



**SP ENERGY
NETWORKS**

Glenlee Substation Extension Environmental Impact Assessment Report

Volume 2: Appendices

SP Energy Networks
September 2019

Glenlee Substation Extension

**EIA Report
Volume 2: Appendices**

**Prepared by LUC
on behalf of
SP Energy Networks**

September 2019



Preface

This Environmental Impact Assessment (EIA) Report has been prepared in support of an application for consent to construct and operate an extension to the operational Glenlee Substation (**‘the proposed development’**). The site is located in Dumfries and Galloway, approximately 1.5km south-**west of St John’s Town of Dalry**.

The EIA-R is divided into two volumes as follows:

- **Volume 1:** Text and Figures
- **Volume 2:** Technical Appendices (this volume)

The EIA Report has been prepared by LUC and supporting sub-consultants on behalf of SP Energy Networks (SPEN). In addition, the EIA Report is accompanied by standalone reports, including a Non-Technical Summary (NTS), Design and Access Statement (DAS) and Pre-Application Consultation Report (PAC).

Electronic copies of the NTS and all other EIA Report documents can be downloaded free of charge via the Project website: www.spendgsr.co.uk.

The EIA Report is available for public inspection during normal opening hours at the following locations:

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

High resolution electronic copies of the EIA Report may be purchased for £15 and hard copies for £75 by contacting SPEN using the contact details set out below:

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

Any representations to the application may be submitted to Dumfries and Galloway Council at:

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

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Statement of Expertise

Appendix 1.1: Statement of Expertise

Chapter	Organisation Responsible
Chapter 1: Introduction Chapter 2: Approach to EIA Chapter 3: Site Selection and Development Design Chapter 4: Development Description and Construction, Operation and Maintenance (prepared by LUC with input from SPEN)	Joanna Wright MA MSc FIEMA CEnv is a Director of Environmental Planning at LUC and a Fellow of the Institute of Environmental Management and Assessment (IEMA). Joanna has an MSc in Environmental Impact Assessment and over 26 years of professional EIA experience, including EIA co-ordination and ES/EIA Report preparation and review across a range of sectors, with a particular focus on energy projects. She has also undertaken related research commissions, a number of which have culminated in the preparation of good practice guidance, and is a regular speaker at EIA conferences. Joanna has led on the integration of the updated 2017 EIA regulations into LUC’s work and also qualified recently to provide EIA input in relation to climate change. Jo Cottin BSc (Hons) MSc MIEMA CEnv is a Principal Environmental Planner and Chartered Environmentalist with nine years of experience in EIA and project management. Jo has worked on a range of EIA and environmental planning projects and has project managed and assisted in managing several EIAs for energy related and mixed use developments. Many of the projects Jo has been involved in have involved complex issues and involve multi-disciplinary teams.
Chapter 5: Planning Policy Context (prepared by LUC)	Laura McGowan BA (Hons) MRTPI is a Principal Planner at LUC. Laura has over 14 years’ town planning experience in all stages of the planning process, including the preparation of supporting planning statements which require the assessment of development proposals against the policies from National, Regional and Local levels. Laura has also been involved in the preparation of EIA screening and scoping requests for a variety of development proposals including residential, mixed use schemes, business and industry, and has prepared planning policy chapters for inclusion in ESs/EIA Reports for a new hospital project in Dumfries and Galloway, residential development in East Renfrewshire and storage and distribution in South Ayrshire.
Chapter 6: Landscape and Visual Amenity (prepared by LUC)	Dan Walker BSc (Hons) MLA CMLI is a Principal Landscape Planner and Chartered Member of the Landscape Institute. Dan has over 8 years of experience in landscape and visual impact assessment and landscape planning projects. Since joining LUC, Dan has built up substantial experience of working in multi-disciplinary teams to undertake landscape and visual impact assessment. Dan has been involved in the production of preliminary landscape and visual studies for numerous electricity transmission developments, such as the Llanbrynmair Wind Farm Grid Connection Assessment and Dogger Bank Wind Farm Onshore Grid Connection, and assessment reports for Environmental Impact Assessment (EIA) for planning applications. Graham Cameron BSc (Hons) MA LI Licentiate has a diverse background in landscape design and LVIA and since joining LUC, Graham has worked on a range of projects including Local Landscape Designation Reviews and Landscape and Visual Character Assessment. Graham has also worked on a number of linear infrastructure projects including the Beauly to Denny and Inveraray to Taynuilt transmission lines. Graham has also advised on wind farm, large infrastructure, commercial and residential projects in the UK. Graham’s key skill strengths are report writing and supporting production of landscape and visual impact assessments. Working with other team members, consultees and clients, Graham has produced a number of LVIA chapters and supporting graphics for development projects and assisted on a variety of larger, more complex projects.
Chapter 7: Hydrology and Water Resources (prepared by Kaya Consulting)	Dr Sally Stewart BSc (Hons) MSc PhD MCIWEM C.WEM is a senior environmental scientist and geomorphologist, with over 18 years of consulting and research experience in the UK, Canada and India. Sally has experience of environmental impact assessment, water resource management, flood risk assessments and developing water management plans for mining projects and irrigation projects worldwide. She is also an experienced river and coastal geomorphologist who has advised on numerous riverine and coastal development projects. Sally has been responsible for carrying out the assessment and writing of hydrology chapters for many windfarm and linear project EIAs in the UK. She has also undertaken numerous flood assessments and coastal geomorphology studies.
Chapter 8: Ecology (prepared by LUC)	Steve Jackson-Matthews MSc (Hons) CEnv MIEEM MEECW is a skilled ecologist with a track record in delivering innovative solutions to ecological challenges. Steve has worked extensively within the planning system for a wide range of proposed developments across the UK and Ireland. Steve routinely gains and implements protected species licences for his clients and has extensive experience in negotiating with Licencing Authorities. Steve is recognised for his work with badgers and is an Advisor to and Trustee of Scottish Badgers. Steve holds a licence to disturb roosting bats in England and Scotland. Steve has experience in a wide range of development types and is familiar with assessing potential ecological impacts on schemes including Nationally-important transport projects such as new rail schemes and new road schemes.

Chapter	Organisation Responsible
Chapter 9: Cultural Heritage (prepared by CFA Archaeology Limited)	Mhairi Hastie BSc MSc FSA Scot MCIfA has over 20 years’ experience as an archaeologist and over 10 years full-time experience of producing EIAs for renewable energy developments, and for other industrial and commercial development across the UK.
Chapter 10: Construction Noise (prepared by Hoare Lea)	Richard Carter BEng (Hons) CEng CEnv MIOA is an Associate Director of Environmental Acoustics, a chartered engineer and a chartered environmentalist with over 20 years’ experience, 15 of which specialised in environmental acoustics. Over the years Richard has worked on numerous noise assessments covering construction and operation. Richard is a full member of the Institute of Acoustics (IOA) and Hoare Lea LLP has corporate memberships of the Acoustics and Noise Consultants (ANC) and the Institute of Environmental Management and Assessment (IEMA). Matthew Cand Dipl Eng PhD MIOA has over 14 years’ experience in the assessment of environmental acoustics. He has worked on numerous noise and vibration assessments to assist the design and planning process, for a wide range of construction schemes, including architectural acoustic design and large scale industrial and infrastructure projects. Matthew provided expert witness evidence on noise from wind farms at a number of planning hearings and inquiries and was centrally involved in key national research projects. Matthew is a full member of the Institute of Acoustics (IOA) and Hoare Lea LLP has corporate memberships of the Acoustics and Noise Consultants (ANC) and the Institute of Environmental Management and Assessment (IEMA). Karl Simpson BEng (Hons) MIOA has over 24 years’ experience in the assessment of environmental acoustics. He has worked on numerous noise and vibration assessments to assist the design and planning process, for a wide range of construction schemes, including architectural acoustic design and large scale mixed use regeneration projects. Karl is a full member of the Institute of Acoustics (IOA) and Hoare Lea LLP has corporate memberships of the Acoustics and Noise Consultants (ANC) and the Institute of Environmental Management and Assessment (IEMA).
Chapter 11: Access, Traffic and Transport (prepared by Mott MacDonald)	Fabian Jahnke BSc (Hons), GMICE is a Senior Transportation Engineer with more than 15 years’ experience covering aspects of civil engineering and transport planning. Fabien has been involved in the Transport & Infrastructure assessments for numerous onshore windfarms and assessment reports for Environmental Statements. Experience also include the production of transport access studies, traffic management plans, engineering feasibility studies and developing highway design schemes. John Dooley BA, FCILT, IEng MICE, MCIHT is a Chartered professional and Projects Director for Mott MacDonald’s Integrated Transport Division. An experienced transportation planner/engineer and project manager, with more than 30 years public and private sector experience in the transport and civil engineering sectors. Has significant experience leading development of Transport Assessments and Transport & Infrastructure assessments for Environmental Statements & ESIAs both nationally and internationally. Experience ranges from feasibility stage to implementation, covering; managing design and construction, transport appraisal /assessment, parking, TROs, Road Safety Audit, Survey coordination & management, highway design and associated Expert Witness experience. These commissions have required extensive stakeholder engagement including regular liaison with key individuals at local authorities, Transport Scotland and Highways Agency/England. John is also an experienced technical lecturer who has delivered courses and seminars on road safety engineering, on-street parking design and management, Cycle Audit & Design, and Road Safety Audit on behalf of PTRC, CILT and Aston University.
Chapter 12: Summary (prepared by LUC)	Joanna Wright MA MSc FIEMA CEnv (as above) Jo Cottin BSc (Hons) MSc MIEMA CEnv (as above)
Non-Technical Summary (prepared by LUC)	Joanna Wright MA MSc FIEMA CEnv (as above) Jo Cottin BSc (Hons) MSc MIEMA CEnv (as above)

Appendix 4.1
CEMP Example

1. SCOPE

This Environmental Management Plan (EMP) details the legal and contractual environmental requirements for all projects within SP Energy Networks (SPEN). All contractors working on behalf of SPEN must comply with this document during the course of the works.

This EMP will remain a live document and the implementation of its provisions will be monitored by SPEN. Please ensure compliance to the Glenlee Pre-Enabling Works Environmental Technical Specification which refers and clarifies SPEN's expectations of all contractors (Appendix 1).

SPEN will update, review, revise and refine the Environmental Management Plan throughout the project so that it continues to be compliant with the company systems and current legislation, and to ensure the plan remains an effective tool for managing Environmental matters.

This is to ensure the construction phase is planned, managed and monitored in a way which enables works to be carried out with full awareness of the associated environmental risks. The benefit of effective forward planning should vastly reduce or where possible eliminate risk to the environment, in accordance with the SPEN Policy (Appendix 2).

Any revisions to the documents shall be uploaded by SPEN into Document Management System Projectwise and communicated to all interested parties in line with the SPEN document management procedure.

2. ISSUE RECORD

It is your responsibility to ensure you work to the current version.

Issue Date DD/MM/YYYY	Issue No.	Author	Amendment Details
23/05/2019	01	Steven Parker	All pages

3. ISSUE AUTHORITY

Prepared	Reviewed	Approved
Name: Steven Parker Title: Environmental Advisor sparker@spenergy networks.co.uk DN: CN = sparker@spenergy networks.co.uk Date: 2019.05.29 16:48:14 Z	Name: James Elliott Title: Environmental Advisor Digitally signed by: James Elliott Date: 2019.05.30 09:29:08 Z	Name: Antonio Fuentes Barrientos Title: Project Manager Date: Digitally signed by: Antonio Fuentes DN: CN = Antonio Fuentes Barrientos Fuentes Barrientos, email = a.fuentes@spenergynetworks.co.uk C = GB O = Customer Delivery PUM2 Date: 2019.05.30 11:38:19 Z

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5. DESCRIPTION OF PROJECT

The pre-enabling works required at Glenlee Substation will allow the existing Newton Stewart/Glenluce No 2 circuit to be deviated ahead of the main enabling and civil works.

The re-location of this circuit will allow space to be created on the south east elevation of the substation that will permit future construction access to be taken to the rear of the site without infringing safety clearances to the electrical plant.

The pre-enabling works will include demolition and removal of existing electrical plant along with associated infrastructure including foundations, 132kV cables, multicore and fibre optic cables, ducting and fencing.

Construction works will include the excavation and installation of new foundations, cable ducts, concrete trenching, palisade fencing and re-surfacing.

The majority of this work will be undertaken within the live 132kV compound and safe systems of work shall be agreed with the Scottish Power Senior Authorised Person (SAP) before work is allowed to commence.

This stage of the pre-enabling includes the installation of one set of cable sealing ends and associated bases and steel support structures at the end internal to the substation fence. The other end of the cable, external to the substation fence, shall be made safe by providing suitable (water tight) end caps, suitable earthing arrangements and being direct buried and backfilled by the Cable contractor, awaiting the new substation platform to be built.

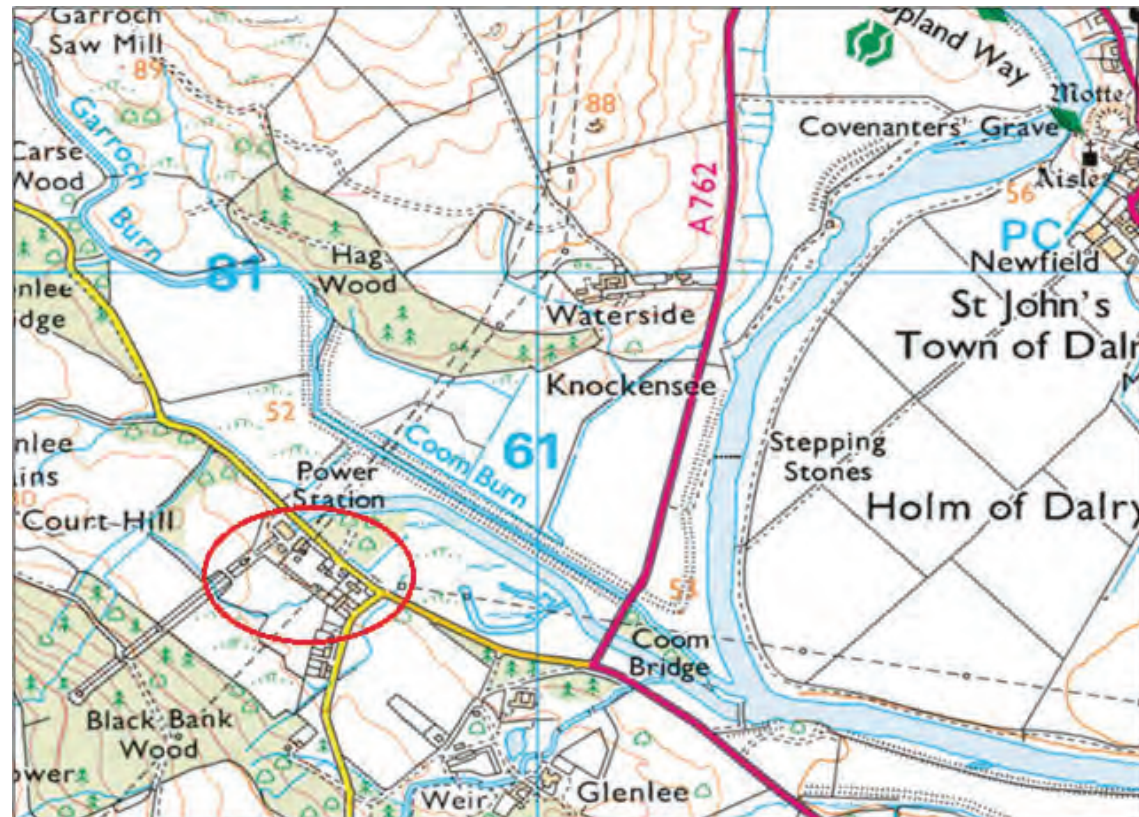
This summary provides only a general overview of the pre-enabling works and does not detail every element of construction or demolition required to complete this phase of the project.

It should also be noted that this 'pre-enabling works' Environmental Management Plan (EMP) is a separate document from the main enabling and civils works EMP and has been created only for the 'pre-enabling works' summarised above.

5.1 Location of site

Glenlee 132kV Substation is positioned next to Glenlee Hydro Electric Power Station, situated to the south west of St. John's Town of Dalry in Dumfries and Galloway. The existing substation, which can be accessed from the A762/U2S, sits on sloping ground that rises to the south and is bounded on one side by residential cottages and the power station on the other.

Figure 1. – Glenlee Substation Extension



Issued Environmental Documents

The EMP requires the contractor to understand and implement the requirements of the documents listed below. SPEN expect a high standard of environmental performance (over and above industry best practice) from all contractors. These can be seen at Appendices 1 - 7 of this document.

1. SPEN Technical Specification;
2. SPEN Environmental Policy;
3. ENDS Compliance Legal Register Report;
4. Pollution Prevention Plan Template;
5. Ecology Survey Calendar;
6. Survey Reports.
7. SPEN Environmental handbook (example TBT's)

This document should be read in conjunction with the above and all other documents issued with the tender pack.

6. COMMUNICATIONS

Regular communication between all parties will be essential for environmental management to be successful. There are a variety of communication channels and methods. In the first instance any communication at a site level should be done through the SP Energy Networks Site/ Construction Manager or SP Energy Networks Environmental Advisor. The SPEN Site/ Construction Manager or SPEN Environmental Advisor will then distribute the information to the relevant parties. All communications with regulators such as SEPA/SNH must also be communicated to SPEN and uploaded to Projectwise.

General communication shall take place on site daily to ensure the project is managed effectively

Direct actions taken by SP Energy Networks to communicate with the contractors:

Communication Tool	Details
Site Induction	All contractors attending site shall receive a site specific induction that addresses the site environmental risks, contact details and any site specific processes or procedures. Site Induction suitability will be inspected by SPEN environmental advisor.
Weekly Meetings	The site construction team will attend a weekly site meeting with all contractors. The minutes shall be recorded and distributed to all the contractors involved in the works. Environmental actions will be captured, discussed and closed out.
SORs (Environmental)	Safety Observation Reports shall include observations related to both good and bad environmental practice witnessed on site, a copy will be provided to the contractor and a copy will be held by SPEN. SORs will be discussed at the weekly meetings.
Email	SPEN must be included in all communications with stakeholders and regulators bodies, all communication must be uploaded to Projectwise. All emails that have a contractual implication shall be saved on Projectwise.
Site Noticeboard	Allocated space on a site noticeboard should be given to relevant environmental aspects. The notice board should include SPEN's environmental policy, any environmental alerts and a site plan detailing environmental controls. Besides that, the notice board shall include an organigram and emergency response team contacts. (See Table 2 below).
Environmental Folders on Projectwise	Up to date electronic copy or hard copy shall be available to reference by site staff and for inspection purposes.

