

Proposed Coalburn North Substation



Environmental Appraisal

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Summary

SP Energy Networks (SPEN)¹ is preparing to apply for planning permission to South Lanarkshire Council to construct Coalburn North Substation (“the new Substation”) adjacent the existing Coalburn Substation. As the overall Planning Application boundary will be greater than 2 hectares, this is considered Major Development² and pre-application consultation regarding the proposed development is required. SPEN is committed to undertaking meaningful and wide-reaching consultation and is therefore inviting comment on the proposals at this second consultation event project stage, which provides an update regarding feedback received so far.

The new Substation is located approximately 1 km to the south of Lesmahagow and 1.5 km north east of the settlement of Coalburn. To the east is Coalburn Moss a designated habitat of international conservation value bounded by a dismantled railway line on embankment to the west and east, and the B7078 Carlisle Road. Further east is the M74 motorway.

The development is required to allow proposed renewable energy development in the wider area to connect to the transmission network.

This Environmental Appraisal reports on the potential environmental effects of the proposed new Substation and associated mitigation measures.

The existing Coalburn Substation was built in 2007 and comprised a compound approximately 208m and 175m wide with electrical equipment and a control building enclosed by a security fence. The substation platform was further extended in 2022/2023 to address further demand requirements. Access into the site is gained from the B7080 Carlisle Road.

The new Substation is located to the north side of the existing Coalburn Substation and will comprise a compound approximately 200 m by 180 m with electrical equipment enclosed by a 3m high security fence. Grid connection to the 400kV overhead line will be via existing towers. During construction a temporary compound and car park will be located adjacent the existing Substation and access road, utilizing the same sites as for the Substation extension works.

Environmental specialists have undertaken an assessment of the environmental effects of the new Substation and associated temporary construction areas. The Environmental Appraisal provides a description of the baseline conditions, and assessment of the predicted changes associated with the construction and operation of the proposed development.

Mitigation measures have been identified and an Outline Landscape Restoration Scheme prepared as part of the Environmental Appraisal which shall be submitted as part of the Planning Application to South Lanarkshire Council. A Pre-Application Consultation (PAC) Report, and Design and Access Statement (DAS) shall also accompany the Planning Application.

The overall significance of environmental effects of the proposed development is assessed to be minor adverse during construction and operation. On completion, it is assessed that the overall permanent effect of the proposed development will on balance, be minor. **No significant** environmental effects are therefore predicted for the proposed Coalburn North Substation.

¹ SPEN owns and operates the electricity transmission and distribution networks in central and southern Scotland through its wholly owned subsidiaries SP Transmission plc (SPT) and SP Distribution plc (SPD). SP Transmission plc is the holder of a transmission licence. The references to SPEN in the context of statutory and licence duties in this document should be read as applying to SP Transmission plc.

² The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009

Context

- 1.1 SP Energy Networks (SPEN) is applying for planning permission to South Lanarkshire Council (SLC) to construct Coalburn North Substation adjacent the existing Coalburn Substation, hereinafter referred to as 'the new Substation'. This Environmental Appraisal accompanies the Planning Application.
- 1.2 The new Substation is located approximately 1 km to the south of Lesmahagow and 1.5 km north east of the small settlement of Coalburn. To the east is Coalburn Moss Site of Scientific Interest (SSSI) and Special Area of Conservation (SAC). This designated habitat of international conservation status is bounded by a dismantled railway line on embankment to the west and east, and the B7078 Carlisle Road. Further east is the M74 motorway.
- 1.3 The location of the new Substation, access road, detention pond, temporary construction compound and car park area, and temporary soil storage area is indicated in Figures 1.1 and 1.2. The proposed development will require the clearance of existing woodland and earthmodelling to create a level platform area for the proposed Substation and to retain all soil on site. The temporary construction compound and car park will use the same sites as established for the construction of the recent extension to the existing Coalburn Substation.
- 1.4 The new Substation development site boundary is indicated in Figure 1.3. A separate drawing as prepared by SPEN shall be submitted to SLC indicating the Planning Application red line boundary.
- 1.5 The Planning Application relates only to the works to be carried out within the development site boundary (Figure 1.3). The proposed temporary construction compound and car park area indicated in Figure 1.2 and works within these areas shall be carried out under Permitted Development (PD) rights under Clause 14 of the Town and Country Planning (General Permitted Development) (Scotland) Order 1992.
- 1.6 Unless otherwise stated, all reference to the new Substation mean works within the Planning Application red line boundary. References to the "development site" relate to the site of the new Substation, temporary construction compound and car park area, and temporary soil storage area.

Project Need

- 1.7 The new Substation is required to facilitate proposed renewable energy development in the wider area to connect to the transmission network.
- 1.8 SPEN has a statutory duty 'to develop and maintain an efficient, co-ordinated and economical system of electricity transmission'.³ It is also subject to transmission licence conditions requiring it to make its transmission system available:
- 1) for the purpose of conveying, or affecting the flow of, electricity and to ensure that the system is fit for purpose; and
 - 2) to generators wishing to connect to it and to ensure that the system is fit for purpose.

³ s9 of the Electricity Act 1989 (as amended by the Utilities Act 2000)

- 1.9 In this respect SPEN must enter into agreements with the system operator National Grid Electricity Transmission plc to carry out works on the transmission system and obtain consents necessary to facilitate connections for generators.
- 1.10 Scotland has a target of Net Zero greenhouse gas emissions by 2045. Energy is increasingly coming from greener, cleaner sources, as many new renewable generators replace older fossil-fuelled power stations. At the same time, demand for electricity is expected to grow rapidly over the next few years, with electric vehicles replacing petrol and diesel, and increased electrification of heating, industry and transport networks. This huge change requires the upgrade of Scotland's electricity transmission network. The proposed new Substation at Coalburn in South Lanarkshire will assist in this process of strengthening the electricity transmission network and guarantee of secure energy supplies for the future.

Legislative Context

- 1.11 All transmission licence holders are required under Schedule 9 of the Electricity Act 1989 (the "Electricity Act") to take account of the following factors in formulating any relevant proposals for works in connection with the transmission of electricity: -
- a) "to have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and,
 - b) to do what it reasonably can to mitigate any effect the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings, or objects."
- 1.12 SPEN interprets the words "reasonably can" to mean that it should make every effort to mitigate the environmental effects as part of the process of developing proposals for the transmission of electricity. In terms of the statutory and licence duties, SPEN therefore needs to balance technical, economic, and environmental considerations.

Statutory Consent

- 1.13 The application for planning permission to construct and operate the proposed new Substation will be submitted to South Lanarkshire Council as Planning Authority for the site. This Environmental Appraisal will accompany the Planning Application which reports on the effects of the construction and operation of the Coalburn North Substation, associated temporary works and proposed mitigation measures.
- 1.14 All applications for planning permission for Major development⁴ require developers to undertake Pre-Application Consultation with potentially affected communities. This ensures that communities are made aware of and have an opportunity to comment on development proposals before a Planning Application is submitted. A report on Pre-Application Consultation (PAC) for the proposed development is also required to accompany such Planning Applications setting out the consultation undertaken, outcomes and how the statutory requirements have been met.

