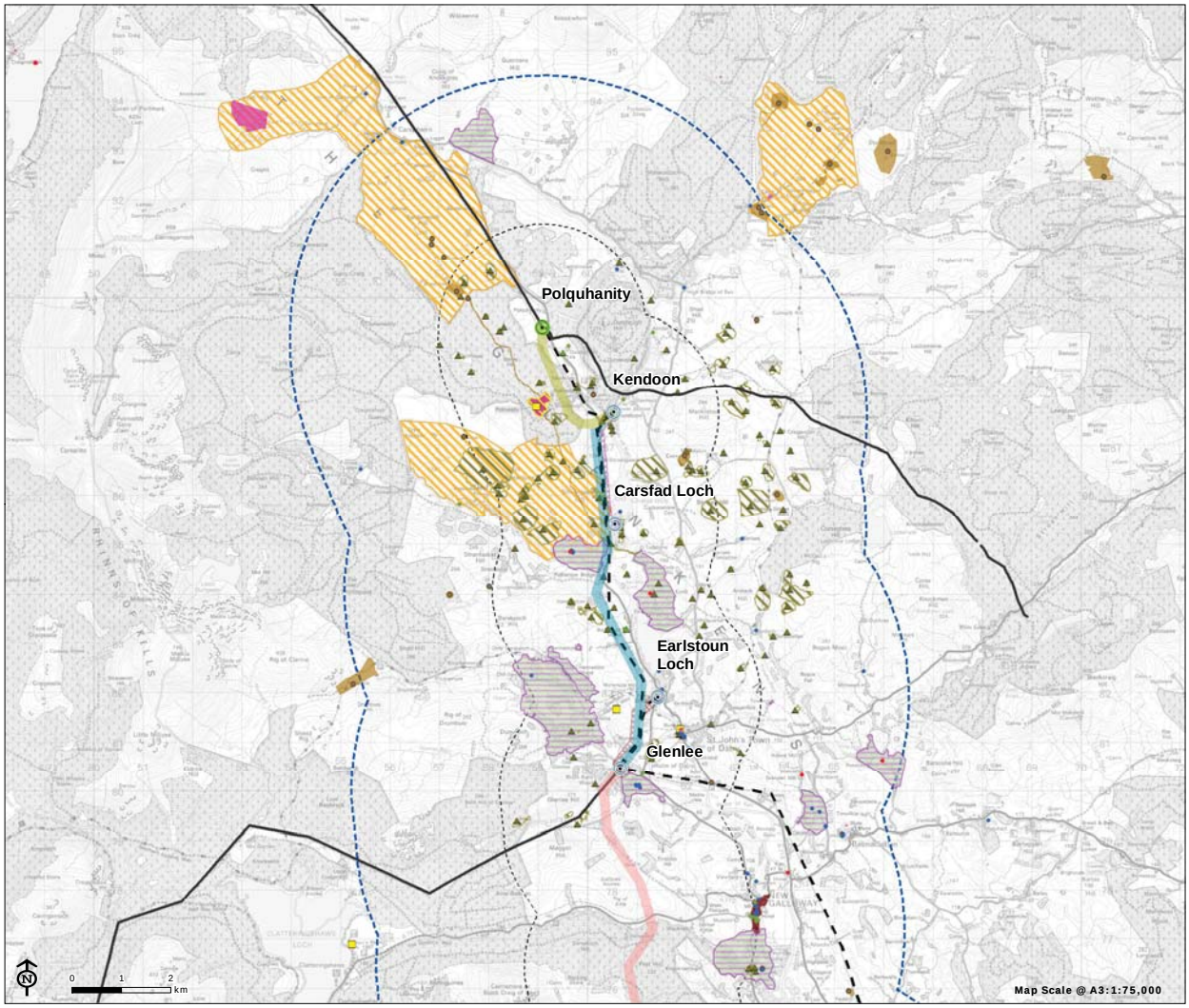
9.28 On that basis, assessment of potential effects on the setting of cultural heritage assets from the decommissioning and removal of the existing overhead lines can be scoped out of the EIA.

Consultation

9.29 The consultees below have been approached for information to inform the EIA. A number of these consultees may also be contacted by the Scottish Government regarding the scope of the EIA:

- Historic Environment Scotland; and
- Dumfries & Galloway Council Archaeologist and Conservation Officer.

Q: Should any other organisations be consulted to inform the EIA?



KTR Project Scoping Report

Figure 9.1a: Cultural Heritage Existing Conditions

Polquhanity - Glenlee

- Polquhanity Sealing End and Terminal Tower
- Substation and Hydro electricity generating station

Proposed Route Section

- Polquhanity - Kendoon
- Carsfad - Kendoon
- Kendoon - Glenlee
- Earlstoun - Glenlee
- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network

Cultural Heritage Criteria

- Scheduled Monument

Listed Building

- Category A
- Category B
- Category C
- Conservation Area
- Archaeologically Sensitive Area (Dumfries & Galloway)
- Non-Inventory Designed Landscape (Dumfries & Galloway)

Unscheduled Archaeology of National Importance

- Point
- Area
- Promoted Heritage Site - Point
- Promoted Hertitage Site Scheduled Monument