Direct actions taken by Contractors to communicate with operatives and sub- contractors:

Communication Tool	Details
Site Induction	All contractors attending site shall receive a site specific induction that addresses the site environmental risks, contact details, and any site specific processes or procedures. Site Induction suitability will be inspected by SPEN environmental advisor.
Weekly Meetings	The site construction team will attend a weekly site meeting with all contractors. The minutes shall be recorded and distributed to all the contractors involved in the works. Environmental actions will be captured, discussed and closed out.
SORs (Environmental) or contractors equivalent	Reports shall include observations related to both good and bad environmental practice witnessed on site, a copy will be provided to the SPEN and shall be uploaded to Projectwise. SORs will be discussed at the weekly meetings.
TBTs	Site and task specific environmental toolbox talks shall be delivered once a week or a frequency otherwise agreed with the SPEN Environmental Advisor.
Daily Briefings	To communicate relevant sensitivities for the planned works on any day which should take account of seasonality, weather and also unexpected findings/required changes in working methods.
Environmental Notice Board	In a public area on site such as staff canteen. Contractors should display relevant environmental information for the site: <ul style="list-style-type: none"> Ecological information; SNH/SEPA Licences or registrations; Refuelling procedure; Spill response; Emergency response plan and contacts including 24hour spill response contractor; and Site layout showing designated refuelling areas, COSHH storage, waste storage/skips/spill kits.
Site signage	Indicating exclusion areas where ecological/archaeological/Private and Public water supplies/sensitive watercourses have been identified.

6.1 Environmental Objectives

SP Energy Networks have established a number of objectives which should enable project delivery, the actions required shall be completed by the SP Energy Networks construction team and the contractors on site. SP Energy Networks will monitor the actions during site Inspections and Audits.

Objective Type	Objective Details	Action required to meet the objective
Training	Raise awareness of Environmental Issues	<ul style="list-style-type: none"> Provide an on-site environmental notice board displaying information on site ecology, pollution prevention, Emergency/ Spill response, Consents and/ or licenses (SEPA/ SNH etc.) Carry out relevant Environmental Toolbox Talks related to work activities and

		<p>identified risks.</p> <ul style="list-style-type: none"> Site specific briefings of site conditions and licences if required. General housekeeping including good waste segregation. Use/ storage of fuels, oils, chemicals etc. and spill prevention measures. Environmental risks associated with working in proximity of watercourses/ drains etc. Be aware of ecological factors such as bird nesting season (March – August inclusive) Take account of effects of weather such as heavy rain and wind (dust issues). Potential for noise and/or dust issues.
Compliance with SEPA guidance	Pollution prevention	<ul style="list-style-type: none"> Ensure storage of fuel on site is in excess of 30m from any waterbody (spill kits placed on site – labelled with easy access) all plant to have spill kits kept within them. Drainage/ surface water run off needs to be managed using sumps/ silt fencing to attenuate flow reaching local burns/ ditches/ watercourses. Understanding of and compliance with SEPA CAR regulations (where appropriate). Understanding of and compliance with SEPA pollution prevention guidelines.
Compliance with UK/ EU environmental legislation	Species and Habitat Protection	<ul style="list-style-type: none"> Ensure sufficient ecological/ ornithological survey works have been undertaken to ensure legal compliance.
Compliance with UK/ EU Waste Regulations	Record all waste movements on the via an agreed SWMP (Site Waste Management Plan) template	<ul style="list-style-type: none"> Update the SWMP monthly Contractor should demonstrate a proactive approach to waste management, making use of the waste hierarchy (Section 10.2). Reuse and recycling of materials must be considered for each waste stream. Special consideration needed for any hazardous waste.

6.2 Project Inputs

All works should be carried out in accordance with the contract documentation.

6.3 Community Liaison

All community liaisons are managed by the client on any network project. Contractors must collaborate with the SP Energy Networks Community Liaison Officer in relation to matters that will have an impact on the local community. All correspondence for issue to the public must have prior approval of the SP Energy Networks Community Liaison Officer.

7. RESPONSIBILITIES

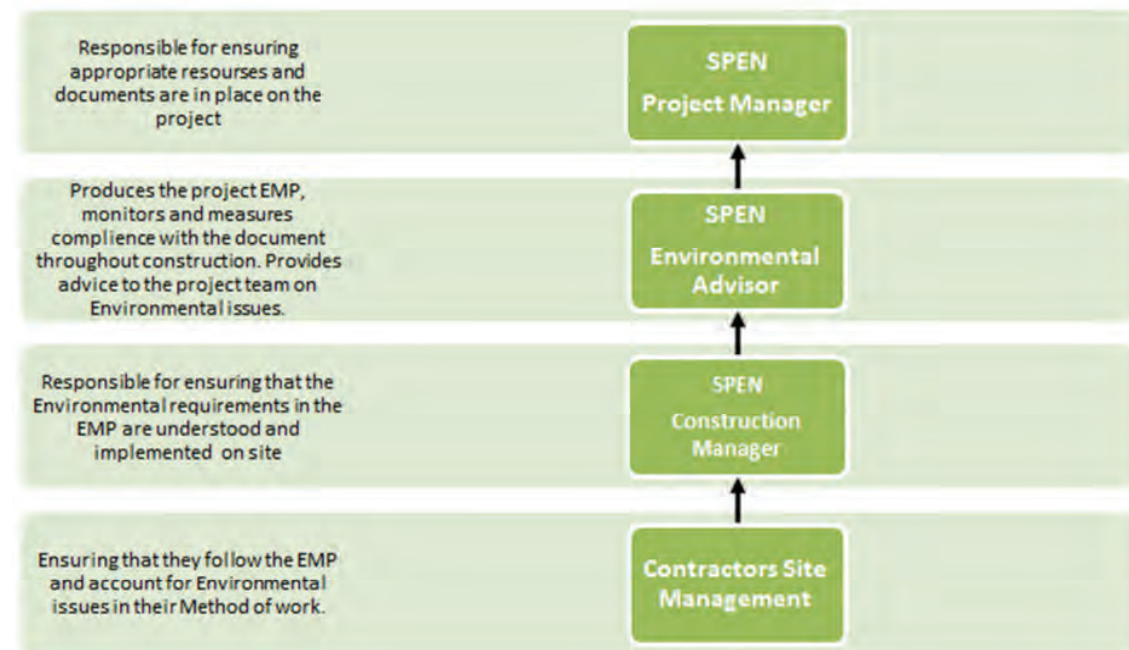
The environmental detailed responsibilities for SP Energy Networks are:

SP Energy Networks are responsible for the transmission and distribution networks within defined licence areas across the UK. Under such licences they are required under The Electricity Act 1989 (The Act) to “develop and maintain an efficient, co-ordinated and economical supply of electricity transmission”.

In doing so it is the responsibility of SPEN to obtain consent, in accordance with relevant legislation, from local or national government for the development of infrastructure. Under ‘The Act’ it is SPEN’s duty to consider the possible environmental impacts of the proposals and state what can ‘reasonably’ be done to mitigate any identified adverse environmental impacts.

SPEN will ensure that all projects are delivered in accordance with requirements of ‘The Act’ together with the relevant consent, conditions of that consent; and committed mitigation relevant to the proposals.

In terms of Environmental Management the organisation chart for the project is;



The environmental detailed responsibilities for SPEN Projects are:

Name/ Title	Responsibility
SPEN Projects Construction/ Site Manager	<ul style="list-style-type: none"> i. Regular liaisons between all parties on site to ensure adequate precautions are taken to minimise the impact on the environment. ii. Ensure the Environmental Management Plan is implemented and monitored by the Contractors. iii. Ensuring that all environmental incidents are reported and investigated where appropriate. iv. Ensuring site environmental inspections are performed and all issues raised are addressed promptly. v. Conducts regular site meetings and discusses any Environmental issues appropriate. vi. Ensure all the following factors are considered and appropriately actioned; <ul style="list-style-type: none"> a. The most appropriate order and method of working b. Allocation of responsibilities between personnel, and other organisations on site. c. The SPEN EMP is prepared and issued in a controlled way to all sites d. The protection of the environment, waste generation is minimised and all waste is disposed of in a safe and responsible manner, and is detailed in the Site Waste Management Plan (SWMP)
Environmental Advisor	<ul style="list-style-type: none"> i. Inputs into the preparation of the SPEN Environmental Management Plan assisted by the Construction Manager and Project Manager. ii. Reviews site inductions and provides information regarding site specific Environmental Aspects iii. Reviews Contractors' Environmental documentation with particular emphasis environmental regulations and requirements. iv. Carries out regular inspections of the construction site. v. Advise the Construction Management Team on compliance with the statutory Environmental requirements. vi. Attends progress and coordination meetings.
SPEN Projects Document Controller	<ul style="list-style-type: none"> i. Ensure all SPEN Projects documentation is on Projectwise for all contractors to access ii. Manage permissions to Projectwise iii. Attend KOM to instruct/train Contractors in Projectwise (Upon PM request) iv. Set up and maintain folder structure on Projectwise

The environmental detailed responsibilities for the Contractor are:

Contractor Role	Responsibilities
Project Manager	<ul style="list-style-type: none"> i. Oversee the project to ensure compliance with the SPEN Environmental Management. ii. Ensure the Construction Manager/ Site Manager are aware of the requirements of the SPEN Environmental Management Plan and these requirements are carried out.
Construction/ Site Manager	<ul style="list-style-type: none"> i. Duty to ensure the compliance and implementation of EMP. ii. To ensure that the workforce is made aware of environmental risks relating to the Project. iii. To ensure that environmental incidents are reported to the company Helpline and client in expected timescales. iv. To ensure that environmental issues are included in site management meetings. v. To ensure that site environmental controls are regularly monitored and recorded. vi. To ensure environmental risk assessments are up to date and changes to the construction site posing environmental risk are recorded on the risk assessment. vii. To report environmental incidents to the helpline and Client (SPEN).
Engineers/ Site Supervisors	<ul style="list-style-type: none"> i. Duty to ensure the compliance and implementation of EMP. ii. To ensure that the workforce is made aware of environmental risks relating to the Project. iii. To ensure that environmental incidents are reported to the company Helpline and client (SPEN). iv. To ensure that environmental issues are included in site management meetings. v. To ensure that site environmental controls are regularly monitored and recorded. vi. To ensure environmental risk assessments are up to date and changes to the construction site posing environmental risk are recorded on the risk assessment.
HSE Manager	<ul style="list-style-type: none"> i. To provide guidance and advice regarding environmental controls and legislation. ii. To assist the Project as required by the Construction or Site Manager. iii. To investigate any environmental incidents that occur on the Project.

Environment Advisor/ ECoW (Environmental Clerk of Works)	<ul style="list-style-type: none"> i. To provide proactive, specialist guidance and advice regarding environmental controls, constraints and legislation specific to the project, in the form of Environmental Risk Assessment, Constraints planning, procedures, standard forms, site briefings and toolbox talks. ii. To comply with the SPEN Environmental Management Plan. iii. To provide additional technical support and solutions to the Project as required. iv. To organise, co-ordinate and manage pre-construction surveys in-line with advice from the Ecological/ Archaeological Survey reports provided by the client. v. To organise, co-ordinate and manage specialist consultants on site by providing a scope of works relevant to operations and in-line with programme. vi. To be fully aware of the project conditions/ commitments agreed by the client, facilitate adherence to all elements, and report activities in relation to conditions and constraints to SPEN Projects on a monthly basis. vii. To effectively communicate the environmental constraints/ risks specific to site, provide briefings/ TBTs relevant to works and in-line with ecological/ archaeological/ hydrological (and any other) recommendations. viii. To consult directly with regulators/ stakeholders (such as, but not limited to: SNH, RSPB, SEPA, Local Authorities) regarding situations that may require the acquisition of consents/ licences/ authorisations/ permissions/ comments, this includes applications and continued reporting to regulators throughout the project. All consultation with regulators will inform an SPEN Projects Environmental Advisor throughout the process and all types of contact with regulators must be documented/ evidenced and copies sent to SPEN Projects. ix. To organise and co-ordinate environmental mitigations on site in line with programme, ensuring inclusion of these activities in monthly report to SPEN Projects. x. To attend project meetings and effectively contribute to project discussions by indicating site sensitivities and management required. xi. To ensure environmental training of project team is current and training records are up to date. xii. To ensure the Emergency response plan is updated at least every 6 months or dynamically should issues arise, this should include details of an Environmental Response sub-contractor should an site emergency occur. xiii. To ensure the Site Waste Management Plan is updated and reviewed, including the legal compliance of Waste Transfer Notes and Consignment Notes from contractors/ sub-contractors xiv. To ensure that care is taken not to damage trees (including roots) and
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	<p>ensure TPO, Bat/ Red Squirrel/ bird and any other potential protected species have been checked prior to works and RPA (Root Protection Areas) are understood, communicated and British Standards are followed. Diseased trees are now common, Larch and Ash particularly. Any works close or requiring removal of a diseased tree will require specific mitigations to be in place and waste regulations adhered to. In addition any works close to or requiring removal of invasive weeds needs to be managed in accordance with legal requirements.</p>
xv.	To ensure the reinstatement and restoration of sites is fully understood, planned into programme and documented.
xvi.	To ensure site water management is planned ahead of operations to prevent pollution and in line with SEPA CAR Practical Guide.
xvii.	To conduct weekly inspections of sites pre-construction, during construction and post construction, ensure all inspections are documented; actions should be agreed with a timescale and upon completion signed off.
xviii.	To be available to organise and facilitate joint inspections/ audits with the client.
xix.	To investigate environmental incidents that occur on the Project, report findings and actions required including (if required) comments from regulators, lessons learnt from incidents should be briefed following investigations. Please ensure all incident investigations are sent to SPEN Projects.
xx.	Any other environmental issue not mentioned specifically above.

8. ENVIRONMENTAL MANAGEMENT

8.1 Regulatory Agencies and Interested Parties

The following regulatory agencies and interested parties have been identified as key stakeholders; this list is not exhaustive, with interests in the activities being undertaken in conjunction with the development of this site:

Regulator/ Interested Party	Responsibility
<p>SEPA's Pollution Hotline – 0800 80 70 60 (24 hour service)</p> <p>SEPA's Floodline service – 0845 988 1188 (24 hour service)</p> <p>SEPA Dumfries Office Rivers House, Irongray Road, Dumfries DG2 0JE</p>	<p>Environmental Regulator. Issue Waste Management Licenses and Exemptions from Waste Management Licensing, CAR Authorisations. Will use enforcement tools to ensure compliance with authorisation conditions issued by them and all other relevant environmental regulation.</p>

Tel: 01387 720502	
Scottish Natural Heritage Tel: 01387 720502	Issuing any protected species or protected area (e.g. SSSI / SPA /SAC) licences required for the project.
Dumfries and Galloway Council Tel: 0303 333 3000	Local Authority
Galloway Fisheries Trust Tel: 01671 403 011	Fisheries Information

8.2 Site Environmental Obligations

Client Obligations	Comply with the SPEN Environmental Management Plan.
Contractual Obligations	<p>All future surveys and licences to be arranged organised and managed by the contractor.</p> <p>Comply with the SPEN Environmental Management Plan.</p> <p>Provide a Pollution Prevention Plan for the works.</p> <p>Update the SWMP monthly.</p> <p>Report Environmental Incidents to SPEN Projects Environmental Advisor initially within 30 minutes of the incident with a follow up notification as soon as is reasonably practicable within 24hours.</p> <p>Provide an Environmental Risk Assessment for all works, make reference to site specific environmental management issues (including: ecology, surface water management, seasonal constraints).</p>
Specific Legal Requirements (for example, authorisations, consents and licences)	<p>NB - The contractor is responsible for preconstruction surveys and arranging any relevant licences (e.g. ecological, archaeological, or SEPA authorisations) or mitigation measures for the works.</p> <p>Ensure compliance with UK legislation regarding protected species and habitats prior to and during construction.</p> <p>Ensure all appropriate SEPA CAR Licences for required works are in place. For example:</p> <ul style="list-style-type: none"> Abstraction works (water abstraction for welfare facilities/ engineering activities such as concrete production or drilling); Engineering works (culverts, bridges, temporary diversions/ impoundments); and Bank works such as grey bank works (all hard landscaping/bank support).
Previous studies/ reports, e.g. EIA, etc.	<ul style="list-style-type: none"> Ecological Constraints Report – LUC.

Ongoing Studies	The contractor is responsible for any further surveys, licences, authorisations, consents upon contract award.
Contractors Obligations	<p>Reassess and evaluate mitigation measures for all environmental constraints with any changes to programme or working methods.</p> <p>Information provided from SPEN needs to be constantly reassessed and re-evaluated by the contractor, for all environmental constraints/ mitigation measures in line with any changes to programme or working methods. This process will be documented and available for inspection and SPEN environmental advisor informed.</p> <p>The Contractor's Environmental Advisor/ project team will provide the SPEN Environmental Advisor with a two week look ahead of working activities and:</p> <ul style="list-style-type: none"> • Provision of a forecast of site wastes • Provision of all environmental method statements/ briefings/ TBTs with attendance sheets. • Provision of an Environmental Emergency Response Plan • Emergency Spillage Contractor • Provision of fuel records for all plant/machinery/generators used on site listing: fuel type, volume (litres), period and comments. <p>Stone/Spoil– the removal of any stone/Spoil will meet all Waste Legislation criteria/ waste duty of care/ waste hierarchy. Any agreements with landowners must have the relevant SEPA exemptions in place prior to any movements of stone, all movements of waste must have a legally compliant waste transfer note/ consignment note.</p>

8.3 Pollution Prevention Plan (PPP)

The contractor will be required to provide at tender stage a Pollution Prevention Plan. This will detail how the associated environmental risks will be controlled and mitigated. There is a template/example to use as reference at Appendix 9.

This PPP needs to be written in accordance with this SPEN EMP and relevant construction industry/ regulator guidance as shown in sections 8.5.1-4 below.

Where it is not possible to be specific at this stage the contractor must provide examples of good practice used on other projects.