⁴ As defined by The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009

- 1.15 A Design and Access Statement (DAS) is also required under Regulation 13 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 for Major development.
- 1.16 The Environmental Appraisal, PAC report and DAS will accompany the Planning Application for the proposed Coalburn North Substation development.

Screening Request

- 1.17 On review of the proposed nature and scale of development, SPEN does not consider the new Substation is EIA development within the meaning of the EIA Regulations. A Screening Request under Regulation 8 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 ('EIA Regulations') shall be submitted to South Lanarkshire Council to adopt a screening opinion to confirm this position.
- 1.18 If an Environmental Impact Assessment Report (EIAR) is required, a Scoping Document will then be submitted to SLC. This will review the proposed scope of information to be provided in the EIAR to ensure that all relevant issues and concerns of external stakeholders are considered.

Purpose of the Report

- 1.19 The purpose of this Environmental Appraisal is to identify and report on the potential environmental effects of the proposed development and demonstrate SPEN's compliance with its duties under Schedule 9 of the Electricity Act. The report is organised as follows: -

Chapter 2: Proposed Development

Chapter 3: Landscape and Visual Appraisal

Chapter 4: Ecology Appraisal

Chapter 5: Cultural Heritage Appraisal

Chapter 6: Hydrology Appraisal

Chapter 7: Noise Appraisal

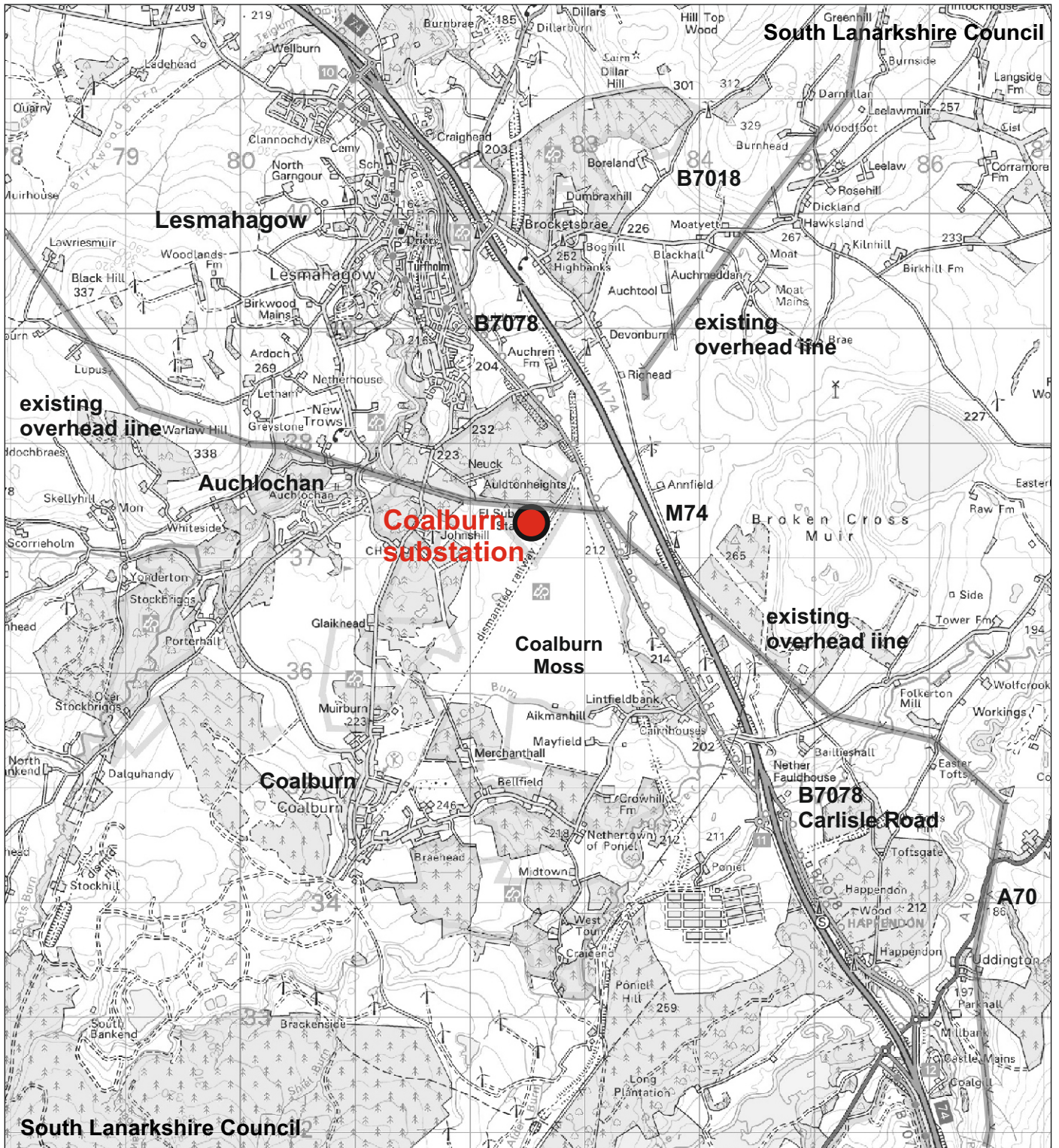
Chapter 8: Conclusion

- 1.20 At the back of the Environmental Appraisal are References and a Glossary. Further supporting information regarding the proposed Coalburn North Substation and as used in preparing the Appraisal Chapters is provided in the Appendices.

Evaluation of Significance

- 1.21 This Environmental Appraisal provides a detailed description at this project stage of the aspects of the environment likely to be affected by the proposed Coalburn North Substation, and the associated temporary construction compound and car park area, and temporary soil storage area. This covers direct effects and any indirect, secondary or cumulative effects.
- 1.22 In assessing whether an effect is significant, reference has been made, where appropriate, to criteria on which the evaluation is based. These may include legal standards, policy guidance or accepted practice, and are identified as appropriate in the Environmental Appraisal.

- 1.23 For the purpose of this appraisal, the relative significance of effects is assessed using the following terms: -
- Major** - a fundamental change to the environment.
 - Moderate** - a material but non-fundamental change to the environment.
 - Minor** - a detectable but non-material change to the environment.
 - None** - no detectable change to the environment.
- 1.24 Any effect of the Coalburn North Substation assessed as “**major**” or “**moderate**” (in terms of the criteria above) would be considered to be “**significant**” within the terms of Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (“EIA Regulations”). Any effect assessed as “**minor**” would not be considered as “**significant**” within the terms of the EIA Regulations.