Unscheduled Archaeology of Regional and Local Importance

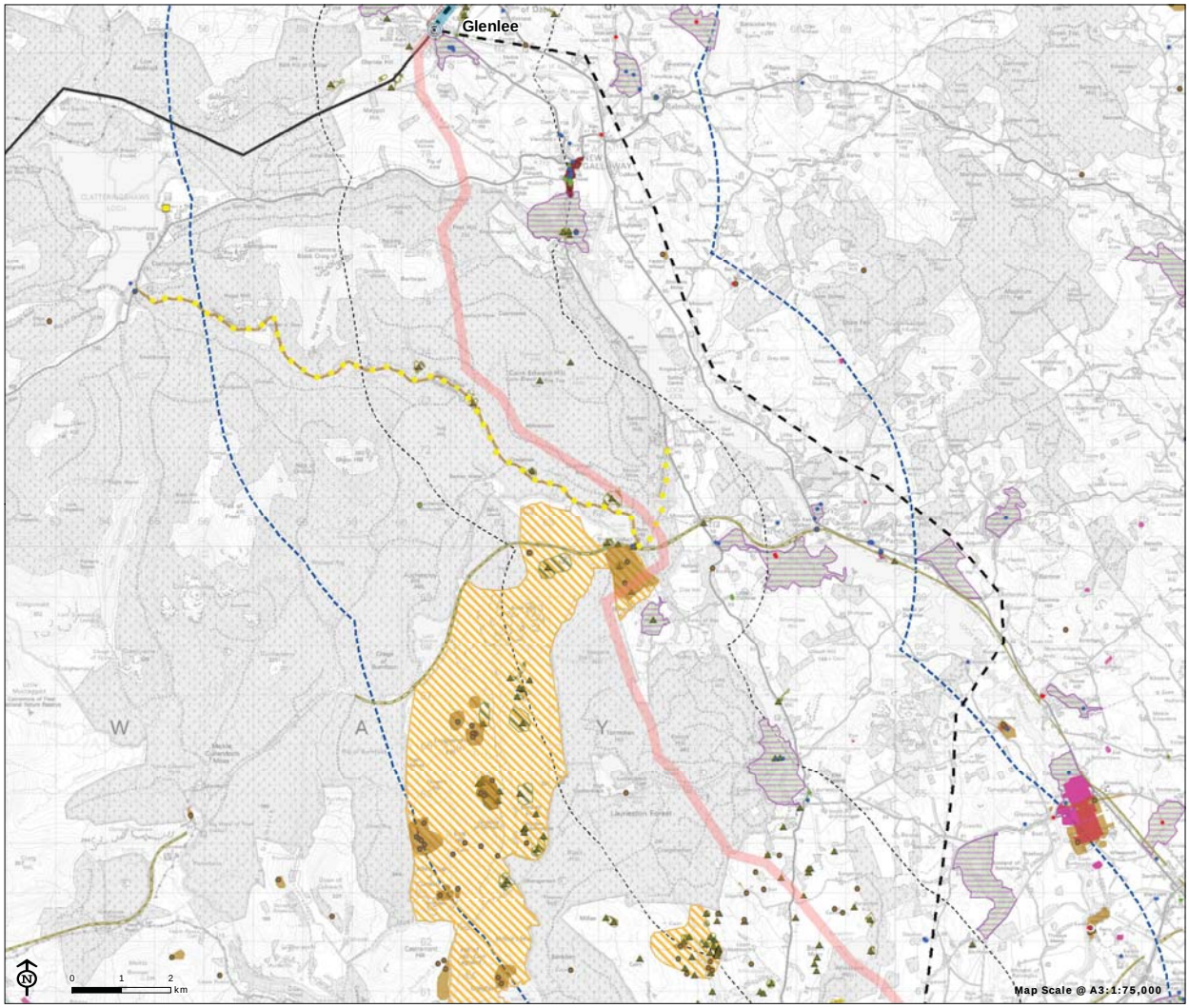
- Point
- Area
- 2km
- 5km

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG09-1_6109-107-r1_KTR_CulturalHeritage_INDEX 21/04/2017

Source: SNH, HS, CFA



KTR Project
Scoping Report

Figure 9.1b: Cultural Heritage Existing Conditions

Glenlee - Tongland

- Substation and Hydro electricity generating station

Proposed Route Section

- Kendoon - Glenlee
- Earlstoun - Glenlee
- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network

Cultural Heritage Criteria

- Scheduled Monument

Listed Building

- Category A
- Category B
- Category C
- Conservation Area
- Archaeologically Sensitive Area (Dumfries & Galloway)
- Inventory of Gardens and Designed Landscape
- Non-Inventory Designed Landscape (Dumfries & Galloway)

Unscheduled Archaeology of National Importance

- Point
- Linear
- Area
- Promoted Heritage Site - Point
- Promoted Heritage Site Driving/Hiking Trail
- Promoted Heritage Site - Area

Unscheduled Archaeology of Regional and Local Importance

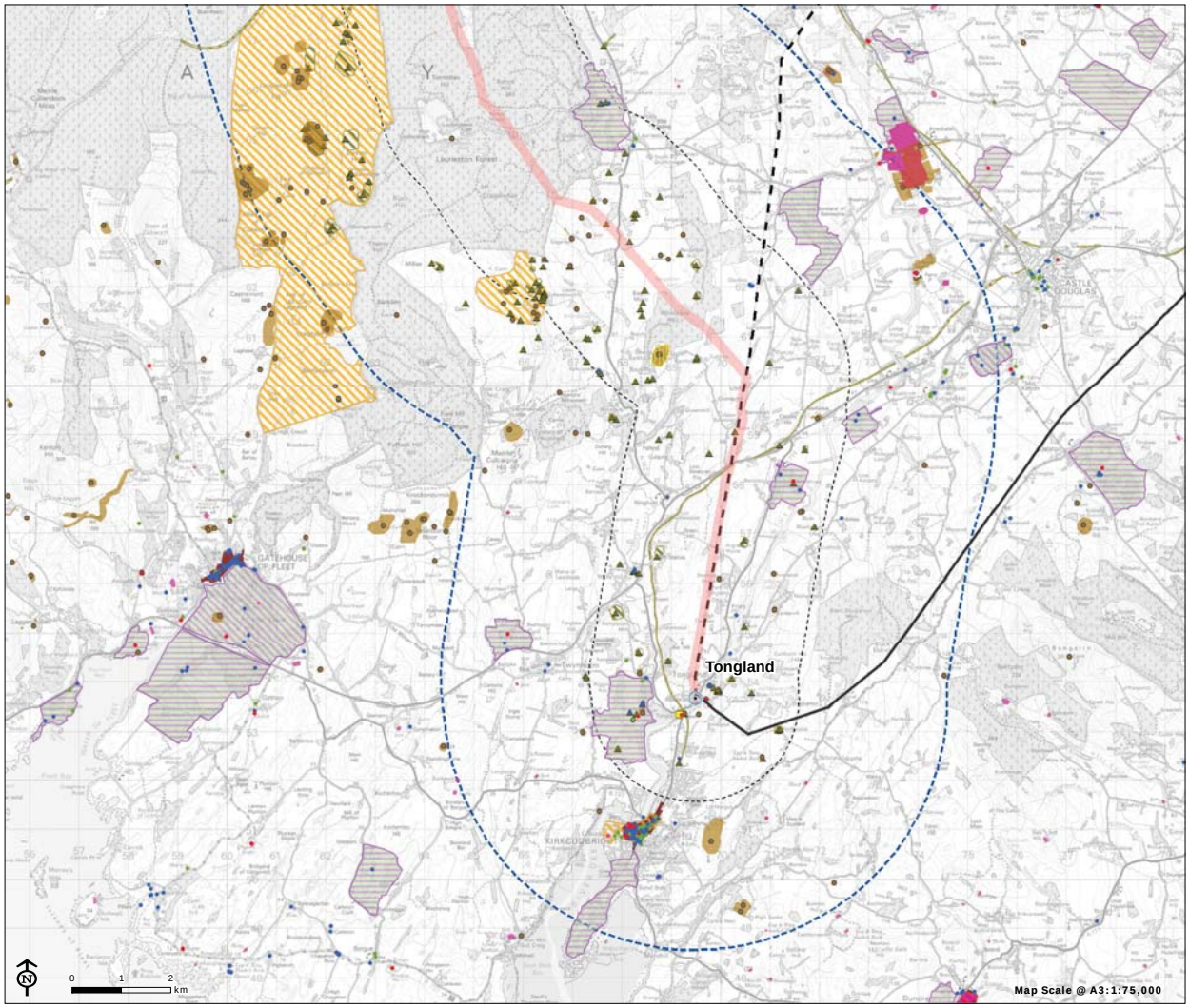
- Point
- Area
- 2km
- 5km
- Property in Care