The PPP should be seen as a live document and therefore should be monitored/ reviewed continually.

The contractor will be responsible to ensure that the Plan is kept up to date and complied with.

The purpose of the PPP is to make sure that steps are taken to prevent potential for pollution arising from the site, the potential impacts of that pollution, and methods (and alternative methods) of preventing environmental harm occurring has been adequately considered.

8.3.1 Construction Aggregates

Provision of detail on the sourcing of suitable construction aggregates which must comply with SEPA GBR22 (see below).

No material that will or is likely to result in metallic, sulphide rich or strongly acidic polluted water run-off from such roads or tracks may be used in the carrying out of the activity.

Chosen aggregates should be free of excessive amounts of fines/clays. Mitigation for suspended solids should be provided.

8.4 Regulatory Bodies and Construction Industry Guidance

In addition to legal frameworks there are a number of good practice guidelines which are published by the construction industry (CIRIA) and regulatory bodies (SEPA) for construction projects. In January 2017 updated versions of some key SEPA PPGs for the construction industry were issued. All works carried out as part of this project should be carried out with reference to these. Please see the current, relevant SEPA guidance provided at NetRegs (www.netregs.org.uk).

8.4.1 SEPA Supporting Guidance Documents

- WAT-RM-08: Regulation of Sustainable Urban Drainage Systems (SUDS)
- WAT-RM-12: Regulation of Discharges from Water Treatment Works
- WAT-SG-12: General Binding Rules for Surface Water Drainage Systems
- WAT-SG-23: Engineering in the water environment – Temporary construction methods
- WAT-SG-75: Sector-specific guidance - Construction sites
- WAT-TEMP-10: Multiple Water Use Licence Template
- WAT-TEMP-21: Construction Site Licence

8.4.2 SEPA Pollution Prevention Guidance (PPGs)

- Pollution Prevention Guidance (PPG) NetRegs.(netregs.org.uk) [and replacement series (GPP) – see PPG/GPP explanation]
- PPG 1: Understanding your environmental responsibilities - good environmental practices
- GPP 2: Above ground oil storage tanks
- GPP 5: Works and maintenance in or near water
- PPG 6: Working at construction and demolition sites
- GPP 13 Vehicle washing and cleaning
- GPP 21: Pollution incident response planning
- PPG 22: Incident response - dealing with spills
- PPG 27 Installation, decommissioning and removal of underground storage tanks

8.4.3 Construction Industry Research and Information Association (CIRIA) Manuals

- Control of water pollution from construction sites. Guidance for consultants and contractors (C532)
- Control of water pollution from linear construction projects. Technical Guidance (C648)
- Control of water pollution from linear construction projects. Site guide (C649)
- Drainage of development sites - a guide (X108)
- Guidance on the Construction of SUDS (C768)

- Site handbook for the construction of SUDS (C698)
- Sustainable Drainage Systems - Hydraulic, structural and water quality advice
- The SuDS Manual (C753)

8.4.4 Published by CREW – Scotland’s Centre of Expertise for Waters

- Rural Sustainable Drainage Systems: A Practical Design and Build Guide for Scotland’s Farmers and Landowners.

8.5 ENDS Compliance Legal Register

SPEN have produced a compliance legal register which lists all of the legislation which may pertain to the project before, during and post construction. This can be seen at Appendix 3.

8.6 Main Aspects

The table below details the known key environmental constraints/ aspects associated with the project. All contractors will use this as a live document, review regularly and update with progress and further constraints. The mitigation and management controls detailed are not exhaustive and should be used as a baseline rather than a complete control plan.

The main aspects are detailed below.

Significant Environmental Aspect	Mitigation & Management Controls
Vegetation Clearance	Vegetation clearance should take place before end of February (nesting season) - ecology survey/SNH licence/guidance may be required. The contractor is responsible for preconstruction surveys and arranging any relevant licences or mitigation measures for the works. Any clearance undertaken during months of March to September (nesting season) must be done under the supervision of an Ecological Clerk of Works, this may result in programme delays if protected species are found. Relevant TBT to be issued to all on site – attendance sheet signed.
Archaeology	There are currently no Archaeological issues within the grounds of the substation. Maintain vigilance when new or unexpected excavations become necessary, especially when required on previously undisturbed ground. Stop work and inform your team leader/site manager if you think you have discovered archaeological features. Protect the site by fencing it off.
Soil Storage/ Stockpiling	Follow all identified mitigation requirements for the location to be stripped. Strip, segregate top soil from sub-soils and store within the identified site working areas for reuse. Locate soil storage bunds away from watercourses (30m). Form bunds of no more than 1.5m and design to shed water. Check the need for measures to reduce dust and potential nuisance Return soils to their original location. Please reference Tool Box Talk.

Concrete	The washing out of any concrete mixer & associated chute, tools or equipment should be carried out in a designated area away from drains and watercourses. Delivery drivers should be made aware of the requirement on arrival at site. Wash down activities will take place in designated areas which may have different set-ups at different sites –use of an RCW Skip, lined skip or lined pit. Relevant TBT to be issued to all on site – attendance sheet signed. Please refer to SPEN Environmental Handbook.
Surface Water Management	The following guidelines should also be adhered to: The potential pollution of drainage systems, watercourses and groundwater is to be prevented during the contract. Surface water drains and the foul water systems are to be clearly identified on the site prior to any works being carried out. <ul style="list-style-type: none"> • Training will be given to key employees in the use of spillage containment. This includes the locations of the equipment, and the means by which they are to be disposed of following use; and • Silt fencing/ hydro dams, cut off ditches or settlement ponds are to be used to prevent water pollution entering watercourses/ and surface water drains Please consult SEPA CAR Practical Guide at all times when working near a watercourse as authorisations may be required – it is the contractors’ responsibility to consult with SEPA and apply for authorisation where required. General Binding Rules (GBR 10, 16, 9) should be consulted as a minimum for all sites near a watercourse: SEPA GBR 10: Discharge of surface water runoff from a surface water drainage system to the water environment from construction sites, buildings, roads, yards and any other built up areas. SEPA GBR 16: Direct Discharges of pollutants into groundwater as a result of construction or maintenance works in or on the ground, which come into contact with groundwater. It is recommended in the CAR guidance that when undertaking SEPA GBR 10, GBR 9 should also be followed. GBR 9: Operating any vehicle, plant or equipment (machinery) when undertaking GBR 10 (and others). All watercourse crossings will be considered against the CAR Practical Guide and level of authorisation justified. SPEN Projects will require a watercourse crossing schedule update on a monthly basis. SPEN Projects will be informed of any consultation with SEPA and included in any correspondence.
Water or Ground contamination	The potential pollution of drainage systems, watercourses and groundwater is to be prevented during the contract by adhering to the following guidelines:

from Spillage or Mud/ Silt	<ul style="list-style-type: none"> All works in and within 10m of water course will be carried out within SEPA guideline and guidance. The banks of watercourses are to be protected from damage and contamination using; silt fencing, cut off ditches, sumps etc. Machine operators will carry out daily checks this is to include Hydraulic lines; A spill kit of reasonable capacity is kept close to the work; A boom could be placed across the watercourse as a preventative measure at appropriate times; and Abstraction/ de-watering of excavations should be in excess of 10m from a watercourse (if highly sensitive or prone to flooding this distance may need to increase. The de-watering exercise should be through a silt protection capture layer such as a siltsock, siltbuster, sump/ silt fencing – grassy area with landowner permission to pump. It is the contractors' responsibility to assess the volume discharged is in line with SEPA guidance GBR 15 and Abstraction Licence parameters are adhered to. <p>Please refer to Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems.</p> <p>Relevant TBT to be issued to all on site – attendance sheet signed.</p>
Access Installation	<p>Provision of access road design to include and take account of installation of cut of ditches, hydro dams, sumps, silt fencing to manage flow pathways and control silt run off at all times during construction, this includes monitoring the effectiveness of the prevention measures and adapting to changes in flow rate and disturbance.</p> <p>All aggregate or stone removed from access tracks are regarded as waste. This must be removed from site via a licenced waste carrier. Disposal/reuse/ recycling can only take place at a licenced or exempt facility and all documentation (waste transfer note, valid exemption/ licence for a relevant activity) must be in place prior to removal from site and recorded in the Site Waste Management Plan (SWMP).</p>
Reptile potential	<p>No reptiles were incidentally observed during the survey and no hibernacula were located.</p> <p>Further survey for reptiles following standard guidance is recommended for all dry stone wall dismantling works. These surveys should utilise artificial refugia, and take place between March and October (ideally September).</p> <p>The contractor is responsible for any further pre-construction surveys and arranging any relevant licences or mitigation measures for the works.</p> <p>Scrub to be progressively cut, trimmed and chipped to remove cover. Clear areas are to be left for at least 24 hours prior to soil stripping.</p> <p>Any area of rocks, brick rubble or other debris that have been present for over six months are to be destructively searched before the start of construction in</p>

	<p>that area.</p> <p>Relevant TBT to be issued to all on site – attendance sheet signed. Please refer to SPEN Environmental Handbook</p>
Invasive Non-native Species	<p>No invasive non-native species were recorded during the course of the survey. Please refer to Appendix 6 - Ecological Constraints Survey for further details.</p> <p>However, if invasive non-native species are encountered during works Stop all work within 7m of the invasive and contact your team leader/site manager for instructions. Fence an area 7m from the nearest plant to prevent access.</p> <p>Chemical control of giant hogweed is most effective – spraying can start on plants above 1 metre high from March and throughout summer. More than one application is needed and follow up spraying will be required to kill seedlings in subsequent years.</p> <p>Do not: Move soil that may contain seeds or other plant material without specific instructions; Store any removed plant materials within 30m of a watercourse.</p>
Bat potential	<p>Trees recorded in the south and west of the substation were considered to have some level of bat roost suitability. Further surveys will be required on those which will be affected by the development.</p> <p>A potential bat roost was recorded in the eastern building located behind an external light figure with bat droppings recorded beneath this.</p> <p>If any of the areas highlighted with bat roost potential are to be impacted by the works, then the environmental advisor and an ecologist should be notified. The trees should be inspected by an ecologist prior to removal. In the event that a bat or bat roost is found or suspected, the work must stop immediately and an ecologist contacted.</p> <p>The contractor is responsible for any further pre-construction surveys and arranging any relevant licences or mitigation measures for the works.</p> <p>Relevant TBT to be issued to all on site – attendance sheet signed. Refer to SPEN Environmental Handbook.</p>
Tree Root Protection	<p>All working activity close to trees should follow NJUG guidelines – root protection areas should be demarcated and any excavations close to a tree or under tree canopy should assess the methodology prior to construction.</p> <p>Ensure Tree Preservation Orders have been checked with the Local Authority and consent granted if required.</p> <p>Please see Root Protection TBT.</p>
Nesting Birds	<p>Nesting birds habitat is found adjacent to the proposed works. A number of common lowland species were recorded singing and holding territories.</p> <p>Preconstruction breeding bird surveys are recommended prior to any works commencing in the bird breeding season of March to August.</p> <p>The contractor is responsible for pre-construction surveys and arranging any relevant licence or mitigation measures for the works.</p> <p>Specific guidelines/ risk assessments/ licences and consultation with SNH and specialist ornithological support may be required.</p>

	<p>All wild birds are protected by law under the WCA. Recent and significant changes have been made to the protection of wild birds in Scotland by The Nature Conservation (Scotland) Act 2004. It is an offence to intentionally or recklessly disturb any wild bird listed while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.</p> <p>The nesting season is designated March to August inclusive and all nesting birds are protected. If any nests are identified at any time works should stop immediately and contact should be made with the Environmental Advisor.</p> <p>Scrub, Hedgerows & Trees should be removed out with the nesting season. If it is required to remove them within the nesting season then this can only be done following a survey to confirm the absence of nesting birds. Consultation and acquisition of licences from Scottish National Heritage SNH to disturb or relocate protected species may be required.</p> <p>Relevant TBT to be issued to all on site – attendance sheet signed.</p> <p>Please refer to SPEN Environmental Handbook.</p>
Dust Management	<p>The following measures should be taken to minimize dust generation:</p> <ul style="list-style-type: none"> • Material discharge heights will be kept to a minimum; • Haul roads will be damped down during dry and windy conditions; • Vehicle speeds will be restricted; and • Keep stockpile levels less than 2 metres. <p>Relevant TBT to be issued to all on site – attendance sheet signed. Please refer to SPEN Environmental Handbook.</p>
Re-fuelling	<p>Refuelling should be considered prior to works commencing to prevent refuelling during access track construction and possible spillage into nearby habitat and water courses.</p> <p>Standard practice:</p> <ul style="list-style-type: none"> • No generators or similar plant and machinery shall be used within 30 metres from appropriate watercourses and water bodies; • Machines will be refuelled minimum of 30 metres away from water courses. Outside edge of all permanent non-mobile storage facilities for oil, fuel, etc. shall be at least 100m away from appropriate watercourses and water bodies; • Records to be kept of all fuel consumption; and • All plant will have a spill kit and plant nappy.
Excavations and dewatering	<p>Ensure that excavations are managed, especially where the potential for encountering groundwater has been identified. Strategies to deal with water, either groundwater or ingress of water due to heavy rain, should be in place. Sufficient equipment (e.g. pumps) and mitigation (e.g. silt mitigation/fencing) should be on hand to deal with dewatering. Any strategy should also deal with where water will be pumped to. Water considered to be contaminated with silt/oils etc. CANNOT be pumped straight into the environment without primary and potentially secondary treatment.</p> <p>Relevant TBT to be carried out on site – attendance sheet signed and uploaded to Projectwise.</p>

The contractor must ensure they have adequate measures in place to effectively manage all of the aspects detailed in the register, and any additional aspects that they may bring to site via their method of work. This is not an exhaustive list constraints need to be re-evaluated throughout the project.

9. TRAINING REQUIREMENTS

SPEN expect the contractors to utilise their electronic document management System Projectwise during the works. All contractors shall request any training on this database via the SPEN construction manager if required.

Records of specific environmental training shall be maintained at the main site office. Task specific environmental training will be given when required.

1.1 Environmental Toolbox Talks (TBTs)

A variety of environmental issues are anticipated on the project, these are area and task specific. Toolbox talks associated to each anticipated issue should be read by staff before work on site commences. Environmental TBTs MUST be provided once a month as a minimum but more frequently when task/sensitivity of location require it. Attendance records must be kept on site and maintained and uploaded to Projectwise. Please provide a list of TBTs which is anticipated will be delivered.

Please reference SPEN Environmental Handbook and Tool Box Talks in all instances.

10. WASTE MANAGEMENT

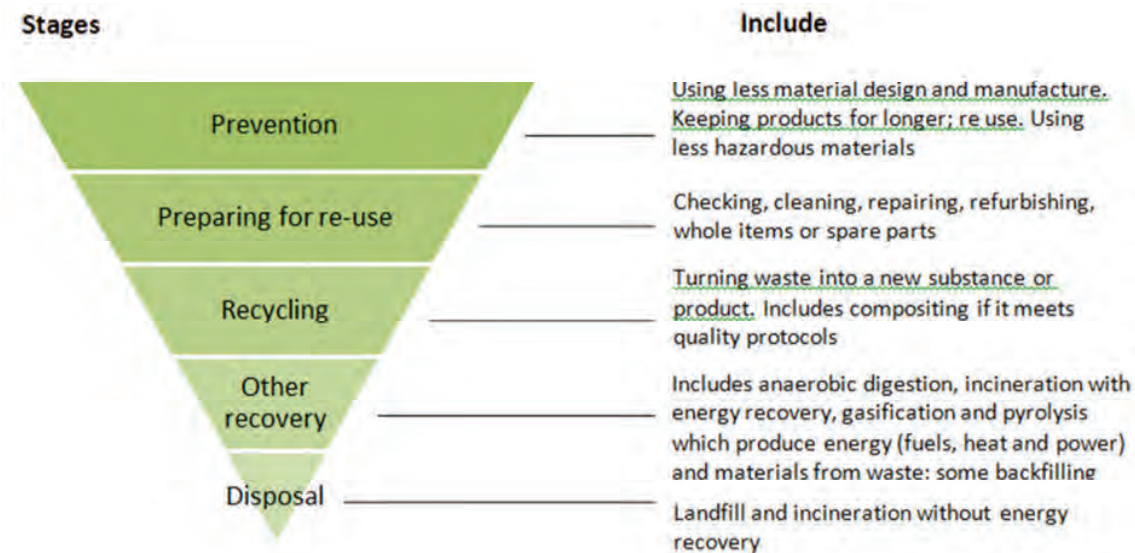
10.1 Duty of care

The Environmental Protection Act 1990 states that all producers of waste have a legal responsibility to ensure that all waste is produced, stored, transported and disposed of without harming the environment. This is called your 'Duty of Care'.

In accordance with the SPEN Environmental Management System and to ensure compliance with the 'Duty of Care', a Site Waste Management Plan shall be completed by each contractor and submitted for review. Each contractor working on an SPEN project must provide a site waste recording form and update all waste information on a monthly basis.

10.2 Waste hierarchy

The waste hierarchy ranks waste management options according to what is best for the environment. Top priority is given to preventing waste in the first place. When waste production is unavoidable priority is then given to preparing it for re-use, then recycling, then recovery. When all other disposal routes have been exhausted disposal of waste to landfill is the final option.



The waste hierarchy should be implemented as part of the (site waste management plan) SWMP to plan the management and disposal of waste produced on site.

10.3 Site waste management plan (SWMP)

A SWMP must be put in place by each contractor on each SPEN project. This can be done using the SPEN format or the contractor can use their own. The SWMP is in 2 parts:

- Waste Forecasting; and
- Waste Recording.

The SWMP is an annual recording system and therefore a new waste forecast and recording sheet will be required for each year of the project. All waste records must be uploaded to ProjectWise with the SWMP updated and uploaded on a monthly basis.

In every case the SWMP must capture the following information:

- An annual waste forecast;
- Waste type i.e. Inert, Non-hazardous, Hazardous;
- Description e.g. soil and stone, toilet water etc.;
- Action to be taken to minimise waste (volumes reused, recycled, landfilled);
- The correct European Waste Code (EWC) provided;
- Date removed from site;
- Weight in tonnes; and
- Name of waste carrier, waste facility and their regulators registration numbers.