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figure 1.1

Title:
Location Plan

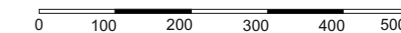
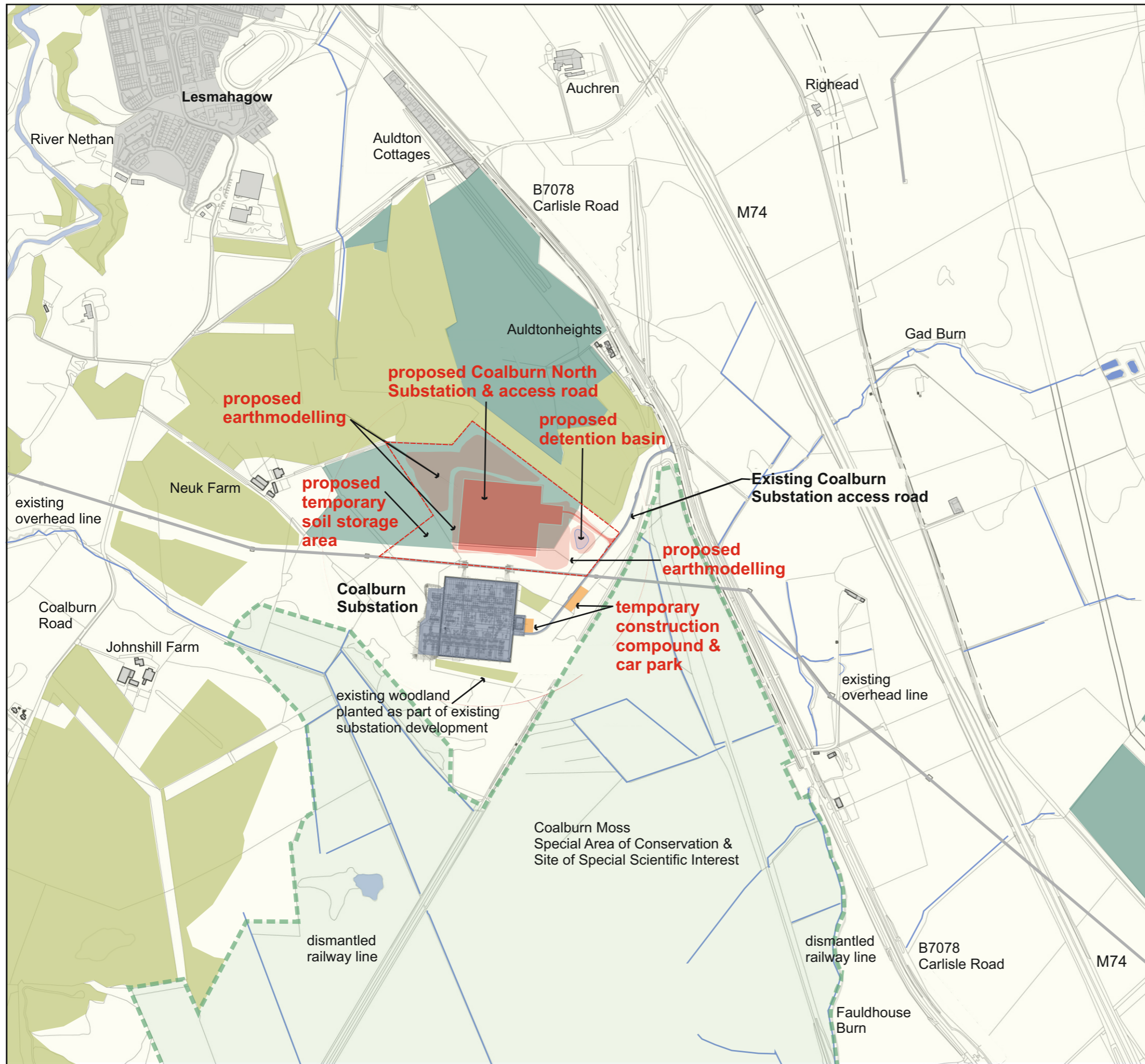
Project:
Proposed Coalburn North Substation

Scale: 1:50,000 @A4/ Bar Scale

Date: Nov 2023

SP EnergyNetworks

Environmental Designworks
Landscape Architecture + Planning



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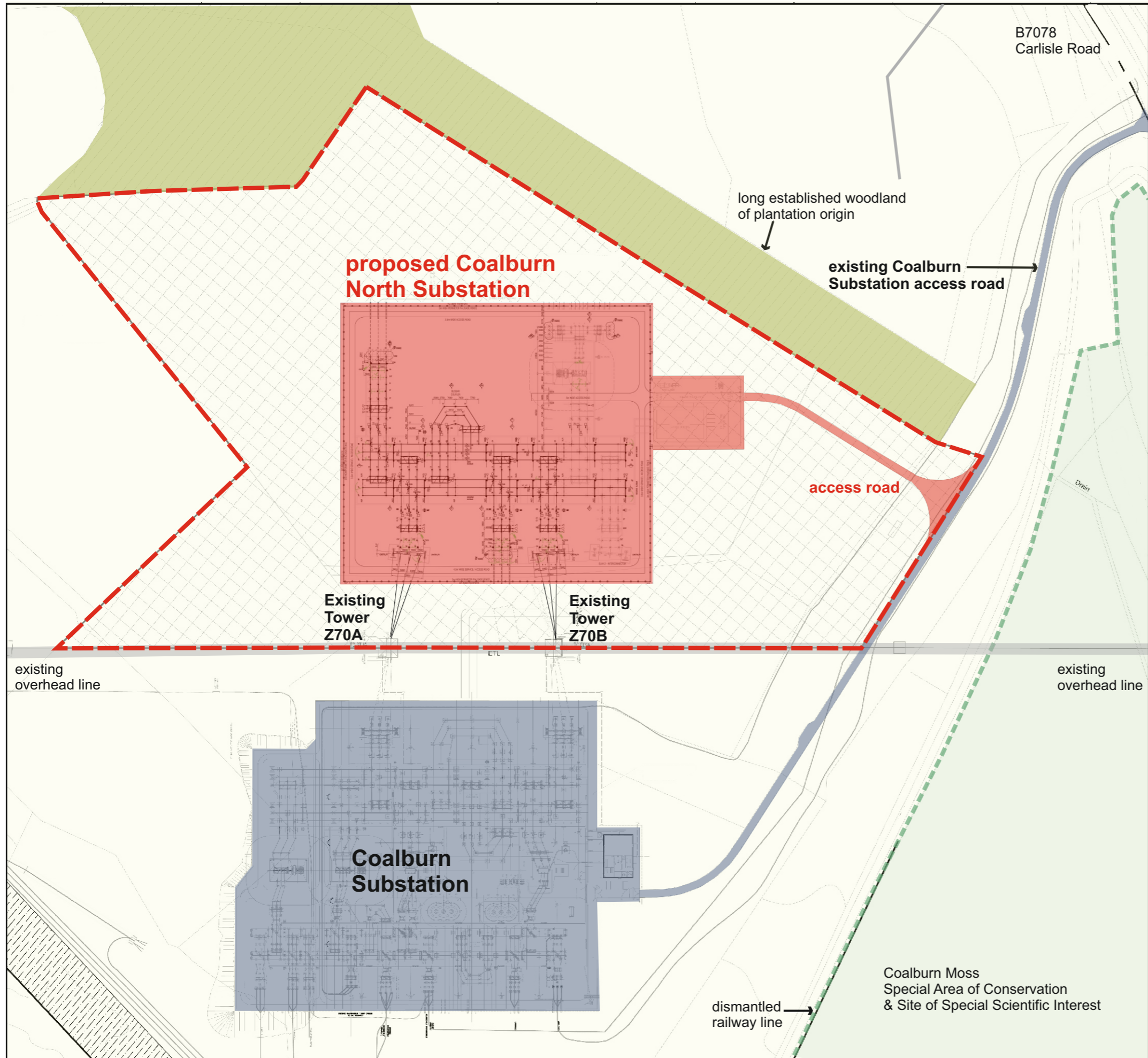
figure 1.2