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG09-1_6109-107-r1_KTR_CulturalHeritage_INDEX 21/04/2017

Source: SNH, HS, CFA



KTR Project Scoping Report

Figure 9.1c: Cultural Heritage Existing Conditions

Glenlee - Tongland

- Substation and Hydro electricity generating station

Proposed Route Section

- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network

Cultural Heritage Criteria

- Scheduled Monument

Listed Building

- Category A
- Category B
- Category C
- Conservation Area
- Archaeologically Sensitive Area (Dumfries & Galloway)
- Inventory of Gardens and Designed Landscape
- Non-Inventory Designed Landscape (Dumfries & Galloway)

Unscheduled Archaeology of National Importance

- Point
- Area
- Promoted Heritage Site - Point
- Promoted Heritage Site - Area

Unscheduled Archaeology of Regional and Local Importance

- Point
- Area
- 2km
- 5km
- Property in Care

LUC

SP ENERGY NETWORKS

CB:SR EB:robertson_s LUCGLA FIG09-1_6109-107-r1_KTR_CulturalHeritage_INDEX 21/04/2017

Source: SNH, HS, CFA

10 Traffic and Transport

Introduction

10.1 This chapter sets out the proposed approach to the assessment of the potentially significant traffic and transport effects associated with the construction of the KTR Project. This assessment will consider potential effects of the KTR Project traffic upon communities and road users.

10.2 Following the approach set out in **Chapter 3**, the assessment of effects on traffic and transport will be carried will be carried out in line with relevant legislation and standards, as well as having regard to the following guidance:

- Institution of Highways and Transportation (IHT) (1994), Guidelines for Traffic Impact Assessment;
- Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment / IEMA) (1993), Guidelines for the Environmental Assessment of Road Traffic, Guidance Notes No. 1 [referred to as the IEMA Guidelines];
- Scottish Government (2005), DMRB, Volume 15, Economic Assessment of Road Schemes in Scotland (referred to as the NESA Manual);
- Transport Scotland (2012), Transport Assessment Guidance; and
- The Scottish Government (2007), Abnormal Load Movements – A Brief Guide to Notification and Authorisation Requirements.

Existing Conditions

10.3 The KTR Project traverses predominantly rural areas in the south and west of Dumfries and Galloway. Within the vicinity of the KTR Project there are a number of local communities, including New Galloway, Kirkcudbright, St. John's Town of Dalry, Mossdale, Glenlee, Kendoon, and Laurieston. There are also several small clusters of properties, and some isolated, residential properties and farm buildings in the locality.

10.4 These communities, and individual properties are served by a number of 'A' class, 'B' class, and unclassified local public roads. Classified roads, sections of which will be considered during assessment include:

- the B795;
- the A711;
- the A712;
- the A713; and
- the A762.

10.5 The A75 trunk route, which is a strategic road, administered by Transport Scotland, is situated in close proximity to the southernmost section of the KTR Project. This trunk road will be appraised along with the local public roads listed above, through the assessment process.

10.6 The locality is popular for leisure and tourist trips, focusing on outdoor activities, with road cycling being a common pursuit. In addition, the Southern Upland Way crosses the KTR Project to the west of St. John's Town of Dalry, and there are also several off-road paths and tracks which are defined as part of the 'core path network' within the vicinity. These are utilised for activities such as mountain biking, and walking, with the Galloway Forest being a popular destination. Off-roads paths and tracks may also be used for access to fishing locations.

10.7 The KTR Project will be serviced by several worksites, which can be individually accessed by existing and/or newly formed track sections. The track sections will in turn link to local public roads or the A75 trunk route; administered by Dumfries & Galloway Council or Transport Scotland respectively, either via existing or newly formed access locations.

Methodology

10.8 The study area for the assessment will include public road sections (in vicinity of the development worksites) which construction traffic will logically utilise; unclassified roads, 'B' class roads and 'A' class roads all termed local roads. This will include:

- the B795;
- the A711;
- the A712;
- the A713; and
- the A762.

10.9 Probable construction phase vehicular access routes will be driven, access constraints examined and sensitive receptors identified. Video, photographs, key dimensions (including visibility splays) and GPS co-ordinates will be recorded. Automatic traffic counters will be placed at strategic locations along with manual sample traffic counts (peak and inter-peak) as necessary to supplement traffic data obtained from roads authorities.

10.10 Road traffic (personal injury) accident data will be sourced from local authorities where potential accident 'blackspots' (cluster sites) are highlighted by stakeholders. These will be collated for analysis during the EIA phase.

10.11 The predicted significance of effects will be determined through a standard method of assessment based on professional judgement and the application of appropriate evaluation criteria. The IEMA (Institute of Environmental Management and Assessment) Guidelines will be adopted accordingly.

10.12 Traffic generation will be calculated through the analysis of required construction materials, plant and staffing volumes, aligned with the construction programme. The distribution of Development traffic across the public road network will be estimated considering the location of worksite access locations relative to local generators of construction traffic, such as quarries and settlements.

10.13 Qualitative effects which might not be picked up through strict quantitative evaluation will be considered via professional judgement. The IEMA Guidelines identify a variety of effects which may result from an increase in traffic and where the increase in traffic is considered to be potentially significant, possible environmental effects will be considered in greater detail.

10.14 Professional judgement will also be used to assess whether residual effects (following the application of mitigation measures) are likely to be significant.

10.15 It is also important to consider the possibility of cumulative effects resulting from the simultaneous construction or operation of significant development in the vicinity of the KTR Project. Those developments will be considered which have the potential to use roads within the defined Study Area at the same time as the KTR Project .

Likely Significant and Non-Significant Effects

10.16 Adopting a precautionary approach, at this preliminary stage, potentially significant effects associated with the KTR Project, comprise:

- effects of felling and construction traffic on existing traffic flows, and the local and trunk road network;

- effects to the facilitation and amenity to users of the Southern Upland Way and the 'core path network', in the vicinity of the KTR Project, and 'off-road tracks' which service associated worksites; and
- cumulative effects with other developments, including on traffic flows during felling, and construction of overhead lines.

10.17 Based on professional judgement and experience in the assessment of traffic and transport effects associated with overhead line projects, additional effects which, at this preliminary stage, are not anticipated to be significant include:

- effects of operational and maintenance vehicles on existing traffic flows and the local road network, it is proposed to scope out the operational effects of traffic and transport. Operational overhead power lines are subject to an annual maintenance inspection with any further visits generally being the result of unplanned outages on the line. These visits are infrequent and are unlikely to generate significant volumes of traffic therefore effects will be negligible during operation;
- effects on the trunk road sections local to the KTR Project (essentially the A75) given residual capacity and strategic nature and that this development is unlikely to result in an intensification of use exceeding 10% of the existing Annual Average Daily Traffic (AADT) on any link section on this route and this assumption will be verified or otherwise through the EIA process; and
- 'road safety' is not anticipated to be a significant issue, assuming an appropriate construction traffic management plan is developed and implemented. Nonetheless, road traffic accident historical data will be sourced and appraised, with due consideration given to any intensified use, as a result of traffic generated by the Development upon public road sections in the local area.
- noise and air quality/dust effects associated with temporary construction traffic on the basis that the KTR Project will be accessed via a number of geographically distinct roads and access points.