10.3.1 Waste Monitoring and Minimisation

The site waste management plan is in place to target, monitor and report against waste arising's on a monthly basis. Waste will be segregated where a viable waste stream is identified. Efficient

procurement of materials and services will reduce the volume of waste that will be generated by the project. Subcontractors and their suppliers will be consulted on methods to reduce potential waste sources before they are brought on to site.

10.4 Waste Transfer Notes (WTNs)

All movements of waste off site must be accompanied by a WTN. This is a legal document stating the type and quantity of waste being removed, the waste carrier's information and the intended end destination. The WTN must include a European Waste Code (EWC), a six digit code for each waste stream, a Standard Industrial Classification (SIC) code to classify the business type producing the waste, and note that the waste hierarchy has been considered. It must also be signed by both the haulage driver and the contractor to whom the waste belongs. A copy of the WTN must be kept for a minimum of 2 years.

10.5 Consignment Note

A Consignment Note is a type of WTN that is used for the movement of Special Waste. A Consignment Note contains all the same information as a WTN but has an additional section that must be completed by the receiving waste management facility on receipt of the waste. 'Pre-notification' of the first movement of waste must be provided to SEPA at least 3 working days before the 'expected removal date'. A copy of the fully completed Consignment Note must be kept for a minimum of 3 years.

10.6 Licences and Exemptions

There are several licences and exemptions that are required to be in place prior to waste being removed from site. The documents required will vary depending on the type of waste and activity being undertaken.

Waste Carriers Licence – any organisation that transports waste as part of its business must be registered as a Waste carrier. This includes any form of waste being removed from site to be disposed of elsewhere, including packaging.

Waste Management Licence/Permit/Exemption – a waste management licence, permit or exemption must be in place for the facility that the waste material is going to. This documentation verifies that the facility can legally accept the waste being removed from site. This documentation must be in place and validated prior to any waste removal from site.

10.7 Site specific requirements

Waste	Management	Documentation
Spoil	Cut and fill exercise undertaken by site team to allow for reuse of excavation material on site.	N/A – all stockpiles kept within site boundary.
Aggregate	All aggregate or stone from access tracks is regarded as waste after its removal. This must be removed from site via a licenced waste carrier. Disposal/reuse can only take	The receiver of any waste product must have a SEPA waste exemption/licence prior to taking ownership. This includes utilisation of previous access road

	place at a licenced or exempt facility and all documentation must be in place prior to removal from site and recorded in the SWMP.	materials for other purposes by the landowner or any other organisation/ or landowner.
Packaging	Timber and cardboard packing materials. To be disposed of off-site to a recycle facility.	Record on waste record sheet and with WTN upload to Projectwise monthly.
Hazardous waste	Excavated material from spills of oil/fuel/chemical. Suitable spill prevention measures to reduce this.	Consignment note showing removal to specialist waste carrier/disposal facility. Record on waste record sheet and with CN upload to Projectwise monthly.

11. INCIDENT MANAGEMENT

SPEN Projects Incident Management Programme will be implemented on this project if required. The Incident Manager shall in all cases be the SPEN Projects Construction Manager.

The Construction Manager shall ensure that the duties identified in the Incident Management Programme documentation are carried out by an incident investigation team that has been identified for the project.

This documentation can be used by SPEN Projects contractors and SPEN Projects Construction Management team.

12. MONITORING AND MEASURING

12.1 Site Inspections

The SPEN Projects Environmental Advisor for the project will carry out regular inspections against the procedures and specifications used during the works. The frequency of the Environmental Inspection will vary depending on the number of contractors present at the site and the risks involved in the activities. The Contractor's Environmental Advisor will provide the SPEN Projects Environmental Advisor with a two week look ahead of working activities. Joint inspections of the site will be agreed to by SPEN Projects and the contractors Environmental Advisor during the site start up meeting.

The findings of site inspections will be communicated at the site and then via Projectwise on return to the office.

Contractors will be responsible for carrying out their own Environmental inspections during the course of the works, and uploading the findings to Projectwise.

12.2 Audits

SPEN Projects have the right to audit the contractor at any time during the course of the works. All contractors will be given at least 10 workings days' notice when a formal audit will be carried out. All contractors are expected to provide suitable resources to assist with the audit.

Contractors are expected to carry out audits in line with the level of environmental risk of project work activities and management system commitments. Contractors will inform SPEN Projects of their audit schedule upon contract award.

ISO 14001 Accreditation audits/certificates to be communicated to SPEN Projects.

13. ENVIRONMENTAL EMERGENCY RESPONSE PLAN (ERP)

The CPP will detail the Contractor responsible for producing the ERP.

The Contractor shall prepare and submit to SPEN Projects Environmental Advisor an Emergency Response Plan (if they are required in the CPP) which details the management arrangements for potential environmental emergencies. The following environmental emergency response procedures (13.2 to 13.5 are examples) should be used as a basis for the development of the contractors Emergency Response Plan. The contractors' emergency response plan should provide more detail relating to types of incidents, hazards, response procedures and emergency contact telephone numbers.

A drill shall be carried out by the Contractor that produced the ERP for each potential emergency situation that can have a major impact on the environment. The details of the drill shall be recorded an Emergency Response Plan and submitted to SPEN Projects.

All Contractors must ensure they are aware of the ERP requirements and that the requirements are communicated to all their staff on site.

The emergency response plan should include the details of the emergency contacts including that of a 24 hour emergency spill contractor that is available throughout the course of the works and equipped to deal with the incidents identified in the Emergency response Plan.

Contractors should complete the table below specific to the project:

Name	Address	Number
Police Scotland		
Scottish Fire and Rescue Service		
Scottish Water		
The Scottish Environmental Protection Agency (SEPA)		Hotline number 0800 80 70 60
Local Council		
Waste Contractor		
Spill Contractor (emergency 24 hr)		
The Scottish Society for the Prevention of Cruelty to Animals (SSPCA)		
Scottish Natural Heritage (SNH)		

13.1 Environmental Yard Plan

The emergency response plan should include a marked up drawing indicating surface, foul and combined drains, along with any watercourses within the yard. A marked up drawing should also be in place for works taking place near sensitive areas such as watercourses and should indicate drainage, silt/pollution prevention measures and location of spill kits. This drawing shall be briefed to all works staff during pollution prevention training to make them aware of at risk areas.

13.2 Emergency pollution Event to Air

- LOCATE the source of the air pollution
- If safe to do so, **STOP** the source of the pollution for example by turning off faulty equipment. Do not expose yourself to any dust or vapours without the appropriate PPE.

- **STOP** any works which are in the vicinity of the pollution event and make sure all site staff and members of public are diverted away from the pollution event.
- **SUPPRESS** particulate air pollution with water but only if you can control the run off such that the water will not enter any drains or watercourses.
- **REPORT** the incident to the works manager and site engineer who will then determine if the event is serious enough to require notification to the Local Authority. Report the incident to the SPEN Projects Environmental Advisor.
- **REVIEW** the cause of the pollution event to determine any actions required to prevent the incident from recurring. Review the effectiveness of the response plan and make any changes necessary.

13.3 Emergency Pollution Event to Land or Water

No discharges can be made to land or water without a discharge consent in place. In the event of a fuel or chemical spillage the following procedure must be employed:

- **ASSESS** the situation. Determine the source, composition and approximate quantity of the spill and determine whether you have the appropriate equipment, PPE and training to tackle the spill.
- Get the **HELP** you require to deal with the spill safely. Inform the Works Manager/ site engineer of the spill. They will contact a spill contractor if required.
- If the spill is located adjacent to the site on one of the roads/pathways used by members of the public, **PREVENT** pedestrians and traffic passing through the spill. Contact police headquarters if the spill prevents a risk to traffic.
- **STOP** the source of the spill.
- **CONTAIN** the spillage using either a spill kit or a suitable inert material e.g. sand. DO NOT allow the spill to enter the local drainage system or watercourses. Cover any drains, and use spill socks to prevent run off to watercourses
- **REMOVE** the spillage. Small spills can be removed using spill mats and/or granules; larger spills may require a pump from a specialist contractor.
- **DISPOSE** of the waste material. Used spill kit should be placed in a designated bin separate from all other types of waste. Do not put used spill kit material in any of the skips. Material which has been pumped may be stored in empty oil drums or other suitable container prior to removal by a registered special waste contractor.
- **REPORT** the incident. Complete an Incident Report Form and provide a copy to the SPEN Projects Environmental Advisor. SEPA must be informed in the event of pollution to a surface water drain; Scottish Water and the Local Authority must be contacted should pollution from site enter the surface water or foul drainage system.
- **REVIEW** event to determine any actions required to prevent the incident from recurring. Review the effectiveness of the response plan and make any changes necessary.

13.4 Silting of Watercourses

It is the contractor's responsibility to ensure all watercourses visible on a 1:50,000 OS map have been identified at the planning stage and mitigation measures have been considered and implemented, such as, but not limited to silt fencing, Hydro dams, cut off ditches. Reference should be made to SEPA CAR Practical Guide and Pollution Prevention Guideline PPG5.

- **CHECK** watercourses during periods of high rainfall or construction activities with potential for significant run-off.
- Get the **HELP** you require to deal with the situation safely and inform Site Manager of the silting.
- Implement mitigation measures immediately. **TRACE** back to the source where possible. Consider whether the site activity should be halted.
- **PREVENT** further spread of sediment downstream by implementing straw bales, silt screens etc. to help control sediment immediately. If already in place check for signs of damage.
- **MONITOR** the effectiveness of protection measures daily and re-plan as necessary.
- **MAINTAIN** straw bales/screens etc. regularly so they do not make problems worse.
- **REPORT** the incident within 24 hours to the SPEN Projects Environmental Advisor. SEPA must be informed in the event of pollution to a surface water drain; Scottish Water and the Local Authority must be contacted should pollution from site enter the surface water or foul drainage system. SPEN Projects must be informed as soon as is reasonably practicable if a regulatory body has been informed of an incident.
- **REVIEW** event to determine any actions required to prevent the incident from recurring. Review the effectiveness of the response plan and make any changes necessary.

13.5 Injured Animal

- **DO NOT APPROACH** the injured animal. It may be aggressive or be harbouring disease
- **STOP** works in the immediate vicinity of the injured animal
- **CONTACT** the SSPCA and follow their advice.
- The incident should be recorded and reported to the SPEN Projects Environmental Advisor.

Appendix 1: SPEN Environmental Technical Specification

Attached separately as a PDF

Appendix 2: SPEN Environmental Policy

Attached separately as a PDF

Appendix 3: ENDS Legal Compliance Register

Attached separately as a PDF

Appendix 4: Pollution Prevention Plan – Example

As a minimum the Pollution Prevention Plans will be site specific and should address the following:

Description of the Project

Location of this land within the construction site as a whole (if the plan covers only part of the site)	Provide maps/drawings
Location of watercourses (inc. culverted watercourses, land drains etc.), ponds, wetlands, estuaries and coast on the construction site	Provide maps/drawings

Description of the Works being undertaken

Type of construction work that will be carried on the land to which this plan applies (e.g. metaled roads; water bound roads; etc.)	
Scale of the construction work (e.g. Road length; etc.).	

Who is the point of contact in relation to this plan?

Person(s) acting as normal contact with SPEN about this plan	
Person(s) acting as 24 hour contact with SPEN in an emergency (i.e. if there is an imminent risk of pollution or where pollution is occurring)	

What pollution risks will be managed under this plan?

Potential pollutant sources during the phase of construction covered by this plan, including exposed soil, fuel storage areas, concrete washouts, wheel washes etc.	
Routes by which pollutants (including soil) could reach the water environment from these sources, e.g. overland flow, field drains, unauthorised pumping	<include map or maps of existing site drainage, watercourses, field drains etc., including how this may change over the period covered by the plan>
Parts of the water environment that the pollutants could reach and any particularly sensitive features (e.g.	<include map or maps of the parts of the water environment, including how these might change (eg as a result of ground works) over the period

salmon, freshwater pearl mussels,)	covered by the plan>
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What will be done to prevent pollution?

How the contractor will manage risks at source, including alternative methods if required.
Source 1 management Source 2 management Source 3 management Add more as required

How we will manage water run-off

Details of minimisation of exposed soil
Drainage system 1

<Map of area drained>			
<Maximum water run-off rate likely from drained area>	<Soil/sediment settlement rate>	<Capacity of drainage system>	<Discharge location>
<Details of the drainage systems that will be installed to intercept and trap/treat contaminated water run-off>			
<Steps to prevent drainage system being bypassed>			
Drainage system 2			
<Map of area drained>			
<Maximum water run-off rate likely from drained area>	<Soil/sediment settlement rate>	<Capacity of drainage system>	<Discharge location>

<Details of the drainage systems that will be installed to intercept and trap/treat contaminated water run-off>			
<Steps to prevent drainage system being bypassed>			
Drainage system 3			
<Map of area drained>			
<Maximum water run-off rate likely from drained area>	<Soil/sediment settlement rate>	<Capacity of drainage system>	<Discharge location>
<Details of the drainage systems that will be installed to intercept and trap/treat contaminated water run-off>			

<Steps to prevent drainage system being bypassed>

What will we do if something goes wrong?

Rapid response actions that will be taken to try to prevent pollutants reaching the water environment	
Rapid response actions that will be taken in the case of pollution occurring	
Rapid response actions that will be taken in the case of site characteristics changing (e.g. soil types)	

How will we ensure that the plan is effective?

Maintenance programme that will be undertaken in relation to vehicles, plant and any infrastructure used to avoid, intercept or trap/treat pollutants	
Inspection programme that will be carried out to check the correct operation and effectiveness of the actions in this plan	

Management programme that will be used to ensure all workers on the site and anyone visiting the site are aware of, and doing, what is required of them in relation to this plan	
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Who is in charge of making sure this plan is implemented?

Person(s) with overall responsibility for ensuring this plan is implemented on a day-to-day basis	
Person(s) responsible for the maintenance programme (if different)	
Person(s) responsible for the inspection programme (if different)	
Person(s) responsible for ensuring appropriate rapid response to prevent or minimise pollution if something goes wrong	

Appendix 5: Ecological Survey Calendar

Protected Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Habitats & Vegetation	Recommended time to surveys mosses and lichens only			Recommended time to undertake Phase 1 habitat surveys			Recommended time to surveys mosses and lichens only			Recommended time to surveys mosses and lichens only		
Badgers	Best time for field surveys			Surveys possible, but sub-optimal			Best time for field surveys			Best time for field surveys		
Bats	Inspection of hibernation, tree and building roosts			Activity surveys only; invasive surveys to be avoided			Activity surveys and inspection of building roosts. Emergence counts.			Activity surveys only; invasive surveys to be avoided		
Birds	Winter birds			Breeding birds/migrant species			Breeding birds			Breeding birds/migrant species		
Otters	Year round surveying, though wet weather can limit visibility.			Surveys for otters can potentially be conducted all year round, preferably when weather condition are stable, though dense vegetation cover can be limiting			Surveys possible, but sub-optimal			Year round surveying, though wet weather can limit visibility.		
Pine marten	Surveys can be carried out at any time of year, though better in spring and summer			Survey for breeding dens			Optimal survey period is spring to summer			Surveys can be carried out at any time of year, though better in spring and summer		
Red squirrels	Survey at any time of year, breeding females			Survey at any time of year weather permitting, optimal in spring and summer. Breeding females can be surveyed December to September			Survey at any time of year			Breeding females		
Water voles	Reduced WV activity	Initial surveys	Best time to survey			Surveys possible, but vegetation cover & weather conditions can be limiting			Initial surveys			Reduced WV activity

Great Crested Newt	No surveys as newts in hibernation	Pond Surveys for adults: mid-March to mid-June. Surveys must include visits undertaken between mid-April and mid-May. Egg surveys April to min-June. Larvae surveys from mid-May Terrestrial habitat surveys	Larvae surveys to mid-August Terrestrial habitat surveys	Terrestrial habitat surveys	No Surveys – newts in hibernation
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Appendix 6: Survey Reports

Attached separately as a PDF

Appendix 7: SPEN Environmental Handbook (example TBTs)

Attached separately as a PDF

Appendix 4.2

Example Toolbox Talk

5. Archaeology

WHAT?

Archaeological sites are the physical remains of our past. Many such remains relating to early human communities are either on, or close to, the surface, although they may be buried in peat. Once an archaeological site has been destroyed it is gone forever. Once uncovered, it is important that, archaeological remains are expertly examined and, where appropriate, protected. The perception that archaeological finds on construction sites will cause major delays to a programme is widespread but incorrect. If addressed at the right time and in the right way, finds may not necessarily affect the progress of works. It is not just buildings and their foundations, but also artefacts, such as jewellery, pottery and coins, as well as bones and skeletons, that need expert examination before removal

WHY?

Avoid Prosecution: It is illegal to damage some protected monuments, archaeological structures and human remains. Contractors are not expected to be archaeological experts, but we all have legal obligations relating to archaeology and cultural heritage.

Avoid Environmental Harm: Archaeology is an important part of our heritage and valuable and irreplaceable remains can easily be damaged on construction sites through:

- excavation of foundations
- driving heavy vehicles over buried sites, which can cause erosion
- allowing vehicles to bog down and make deep ruts which can destroy the buried parts of sites undertaking works which may affect the setting of monuments or listed buildings

Do

- ✓ **Protect** any known archaeological features in accordance with contract and planning conditions
- ✓ **Be** prepared for unexpected finds whether or not known archaeological or historical features have been identified on your site
- ✓ **Look** out for burned or blackened material, brick or tile fragments, coins, pottery or bone fragments, skeletons, timber joists or post hole, brick or stone foundations and in-filled ditches
- ✓ **Stop** work and inform your team leader/ site manager if you think you have discovered archaeological features
- ✓ **Protect** the site by fencing it off
- ✓ **Take** the advice provided by any appointed archaeologist
- ✓ **Ensure** all of the required consents are in place before working in or near designated monuments

Do Not

- ✗ **Assume** that any artefacts or features discovered are unimportant
- ✗ **Remove** any 'finds' such as coins, pottery, or bones from the site. This is illegal
- ✗ **Undertake** any work adjacent to areas of archaeological importance without considering the risk that damage may be caused. For example:
 - vibration may cause cracking
 - dewatering may cause a preserved feature to settle and crack
- ✗ **Drive** vehicles through protected sites
- ✗ **Work** in sites without necessary consents in place
- ✗ **Plant** in designated areas without consulting with Historic Environment Scotland



Appendix 4.3

Good Practice Construction Measures

Appendix 4.3: Good Practice Construction Measures

- 1.1 Good practice will be followed to minimise the impact of construction activities on the environment.
- 1.2 A Construction Environmental Management Plan (CEMP) will be developed and agreed with Dumfries and Galloway Council and SEPA in advance of construction commencing. The CEMP will establish a framework to ensure that health and safety and environmental best practices are adopted throughout the works. The CEMP will include the approved Pollution Prevention Plan (PPP).
- 1.3 The following sections provide a general description of the mitigation measures which will be included within the CEMP and PPP during construction. These mitigation measures reflect best practice guides and recognised industry standards, as well as SPEN'S recent experience of constructing electricity substations, to help avoid and minimise the potential impacts of the proposed Glenlee substation extension and are incorporated into the project design.
- 1.4 Many of the measures described below are designed to mitigate the impact of several effects (e.g. mitigation to minimise sedimentation and pollution such as Sustainable Drainage Systems (SuDS) can also serve to attenuate surface water run-off and minimise flood risk). Hence, there is some overlap in the sections below.