Title:
Proposed Coalburn North Substation, Temporary Construction Compound, Car Park & Soil Storage Area

Project:
 Proposed Coalburn North Substation

Scale: 1:10,000 @A3/Bar Scale

Date: Jan 2024



Key

 proposed development site boundary

Note: refer to SPEN Dwg for Red Line Planning Application Boundary. Dimensions indicative only.



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figure 1.3

Title:
Proposed Coalburn North Substation Development Site

Project:
Coalburn North Substation

Scale: 1:2500 @A3/Bar Scale

Date: Jan 2024

Existing Substation

- 2.1 Coalburn Substation is a compound approximately 208 m x 175 m with electrical equipment and a control building enclosed by a security fence. The setting level of the Substation is 227m AOD and the maximum height of electrical equipment within the compound is 13.5 m (400kV bus bar). Access into the site is gained from the B7080 Carlisle Road.
- 2.2 The existing Substation drainage scheme collects surface water runoff and drains to a ditch along the west side of the permanent access road, which in turn drains to the Fauldhouse Burn at Carlisle Road B7078 to the north east.
- 2.3 Landscape mitigation measures to provide screening, enhance biodiversity and reinforce the existing landscape character were implemented as part of the Planning Consent. These works included new mixed woodland, field boundary trees and hedges.
- 2.4 An extension to the west of the existing Substation was granted Planning Consent by SLC in 2021 (Ref P/20/1837) and is currently under construction. This comprises a compound area of approximately 50 m x 198 m at the same setting level of 227 m AOD for additional electrical equipment. Landscape mitigation measures comprising of mixed woodland, specimen tree, shrub planting and grass meadow seeding shall also be implemented as part of the development (Aecom 2021, Figure 5 Ref CS-201027_PASR5_v1).
- 2.5 Drainage from the extension is connected to the existing Coalburn Substation site to discharge runoff via a detention basin to the existing drainage ditch linking to Fauldhouse Burn or to a new detention basin and drainage ditch which has been installed to the west.

Site Selection

- 2.6 The site selection process for the new Substation started with an “Area of Search”, defined by the existing transmission network and system requirements, where the proposed development and overhead connection could be developed and the identification of high level environmental constraints. This strategic review and appraisal led to the identification of the proposed site which is considered balances technical, economic, and environmental considerations.

Proposed Substation

- 2.7 The proposed new Substation is approximately 200 m x 180 m enclosed by a 3m high security fence and located to the north side of the existing Coalburn Substation. Within the compound there will be a 400kV double bus bar substation with a bus coupler circuit breaker and two feeder bays to connect into the Strathaven to Elvanfoot 400kV overhead line circuit and a control building. To the west of the compound a new road will link to the existing Substation access road. The setting level of the proposed Substation will be 231 m AOD and the maximum height of electrical equipment within the compound 13.5 m (400kV bus bar).
- 2.8 Existing 400kV towers (ZV070A and ZV070B) will be used to connect the new Substation with the adjacent overhead line. During construction, a temporary compound and car park will be located adjacent the existing Substation and access road and a temporary soil storage area will be located to the south west of the proposed Substation compound (Figure 1.2).

Proposed Development

2.9 In summary, the new Substation construction, development, and associated works comprise of the following:

- Establishment of a temporary secure construction compound adjacent the existing Substation with portacabins for offices, changing and welfare, and parking area adjacent the access road. Within the construction compound there will be a demarcated laydown and storage area for equipment and materials. These are the same sites as used for the Coalburn Substation extension.
- Access will be via the existing Coalburn Substation access road with a new 5.5m wide link leading off to west to the new Substation.
- Installation of temporary protective fencing delineating the extent of the works during construction.
- Safeguarding of all underground cables adjacent the new Substation during the construction and landscape restoration works by protective fencing and ducting to provide appropriate wayleaves.
- Construction of temporary measures to control drainage during construction as agreed with SEPA. This shall include track-side ditches and silt traps adjacent to the access road to collect and treat runoff. For the new Substation platform, cut-off drains and settlement lagoons shall be installed to collect and treat runoff from the construction works area.
- Removal of the coniferous plantation of Sitka species which was planted in 2012 and now approximately 8m height with a diameter of less than 10cm⁵. To the east an area of Birch and Oak broadleaved plantation will also be removed. These trees covering an approximate area of 8.245⁶ Ha will be felled and all arisings including stumps removed site in accordance with Forest Land Scotland (FLS)/ Scottish Forestry (SF) guidance. The location and requirement for compensatory planting shall be discussed and agreed with SLC and FLS/SF with the aim of contributing to the Lesmahagow Land Management Plan (FLS, 2023), and the proposals and guidance contained in the Glasgow and the Clyde Valley Forestry and Woodland Framework (Clydeplan SDPA, 2020).
- The felling of approximately six mature Beech former field boundary trees in drystone wall, and 28 young specimen trees and length of mixed hedge planted as part of the existing Substation development, and removal of vegetation in the construction works area⁷. All vegetation clearance shall be undertaken in accordance with the Landscape Architect and Ecologist recommendations (Chapters 3 & 4).
- Existing trees to be retained shall be safeguarded with protective fencing for the duration of the works in accordance with BS5837: Trees in Relation to Design, Demolition and Construction. In detail this includes: the identified Long Established Woodland of Plantation

⁵ RTS Forestry January 2023

⁶ SPEN Dwg BT3091-2-1000-DO-FAIREC-1514 Rev A

⁷ SPEN Dwg BT3091-2-1000-DO-FAIREC-1514 Rev A

Origin (LEWPO) to the north, existing mature trees on drystone walls delineating former field boundaries to the west, and area of dense scrub to the south.