Q: Confirmation of the acceptability of scoping out the operational effects of traffic and transport is requested.

Approach to Mitigation

10.18 Where potentially significant traffic and transport effects are identified, measures to prevent, reduce and where possible offset these adverse effects will be proposed. The mitigation measures proposed will draw on guidance and best practice, and will be appropriate to the nature and significance of the effect identified.

10.19 Possible mitigation measures may include:

- preparation of a Traffic Management Plan for the construction phase of the scheme;
- the use of approved access routes to site only (including for general construction traffic, abnormal loads, and site personnel as appropriate); and
- no parking of construction plant, equipment, and vehicles offsite on public roads.

10.20 SPEN will be committed to implementing all the mitigation measures identified in the traffic and transport assessment.

Decommissioning of the Existing 132kV Overhead Lines

10.21 Removal of individual towers will necessitate few vehicle movements and many of these movements will involve light goods vehicles only; as in many locations towers, will be broken down into manageable sections in-situ, thus, reducing requirement for HGV movements. HGV movements will predominantly relate to requirement to transport construction plant into worksite

areas, and removal of some forestry to aid local access. However, in areas where sensitive ground conditions or land use exist, a mobile crane may be required for tower removal including additional HGV movements to transport larger tower sections from site. Such instances are likely to be limited in number.

10.22 Activities relating to decommissioning and removal of the existing network ('N' and 'R' routes), will generate traffic at a level notably less than the construction of the new overhead line sections comprising the KTR Project , but at levels exceeding that of the operational phase. Accordingly, traffic generation will be calculated through the analysis of required construction materials, plant, and staffing volumes, aligned with the construction programme. Depending upon the outcome of this exercise, assessment consistent with that utilised for appraising effects of the KTR Project will be implemented. If extremely low traffic activity is forecast, then at that stage, decommissioning would be formally scoped out of the requirement for subsequent assessment and aligned mitigation.

10.23 The overhead line infrastructure proposed for decommissioning (comprising 'N' and 'R' routes totalling 43km) will necessitate the use road sections, further to the list of routes identified for the KTR Project. Several unclassified roads will be utilised in addition to sections of, 'B' class roads and 'A' class roads (including trunk routes), these routes will include, but are not limited to:

- the B795;
- the A702
- the A712; and
- the A713.

Consultation

10.24 The consultees below have been approached for information to inform the EIA. A number of these consultees may also be contacted by the Scottish Government regarding the scope of the EIA:

- Transport Scotland (or agents thereof); and
- Dumfries and Galloway Council.

Q: Should any other organisations be consulted to inform the EIA?

11 Construction Noise

Introduction

11.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of construction noise associated with the KTR Project. Operational noise is covered separately, within **Chapter 14: Other Issues**.

11.2 Following the approach set out in **Chapter 3**, the assessment of effects on noise will be carried out in line with relevant legislation and standards, as well as having regard to the following guidance:

- Scottish Planning Policy (SPP) 2014
- Planning Advice Note 1/2013: Environmental Impact Assessment (PAN1).
- British Standard 5228-1:2009 (Amendment, 2014) *Code of practice for noise and vibration control on construction and open sites. Noise.* (BS 5228-1)
- BS 4142:2014 *Methods for rating and assessing industrial and commercial sound.* (BS 4142)

Existing Conditions

11.3 The KTR Project covers an approximate length of 44km between Polquhanity and Tongland. The KTR Project will pass through areas primarily comprising rural environments. The existing baseline noise environment in rural areas are likely to be characterised by 'natural' sources such as wind disturbed vegetation with some contribution from anthropogenic sound such as distant road traffic and agricultural activity.

11.4 Several sections of the KTR Project either pass over or alongside main A-roads and the location of existing substations are also near to roads. The existing day-time baseline noise environment in these areas are likely to be characterised by road traffic vehicles using the nearby roads.

Methodology

11.5 The noise assessment will centre on a GIS database of the construction route. Calculations will be undertaken in accordance with BS5228-1-2009+A1-2014 'Code of practice for noise and vibration control on construction and open sites'. Noise for construction activity along the route and the grid noise maps stored in the GIS database. These noise effects will be assessed in accordance with appropriate criteria derived in accordance with the guidance found within BS 5228-1 to determine any significant effects.

Likely Significant and Non-Significant Effects

11.6 In assessing the effects of construction noise associated with the construction of the overhead lines, it is accepted that the associated works, which are linear in the geographical extent, are of a temporary nature. The noise generated by construction activities associated with the overhead lines will quickly diminish as construction progresses, moving the activity further away from noise-sensitive locations. It is therefore considered appropriate to scope out the assessment of noise resulting from the construction of the overhead lines.

11.7 However, construction work associated with the extension to the Glenlee substation may involve longer duration works at a specific location; therefore construction noise, associated with the extension of the substation, will be included in the assessment.

11.8 Based on professional judgement and experience in the assessment of construction noise effects associated with overhead line projects, effects which, at this preliminary stage, are not anticipated to be significant include:

- construction noise associated with the overhead lines;
- changes in road traffic flows on existing roads during construction; and
- vibration caused during construction.

Approach to Mitigation

11.9 Where potentially significant noise effects are identified, measures to prevent, reduce and where possible offset these adverse effects will be proposed. The mitigation measures proposed will draw on guidance and best practice, and will be appropriate to the nature and significance of the effect identified.

11.10 Possible mitigation measures may include:

- construction environmental management plans; and

best practice construction noise control measures.Decommissioning of the Existing 132kV Overhead Lines

11.11 Construction noise effects, during the decommissioning and removal of the existing network, will be dependent on the specific types of construction equipment used, and the proximity of works to residential properties and other sensitive receptors along the existing route.

11.12 Significant effects are not anticipated; however a desk study will be carried out to identify any sensitive receptors and their proximity to the existing network, which is subject to removal. Any significant effects identified will be temporary and will be mitigated using best practice construction noise control measures.

Consultation

11.13 The consultees below have been approached for information to inform the EIA. A number of these consultees may also be contacted by the Scottish Government regarding the scope of the EIA:

- Dumfries and Galloway Council Environmental Protection Department.

Q: Should any other organisations be consulted to inform the EIA?

12 Forestry

Introduction

12.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the KTR Project on forestry during construction and operation.