Landscape and Visual Amenity

- 1.5 Construction activities will be conducted in accordance with the CEMP. The following measures will be implemented throughout the construction phase to ensure landscape and visual effects are avoided or reduced wherever possible:
 - Existing landscape features such as hedgerows, woodland, tree belts and stone dyke field enclosures will be retained as far as practical.
 - Any disturbance to or temporary removal of existing field boundaries (e.g. hedgerows, stone dykes or fences) to facilitate construction access through construction of the passing places will be undertaken sensitively to ensure successful reinstatement of these features following completion of construction activities.
 - Delivery of equipment for enabling works and construction vehicles will access the site from the proposed access from the U2s.
 - Construction vehicles will not track across undisturbed areas outside their defined working areas and access corridor.
 - Materials and machinery will be stored tidily during the works. Machinery will not be left in place for longer than required for construction purposes to minimise effects on views and visual amenity.
 - Following the introduction of project components which will remain during the operational phase construction works (e.g. construction working areas, access roads) and previously disturbed areas will be restored and revegetated during the construction phase.
 - Topsoil, and the seedbank within it, will be carefully stripped and will be stored in areas where it will not be disturbed or tracked upon in low uncompacted mounds (Proposed topsoil storage areas are shown on **Figure 4.1** of the EIA Report). Stored topsoil will be used for the progressive restoration of disturbed areas in line with the landscape mitigation proposals shown on **Figure 4.2** of the EIA Report. Soft materials will be used to regrade slopes prior to promotion of natural recolonisation of vegetation.
 - Seeding will be undertaken using locally native species of plants, and to tie in with adjacent vegetation types, where considered appropriate and essential to prevent erosion.
 - On completion of the construction phase, all equipment and temporary infrastructure not required for future operational use will be dismantled and removed, including removal of construction waste and its appropriate disposal; filling and compacting hollows and excavation trenches with the appropriate stockpiled materials.

- Slope regrading activities will be undertaken to provide sustainable and erosion resistant landforms compatible with the pre and post-construction land use and water management strategies.

Hydrology and Water Resources

- 1.6 As a minimum, during construction the contractor will be required to follow the guidance contained in SEPA Pollution Prevention Guidelines (PPGs) and Guidance for Pollution Prevention (GPPs)¹. There will **also be a requirement to adhere to SEPA's general binding rules (GBR) under the** Water Environment (Controlled Activities) (Scotland) Regulations 2011, as amended (CAR Regulations), to protect the water environment.
- 1.7 A Construction Site Licence will be required from SEPA under the CAR Regulations in advance of the works which will include a detailed PPP to ensure that any discharges of water run-off from the site to the water environment do not cause pollution. This will be prepared, and authorisation sought from SEPA, before construction commences. A CAR Licence for the culvert realignment works will also be prepared, and authorisation sought from SEPA, in advance of the works.

Flood Risk and Increased Run-off

- 1.8 Mitigation measures to deal with increased surface runoff include:
 - Areas of impermeable and hard standing will be kept to a minimum through strategic construction management and staged working where possible.
 - All surface water drainage systems will incorporate the appropriate level of treatment and attenuation with all SuDS and drainage features designed taking account of measures published by the appropriate body i.e. SEPA, CIRIA, etc.
 - Discharge of attenuated surface water runoff from the working areas and hardstanding into the watercourses will be limited to greenfield runoff rates entering each watercourse from the site at present.

Sedimentation and Erosion

- 1.9 Measures to manage sedimentation and erosion include:
 - Runoff from site work areas during construction will be treated and attenuated using appropriately sized SuDS.
 - Surface water that can enter a working area from upslope will be captured by a drainage ditch or similar and diverted around the working area to reduce washout of aggregate.
 - Runoff from hardstanding areas will be treated and attenuated to levels relative to the area of use. Further treatment may be required from areas subject to high pollution risk i.e. fuelling areas, vehicle wash areas.
 - Where possible, a minimum buffer zone of at least 10m between the construction areas and watercourses has been incorporated into project design.
 - Exposed soil slopes adjacent to watercourses will be minimised and seeded as soon as possible to reduce the risk of instability and sediment runoff to watercourses as well as minimising disturbance to riparian habitat.
 - SuDS including temporary silt traps, settlement lagoons and storage lagoons will be constructed at to intercept and contain sediment and to attenuate surface water runoff to greenfield rates.
 - The extent of exposed topsoil will be kept to a minimum, by phasing vegetation removal and earthworks so that soil exposure and areas of open excavation are minimised and can be managed appropriately.
 - Temporary silt fences will be installed to protect exposed topsoil from erosion and runoff.

¹ A review of PPGs is currently underway, to be replaced by GPPs. These documents provide environmental good practice guidance for the whole UK, and environmental regulatory guidance directly to Northern Ireland, Scotland and Wales and are available to download on the NetRegs website: <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/>.

- The culvert realignment works will be undertaken off-line and the culvert works will follow SEPA guidance and the requirements of the authorised CAR licence will be adhered to.

Pollution and Accidental Spillage

- 1.10 The following mitigation measures will be implemented to reduce the chance of pollution from plant and machinery and the risk of a spillage occurring:
- Concrete pouring and washout activities will be closely controlled and will not take place close to a watercourse.
 - Good construction practices will ensure that all harmful substances including fuel, oil, etc. would be safely stored on the working areas using the recommended storage facilities recommended in SEPA guidance and the relevant GBRs.
 - All machinery will be checked regularly to identify leakages, and during winter, de-icing of plant machinery kept to a minimum.
 - Spill kits, absorbent materials, and full training on their appropriate use will be available on the site to limit the potential impact of any accidental spillages.
 - Except for emergency repairs, all maintenance and repair for vehicles will be undertaken offsite.

Dust Management

- 1.11 Dust emitting activities generally respond well to appropriate dust control measures such as those outlined in PAN 50: Controlling the Environmental Effects of Surface Mineral Workings, and negative effects can be greatly reduced or eliminated. SPEN will commit to adopting good practice measures for dust management during construction, focussing in particular on areas within 200m of the KTR Project, thereby controlling and reducing any potential effects on the potential receptors identified. These good practice measures include:
- ensuring all loads which will enter the site are covered where practicable;
 - enforcing an appropriate speed limit; and
 - making use of netting screens for construction activities within 200m of both receptors.

Noise Management

- 1.12 Construction will be undertaken in line with the following good practice measures for noise:
- All construction activities will also be undertaken in accordance with good practice as set out in BS5228.
 - All equipment will be maintained in good working order and will be fitted with appropriate noise control at all times (for example, silencers, mufflers and acoustic hoods).
 - All site employees will be advised of the noise sensitive nature of the area and will be informed to adopt the quietest work practices, where appropriate.
 - Site terrain, material stockpiles and suitable work locations will be used so as to screen work locations and maximise the distance between work activities and receptors where possible.

Access, Traffic and Transport

- 1.13 The temporary effects of construction will be mitigated through adoption of a regulated and approved agreed Construction Traffic Management Plan (CTMP). A Framework CTMP is provided as **Appendix 11.1**. SPEN will agree temporary traffic management measures then adopt and monitor an appropriate way of working in consultation with D&G Council Roads Department, Ayrshire Roads Alliance, Transport Scotland and/or their Agent and the Police as appropriate.

- 1.14 There will be a requirement for all contractors to adhere to the CTMP which will contain traffic management measures for traffic movements within the site away from the public highway during construction.
- 1.15 Vehicles associated with construction activity (with the exception of site personnel in cars and vans) will travel on pre-defined routes to and from the site to reduce effects on existing local traffic.
- 1.16 Timing and frequency of vehicle movements will be managed to ensure, wherever practical, that vehicle movements are spaced adequately to reduce disruption and coincide (if/where applicable) with existing/current local forestry operations.
- 1.17 The Framework CTMP has been developed in consultation with relevant Roads Authorities and will be further developed as necessary in consultation with the Police prior to commencement on-site. This document outlines measures to promote the efficient transportation of components and materials to site, whilst reducing congestion and disruption which might impact negatively on local communities or general **traffic and in particular the emergency services. The CTMP should be considered a 'live' document that** includes:
- a programme of delivery types/numbers by month;
 - a statement of which public roads are to be used by construction traffic;
 - a statement of which public roads are not to be used by construction traffic;
 - a statement of which local towns and villages are to be avoided (completely or on stated days and times);
 - details of all proposed mitigation measures, list of contacts, and details of measures that will be implemented to limit the potential of vehicle stacking on any part of the public road network;
 - if appropriate, details of speed restrictions through sensitive areas and procedures to ensure pedestrian safety adjacent to worksites; and
 - details of temporary signage to be installed at defined locations.
- 1.18 It will be mandated through the CTMP that HGV traffic:
- shall not travel through New Galloway via the A762; this is to reduce the impact of construction traffic on New Galloway;
 - must not travel through Moniaive via the A702; this is to reduce the impact of construction traffic on Moniaive; and
 - shall not travel through central Dalmellington; this is to reduce impact of construction traffic on the Dalmellington historic centre.

Appendix 6.1

L VIA Assessment Methodology

Appendix 6.1: LVIA Assessment Methodology

Introduction

- A6.1.1 This appendix sets out the detailed methodology used for the Glenlee substation extension Landscape and Visual Impact Assessment (LVIA) and Cumulative Landscape and Visual Impact Assessment (CLVIA) set out in **Chapter 6: Landscape and Visual Amenity** of the Environmental Impact Assessment (EIA) Report.
- A6.1.2 Landscape and visual assessments are separate, although linked, processes. LVIA therefore considers the potential effects of a proposed development 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).
- A6.1.3 Whilst landscape and visual effects are linked, this LVIA deals with landscape and visual effects separately, followed by an assessment of cumulative landscape and visual effects where relevant.

Guidance

- A6.1.4 This methodology has been developed by Chartered Landscape Architects (Chartered Members of the Landscape Institute (CMLI)) at LUC, who have extensive experience in the assessment of landscape and visual effects arising from electricity transmission infrastructure (e.g. overhead transmission lines, substation infrastructure etc.) and a wide range of other types and scales of development.
- A6.1.5 The methodology has been developed primarily in accordance with the principles contained within the Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3)ⁱ. Scottish Natural Heritage (SNH) cumulative guidanceⁱⁱ also informs the approach to the assessment of cumulative landscape and visual effects. Whilst this SNH guidance has been prepared in relation to onshore wind energy development the overarching principles of cumulative assessment are of relevance to this methodology.
- A6.1.6 The methodology for the production of accompanying visualisations is based on current good practice guidance¹ as set out by SNHⁱⁱⁱ and the Landscape Institute^{iv,v} and detailed information about the approach to viewpoint photography, and visualisation production is provided in **Appendix 6.2: Visualisation Methodology**.

Scope of the Assessment

- A6.1.7 An LVIA considers physical changes to the landscape as well as changes in landscape character. It also considers changes to areas designated for their scenic or landscape qualities, and the visual impacts of a proposed development as perceived by people.
- A6.1.8 All potentially significant landscape and visual effects (including cumulative effects) are examined, including those relating to construction, operation and, where relevant, decommissioning.
- A6.1.9 Where it is judged that significant effects are unlikely to occur, the assessment of potential effects on **some receptors may be 'scoped out'**. For an EIA development this is usually agreed at scoping stage, or through the iterative detailed design of the development through the EIA process. Effects assessed in full and effects scoped out of the LVIA are detailed in **Chapter 6: Landscape and Visual Amenity**.

LVIA Assessment Methodology

Study Area

- A6.1.10 The study area for an LVIA is determined by the nature and scale of the development proposed and the nature of the surrounding area (e.g. complex topography or extensive tree cover leading to visually enclosed areas may limit the extent of likely significant effects). For the purposes of the LVIA a study area of 2.5km radius from the proposed Glenlee Substation Extension was agreed with statutory consultees (e.g. Dumfries & Galloway Council (D&GC) and SNH) as detailed in **Table 6.1** in **Chapter 6: Landscape and Visual Amenity**.

Methodological Overview

- A6.1.11 The key steps in the methodology for assessing landscape and visual effects are as follows:
- the landscape of the study area is analysed and landscape receptors identified, informed by desk and field survey;
 - the area over which the development will potentially be visible is established through fieldwork based, informed by perceptibility of the existing Glenlee Substation infrastructure;
 - the visual baseline is recorded in terms of the different receptors (groups of people) who may experience views of the development and the nature of their existing views and visual amenity;
 - potential assessment viewpoints are selected, as advocated by GLVIA3 to represent a range of different receptors and views, in consultation with statutory consultees (e.g. D&GC and SNH) as detailed in **Table 6.1** in **Chapter 6: Landscape and Visual Amenity**:
 - **"Representative viewpoints, selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example, certain points may be chosen to represent the views of users of particular public footpaths and bridleways;**
 - **Specific viewpoints, chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, viewpoints in areas of particularly noteworthy visual and/or recreational amenity such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations; and**
 - **Illustrative viewpoints, chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations"** (GLVIA3, Para 6.19, Page 109)
 - likely significant effects on both the landscape as a resource and visual receptors are identified; and
 - the level (and significance) of landscape and visual effects are judged with reference to the nature of the receptor (commonly referred to as the sensitivity of the receptor), which considers both susceptibility and value, and the nature of the effect (commonly referred to as the magnitude of effect), which considers a combination of judgements including size/scale, geographical extent, duration and reversibility.

Direction of Effects

- A6.1.12 As required by the EIA Regulations^{vi}, the assessment must identify the direction of effect as either being beneficial (or positive), adverse (or negative) or neutral.
- A6.1.13 The direction of landscape, visual and cumulative effects (**beneficial, adverse** or **neutral**) is determined in relation to the degree to which the proposal fits with the existing landscape character or views, and the contribution to the landscape or views that the proposed development makes, even if it is in contrast to the existing character of the landscape or views. With regard to electricity transmission infrastructure an **assessment is required to take an objective approach. Therefore, to cover the 'maximum case effect'** situation, potential landscape and visual effects relating to the introduction of electricity transmission infrastructure are generally assumed to be adverse (negative), however, the removal of existing transmission infrastructure (N and R routes) as part of the proposed development is likely to result in beneficial (positive) landscape effects.

¹ Current good practice guidance valid as of 1st June 2019 was considered when progressing the assessment

Method for Assessing Landscape Effects

- A6.1.14

As outlined in GLVIA3 '*An assessment of landscape effects deals with the effects of change and development on landscape as a resource.*' (GLVIA3, Para 5.1, Page 70). Changes may affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.
- A6.1.15

An assessment of landscape effects requires consideration of the nature of landscape receptors (sensitivity of receptor) and the nature of the effect on those receptors (magnitude of effect). GLVIA3 states that the nature of landscape 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 landscape receptor, commonly referred to as its magnitude, should be assessed in terms of size and scale of effect, geographical extent, duration and reversibility.
- A6.1.16

These aspects are considered together, to form a judgement regarding the overall significance of landscape effects (GLVIA3, Figure 5.1 Page 71). The following sections set out the methodology used to evaluate sensitivity and magnitude.

Sensitivity of Landscape Receptors

- A6.1.17

The sensitivity of a landscape receptor to change is defined as **high, medium or low** and is based on weighing up professional judgements regarding susceptibility and value, as set out in **Table A6.1.1** below.

Table A6.1.1: Sensitivity of Landscape Receptors

Sensitivity of Landscape Receptors		
	Higher	Lower
Susceptibility	Attributes that make up the character of the landscape offer very limited opportunities for the accommodation of change without key characteristics being fundamentally altered by electricity transmission infrastructure, leading to a different landscape character.	Attributes that make up the character of the landscape are resilient to being changed by electricity transmission infrastructure.
Value	Landscapes with high scenic quality, high conservation interest, recreational value, important cultural associations or a high degree of rarity. Areas or features designated at a national level e.g. National Parks or National Scenic Areas or key features of these with national policy level protection.	Landscape of poor condition and intactness, limited aesthetic qualities, or of character that is widespread. Areas or features that are not formally designated.

Susceptibility of Landscape Receptors

- A6.1.18

Susceptibility is defined by GLVIA3 as *"the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies"* (GLVIA3 paragraph 5.40).
- A6.1.19

A series of criteria are used to evaluate the susceptibility of Landscape Character Types (LCTs) to electricity transmission infrastructure as set out in **Table A6.1.2** below. Aspects of these criteria are drawn from a range of published sources relating to electricity transmission infrastructure, including The Holford Rules, The Horlock Rules and GLVIA3.