- Strip of topsoil and subsoil, and bulk earthworks to establish the new Substation formation level, access road and detention pond, and proposed earthmodelling to retain all material on site. A temporary soil storage bund shall be located within the Substation development site to the south west for use in the sequencing of the earthworks. All works will be undertaken in accordance with BS 4428: Code of Practice for General Landscape Operations, BS3882: Specification for Topsoil and Requirements for Use, and BS 8601: Specification for Subsoil and Requirements for Use.
- Earth modelling shall be undertaken on a cut and fill basis to create a level site for the proposed Substation compound. To retain all material on site landscape bunds approximately 4 m above existing ground level are proposed to the west and east of the proposed development and shall have gradients of generally 1 in 3, graded into existing ground levels⁸. Cut off ditches will be aligned along the top and bottom of embankments with check dams to slow the flow and allow sediment to settle. Clean water run off will then discharge via a detention basin into an existing ditch. All drainage works shall be outlined in a Surface Water Drainage Strategy and agreed with SEPA.
- Import, spreading and compaction of graded stone to create the proposed Substation compound of suitable load bearing capacity for the electrical equipment. The Substation platform will have a gravel surface area of approximately 200 m x 180 m with a setting level of 231 m AOD.
- Foundations for electrical equipment will be constructed with imported ready mixed concrete pored at predetermined locations and sizes.
- Erection of a 3m high security galvanised metal fence surrounding the new Substation with a 2m wide perimeter walkway outside the security fence;
- Installation of cable ducts and electrical equipment with a maximum height of 13.5 m (400 kV bus bar) and single storey control building.
- The permanent drainage design for the new Substation will be based on Sustainable Urban Drainage System (SUDs) principals and measures as installed for the existing Substation and agreed with SEPA. A SUDs pond is proposed to the south of the new Substation access road. The new drainage scheme will link to the existing Coalburn Substation system and collect and treat surface water runoff prior to discharge. The drainage design will include oil interceptors to collect any fuels contained in runoff. A concrete bunded oil containment system will be installed to collect any potential fuel leaks from electrical equipment which contain oil as an insulating medium. The existing Coalburn Substation drainage scheme outfalls to a ditch aligned along the west side of the access road which then drains into the Fauldhouse Burn at Carlisle Road.

⁸ SPEN Dwg BT3091-2-1000-DO-FAIREC-1502 Rev C

- Site reinstatement and landscape restoration work. The Outline Landscape Restoration Scheme as indicated in **Figure 2.1** shall be implemented as soon as practicable in the construction programme during suitable planting conditions.

2.10 The proposed development will have a construction programme of approximately 24 months. During operation the Substation will be unmanned and visited for maintenance and monitoring purposes.

Mitigation Measures

2.11 All mitigation measures as outlined in the Environmental Appraisal and any Planning Consent Conditions will be detailed and implemented by the Construction Environmental Management Plan (CEMP) and Pollution Prevention Plan (PPP) prepared specifically for the proposed Coalburn North Substation development, associated temporary construction compound and car park area, and temporary soil storage area. These documents shall control and guide the working practices of the Contractor for the duration of the construction works and shall reflect current best practice and guidance in protecting the environment and safeguarding community interests.

2.12 The CEMP will include the approved Landscape Restoration Scheme outlining the requirements for restoration and reinstatement of the proposed Substation surrounds, detention pond, access road link, temporary construction compound, car park area, and soil storage area.

2.13 At this project stage an outline structure of the Construction Environmental Management Plan (CEMP) has been placed for information in **Appendix 1.0**. The CEMP and PPP will be finalised by SPEN in consultation with SLC, Nature Scot, SEPA and other key stakeholders as required.

Landscape Restoration Plan

2.14 On completion of the proposed development, the Outline Landscape Restoration Scheme as indicated in **Figure 2.1** shall be implemented. The landscape design aims to: provide screening, enhance biodiversity, reinforce existing distinctive landscape features, and integrate the proposed development into the surrounding countryside.

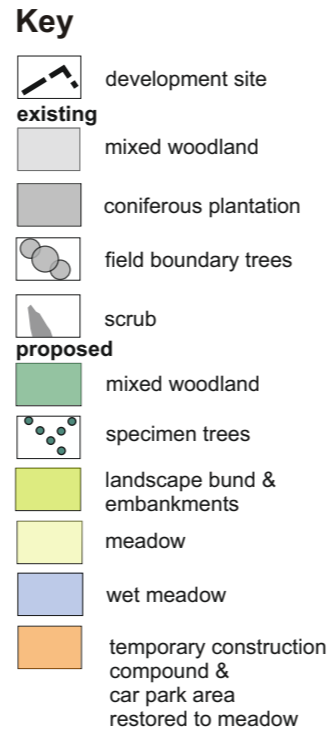
2.15 In summary, the outline landscape restoration works for the new Substation shall comprise:

- Removal of any hardcore, material, redundant fencing installed during the construction works.
- Respreading of subsoil and topsoil set aside at the outset of the construction works. All finished levels shall be smooth and free flowing, marrying with existing levels, eliminating all abrupt angles and changes in level.
- Proposed Mixed Woodland, Specimen Tree planting, and seeding of Meadow and Wet Meadow areas.
- Monitoring of the landscape works to ensure establishment and determine the requirement for any additional measures such as the installation of temporary protective deer fencing etc.

2.16 Landscape management works to the existing Substation planting shall also be undertaken as part of the proposed development. This will include works to ensure long term viability, screening and enhance biodiversity. Proposed works shall include: removal of redundant protective shelters and stakes; and removal of wire mesh to fences to allow animal movement and improve nature network linkages (posts shall be retained as woodland edge markers).

2.17 All landscape and tree operations shall be undertaken in accordance with BS 4428: Code of Practice for General Landscape Operations and BS 3998 Tree Work- Recommendations.

Landscape Restoration Outline Scheme 1:5000@ A3



1.Planning

This Outline Landscape Restoration Scheme has been prepared as part of the Environmental Appraisal (EA) to accompany the Planning Application to South Lanarkshire Council for the proposed Coalburn North Substation .

For Construction, this Landscape Dwg shall be checked, updated and detailed for implementation purposes and read in conjunction with the prepared Specification, and relevant SPEN Drawings, Specifications and Standards.

Prior to the start of the Works SPEN shall confirm the proposed Landscape Works do not present a breach of any potential Electricity, Safety, Quality and Continuity Regulations.

2. Landscape Aims

- In summary the **Landscape Restoration Works** design aims to:
 - provide screening
 - increase biodiversity
 - reinforce existing landscape features and character
 - integrate the proposed development into the surroundings.

- To undertake one off **Landscape Management Works** as part of the proposed development to the Coalburn Substation Existing Planting.

-To undertake **Landscape Maintenance Works** to promote the establishment and effectiveness of the Landscape Restoration Works and Existing Planting.