12.2 Following the approach set out in **Chapter 3**, the assessment of effects on forestry will be carried will be carried out in line with relevant legislation and standards, as well as having regard to the following guidance:

- In assessing forest areas Forestry Commission guidelines in the assessment of Yield class will be utilised, to consider the growth rates and productivity of the individual sites.
- The Scottish Government, (2009), Policy on the Control of Woodland Removal.
- The Forestry Commissions survey data "Scottish Native Woodlands 2014 (NWSS) and Data collected on Ancient and Semi Natural Woodlands (ASNW) will be utilised in the assessment of the KTR Project.

Existing Conditions

12.3 The forestry assessment includes all conifers and broadleaved trees, woodlands and forests potentially affected by the KTR Project. Along the KTR Project length of approximately 44km, an estimated 20km of this will pass through forestry. Of this forest area it is further estimated that 91% is commercial conifer forest the balance being broadleaf woodland. The areas of commercial conifer plantation forestry have been predominately created over the past 40-50 years and the largest single landowner of these areas is the Scottish Government (via Forest Enterprise Scotland). Those Forest Enterprise owned forests are part of the Galloway Forest Park which was established in 1947 to promote the local area and specifically the forest areas.

12.4 These forests are a combination of first and second rotation crops planted on previous agricultural land. A relatively small proportion of the forest sites in proximity to the KTR Project are Ancient and Semi Natural Woodland (ASNW) sites. These will be identified and assessed separately in recognition of their environmental value. It should be noted that ASNW has been avoided where possible during the routeing process.

12.5 Whilst areas of broadleaf woodland have been avoided where possible during routeing, there are areas which are also likely to be affected by the KTR Project and in assessing these; use will be made of The Native Woodland Survey of Scotland (NWSS) in addition to ANSW data. The areas of broadleaf woodland will include both long term ancient and semi natural woodland and some areas of more recently created broadleaf woodland, both native and non-native. In most cases the recently created broadleaf woodland was developed in association with the larger coniferous forests as part of the overall planned design for these areas.

12.6 Existing forestry conditions are shown on **Figure 12.1**.

Methodology

12.7 Both desk based and onsite surveys will be undertaken to assess local forest conditions, extent of tree clearance required and the effect of this on current forest management practices. The methodology will also consider existing Forestry Management Plans and incorporate existing long term management works into the tree clearance proposals where practicable. Tree clearance associated with the overhead line will affect the existing location and quantities of tree clearance

proposed by the landowners. An assessment of the effects of the KTR Project as a linear feature will be assessed in relation to the overall tree felling and replanting long term plans for the forest. During this period an assessment of the potential mitigation works associated with the proposed tree clearance will be also undertaken.

12.8 Discussions will be held with any adjoining landowners where their future forestry management works may have an effect on the cumulative effect on the tree clearance proposed.

Likely Significant and Non-Significant Effects

12.9 Adopting a precautionary approach, at this preliminary stage, possible effects associated with the KTR Project, which may be potentially significant include:

- The extent of the physical change and the degree of change this causes to the character of the site and its surroundings. This will involve the age, species and area of forest to be felled and the extent by which the same areas can be replanted or off site mitigation developed.
- The effects resulting from the construction and subsequent maintenance of the line. This will consider the long term loss of forest as a result of the construction of the line, and also the short term requirements for felling and replanting of other areas to facilitate the construction of the line. This includes the requirements for access and the need for mitigation felling for to windfirm boundaries as a method to reduce the risk of wind damage.
- The increase of windthrow risk and the associated requirement to fell to windfirm boundaries.
- The effects on shelter for agriculture. Shelterbelt woodlands have been shown to provide a major benefit shelter for livestock. As such there is a need to consider the effect of their removal.
- The effect of the wayleave corridor on the management of the woodland.
- The loss of forest in terms of the effect on the national resources following the creation of a forestry 'sterilised' corridor within the wayleave.

Approach to Mitigation

12.10 Where potentially significant forestry effects are identified, measures to prevent, reduce and where possible offset these adverse effects will be proposed. The mitigation measures proposed will draw on guidance and best practice, and will be appropriate to the nature and significance of the effect identified.

12.11 Possible mitigation measures will be developed by SPEN in consultation with Forestry Commission Scotland, as the primary foresty consultee, and forestry landowners including Forest Enterprise, and may include:

- Compensatory planting, to replace the areas of forestry which will require to be felled to facilitate construction and operation of the KTR Project.
- In addition to the clearance of trees within the wayleave for the safe construction and operation of the line, additional tree clearance may be required outwith the normal 80m wide corridor. This may be for reasons of landscape benefit or to create a windfirm forest edge.
- A range of site specific mitigation methods will be developed in conjunction with the other disciplines within the EIA team. These mitigation measures will aim to optimise the opportunities to design the KTR Project to incorporate landscape and ecological aspects of the forests through which it is passing. In the forest areas such mitigation will include the felling and replanting design utilising both shape of the final forest area and the species composition. This design input will aim to link in with delivery of overall landscape design mitigation principles for the KTR Project. In addition the forestry mitigation works will look to combine with the development of ecological diversity both within the 80m corridor where some low growing shrub and tree planting can be considered and also within areas outwith the corridor

In all cases there will be a requirement to deliver this mitigation with the consent of the landowner.

Decommissioning of the Existing 132kV Overhead Lines

12.12 As a wayleave through forestry associated with the existing 'N' and 'R' route already exists, the access routes required for the decommissioning works associated with 'N' and 'R' routes will be the main effect when decommissioning and removing the existing network. The need for vehicle or excavator access over adjoining wooded areas will require assessment. As no previous assessment of decommissioning access has been undertaken, assumptions based on existing road infrastructure will be necessary.