Table A6.1.2: Aspects Influencing Susceptibility of Landscape Receptors to Electricity Transmission Infrastructure

Aspects Influencing Susceptibility of Landscape Receptors to Electricity Transmission Infrastructure		
Criteria	Aspects indicating reduced susceptibility to electricity transmission infrastructure	Aspects indicating greater susceptibility to electricity transmission infrastructure
Scale	Larger scale	Smaller scale
Topography and landform	Undulating and valley landscapes which offer opportunities for screening and backclothing of electricity transmission infrastructure	Presence of strong topographical variety or distinctive landform features Absence of strong topographical variety, featureless, convex or flat with little opportunity for screening and backclothing of electricity transmission infrastructure
Landcover, pattern and complexity	Extensive areas of woodland/forestry cover to reduce views of electricity transmission infrastructure (e.g. providing screening or backclothing of infrastructure) Simple Regular or uniform	Limited woodland/forestry cover to help reduce views of electricity transmission infrastructure (e.g. providing screening or backclothing of infrastructure) Complex Rugged and irregular
Settlement and man-made influence	Presence of contemporary structures e.g. utility, infrastructure or industrial elements	Absence of modern development Presence of small scale, historic or vernacular settlement
Ridges and Skylines	Non-prominent/screened skylines Presence of existing modern man-made features (e.g. other electricity transmission infrastructure, telecommunications masts or wind turbines)	Distinctive, undeveloped skylines Skylines that are highly visible over large areas or exert a large influence on landscape character Skylines with important historic landmarks
Inter-visibility with adjacent landscapes	Little inter-visibility with adjacent sensitive landscapes or viewpoints Visually enclosed	Strong inter-visibility with sensitive landscapes Forms an important part of a view from sensitive viewpoints Visually open
Perceptual aspects	Close to visible or audible signs of human activity and development	Remote from visible or audible signs of human activity and development

- A6.1.20

Published landscape capacity or sensitivity studies (where they exist) have been reviewed to inform the evaluation of susceptibility, in addition to fieldwork undertaken across the study area. This review includes an evaluation as to the relevance of the publication to the assessment being undertaken (e.g. consideration of the purpose and scope of the published studies and whether they are still deemed to be current/up to date).

Value of Landscape Receptors

- A6.1.21

The European Landscape Convention advocates that all landscape is of value, whether it is the subject of defined landscape designation or not: *"The landscape is important as a component of the environment and of people's surroundings in both town and country and whether it is ordinary landscape or*

*outstanding landscape.*² The value of a landscape receptor is recognised as being a key contributing factor to the sensitivity of landscape receptors.

- A6.1.22
- The value of landscape receptors is determined with reference to:
- Review of relevant designations and the level of policy importance that they signify (such as landscapes designated at international, national or local level); and/or
 - Application of criteria that indicate value (such as scenic quality, rarity, recreational value, representativeness, conservation interests, perceptual aspects and artistic associations) as described in GLVIA3, paragraphs 5.44 - 5.47.
- A6.1.23
- Internationally and nationally designated landscapes would generally indicate landscape of higher value whereas those without formal designation (such as a widespread or common landscape type without high scenic quality) are likely to be of lower value, bearing in mind that all landscapes are valued at some level. There is however variation across both designated and undesignated areas, and so judgements regarding value are also informed by fieldwork.
- A6.1.24
- Landscape value is described as being **high**, **medium** or **low**.

Magnitude of Landscape Effect

- A6.1.25
- The overall judgement of magnitude of landscape effect is based on combining professional judgements on size and scale, geographical extent, duration and reversibility. Further information on the criteria is provided below.
- Size and Scale of Effect
- A6.1.26
- For landscape elements/features this depends on the extent of existing landscape elements that would be lost or changed, the proportion of the total extent that this represents, and the contribution of that element to the character of the landscape.
- A6.1.27
- In terms of landscape character, this reflects the degree to which the character of the landscape would change as a result of removal or addition of landscape components, and how the changes would affect key characteristics.
- A6.1.28
- The size and scale of the effect is described as being **large**, **medium**, **small**, or **barely perceptible**.

Geographical Extent of Effect

- A6.1.29
- The geographical extent over which the landscape effect would arise is described as being **large** (widespread or scale of the landscape character type, affecting several landscape types or character areas), **medium** (more immediate surroundings) or **small** (localised, for example at a site level).

Duration of Effect

- A6.1.30
- GLVIA3 states that '*Duration can usually be simply judged on a scale such as short term, medium term or long term.*' For the purposes of the assessment, duration is often determined in relation to the phases of the proposed development, as follows:
- Short-term** effects are those that occur during construction, and may extend into the early part of the operational phase, e.g. construction activities (generally lasting 0 - 5 years); and
 - Long-term** effects are those which occur throughout the operational phase, e.g. presence of electricity transmission infrastructure (generally lasting 5-80 years³).

Reversibility of Effect

- A6.1.31
- In accordance with the principles contained within GLVIA3, reversibility is reported as **reversible**, **partially reversible** or **irreversible** (i.e. permanent), and is related to whether the change can be

reversed at the end of the phase of development under consideration (i.e. at the end of construction or at the end of the operational lifespan of the development).

- A6.1.32
- Judgements on the magnitude of landscape effect (nature of landscape effect) are recorded as **high**, **medium** or **low** and are guided by **Table A6.1.3** below.

Table A6.1.3: Magnitude of Landscape Effect

Magnitude of Landscape Effect			
	Higher	↔	Lower
Size/Scale	Extensive loss of landscape features and/or elements, and/or change in, or loss of key landscape characteristics, and/or creation of new key landscape characteristics	↔	Limited loss of landscape features and/or elements, and/or change in or loss of some secondary landscape characteristics
Geographical Extent	Change in landscape features and/or character extending considerably beyond the immediate site and potentially affecting multiple landscape character types/areas	↔	Change in landscape features and/or character extending contained within or local to the immediate site and affecting only a small part of the landscape character type/area
Duration	Changes experienced for a period of around 5 years or more	↔	Changes experienced for a shorter period of up to 5 years
Reversibility	Change to features, elements or character which cannot be undone or are only partly reversible after a long period	↔	A temporary landscape change which is largely reversible following the completion of construction, or decommissioning of the development

Judging Levels of Landscape Effect and Significance

- A6.1.33
- The final step in the assessment requires the judgements of sensitivity and magnitude of effect to be combined to make an informed professional assessment on the significance of each landscape effect (GLVIA3, Figure 5.1, Page 71).
- A6.1.34
- There may be a complex relationship between the value attached to a landscape and the susceptibility of the landscape to a specific change. Therefore the rationale for judgements on the sensitivity of landscape receptors needs to be clearly set out for each receptor. It should be noted that whilst landscape designations at an international or national level are likely to be accorded the highest value, it does not necessarily follow that such landscapes all have a high susceptibility to all types of change, and conversely, undesignated landscapes may also have high value and susceptibility to change (GLVIA3, Page 90).
- A6.1.35
- This determination requires the application of professional judgement and experience to take on board the many different variables which need to be considered, and which are given different weight according to site-specific and location-specific considerations in every instance. Judgements are made on a case by case basis, guided by the principles set out in **Diagram 1** below and the example descriptions/definitions detailed in the table below. A rigid matrix-type approach, which does not take on board professional judgement and experience, and where the level of effect is defined simply based on the level of sensitivity (nature of receptor) combined with the magnitude of change (nature of effect), is not used. As such, the conclusion on the level of effect is not always the same, or determined through a formulaic process.
- A6.1.36
- Although a numerical or formal weighting system is not applied, consideration of the relative importance of each aspect is made to feed into the overall decision. Levels of effect are identified as **none**, **minor**, **moderate** or **major** as set out in **Table A6.1.4 below**, where moderate and major effects are considered **significant** in the context of the EIA Regulations.

² Council of Europe, (2000). The European Landscape Convention – Council of Europe Treaty Series No. 176.

³ Based on the length of time the existing transmission infrastructure (N and R routes) has been present and the predicted likely lifespan of the proposed infrastructure.

Table A6.1.4: Level and Significance of Landscape Effects

Level and Significance of Landscape Effects	Description/Definition
Major	The proposed development will result in an obvious change in landscape characteristics and character, likely affecting a landscape with a moderate or high susceptibility to that type of change. This level of effect may also occur when a medium scale of effect acts on a nationally valued landscape. The effect is likely to be long-term and affect a relatively large area.
Moderate	The proposed development will result in a noticeable change in landscape characteristics and character, likely affecting a landscape with a moderate susceptibility to that type of change. This level of effect may also occur when a smaller scale of effect acts on a more widely valued landscape, or a larger scale of effect acting on a landscape valued at a more local level. This level of effect may also occur when a large scale of effect occurs over a relatively short period or over a small area.
Minor	The development will result in a small change in landscape characteristics and character over a long-term duration. This level of effect may also occur when a larger scale of effect is of short-term duration or confined to the site.
None	The development will not result in a noticeable (barely perceptible) change in landscape characteristics/character.

Method for Assessing Visual Effects

Significance of Visual Effects

- A6.1.37

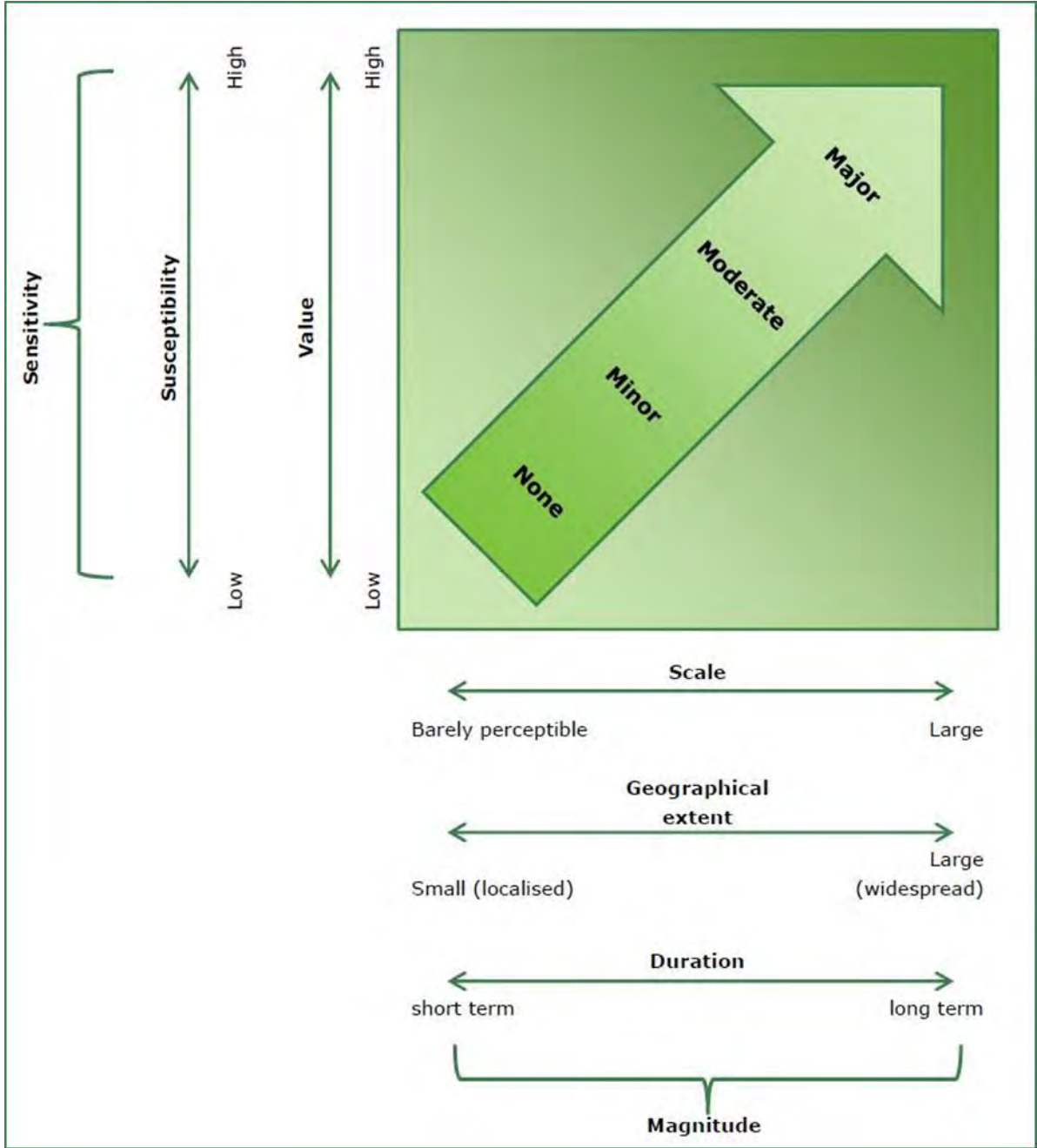
As outlined in GLVIA3 *“An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity”* (GLVIA3, Para 6.1, Page 98). Changes in views may be experienced by people at different locations within the study area including from static locations (normally assessed using representative viewpoints) and whilst moving through the landscape (normally referred to as sequential views, e.g. from roads and walking routes).
- A6.1.38

Visual receptors are individuals or groups of people who may be affected by changes in views and visual amenity. They are usually grouped by their occupation or activity (e.g. residents^{vii}, motorists, recreational users, tourists visiting a specific location or area) and the extent to which their attention is focused on the view (GLVIA3, Paras. 6.31 – 6.32, Page 113).
- A6.1.39

GLVIA3 states that the sensitivity of visual receptors should be assessed in terms of the susceptibility of the receptor to change in views and/or visual amenity and the value attached to particular views. The magnitude of effect should be assessed in terms of the size and scale, geographical extent, duration and reversibility of the effect.
- A6.1.40

These aspects are considered together, to form a judgement regarding the overall significance of visual effect (GLVIA3, Figure 6.1 Page 99). The following sections set out the methodology used to evaluate sensitivity and magnitude.

Diagram 1: Judging levels of effect – Landscape or Visual (including cumulative)



Sensitivity of Visual Receptor

A6.1.41 The sensitivity of a visual receptor to change is defined as **high**, **medium** or **low** and is based on weighing up professional judgements regarding susceptibility and value, and each of their component considerations, as set out in **Table A6.1.5** below.

Table A6.1.5: Level and Significance of Landscape Effects

Sensitivity of Visual Receptors		
	Higher	Lower
Susceptibility	Viewers whose attention or interest is focused on their surroundings, including communities/ individual residential receptors ⁴ / people engaged in outdoor recreation/ visitors to heritage assets or other attractions where views of surrounding area an important contributor.	People whose attention is not on their surroundings (and where setting is not important to the quality of life) such as commuters/ people engaged in outdoor sports/ people at their place of work.
	Views may be recorded in management plans, guide books, and/or which are likely to be experienced by large numbers of people.	Views which are not documented or protected.
Value	Views may be associated with nationally designated landscapes; local authority designated landscapes; designed views recorded in citations for historic parks, gardens/scheduled monuments etc.	Views which are more incidental, and less likely to be associated with somewhere people travel to or stop, or which may be experienced by smaller numbers of people.

Susceptibility of Visual Receptors

A6.1.42 The susceptibility of visual receptors to changes in views/visual amenity is a function of the occupation or activity of people experiencing the view and the extent to which their attention is focused on views (GLVIA 3, para 6.32). This is recorded as **high**, **medium** or **low** informed by **Table A6.1.6** below.

Table A6.1.6: Susceptibility of Visual Receptors

Susceptibility of Visual Receptors		
Higher		Lower
Viewers whose attention or interest is focussed on their surroundings, including: <ul style="list-style-type: none">communities where views contribute to the landscape setting enjoyed by residents;people engaged in outdoor recreation (including users of cycle routes, footpaths and public rights of way whose interest is likely to be focused on the landscape);visitors to heritage assets or other attractions where views of surroundings are an important contributor to experience;formal or promoted stopping places on scenic or tourist routes.	People travelling in vehicles on scenic routes and tourist routes, where attention is focused on the surrounding landscape, but is transitory; People at their place of work whose attention is focused on the surroundings and where setting is important to the quality of working life.	People travelling more rapidly on more major roads, rail or transport routes (not recognised as scenic routes); People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape; people at their place of work whose attention is not on their surroundings (and where setting is not important to the quality of working life).

Value of View or Visual Amenity

- A6.1.43 GLVIA3 also requires evaluation of the value attached to the view or visual amenity and relates this to planning designations and cultural associations (GLVIA3, Para. 6.37, Page 114).
- A6.1.44 Recognition of the value of a view is determined with reference to:
- planning designations specific to views;
 - whether it is recorded as important in relation to designated landscapes (such as views specifically mentioned in the special qualities of a National Scenic Area);
 - whether it is recorded as important in relation to heritage assets (such as designed views recorded in citations of Gardens and Designed Landscapes (GDL) or views recorded as of importance in Conservation Area Appraisals); and
 - the value attached to views by visitors, for example through appearances in guide books or on tourist maps, provision of facilities for their enjoyment and references to them in literature and art.
- A6.1.45 A designated viewpoint or scenic route advertised on maps and in tourist information, or which is a significant destination in its own right, such as a Munro summit, is likely to indicate a view of higher value. High value views may also be recognised in relation to the special qualities of a designated landscape or heritage asset, or it may be a view familiar from photographs or paintings.
- A6.1.46 Views experienced from viewpoints or routes not recognised formally or advertised in tourist information, or which are not provided with interpretation or, in some cases, formal access are likely to be of lower value.
- A6.1.47 Judgements on the value of views or visual amenity are recorded as **high**, **medium** or **low**.

Magnitude of Visual Effect

A6.1.48 The overall judgement of magnitude of visual effect (nature of visual effect) is based on weighing up professional judgements on size and scale, geographical extent, duration and reversibility. Further information on the criteria is provided below.

Size and Scale

- A6.1.49 The size and scale of a visual change depends on:
- the scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the proposed development;
 - the degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and texture; and
 - the nature of the view of the proposed development, in terms of the relative amount of time over which it will be experienced and whether views will be full, partial or glimpsed.
- A6.1.50 All changes are assumed to be during winter, representing a 'maximum case effect' scenario with minimal screening by deciduous vegetation and trees.
- A6.1.51 The methodology and baseline data to inform the production of visualisations is presented in **Appendix 6.2: Visualisation Methodology**.
- A6.1.52 In this assessment size/scale of visual change is described as being **large**, **medium**, **small** or **barely perceptible**.

Geographical Extent

A6.1.53 The geographical extent of a visual change records the extent of the area over which the changes will be visible e.g. whether this is a unique viewpoint from where the proposed electricity transmission infrastructure can be glimpsed, or whether it represents a larger area from which similar views are gained. Geographical extent is described as being **large** (widespread), **medium** or **small** (localised).

Duration

A6.1.54 The duration of visual effects is reported as **short-term** or **long-term**, as defined for the duration of landscape effects (see above).