In summary the **Landscape Restoration Works** comprise:

- Removal of any hardcore, material, redundant fencing installed during the Construction Works.
- Ripping of ground to relieve compaction prior to respread of subsoil and topsoil set aside at outset of Construction Works.
- Cultivation of area to ensure free drainage and create a suitable medium for planting and grass seeding.
- Mixed Woodland planting to replace coniferous and broadleaved plantation removed, reinforce the Long Established Woodland of Plantation Origin to north and provide screening.
- Specimen tree planting to extend and replace trees removed along former field boundaries and reinforce this existing distinctive landscape feature.

▪Grass seeding of open areas including embankments, detention pond surrounds, temporary construction compound and car park area, and maintenance as Meadow or Wet Meadow areas and Grass Verge.

▪Maintenance of the Landscape Restoration Works and monitoring to determine the requirement for any further works to promote planting establishment e.g. additional protective fencing.

In summary the one- off **Landscape Management** operations to the Existing Coalburn Substation planting comprise:

- removal of all redundant stakes and shelters.
- removal of fences containing the existing Woodland Planting (posts shall be retained as woodland edge markers).

3. General Landscape Notes

Standards: All Landscape Works shall be carried out in accordance with the mitigation requirements as outlined in the Environmental Appraisal (EA) and Construction Environmental Management Plan (CEMP). All Landscape Works shall be carried out in accordance with the recommendations of BS4428: 1989 "General Landscape Operations" and BS7370 "Grounds Maintenance". The Landscape Contractor shall undertake all operations required to meet the Landscape Aims, and SPEN requirements with due skill, care and diligence to ensure the establishment of healthy, vigorous plants and grass areas.

Services: Where services are situated within or adjacent to the proposed Landscape Works (overhead and underground), the detailed position shall be amended and undertaken as per the requirements of SPEN, Statutory bodies or other Companies (NJUG Vol 4 2007).

Programme: The Landscape Works shall be completed in the first planting and grass sowing season following completion of the proposed Coalburn North Substation and removal of the Temporary Construction Compound and Car Park Area. Seasonal restrictions shall be observed: Bare Root planting between Nov to end of March. Grass seeding between April-September.

Protected Species: Prior to starting the Works a qualified Ecologist shall undertake an assessment of the site including all trees/ shrubs to be pruned/ felled to confirm the presence/ absence any protected species. If the presence of any protected species is confirmed prior to the Landscape Works, NatureScot must be notified, approved licences obtained, and best practice measures implemented and duly observed.

Protection of Existing Trees & Scrub: Existing trees to be retained shall be protected for the duration of the Works in accordance with BS 5837:2012. This requirement encompasses: the Long Established Woodland of Plantation Origin to the north, existing mature trees on drystone walls delineating former field boundaries to the south west, and scrub to the south.

Vegetation Removal to Accommodate the Works: To minimise disturbance to breeding birds, any vegetation clearance shall ideally be undertaken between Sept to Feb. Any required clearance within the bird breeding season (March-August) shall be checked 2 days ahead by a qualified Ecologist and if present, suitable procedures agreed with SPEN.

The method of removal and disposal of the existing coniferous Sitka plantation within the proposed development site shall be agreed with Forest Land Scotland. The Contractor shall be responsible for the disposal off site of all other timber, branches, and other debris arising from tree and scrub removal, and general landscape work. Thinnings can be chipped and spread to a max depth of 25mm within existing Substation woodland areas.

Topsoil/ Subsoil Storage: prior to start of Works carefully strip topsoil and subsoil for reuse, to depths as determine by Eng Site Investigation. Keep topsoil separate from subsoil. All temporary storage works shall be in accordance with BS4428, BS3882 & BS8601.

Earthworks/ Drainage/ Hardworks: All earthworks/ levels in accordance with SPEN Eng Design and Specification. Minimum topsoil depth shall be 100mm for new Grass seeding areas and 400mm depth for Planting, all cultivated in accordance with BS4428. Finished levels shall be smooth and free flowing, marrying with existing levels, eliminating all abrupt angles and changes in level. The top and toe of banks shall be rounded for ease of grass cutting maintenance. All Drainage works be in accordance with SPEN Eng. Design and Spec. All Hardworks, including hardstanding, and kerbs shall be in accordance with SPEN Eng. Design and Spec.

Fencing: The proposed Mixed Woodland Planting shall be protected by tree guards and monitored. If required a 1.8m hgt deer fence shall be installed.

Proposed Planting

Proposed Mixed Woodland Planting (2m centres, grouped 9-12 of same spp.)			
Species	Name	% Mix	Size/ description
Alnus glutinosa	Alder	10%	40-60cm Cell Grown
Corylus avellana	Hazel	10%	40-60cm Cell Grown
Crataegus monogyna	Hawthorn	10%	40-60cm Cell Grown
Ilex aquifolium	Holly	5%	40-60cm Pot Grown
Pinus sylvestris	Scots Pine	30%	40-60cm Pot Grown
Prunus spinosa	Blackthorn	5%	40-60cm Cell Grown
Quercus petraea	Oak	20%	40-60cm Cell Grown
Sorbus aucuparia	Rowan	10%	40-60cm Cell Grown

Specimen Trees @ 6m centres		Size/ description
Clear stem 1.75-2.0m		
Alnus glutinosa	Alder	8-10cm Girth 2.5-3.0m Hgt BR S
Fagus sylvatica	Beech	8-10cm Girth 2.5-3.0m Hgt BR S
Quercus petraea	Oak	8-10cm Girth 2.5-3.0m Hgt BR S

Grass Seeding	
Meadow	Geminal WFG13 Wild Flora Seed Mix @ 3-5g/m ² Overseed/ repair barepatches with Geminal A3 @ 35g/m ² as req.
Wet Meadow	Scotia Seeds Wet Meadow Mix @ 3-5g/m ²

One- Off Landscape Management Operations to Existing Coalburn Substation Planting

One Off Landscape Management Operations Schedule Existing Coalburn Substation	No /Yr	M o n t h s													
		J	F	M	A	M	J	J	A	S	O	N	D		
Existing Woodland & Specimen Trees															
Remove all protective guards, stakes, ties & remove arisings off site.	1														1
Remove any dead and dying trees and remove arisings off site.	1														1
Existing Fences, Gates and Stiles															
Remove all netting/ wire from fences protecting landscape planting works undertaken for existing Substation. Retain posts as markers.	1														1

Landscape Maintenance

The Landscape Restoration Scheme shall be maintained and protected in accordance with BS7370 and BS4428, and shall include all operations as outlined below.