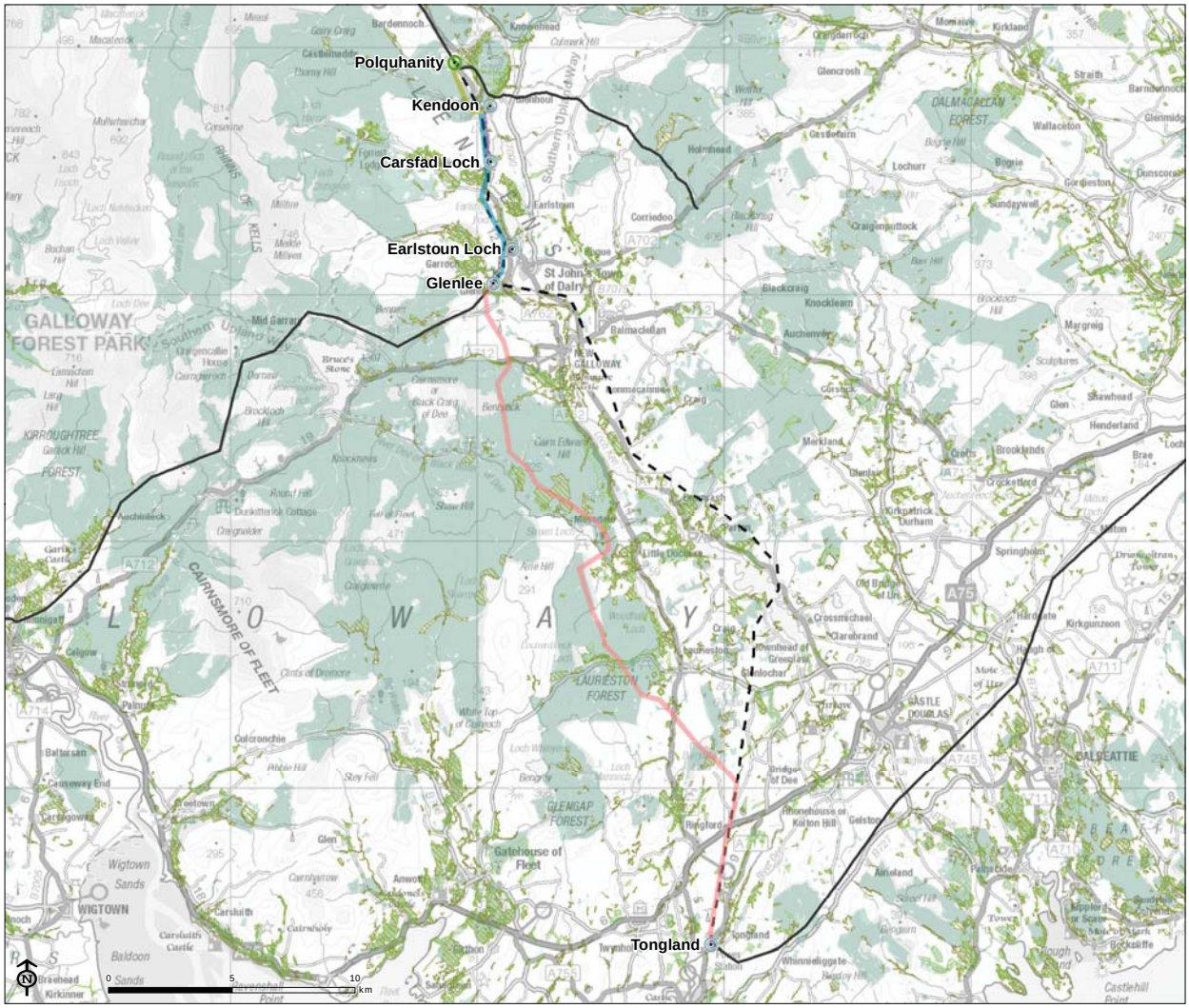
12.13 Significant effects are unlikely but information on any woodland removal necessary will be identified and presented within the ES.

Consultation

12.14 The consultees below have been approached for information to inform the EIA. A number of these consultees may also be contacted by the Scottish Government regarding the scope of the EIA:

- Forestry Commission Scotland;
- Individual forest owners and their agents;
- SNH; and
- SEPA.

Q: Should any other organisations be consulted to inform the EIA?



KTR Project Scoping Report

Figure 12.1: Existing Forestry Conditions

- Polquhanity Sealing End and Terminal Tower
- Substation and Hydro electricity generating station

Proposed Route Section

- Polquhanity - Kendoon
- Carsfad - Kendoon
- Kendoon - Glenlee
- Earlstoun - Glenlee
- Glenlee - Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing Network

Forestry Existing Conditions

- Ancient Woodland Inventory
- Native Woodland
- Woodland

Map Scale @ A3: 1:150,000

LUC

SP ENERGY NETWORKS

CB:JN EB:robertson_s LUCGLA FIG12-01_6109-106-r1_KTR_ExistingForestry_A3L 21/04/2017

Source: National Grid, FC

13 Socio Economics, Tourism and Recreation

Introduction

13.1 The potential for the KTR Project to provide both adverse and positive local effects will be evaluated in the EIA process. This will involve identification of the existing socio-economic and tourism baseline conditions in the study area, and consideration of potential direct or indirect effects on employment, investment, Gross Value Added (GVA)[16] and the areas recreation and tourism economy.

Existing Conditions

Socio-Economics

13.2 Data will be collected on the socio-economic profile of the consultation corridor and wider Dumfries and Galloway area, setting out key indicators and measures of socio-economic activity, and particularly reflecting the level of tourism and recreation related employment in the surrounding area. This will also include a review of relevant economic, policy and strategy establishing the context for socio-economic activity, and tourism and recreation in the local and wider area.

13.3 The wider area (Dumfries & Galloway Council) is characterised by[17]:

- decreasing population between 2009-2015 (1%) with a further population decrease to 2039 (5%);
- a lower than average working age population;
- higher levels of economic activity than the national average; and
- higher than average employment in manufacturing, retail and accommodation and food services.

13.4 The assessment will include a socio-economic profile of the local area based on drive time catchment areas.

Tourism & Recreation

13.5 Tourism is a vital component of the Dumfries and Galloway economy generating spend of £302million and supporting some 7,000 jobs per annum.[18] Employment in food and accommodation services (a sub set of the tourism economy) has increased year on year since 2009 and now accounts for more than 10% of all jobs in Dumfries and Galloway.

13.6 Dumfries and Galloways has a wide product offer and benefits from being both a rural and coastal location. The local tourism industry is heavily reliant on the domestic market, particularly from England. Visitor numbers are positively influenced by relative proximity to the Central Belt of Scotland and the North and Midlands of England.

13.7 The Dumfries and Galloway Regional Tourism Strategy (2016-2020) identifies key challenges for the sector including:

- 'attracting and retaining a range of higher quality accommodation and food and beverage businesses; and

[16] Gross value added (GVA) is the measure of the value of goods and services produced in an area, industry or sector of an economy
[17] NOMIS - Official Labour Market Statistics (2017 based on 2016 data)
[18] Dumfries and Galloway Regional Tourism Strategy (2016-2020)

- business operators who are content to service existing customers and not push for volume or value growth.'

13.8 Research quoted in the Strategy also highlights the challenges the area faces in attracting returning visitors and their likelihood to recommend the area to other people.

13.9 The natural environment is one of Dumfries and Galloway's main assets and is a vital component in the growing the areas tourism product (volume and value).[19]

13.10 Initial consultation feedback[20] has identified concerns relating to how the KTR Project may effect key tourism resources within close proximity of the route and the wider study area. Respondents have identified some of the key receptors in the area including:

- Galloway Forest Park;
- Galloway Dark Sky Park;
- Galloway and Southern Ayrshire Biosphere; and
- A number of routes, trails and walks with views over the KTR Project within and outside the consultation corridor (1km either side of the KTR).

13.11 All tourism and recreational resources, including but not limited to: visitor attractions and activities; fishing lochs and rivers, cycle routes, promoted paths; core paths and hill tracks within the consultation corridor will also be individually assessed.

13.12 Named tourism and recreational resources identified through the Stage 1 and 2 consultation process but outwith this consultation boundary will also be individually assessed.