⁴ Consideration of changes in views experience from private residencies informed by the approach detailed in Landscape Institute Technical Guidance Note 2/19 Residential Visual Amenity Assessment (RVAA)^{vii}

Reversibility

- A6.1.55 Reversibility is reported as **irreversible** (i.e. permanent), **partially reversible** or **reversible**, and is related to whether the visual change can be reversed at the end of the phase of development under consideration (i.e. at the end of construction or at the end of the operational lifespan of the development). Operational visual effects associated with the proposed substation infrastructure have been considered to be irreversible. Although unlikely for practical system operation reasons, the decommissioning and reinstatement of infrastructure located within the pre-existing substation or proposed substation extension site is possible, for the purposes of the assessment all visual effects associated with substation infrastructure (e.g. all infrastructure such as terminal towers, gantries and ancillary substation componentry contained within the existing or extended substation compound) are deemed to be irreversible.
- A6.1.56 Judgements on the magnitude of visual effect are recorded as **high**, **medium** or **low** guided by **Table A6.1.8** below.

Table A6.1.8: Magnitude of Visual Effects

Magnitude of Visual Effects		
	Higher	↔ Lower
Size/Scale	A large visual change resulting from the proposed development is the most notable aspect of the view, perhaps as a result of the development being in close proximity, or because a substantial part of the view is affected, or because the development introduces a new focal point and/or provides contrast with the existing view and/or changes the scenic qualities of the view.	↔ A small or some visual change resulting from the proposed development as a minor or generally unnoticed aspect of the view, perhaps as a result of the development being in the distance, or because only a small part of the view is affected, and/or because the development does not introduces a new focal point or is in contrast with the existing view and/ does not change the scenic qualities of the view.
Geographical Extent	The assessment location is clearly representative of similar visual effects over an extensive geographic area.	↔ The assessment location clearly represents a small geographic area.
Duration	Visual change experienced over around 5 years or more	↔ Visual change experienced over a short period of up to 5 years.
Reversibility	A permanent visual change which is not reversible or only partially reversible following decommissioning of the proposed development.	↔ A temporary visual change which is largely reversible following the completion of construction, or decommissioning of the proposed development.

Direction of Visual Effects

- A6.1.57 The direction of visual effects (**beneficial**, **adverse** or **neutral**) is determined in relation to the degree to which the proposal fits with the existing view and the contribution to the view that a proposed development makes, even if it is in contrast to the existing character of the view.
- A6.1.58 With regard to the introduction of electricity transmission infrastructure and **to cover the 'maximum case effect' situation**, **potential** visual effects are generally assumed to be adverse.

Judging the Level of Visual Effect and Significance

- A6.1.59 As for landscape effects, the final step in the assessment requires the judgements on sensitivity of visual receptor and magnitude of visual effect to be combined to make an informed professional assessment on the significance of each visual effect.
- A6.1.60 The evaluations of the individual aspects set out above (susceptibility, value, size and scale, geographical extent, duration and reversibility) are considered together to provide an overall profile of each identified visual effect. An overview is then taken of the distribution of judgements for each aspect to make an informed professional assessment of the overall level of effect, drawing on good practice guidance provided in GLVIA3.

- A6.1.61 The sensitivity of visual receptors may involve a complex relationship between a visual receptors (e.g. **people's**) **susceptibility to change** and the value attached to a view. Therefore the rationale for judgements of sensitivity is clearly set out for each receptor in relation to both its susceptibility (to the type of change proposed) and its value.
- A6.1.62 A rigid matrix-type approach, where the level of visual effect is defined simply based on the level of sensitivity combined with the magnitude of effect is not used. As such, the conclusion on the level of effect is not always the same. Although a numerical or formal weighting system is not applied, consideration of the relative importance of each aspect is made to feed into the overall decision. Levels of visual effect are identified as **none**, **minor**, **moderate** or **major**, where moderate and major visual effects are considered **significant** in the context of the EIA Regulations.
- A6.1.63 This determination requires the application of professional judgement and experience to take on board the many different variables which need to be considered, and which are given different weight according to site-specific and location-specific considerations in every instance. As such, the conclusion on the level of effect is not always the same. Judgements are made on a case by case basis, guided by the principles illustrated in **Diagram 1** above, and the example descriptions/definitions detailed in **Table A6.1.9** below.

Table A6.1.9: Level and Significance of Visual Effects

Level and Significance of Visual Effects	Description/Definition
Major	The proposed development will result in an obvious change in view, likely affecting a visual receptor with a moderate or high susceptibility to that type of change. This level of effect may also occur when a medium scale of effect acts on a nationally valued view and/ or a high susceptibility receptor. The effect is likely to be long-term and affect a relatively large area or relatively large number of people.
Moderate	The proposed development will result in a noticeable change in a view, likely affecting a viewer with a moderate susceptibility to that type of change and/ or locally valued view. This level of effect may also occur when a smaller scale of change acts on a higher susceptibility receptor or affects a large number of people, or a larger scale of effect acting on a lower susceptibility receptor or affecting fewer people. This level of effect may also occur when a large scale of effect occurs over a relatively short period or over a small area/ affects few people.
Minor	The development will result in a small change in view over a long-term duration, likely affecting a smaller geographic extent and/ or fewer people. This level of effect may also occur when a larger scale of effect is of short-term duration or is confined in its geographical extent.
None	The development will not result in a noticeable (barely perceptible) change in views.

Cumulative Landscape & Visual Impact Assessment (CLVIA)

- A6.1.64 The aim of a Cumulative Landscape and Visual Impact Assessment (CLVIA) is to identify any interactions with other types of development (including transmission infrastructure, wind farms or other large scale development) which could result in further significant landscape and visual effects not identified within the LVIA.
- A6.1.65 SNH has prepared guidance relating to the cumulative assessment of wind energy developments: *Assessing the Cumulative Impact of Onshore Wind Energy Developments*^{Error! Bookmark not defined.}. Whilst this guidance specifically relates to wind farms, many of the overarching principles are of relevance to the cumulative assessment of other types of development. This guidance states that the aim of CLVIA is to: *"describe, visually represent and assess the ways in which a proposed windfarm would have additional impacts when considered together with other existing, consented or proposed windfarms"* (Para. 55, SNH, 2012).
- A6.1.66 The cumulative assessment therefore focuses on the *additional* cumulative change which may result from the introduction of a proposed development. The cumulative assessment may also make reference to *total* (also referred to as combined) cumulative effects, where these have the potential to be significant. A cumulative assessment considers the potential interactions between different types of development (including wind farms, other energy generation stations or other large scale development) if these are likely to result in similar landscape and visual impacts.
- A6.1.67 As with an LVIA, a CLVIA deals with cumulative landscape and visual effects separately.

Differences between LVIA and CLVIA

- A6.1.68 Although both LVIA and CLVIA look at the effects of a proposed development on the landscape and on views, there are differences in the baseline against which the assessments are carried out.
- A6.1.69 For the LVIA, the baseline includes existing developments (including transmission infrastructure, wind farms other large scale development) which are present in the landscape at the time of undertaking the assessment, which may be either operational or under construction, and as such they are assumed to form a part of the baseline situation. Their presence has the potential to influence the assessment of effects on landscape character and the assessment of effects on views.
- A6.1.70 For the CLVIA the baseline is partially speculative and considers transmission infrastructure, wind farms or other large scale development which have been granted planning consent but are not yet constructed (consented); and developments which are the subject of a submitted valid application which are currently awaiting determination by the relevant consenting authority, including those at appeal and in some instances those currently at scoping when specifically requested (proposed)⁵.
- A6.1.71 The cumulative assessment considers the operational and under construction sites, as well as consented and proposed sites, and differs from that contained in the LVIA in that it focuses specifically on the cumulative effects of the proposed development arising in association with all other transmission infrastructure, wind farms or other large scale developments, and assesses the relationship between them.
- A6.1.72 Where the magnitude of change that would occur as a result of the introduction of the proposed development in the LVIA is identified as either low or barely perceptible, potential cumulative effects are often not assessed in the cumulative assessment as it is considered that such an addition would not give rise to a significant cumulative effect.

Types of Cumulative Effects

- A6.1.73 Assessing the Cumulative Impact of Onshore Wind Energy Developments^{Error! Bookmark not defined.} states that *"cumulative landscape effects can impact on either the physical fabric or character of the landscape, or any special values attached to it"* (Para. 48, SNH, 2012).
- A6.1.74 Three types of cumulative effects on visual amenity are considered in the assessment: combined, successive and sequential:

- **Combined** effects occur where a static viewer is able to view two or more developments from a **viewpoint within the viewers' same arc of vision (assumed to be about 90 degrees for the purpose of the assessment)**;
- **Successive** effects occur where a static viewer is able to view two or more developments from a viewpoint, but needs to turn to see them; and
- **Sequential** effects occur when a viewer is moving through the landscape from one area to another, for instance when a person is travelling along a road or footpath, and is able to see two or more developments at the same, or at different times as they pass along the route. Frequently sequential effects occur where developments appear regularly, with short time lapses between points of visibility. Occasionally sequential effects occur where long periods of time lapse between views of developments, depending on speed of travel and distance between viewpoints.

CLVIA Assessment Methodology

Study Area

- A6.1.75 The study area for a CLVIA is determined by the nature and scale of the development proposed, the nature of the surrounding area (e.g. complex topography or extensive tree cover leading to visually enclosed areas may limit the extent of likely significant effects), and informed by the location, pattern and distribution of existing, consented and proposed developments which may give rise to similar landscape and visual effects as the proposed development. For the purposes of the EIA a study area of 10km radius from the proposed development was agreed with statutory consultees (e.g. D&GC and SNH) as detailed in **Figure 2.1** within the EIA Report.
- A6.1.76 Informed by the extent of likely significant landscape and visual effects arising from the introduction of the proposed substation extension and the distribution of other developments within a 10km radius of the proposed development, a refined study area of 2.5km radius has been used for the consideration of cumulative landscape and visual effects. The developments which this study area encompasses are shown on **Figure 6.1**, and are limited to the following proposed Kendoon to Tongland 132kV Reinforcement (KTR) Project connections:
- Polquhanity to Glenlee via Kendoon;
 - Earlstoun to Glenlee;
 - BG Route Deviation; and
 - Glenlee to Tongland.
- A6.1.77 No other developments presented on **Figure 2.1** have been considered in the CLVIA.

Methodological Overview

- A6.1.78 The CLVIA considers the potential effects of the addition of the proposed development, against a baseline that includes existing transmission infrastructure (such as the pre-existing Glenlee Substation infrastructure), Glenlee hydro power station and the proposed KTR Project Connections (overhead transmission line infrastructure, as detailed above), that may or may not be present in the landscape in the future, following determination of Section 37 consent applications⁶. The developments included are assumed to be present in the landscape for the purposes of the CLVIA.
- A6.1.79 As the existing BG Route (subject to the BG Deviation) and R Route (north and south of Glenlee) will be relocated or decommissioned as part of the KTR Project, these developments are assumed not to be present in the landscape for the purposes of the CLVIA.
- A6.1.80 The methodology for the CLVIA follows that of the LVIA, which considers the introduction of the proposed development to a baseline which includes existing (operational and under construction) developments. The size and scale of cumulative change focuses on:
- the number of other existing, consented and/or proposed developments visible;

⁵ A cut-off date of 1st June 2019 was applied for the inclusion of developments to be considered in the CLVIA.

⁶ The Section 37 consent applications for the individual connections which form The Kendoon to Tongland 132kV Reinforcement Project will be submitted in Autumn 2019, accompanied by an EIA Report. The cumulative assessment presented within this EIA Report assumes that the KTR Project is at the application stage.

- the pattern and arrangement of developments in the landscape or view, e.g. developments seen in one direction or part of the view (combined views), or seen in different directions (successive views in which the viewer must turn) or developments seen sequentially along a route;
- the relationship between the scale of the developments (similar scale developments or scales of development which are clearly at odds with each other);
- the position of the developments in the landscape, e.g. in similar landscape or topographical context;
- the position of the developments in the view, e.g. on the skyline or against the backdrop of land; or how the proposed development will be seen in association with another development (separate, together, behind etc.); and
- the distances between developments, and their distances from the viewer.

Significance of Cumulative Effects

- A6.1.81 As for the LVIA, judging the significance of cumulative landscape and visual effects requires consideration of the sensitivity and the magnitude of effect on those receptors. The following sections set out the methodology applied for the assessment of cumulative effects for both landscape and visual receptors and explain the terms used.

Assessing Cumulative Landscape Effects

Sensitivity

- A6.1.82 An assessment of cumulative landscape effects requires consideration of the sensitivity of the landscape receptors. This requires consideration of susceptibility and value, and is as recorded in the LVIA.

Magnitude of Cumulative Landscape Effects

- A6.1.83 Similarly to the methodology applied for the LVIA, the magnitude of cumulative landscape effect (nature of cumulative landscape effect) is based on combining professional judgements on size and scale, geographical extent, duration and reversibility. Judgements on the magnitude of cumulative landscape effect (nature of cumulative visual effect) are recorded as **high**, **medium** or **low**.

Size and Scale

- A6.1.84 The size/scale of cumulative landscape change is the additional influence the proposed development has on the characteristics and character of the area assuming the other transmission infrastructure/energy developments considered in the CLVIA baseline scenarios are already present in the landscape. This is influenced by:
- how the proposal fits with existing pattern of cumulative developments, including the relationship to landscape character types and areas; and
 - the siting and design of the proposed development in relation to other existing and proposed developments (including distance between developments, composition, size and scale).

Geographical Extent

- A6.1.85 As for the LVIA, the geographical extent over which the cumulative landscape change will be experienced is described as being **large** (scale of the landscape character type, or widespread, affecting several landscape types or character areas), **medium** (immediate surroundings) or **small** (site level).

Duration & Reversibility

- A6.1.86 For the purpose of the cumulative landscape assessment consideration of the judgements of the duration and reversibility of landscape effects are as recorded in the LVIA.
- A6.1.87 Judgements on the magnitude of cumulative landscape effect are recorded as **high**, **medium** or **low**.

Levels of Cumulative Landscape Effect and Significance

- A6.1.88 The final step in the assessment of cumulative landscape effects requires the judgements of sensitivity and magnitude of cumulative landscape effect to be combined to make an informed professional assessment on the significance of each cumulative landscape effect.

- A6.1.89 As for the LVIA the levels of cumulative landscape effect are described as **none**, **minor**, **moderate** or **major**, where moderate and major cumulative landscape effects are considered **significant** in the context of the EIA Regulations.

- A6.1.90 Significant effects are likely where:

- The proposed development extends or intensifies a landscape effect;
- **The proposed development 'fills' an area such that it alters the landscape resource;** and/or
- the interaction between the proposed development and other developments means that the total effect on the landscape is greater than the sum of its parts.

- A6.1.91 *GLVIA 3 states 'The most significant cumulative landscape effects are likely to be those that would give rise to changes in the landscape character of the study area of such an extent as to have major effects on its key characteristics and even, in some cases, to transform it into a different landscape type. This may be the case where the project being considered itself tips the balance through its additional effects. The emphasis must always remain on the main project being assessed and how or whether it adds to or combines with the others being considered to create a significant cumulative effect'* (para 7.28 GLVIA 3).

- A6.1.92 This determination of cumulative landscape effects requires the application of professional judgement and experience to take on board the many different variables which need to be considered, and which are given different weight according to site-specific and location-specific considerations in every instance. Judgements are made on a case by case basis, guided by the same principles as set out in **Diagram 1**, and the typical descriptions/definitions of potential landscape effects set out above.

Assessing Cumulative Visual Effects

Sensitivity

- A6.1.93 The assessment of the significance of cumulative visual effects requires consideration of the sensitivity of the visual receptors. This requires consideration of susceptibility and value, and is as recorded in the LVIA.

Magnitude of Cumulative Visual Effects

- A6.1.94 As for cumulative landscape effects and the methodology for the LVIA, the magnitude of cumulative visual effect (nature of cumulative visual effect) is based on combining professional judgements on size and scale; geographical extent; duration and reversibility. Judgements on the magnitude of cumulative visual effect (nature of cumulative visual effect) are recorded as **high**, **medium**, **low** or **barely perceptible**.

Size and Scale

- A6.1.95 The size/scale of cumulative change to views depends on the additional influence the proposed development has on views assuming the other developments considered in the cumulative assessment are already present in the landscape. This is influenced by:
- Whether the proposed development introduces development into a new part of the view so that the proportion of the developed part of the view increases;
 - the relationship between the proposed development and other developments in terms of design, size and layout;
 - the apparent visual relationship of cumulative developments to landscape character types and or landscape character areas; and/or
 - in the case of magnitude of change to routes, the relative duration of views of developments from routes.

- A6.1.96 There has to be clear visibility of more than one cumulative development, of which one must be the proposed development, for there to be a cumulative effect (given this is an assessment of the effects of the proposed development and not a broader CLVIA of combined cumulative effects or capacity study). Where the proposed development is clearly visible and other developments are not, the effect is likely to be the same as recorded in the LVIA (i.e. the effect is not a cumulative effect).

Geographical Extent

- A6.1.97 As for the LVIA, the geographical extent of cumulative visual changes records the extent of the area over which the changes will be visible e.g. whether this is a unique viewpoint from where the proposed development and other cumulative developments can be glimpsed, or whether it represents a large area from which similar views are gained from large areas. Geographical extent is described as being **large**, **medium** or **small**.

Duration & Reversibility

- A6.1.98 For the purpose of the cumulative visual assessment consideration of the judgements of the duration and reversibility of visual effects are as recorded in the LVIA.

Levels of Cumulative Visual Effect and Significance

- A6.1.99 The final step in the assessment of cumulative visual effects requires the judgements of sensitivity and magnitude of cumulative visual effect to be combined to make an informed professional assessment on the significance of each cumulative visual effect.
- A6.1.100 As for the LVIA the levels of cumulative visual effect are described as **none**, **minor**, **moderate** or **major** where moderate and major cumulative visual effects are considered **significant** in the context of the EIA Regulations.
- A6.1.101 The evaluations of susceptibility, value, size and scale, geographical extent, duration and reversibility are considered together to provide an overall profile of each identified visual effect. An overview is taken of the distribution of judgements for each aspect to make an informed professional assessment of the overall level of each visual effect, drawing on guidance provided in GLVIA3. Levels of effect are identified as **none**, **minor**, **moderate** or **major** where moderate and major visual effects are considered significant in the context of the EIA Regulations.
- A6.1.102 Most significant effects are likely where:
- the proposed development extends or intensifies a visual effect;
 - the proposed development 'fills' an area such that it alters the view/visual amenity;
 - the interaction between the proposed development and other developments means that the total visual effect is greater than the sum of its parts; and/or
 - the proposed development will lengthen the time/duration over which effects are experienced (sequential effects).
- A6.1.103 This determination of cumulative visual effects requires the application of professional judgement and experience to take on board the many different variables which need to be considered, and which are given different weight according to site-specific and location-specific considerations in every instance. Again, as for the assessment of landscape and visual effects, judgements are made on a case by case basis, guided by the same principles as set out in **Diagram 1** and the typical descriptions/definitions of potential visual effects set out above.