Annual Maintenance Operations Schedule Proposed Coalburn North Substation	No /Yr	M o n t h s													
		J	F	M	A	M	J	J	A	S	O	N	D		
Mixed Woodland, Specimen Trees & Existing Hedge															
Watering as required to ensure establishment.	?														
Firm-in plants, check & adjust Guards*Ref 1, Stakes & Ties.	2			1											1
Weed control* Ref 2	6				1	1	1	1	1	1	1				
Apply fertiliser	1					1									
Replace dead and dying plants.	1														1
Remove redundant guards, stakes, ties when established (tbc).	1														1
Meadow Grass & Wet Meadow Grass															
Cut to 100 mm and remove all cuttings.	1														1
Apply selective herbicide to noxious weeds only.	1								1						
Repair and grass re-seed any bare areas	1							1							
Grass Verge – 2m width strip to back of Substation Perimeter Walkway and Access Road															
Cut to 100 mm and disperse cuttings	6				1	1	1	1	1	1					
Apply fertiliser	1														
Apply selective herbicide	1									1					
Repair and re-seeding any bare areas	1										1				
Litter															
Litter pick all Landscape Planting Areas	1														1
Substation Perimeter Walkway & Hard Surfaces															
Apply translocated herbicide to all weeds in gravel and hard surfaces outside Substation Security Palisade Fence.	3							1		1		1			
Maintenance Inspection & Report by Landscape Contractor required during Maintenance period															
Inspect & Submit to SPEN (& Landscape Arch.) Maintenance Inspection Report with Photo Record every 4 Months (3No) covering: Work completed; Work required; any H & S/ Security issues; and any Works requiring instruction e.g pests etc.	3														1

*1. Monitor plant guards protection from deer and advise SPEN for instruction if additional fencing is required.
*2. Treat noxious weeds (injurious plants under the Weeds Act 1959) in entire Landscape Planting Area, cut other vegetation prior to setting seed. Cuttings can be left in situ as Mulch.

Note: Refer to SPEN Dwg for Red Line Planning Application Boundary. All dimensions indicative only. Refer to Environmental Appraisal Ecology Chapter for additional mitigation/ enhancement measures for birds, bats and reptiles.



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figure 2.1

Title:
Outline Landscape Restoration Scheme

Project:
Proposed Coalburn North Substation

Scale: 1:5000 @A3 / Bar Scale

Date: Jan 2024

Introduction

- 3.1 This Chapter provides an assessment of the potential effects on landscape and visual amenity arising from the proposed Coalburn North Substation, temporary construction compound and car park area. The Landscape and Visual Impact Assessment (LVIA) provides a description of the landscape and visual baseline conditions, and qualitative assessment of the predicted changes to the baseline associated with the construction and subsequent operation of the proposed development.

Scope & Methodology

- 3.2 The scope of the landscape and visual appraisal covers a 3km radius Study Area encompassing the new Substation. Review of the scale of the proposed development, initial site survey and professional judgement determined that this Study Area was appropriate for the LVIA.
- 3.3 Good practice as described in the “Guidelines for Landscape and Visual Impact Assessment” (LI, IEMA, 2013) has been followed in undertaking the appraisal of the potential effects on landscape and visual amenity arising from the proposed development.
- 3.4 The adopted methodology and approach are outlined in **Appendix 2.0**, Section 1.0 and summarised below:

Baseline Survey and Analysis **Figures 3.1- 3.4**

- **Site and Surroundings:** Collation and review of baseline information covering key features of the physical environment, planning allocation, natural and cultural heritage of the site and surroundings.
- **Landscape and Features:** The character, condition and value of the landscape are determined through a combination of desk and field study. Relevant designations are identified from a review of planning policies and other designations relating to the area.
- **Existing Visibility and Visual Amenity:** Visibility, visual amenity and potential visual receptors are identified, for example, residential properties, public footpaths, transport routes, key viewpoints, etc. The visual baseline including extent of visibility has been determined by using a combination of specialist computer mapping and site survey work.

Impact Assessment

- **Landscape and Visual Effects:** These are reviewed and identified with reference to: the potential sources of effect of the proposed development; sensitivity of the landscape and visual resources (nature of receptors); and magnitude of change to the existing landscape and visual environment (nature of effects).
- **Evaluation of Significance of Effects:** Provides an assessment of the likely significance of effects reviewed with reference to landscape features, character, views and visual amenity. The different thresholds of significance of effect are determined through professional judgement and evaluation of the environmental sensitivity of the location or receptor and the nature or magnitude of effect, and are described using the terms Major, Moderate, Minor or None.

Policy Context

- 3.5 The main planning policies and guidance relevant to the landscape and visual appraisal of the proposed development have been reviewed and referenced. Key planning guidance particular to the landscape and visual assessment is outlined below.

National

- 3.6 The National Planning Framework 4 (NPF4) adopted in 2023 places climate and nature at the centre the planning system with clear support for all forms of renewable, low carbon and zero emission technologies, including transmission and distribution infrastructure. NPF4 sets out policies and proposals for the development and use of land and provides a long term spatial strategy to 2045.
- 3.7 Significant developments of national importance will deliver the spatial strategy. Eighteen national developments support the NPF4 strategy and include with reference to the delivery of sustainable places, “strategic renewable electricity generation and transmission infrastructure”⁹. National development (No 3) supports “electricity generation and associated grid infrastructure throughout Scotland, providing employment and opportunities for community benefit, helping to reduce emissions and improve security of supply”.¹⁰ New high voltage grid connections of 132kV or more, and associated infrastructure such as substations are noted within the context of NPF4 to be national development.
- 3.8 With reference to Energy, Policy 11 aims to encourage, promote, and facilitate all forms of renewable energy both onshore and offshore. All renewable development proposals will be supported, and it is noted this includes “enabling works, such as grid transmission and distribution infrastructure”.¹¹ Environmental impacts of such developments are to be addressed in the project design and mitigation. It is noted that in the consideration of impacts “significant weight will be placed on the contribution of the proposal to renewable energy generation targets and on greenhouse gas emissions reduction targets”.¹²
- 3.9 With specific reference to the environment and biodiversity, NPF4 notes that “development proposals for national, major or EIA development will only be supported where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention”.¹³ This planning aim for biodiversity is embodied in Policy 3. Policy 4 aims to protect, restore and enhance natural assets and notes that “development proposals which by virtue of type, location or scale will have an unacceptable impact on the natural environment, will not be supported”¹⁴.
- 3.10 Protection of carbon rich soils, peatland restoration and the requirement to minimise disturbance to soils by development is covered by Policy 5. This notes that development proposals on peatland, carbon-rich soils and priority peatland habitat will only be supported in

⁹ Scottish Government (2023) National Planning Framework 4. p 7

¹⁰ Scottish Government (2023) National Planning Framework 4. p 7

¹¹ Scottish Government (2023) National Planning Framework 4. p 53

¹² Scottish Government (2023) National Planning Framework 4. p 54

¹³ Scottish Government (2023) National Planning Framework 4. p 9

¹⁴ Scottish Government (2023) National Planning Framework 4. p 40

a few specific circumstances including “Essential infrastructure and there is a specific locational need and no other suitable site”.¹⁵