Methodology

Socio Economic

13.13 The socio-economic effects of construction and operation of the new overhead lines and decommissioning of the 'N' and 'R' routes will be assessed identifying quantitative and qualitative effects.

13.14 There is currently no established EIA methodology for the assessment of socio-economic effects. This chapter of the ES therefore will describe the processes and outcomes of a socio-economic impact assessment based on professional experience and EIA good practice.

13.15 The methodology for the socio-economic assessment is consistent with HM Treasury's 'Green Book for Economic Appraisal and Evaluation' (HM Treasury, 2016) and good practice guidance for economic assessment used by the Scottish Government[21] and Scottish Enterprise.[22]

Tourism

13.16 A business survey will be prepared to provide a specific quantification of potential effect within the local economy potentially affected by the KTR Project.

13.17 Tourism related businesses will be asked to assess the projects effects their turnover and customer base according to the following scale: low (<10%); medium (10-15%) and high (over 15%). The business survey findings will highlight perceived effects, which will be contrast with ex post (after the event) tourism analysis for similar infrastructure projects (e.g. Scotland Ireland Interconnector and the Second Yorkshire Link (2YL)). This will inform the assessment of effects.

13.18 The location of the proposed new overhead lines, in relation to the existing 'N' and 'R' routes which will be decommissioned and removed as part of the KTR Project, also provides the

[19] Based on Dumfries and Galloway Regional Tourism Strategy (2016-2020) and c.20 Tourism Business Survey's carried out by PBA in Dumfries and Galloways between 2006-2016.
[20] Summary of Feedback from Second Round of Consultation (March 2017)
[21] The Green Book: appraisal and evaluation in central government: https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent
[22] Scottish Enterprise's Impact Appraisal and Evaluation Guidance: http://www.evaluationsonline.org.uk/evaluations/help/guidance.htm

circumstances whereby some businesses consider their business performance will improve due to reduced proximity and visibility. Positive and negative business effects will be clearly presented along with an overall combined net position.

Recreation

13.19 In assessing recreation effects, guidance on 'Outdoor Access Effect Assessment' is provided by Scottish Natural Heritage (SNH). This outlines the approach to the assessment of recreation effects that will be broadly adopted in the assessment, which considers potential for loss / closure / extinguishment / diversion of links, routes, or walks etc.; reduction in amenity; enhancement in amenity; intrusion; obstructing access routes; enhancing access; and changes to setting and context.

13.20 An assessment of likely effects on recreational facilities will be carried out. Effects will be assessed on the basis of: physical disturbance to users; severance of the recreational resource; or potential consequences of the KTR Project's visual effect on users of the recreational resources. The latter will be informed by the LVIA (see **Chapter 5**) undertaken as part of the overall EIA.

Likely Significant and Non-Significant Effects

13.21 Likely significant effects will be investigated as part of the EIA process. Effects identified as likely to be significant prior to the implementation of mitigation measures will be addressed fully in the ES, and any residual effects identified.

13.22 Adopting a precautionary approach at this preliminary stage, possible effects associated with the KTR Project which may be potentially significant include:

- effects on the labour market during manufacturing, construction and operational phases;
- effects on tourism related businesses;
- effects on recreational receptors (e.g. walking and cycling routes); and
- effects on the local accommodation sector associated with construction workers potentially displacing established tourism visitors and discouraging repeat visits.

Approach to Mitigation

13.23 Where potentially significant socio-economic effects are identified, measures to prevent, reduce and where possible offset these adverse effects will be proposed. The mitigation measures proposed will draw on guidance and best practice, and will be appropriate to the nature and significance of the effect identified.

13.24 As the most effective way of avoiding and/or reducing potential socio-economic effects is via careful routeing and siting of towers, as effects are generally linked to views and visibility (see **Chapter 5),** possible mitigation measures may include:

- micro-siting of individual towers and poles (informed by discussions with landowners and local groups); and
- maximising the distance of the final route from businesses and properties (wherever possible).

Decommissioning of the Existing 132kV Overhead Lines

13.25 Socio-economic effects relating to the decommissioning of 'N' and 'R' routes are likely to be minor and positive. Significant adverse effects are not anticipated; however a desk based study will be carried out to identify any sensitive receptors. This will be overlaid with the ZTV for the existing 'N' and 'R' routes and the proposed new KTR routes to determine the net impact on recreational receptors and tourism businesses. Labour market effects will also be assessed but are considered to be minor positive or negligible. Socio-economic effects will be combined with the

main KTR Project as 'mitigation'. On this basis, is not proposed to assess the effects in full as part of the EIA.

Consultation

13.26 The consultees below have been approached for information to inform the EIA. A number of these consultees may also be contacted by the Scottish Government regarding the scope of the EIA:

- British Horse Society;
- Cycling Touring Club Scotland;
- Dumfries & Galloway Council (Economic Development/Access Officer);
- Forestry Commission Scotland;
- Galloway Glens Landscape Partnership;
- Galloway and Southern Ayrshire Biosphere Partnership;
- Galloway Activity Centre (Loch Ken)
- Historic Environment Scotland;
- National Trust for Scotland;
- Ramblers Association Scotland;
- Southern Uplands Partnership;
- Scottish Civic Trust;
- Scottish Countryside Access Network;
- Scottish Cycling Union;
- Scottish Land and Estates;
- Scottish Natural Heritage;
- Sports Scotland;
- Sustrans Scotland;
- The Galloway Forest Park and Dark Sky Park (operated by Forestry Commission Scotland);
- The Mountaineering Council;
- The Scottish Ornithologists Club;
- Visit Scotland; and
- Walking Support.

14 Other Issues

Introduction

14.1 This chapter sets out the proposed approach to the assessment of Other Issues, including Electric Magnetic Fields (EMF) and operational noise effects associated with the operation of the KTR Project. The EIA will consider the effects of operation of the proposed overhead lines upon EMFs and Audible (operational) Noise levels. The assessments will be carried out with reference to the proposed overhead line design.

Existing Conditions

EMF Baseline

14.2 Electric and magnetic fields (EMFs) are produced both naturally and as a result of human activity. The earth has both a magnetic field (produced by currents deep inside the molten core of the planet) and an electric field (produced by electrical activity in the atmosphere, such as thunderstorms).

14.3 Wherever electricity is used there will also be electric and magnetic fields. This is inherent in the laws of physics - we can modify the fields to some extent, but if we are going to use electricity, then EMFs are inevitable.

14.4 Like many other things that we encounter in nature, EMFs can be harmful at high-enough levels. But the fields required, for example, to start interfering with the body's nervous system are much greater than those produced by the UK electricity system.

Operational Noise Baseline

14.5 Overhead line noise is generated when the conductor's surface electric stress exceeds the inception level for corona discharge activity. Transmission conductors (wires) are designed to operate below this threshold. Surface contamination on a conductor will, however, cause a local enhancement of electrical stress and possibly initiate discharge activity. At each discharge site a limited electrical breakdown of the air occurs. A portion of the energy associated with the corona process is released as acoustic energy and radiates into the air as sound pressure waves.