Residential Visual Amenity

Background

- A6.1.104 The Landscape Institute published Residential Visual Amenity Assessment (RVAA) Guidance^{vii} in early 2019 setting out the background and approach to the assessment of potential effects on residential visual amenity. The guidance states that *"Residential Visual Amenity Assessment (RVAA) is a stage beyond LVIA and focusses exclusively on private views and private visual amenity."* (Foreword, Page 2).
- A6.1.105 This is reinforced by the guidance provided in GLVIA3^l, which states: *"Effects of development on private property are frequently dealt with mainly through 'residential amenity assessments'. These are separate from LVIA although visual effects assessment may sometimes be carried out as part of a residential amenity assessment, in which case this will supplement and form part of the normal LVIA for a project. Some of the principles set out here for dealing with visual effects may help in such assessments but there are specific requirements in residential amenity assessment."* (Para. 6.17, Page 107 and 109).
- A6.1.106 It is also important to note that residential visual amenity is only one component of residential amenity and should be considered in conjunction with assessments of potential effects on the other components of residential amenity including noise, dust, access to daylight, vibration and electromagnetic field etc. and which may otherwise be referred to collectively as 'living conditions'.
- A6.1.107 With respect to visual effects, the focus of LVIA is on public views and public visual amenity which are given due consideration in the planning process. In respect of private views and visual amenity, it is widely accepted that no one has 'a right to a view', including situations where the visual amenity of a property is judged to be significantly affected by a proposed development. As a consequence, views from private residences are not a 'material consideration' in the determination of an application for planning or associated consents. However, in instances where the views of development from a property or its curtilage are judged to be so overbearing or unavoidable in key/principal views that they become a material planning consideration which is of greater public interest.
- A6.1.108 GLVIA3^l provides further clarification of the differences between LVIA and RVAA: *"The issue of whether residents should be included as visual receptors and residential properties as private viewpoints has been discussed in Paragraph 6.17. If discussion with the competent authority suggests that they should be covered in the assessment of visual effects it will be important to recognise that residents may be particularly susceptible to changes in their visual amenity - residents at home, especially using rooms normally occupied in waking or daylight hours, are likely to experience views for longer than those briefly passing through an area. The combined effects on a number of residents in an area may also be considered, by aggregating properties within a settlement, as a way of assessing the effect on the community as a whole. Care must, however, be taken first to ensure that this really does represent the whole community and second to avoid double counting of the effects"*. (Para. 6.36, Page 114).
- A6.1.109 The RVAA guidance introduces an approach to considering a potential 'Residential Visual Amenity Threshold', beyond which effects may be of *"such nature and/or magnitude that it potentially affects 'Living Conditions' or residential Amenity"* (Para. 2.1, Page 5).
- A6.1.110 The guidance highlights that *"LVIA prepared in accordance with GLVIA3 provides an appropriate starting point for a RVAA."* (Para. 2.4, Page 5), and recommends four step approach (Figure 1 RVAA Process, page 7) and which draws heavily on the GLVIA3 principles and process. The first three steps of the approach *"fall broadly within the normal scope of LVIA consisting of an assessment of the magnitude and significance of visual effect (in the EIA context) and change to visual amenity likely to be experienced by occupants at those individual residential properties which were identified"* (Para. 3.2, Page 6). The fourth step *"requires a further assessment of change to visual amenity examining whether the Residential Visual Amenity Threshold is likely to be, or has been, reached. Whether or not this final step is engaged depends on the circumstances specific to the case."* (Para. 3.3, Page 6).

Identification of Residential Properties to be Assessed

- A6.1.111 The assessment of potential effects on views and visual amenity from residential properties considers properties located within the immediate vicinity of the proposed development (to determine whether any potential visual effects require further consideration through more detailed study as part of a RVAA, in line with the RVAA guidance (para 4.7, page 10). An assessment of potential changes in the view from each property is undertaken, however where appropriate some properties may be grouped, where similar views may be experienced from a number of properties located in particularly close proximity to one another.

Approach to Consideration of Visual Effects from Residential Properties

- A6.1.112 As set out above it is important to note that the assessment of effects on residential visual amenity is often distinctly separate from the assessment of visual effects as covered in a standard LVIA. Nevertheless, in order to determine whether more detailed consideration of effects on views and visual amenity from residential properties is required, in the form of an RVAA, potential effects on views and visual amenity from residential properties in closest proximity to the proposed Glenlee Substation Extension, experienced during construction and operation, has been undertaken.
- A6.1.113 It is this distinction between LVIA and RVAA which has informed the approach to considering potential effects on views and visual amenity in relation to the introduction of the proposed KTR Project connections, and *"In any event RVAA should be considered supplementary to LVIA following on from, and informed by, the latter's findings and conclusions."* (Para. 3.3, Page 6).

Sensitivity of Residential Receptors

- A6.1.114 As advocated in Landscape Institute Guidance receptors at their homes are often judged to be most susceptible to changes in views and visual amenity. GLVIA3 **Error! Bookmark not defined.** states at paragraph 6.36: *"in the assessment of visual effects it will be important to recognise that residents may be particularly susceptible to changes in their visual amenity - residents at home, especially using rooms normally occupied in waking or daylight hours, are likely to experience views for longer than those briefly passing through an area."*
- A6.1.115 As outlined in Landscape Institute Guidance (para 4.23)^{viii} residential receptors (people) are considered to be of high susceptibility to changes in views from their places of residence (property, curtilage, and access). An appreciation of the surrounding views is often material to the quality of life from residential properties, therefore the value of these views is typically considered to be high. However, this may vary and is determined in relation to the availability and nature of existing views, including the presence of other existing transmission infrastructure (such as the pre-existing Glenlee Substation infrastructure, BG Route and R Route), Glenlee hydro power station, or other infrastructure in views.
- A6.1.116 The nature of the existing view, including the direction of the view, the orientation of buildings, location of garden or curtilage areas, access and the presence of intervening features such as vegetation are considered, whilst the seasonality of vegetation screening and potential changes to forestry are referred to where applicable.
- A6.1.117 Taking account of the susceptibility of receptors and the value of views from residential properties, the overall sensitivity of residential receptors is typically judged to be **high** and is referred to as such throughout the assessment.

Magnitude of Visual Change

- A6.1.118 In order to establish whether visual effects are of such magnitude that they require further consideration as part of a more detailed RVAA (final fourth step) and thus warrant material consideration within the **planning balance**, it is important to determine whether these effects make the property 'an unattractive place to live'. Potential significant adverse effects on views and visual amenity, in the context of the EIA Regulations^{vi}, experienced by people at their place of residence as a result of introducing a new development are not uncommon, but in themselves may not trigger further consideration in the **planning balance as a 'material consideration'**.
- A6.1.119 As outlined in the RVAA guidance, *"Determining whether the threshold has been reached requires informed professional judgement. It is the process by which informed professional judgement is engaged to reach a conclusion regarding the Residential Visual Amenity Threshold that is the subject of this Technical Guidance Note."* (Para. 2.2, Page 5), informed by the *"LVIA findings of significant (adverse) effects on outlook and /or on visual amenity at a residential property do not automatically imply the need for a RVAA. However, for properties in (relatively) close proximity to a development proposal, and which experience a high magnitude of visual change, a RVAA may be appropriate, and may be required by the determining / competent authority."* (Para. 2.5, Page 5).
- A6.1.120 In line with Step 3 of the RVAA guidance, the consideration of visual effects from residential properties in the LVIA therefore concludes *"by identifying which properties should be assessed further in the final step in order to reach a judgement regarding the Residential Visual Amenity Threshold."* (Para. 4.16, Page 12). Typically this will be limited to those properties judged to experience a **high** magnitude of visual change, resulting in major significant adverse visual effects, as a consequence of the introduction of the proposed development.

Further Residential Visual Amenity Assessment (RVAA)

- A6.1.121 In the event that more detailed examination of effects on residential visual amenity is required, as identified during Step 3 of the process advocated with the RVAA Guidance, properties which are predicted to experience the largest magnitude of visual effect will be subject to a further judgement regarding the Residential Visual Amenity Threshold.
- A6.1.122 As detailed in the RVAA Guidance, *"This concluding judgement should advise the decision maker whether the predicted effects on visual amenity and views at the property are such that it has reached the Residential Visual Amenity Threshold, therefore potentially becoming a matter of Residential Amenity. This judgement should be explained in narrative setting out why the effects are considered to reach the Residential Visual Amenity Threshold. Equally, judgements should explain why the threshold has not been reached."* (Para. 4.18, Page 12).
- A6.1.123 It is however important to note that any judgement in relation to the Residential Visual Amenity Threshold *"goes beyond the assessment undertaken in Step 3 which is restricted to judging the magnitude and significance of visual effect, typically as a supplement to the accompanying LVIA."* (Para. 4.20, Page 12), and as such, the detailed approach and methodology to inform this concluding step is not presented here. In the event that effects identified within the LVIA and/or CLVIA undertaken during Step 3, and in accordance with GLVIA3 principles and processes, require further consideration, the RVAA approach to Step 4 would be undertaken in accordance with the approach advocated within the LI RVAA Guidance.

ⁱ The Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition

ⁱⁱ Scottish Natural Heritage (2012) Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments

ⁱⁱⁱ Scottish Natural Heritage (2017) Visual Representation of Wind Farms Guidance, Version 2.2

^{iv} The Landscape Institute (2011) Advice Note 01/11, Photography and photomontage in landscape and visual impact assessment

^v The Landscape Institute (2017) Technical Guidance Note 02/17: Visual Representation of Development Proposals

^{vi} The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations (2017) (as amended)

^{vii} The Landscape Institute (February 2019) Technical Guidance Note 2/19: Residential Visual Amenity Assessment (RVAA)

Appendix 6.2

Visualisation Methodology

Appendix 6.2: Visualisation Methodology

Introduction

- A6.2.1 This appendix sets out the approach to the production of visualisations which accompany the Glenlee substation extension Landscape and Visual Impact Assessment (LVIA) and Cumulative Landscape and Visual Impact Assessment (CLVIA) set out in **Chapter 6: Landscape and Visual Amenity** of the Environmental Impact Assessment (EIA) Report.
- A6.2.2 The methodology for the production visualisations is based on current good practice guidance from Scottish Natural Heritage (SNH)ⁱ and the Landscape Institute^{ii,iii,iv}. Further information about the approach is provided below.

Reference Base Mapping

- Ordnance Survey (OS) Maps:
 - Landranger 1:50,000 Scale (Sheet 77);
 - Explorer 1:25,000 Scale (Sheets 318, 319, 320, 328);
- Online map search engines:
 - Bing, mapping website. (Online - Available at: www.bing.com/maps); and
 - Google, mapping website. (Online - Available at: www.maps.google.com).

Data Used for Digital Terrain Modelling (DTM) and Figures

- OS Terrain® 5 mid-resolution height data (DTM) (5m grid spacing, 2.5 metres RMSE);
- OS Terrain® 50 mid-resolution height data (DTM) (50m grid spacing, 4 metres RMSE);
- Ordnance Survey 1:25,000 raster data (to provide detailed maps for viewpoint locations);
- Ordnance Survey 1:50,000 raster data (to show surface details such as roads, forest and settlement detail equivalent to the 1:50,000 scale Landranger maps);
- Ordnance Survey 1:250,000 raster data (to provide a more general location map); and
- Aerial Imagery (2m resolution) from Jul 2017 to June 2018 © Getmapping Plc.

Viewpoint Photography

- A6.2.3 The methodology for undertaking viewpoint photography is in accordance with guidance from Scottish Natural Heritage (SNH, 2017) and the Landscape Institute (Landscape Institute (LI), 2011). The focal lengths used are in accordance with recommendations contained in guidance, and are stated on the figures. Photography was undertaken by LUC between November 2017 and April 2019. A Nikon D750 full frame sensor digital single lens reflex (SLR) camera with a fixed 50mm focal length lens was used to undertake photography from all viewpoint locations.
- A6.2.4 A tripod with vertical and horizontal spirit levels is used to provide stability and to ensure a level set of adjoining images. The camera is orientated to take photographs in portrait format from locations in close proximity to the development site to show increased vertical context of the baseline. Photography from Viewpoint locations 1 and 2 was taken in portrait format to maximise the vertical extents of the images illustrating the close proximity views of the existing transmission infrastructure within the views. A panoramic head is used to ensure the camera rotated about the no-parallax point of the lens in order to eliminate parallax errors¹ between the successive images and enable accurate stitching of the images. The camera is moved through increments of 15° and rotated through a full 360° at each viewpoint, with 24 photographs taken in portrait format. Photography from viewpoint locations 3, 4 and 5 was taken in

landscape format and a single 50mm frame centred on the development site is used as the baseline for each of these images.

- A6.2.5 The location of each viewpoint and information about the conditions is recorded in the field in accordance with SNH (SNH, 2017) and LI guidance (LI, 2011).
- A6.2.6 Weather conditions and visibility were considered an important aspect of the field visits for the photography. Where possible, visits were planned around clear days with good visibility. Viewpoint locations were visited at times of day to ensure, as far as possible, that the sun lit the scene from behind, or to one side of the photographer. South facing viewpoints can present problems particularly in winter when the sun is low in the sky. Photography opportunities facing into the sun were avoided where possible to prevent the overhead transmission infrastructure appearing in silhouette.
- A6.2.7 Adjustments to lighting of the proposed electricity transmission infrastructure are made in the rendering software to make the infrastructure appear realistic in the view under the particular lighting and atmospheric conditions present at that time the photography was taken.

Visualisations

Figure Layout

- A6.2.8 Adobe InDesign® software is used to present the figures. The dimensions for each image (printed height and field of view) along with the OS coordinates of the viewpoint locations, Above Ordnance Datum (AOD) height at the location, direction of view to the centre of the image and camera and photography details are included on each page.
- A6.2.9 Views from two viewpoints (**Figure 6.4** - Viewpoint 1: Rear of Residential Property: Rannoch; and **Figure 6.5** - Viewpoint 2: Rear of Residential Property: Orrin) are illustrated with photomontage visualisations and presented as follows:
- Viewpoint location map (A3);
 - **Panoramic baseline photography (90° cylindrical projection)** (A1 width, elongated A3);
 - Panoramic Photomontage – **substation extension only (90° cylindrical projection)** (A1 width, elongated A3);
 - Panoramic Photomontage – substation extension and landscape mitigation proposals (**90° cylindrical projection**) (A1 width, elongated A3); and
 - Panoramic Photomontage – substation extension, landscape mitigation proposals and relevant KTR Connections (**90° cylindrical projection**) (A1 width, elongated A3).
- A6.2.10 Views from more distant viewpoints (**Figure 6.6** - Viewpoint 3: Southern Upland Way at Waterside Hill; **Figure 6.7** - Viewpoint 4: St. John's Town of Dalry Church; and **Figure 6.8** - Viewpoint 5: Mulloch Hill) from where the proposed development is largely imperceptible, are illustrated with annotated baseline photography indicating the extents of the proposed development and the influence of existing landform, built development and woodland in screening views from the wider extents of the study area:
- Viewpoint location map (A3); and
 - Annotated baseline photography (**40° planar projection**) (A3).

Photographic Stitching, Wirelines and Photomontages

- A6.2.11 Photographic stitching software PTGui© and Adobe Photoshop© is used to stitch together the adjoining frames to create panoramic baseline photography.
- A6.2.12 The software package 43d Topos is used to create a digital terrain model (DTM) from OS Terrain® 5 and OS Terrain® 50 height data. The DTM includes all landform visible within the baseline photography. Existing buildings and the main transmission infrastructure visible within the photography were modelled from the development layout AutoCAD© DWGs provided by SP Energy Networks (SPEN) and imported to the DTM. Viewpoint location coordinates are entered to replicate the camera views for the visualisations. The Topos camera view exports were imported into Adobe Photoshop and aligned with the photography to inform the addition of the infrastructure.

¹ Parallax is the difference in the position of objects when viewed along two different lines of sight. In the case of a camera this would occur if the rotation point of the lens was not constant and would result in stitching errors in the panorama.

- A6.2.13 The proposed substation extension development was modelled in 3D using Autodesk 3DS Max© software from AutoCAD© DWG format Plans and Elevations provided by SP Energy Networks. Cameras were added to the model informed by the OS coordinates of the site photography and a lighting system was created to replicate the conditions present on the day and time each photography range was taken. The camera views were then rendered and exported out as a high-resolution TIF files.
- A6.2.14 The next stage required the substation extension renders to be composited with the baseline photograph to create the photomontages. Adobe Photoshop© software was used to combine the images and mask out (remove) complete or partial elements of the proposed substation extension components which were located behind foreground elements in the original photograph. The original photography was also modified to remove any trees or areas of planting which will be lost as a result of the development construction or operation.
- A6.2.15 Photomontages have been constructed to show the proposed substation extension infrastructure including the proposed earthworks, extended substation compound and internal electricity transmission infrastructure, including gantry structures, transformers and other ancillary infrastructure. The external perimeter of the proposed substation extension is defined by a 3m high galvanised steel palisade security fence which has also been modelled in views.
- A6.2.16 Photomontages (Viewpoint 1 and Viewpoint 2) also show the areas of broadleaf woodland planting proposed in the Landscape Mitigation Plan (as shown on **Figure 4.1** and detailed Planning drawing Landscape Mitigation Plan ref: **LUC_6118_LP_PLN_001**). Trees are indicated at approximately 5 years maturity and an estimated average vertical height of 5m².

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Scottish Natural Heritage (2017) Visual Representation of Wind Farms - Version 2.2

ⁱⁱ

Landscape Institute (2011) Advice Note 01/11, Photography and photomontage in landscape and visual impact assessment

ⁱⁱⁱ

Landscape Institute and the Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual I mpact Assessment Third Edition (GLVIA3)

^{iv}

Landscape Institute (2017) Technical Guidance Note 02/17 Visual representation of development proposals

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Proposed post and wire stock proof fence as detailed on Landscape Mitigation Plan ref: LUC_6118_LP_PLN_001 (approximately 1.3m in height) is not shown in photomontage visualisations due to proximity of this feature to the viewpoint photography locations.