Methodology

14.6 Although significant effects are expected, potential EMF effects and recent research evidence will be considered in the EIA, together with the conclusions of the national and international bodies who have reviewed the evidence for possible health effects.

14.7 Possible effects of audible noise will be considered in the EIA and will be assessed against BS 4142:1997 "Method for rating industrial noise affecting mixed residential and industrial areas".

Likely Significant and Non-Significant Effects

14.8 Although no significant effects are anticipated, potential EMF effects and recent research evidence will be considered in the EIA.

14.9 Again, although no significant effects are expected, operational noise will be considered in the EIA and will be assessed against BS4142: 1997 "Method for rating industrial noise affecting mixed residential and industrial areas".

14.10 Based on professional judgement and experience in the assessment of effects associated with overhead line projects, effects which, at this preliminary stage, are not anticipated to be significant include:

- air quality and climate,
- agriculture,
- aviation and defence; and
- existing services.

14.11 It is not considered that these issues are likely to give rise to significant effects and therefore it is proposed that these topics are 'scoped out' of the EIA.

15 Topics Proposed to be Scoped In / Out

15.1 **Table 15.1** below summarises the topics which are proposed to 'scoped in' and 'scoped out' for each component section of the KTR Project. It should be noted that where a topic is proposed to be 'scoped out', sufficient baseline information will be gathered to demonstrate this approach is appropriate and the information presented within the ES.

Table 15.1: Topics Proposed to be Scoped in and Scoped out of Assessment

Topic Area / Project Component	Polquhanity to Kendoon	Kendoon to Glenlee	Carsfad to Kenodoon	Earlstoun to Glenlee	BG deviation	Glenlee to Tongland	Removal of 'N' and 'R'
LVIA (c)	√	√	√	√	√	√	X
LVIA (o)	√	√	√	√	√	√	X
Geology, Hydrology, etc (c)	√	√	√	√	√	√	X
Geology, Hydrology, etc (o)	√	√	√	√	√	√	X
Ecology (c)	√	√	√	√	√	√	√
Ecology (o)	√	√	√	√	√	√	X
Ornithology (c)	√	√	√	√	√	√	√*
Ornithology (o)	√	√	√	√	√	√	X
Cultural Heritage (c)	√	√	√	√	√	√	X
Cultural Heritage (o)	√	√	√	√	√	√	X
Traffic and Transport (c)	√	√	√	√	√	√	X
Traffic and Transport (o)	X	X	X	X	X	X	X
Noise (c)	√	√	√	√	√	√	X
Noise (o)	X	X	X	X	X	X	X
Forestry (c)	√	√	√	√	√	√	X
Forestry (o)	X	X	X	X	X	X	X
Socio Economics (c)	√	√	√	√	√	√	X
Socio Economics (o)	√	√	√	√	√	√	X
Other Issues (incl. EMF and Operational Noise) (c)	√	√	√	√	√	√	X
Other Issues (incl. EMF and Operational Noise) (o)	X	X	X	X	X	X	X

√ - topic scoped in for assessment

X – topic scoped out for assessment

(c) – construction

(o) – operation

* In relation to removal of the overhead line within the Loch Ken SPA only.

Appendix 1: Proposed Content of the ES

PREFACE
NON TECHNICAL SUMMARY

1. INTRODUCTION

- RATIONALE FOR THE KTR PROJECT

- LEGISLATIVE REQUIREMENTS FOR EIA

- RESPONSIBILITIES FOR THE ES

- STRUCTURE OF THE ES

2. APPROACH TO THE EIA

- INTRODUCTION

- THE EIA PROCESS

- SCOPE OF THE EIA

- THE DO NOTHING SCENARIO

3. DEVELOPMENT DESCRIPTION

- INTRODUCTION

- STUDY AREA DESCRIPTION

- DEVELOPMENT DESCRIPTION

- CONSTRUCTION PROCESS

- OPERATIONAL DETAILS

- DECOMMISSIONING

4. PLANNING POLICY CONTEXT

- INTRODUCTION

- PLANNING POLICY CONTEXT

5. DESIGN STRATEGY

- OVERVIEW OF ROUTEING METHODOLOGY

- PROPOSED ROUTE

- MODIFICATIONS TO SCHEME DESIGN DURING EIA

6-15. TECHNICAL CHAPTERS (LANDSCAPE AND VISUAL AMENITY; FORESTRY; GEOLOGY, HYDROLOGY, HYDROGEOLOGY, WATER RESOURCES AND PEAT; ECOLOGY; ORNITHOLOGY; CULTURAL HERITAGE; TRAFFIC AND TRANSPORT; CONSTRUCTION NOISE, SOCIO ECONOMICS, TOURISM AND RECREATION; OTHER ISSUES)

- INTRODUCTION

- ASSESSMENT METHODOLOGY

- EXISTING CONDITIONS

- MODIFICATIONS TO DEVELOPMENT DESIGN

- PROPOSED GOOD PRACTICE MEASURES

- ASSESSMENT OF CONSTRUCTION EFFECTS

- ASSESSMENT OF OPERATIONAL EFFECTS

- MITIGATION AND FUTURE MONITORING

- RESIDUAL EFFECTS

- SUMMARY AND CONCLUSIONS

16. SUMMARY OF EFFECTS

FIGURES
APPENDICES

Appendix 2: List of Potential Consultees

The following consultees will be contacted by the Scottish Government Energy Consents and Deployment Unit in relation to the scope of the EIA:

Dumfries and Galloway Council

Scottish Natural Heritage

Scottish Environment Protection Agency

Scottish Water

Historic Environment Scotland

Transport Scotland (or agents thereof)

Marine Scotland Science

Forestry Commission Scotland

Royal Society for the Protection of Birds

The following consultees will be contacted in relation to the provision of information to inform the EIA:

Dumfries and Galloway Environmental Resources Centre

The Scottish Wildlife Trust

Galloway Fisheries Trust

The Association of Salmon Fishery Boards

Gatehouse Squirrel Group

Saving Scotland's Red Squirrels

The Scottish Badgers Group

The National Trust for Scotland

Dumfries and Galloway Raptor Study Group

Wildfowl and Wetlands Trust

Individual forest owners and their agents

British Horse Society

Cycling Touring Club Scotland

Galloway Glens Landscape Partnership

Galloway and Southern Ayrshire Biosphere Partnership

National Trust for Scotland

Ramblers Association Scotland

Southern Uplands Partnership

Scottish Civic Trust

Scottish Countryside Access Network

Scottish Cycling Union

Scottish Land and Estates

Sports Scotland

Sustrans Scotland

The Galloway Forest Park and Dark Sky Park (operated by Forestry Commission Scotland)

The Mountaineering Council

The Scottish Ornithologists Club

Walking Support