- 3.11 Policy 6 aims to protect and expand forestry, woodland, and trees. In particular, it is noted that development proposals will not be supported where there is “any loss of ancient woodlands” or “adverse impacts on native woodlands, hedgerows and individual trees of high biodiversity value”.¹⁶ Proposed development which requires woodland to be removed will only be supported where this “will achieve significant and clearly defined additional public benefits” and “compensatory planting will most likely be expected to be delivered”.¹⁷
- 3.12 The protection and enhancement of the historic environment assets and places is afforded by Policy 7. This aim encompasses non designated historic sites and their setting, and wherever possible should be protected in situ. It is noted that where there is potential for non designated buried archaeological remains to exist developers should “provide an evaluation of the archaeological resource at an early stage so that planning authorities can assess impacts”.¹⁸

Development Plans

- 3.13 Planning policies for South Lanarkshire Council are set out in strategic and local development plans. The following development plans cover the Study Area: -
- Glasgow and Clyde Valley Strategic Development Plan (Clydeplan) 2017
 - South Lanarkshire LDP2 2021¹⁹

Clydeplan 2017

- 3.14 The Planning (Scotland) Act 2019 removed the statutory requirement to prepare a SDP and replaced it with a duty to prepare a Regional Spatial Strategy (RSS). The most current Clydeplan SDP (2017) remains in force until both NPF4 and the RSS are adopted. The RSS will guide future long term strategic development and use of land in the public interest and is expected to be adopted later in 2023/early 2024. In the interim, Clydeplan have also prepared a Development Plan Scheme and Participation Statement.
- 3.15 Clydeplan 2017 supports the transition to a low carbon economy (Policy 10). Other relevant strategic planning policy statements for the LVIA include the retention and expansion of woodland, and where appropriate the planting of new trees (Policy 13).

South Lanarkshire Local Development Plan (SLLDP2) 2021

- 3.16 The SLLDP2 (2021) overall strategic vision is encompassed in Volume 1 by Policy 1 Spatial Strategy which states “The spatial strategy of LDP2 will encourage sustainable economic growth and regeneration, move towards a low carbon economy, protect the natural and historic environment and mitigate against the impacts of climate change”.²⁰ This spatial strategy will be achieved in a variety of ways including:

¹⁵ Scottish Government (2023) National Planning Framework 4. p 42

¹⁶ Scottish Government (2023) National Planning Framework 4. p 44

¹⁷ Scottish Government (2023) National Planning Framework 4. p 44

¹⁸ Scottish Government (2023) National Planning Framework 4. p 46

¹⁹ adopted 9th April 2021

²⁰ SLLDP Vol 1 (2021) p 11

“5. Ensure that proposals for new development seek to minimise and mitigate against the effects of climate change, including flood risk...

9. Protect and enhance the natural and historic environment.

10. Protect and enhance the green network within and around settlements and encourage new forestry and woodland creation.

11. Support renewable energy developments in appropriate locations”.²¹

3.17 Beyond the settlements, the countryside is protected by Policy 4 Green Belt and Rural Area and encompasses the proposed new Substation. The overall aim of this policy is to control development and “ensure there is no unacceptable significant adverse impact on the environment or on local services and infrastructure”.²²

3.18 Policy 14 notes the “Council will assess all development proposals in terms of their impact on the natural and historic environment, including biodiversity, geodiversity, landscape and townscape”.²³ A hierarchy of categories of natural and historic designations is provided in the SLLDP2 where differing degrees of protection are required. Detailed policies, which apply to the designated areas are set out in Volume 2 of the SLLDP2. With specific reference to landscape, Policy 14 notes, that “development proposals should take account of the guidance in the South Lanarkshire Landscape Character Assessment 2010”.²⁴ It is also noted that developers should also take account of the Local Biodiversity Strategy 2018-2022.

3.19 The importance of trees and woodland as a local nature resource is also noted in Policy 14 which should be “managed, protected and enhanced”.²⁵ It is noted that South Lanarkshire offers opportunities to create new areas in line with the Glasgow and Clyde Valley Forest and Woodland Strategy.

3.20 To the east of the proposed new Substation, the Coalburn Moss Special Area for Conservation (SAC) is protected under the Habitats Directive and Policy NHE7 of the SLLDP2. Such sites are intended to form a European wide network of protection known collectively as Natura 2000. Coalburn Moss is also a designated Site of Special Scientific Interest (SSSI) and protected by Policy NHE 8. The SLLDP protects peatland and carbon rich soils, the water environment and biodiversity by Policies NHE 11 and 12.

3.21 With reference to forestry and woodland Policy NHE13 states “Development proposals should seek to manage, protect and enhance existing Ancient Semi-Natural Woodland (ASNW), other woodlands, hedgerows and individual trees....and... Removal for development purposes will only be permitted where it would achieve significant and clearly defined public benefits....In all cases, developers will generally be expected to deliver compensatory planting”.²⁶

3.22 An Area of Long-Established Woodland of Plantation Origin (Antiquity Category 2, SNH 1997) is located to the north of the proposed new Substation. Policy 14 of SLLDP2 affords category

²¹ SLLDP Vol 1 (2021) p 11

²² SLLDP Vol 1 (2021) p 16

²³ SLLDP Vol 1 (2021) p 35

²⁴ SLLDP Vol 1 (2021) p 36

²⁵ SLLDP Vol 1 (2021) p 33

²⁶ SLLDP Vol 2 (2021) p 67

3 protection for such areas and notes “development which would have a significant adverse impact following the implementation of mitigation measures will only be permitted where the effects are outweighed by significant social or economic benefits”.²⁷

- 3.23 Policy NHE16 as outlined in Volume 2 protects identified Special Landscape Areas and the wider landscape of South Lanarkshire, and notes “development proposals should maintain and enhance landscape character including:
- the scale, design, and location of development within the landscape,
 - the setting of settlements and buildings within the landscape,
 - the pattern of woodland, fields, trees, hedgerows, waterbodies and other features, particularly where they define / create a positive settlement/ urban edge,
 - the historical qualities of the area and its sensitivity to change,
 - landform features, including key/notable skylines and hills and views to and from them”.²⁸
- 3.24 Existing footpaths, cycle and riding routes are protected by Policy NHE18, which notes that any adjacent development proposals “will require to take account of the route in the design and layout of their scheme”.²⁹ The opportunity to enhance biodiversity afforded by proposed development is outlined in Policy NHE20.
- 3.25 For reference, the full wording of key National Planning Framework and Development Plan policies has been extracted and placed in **Appendix 2.0** Sections 1.2 and 1.3.

Baseline Conditions

Information

- 3.26 Baseline information has been collected from a review of published documents, maps and site visits. Specifically, the following has been undertaken:
- desk review of environmental data, designations and policies relating to the Study Area;
 - site appraisal of potential landscape and visual receptors within the Study Area;
 - reference to the Landscape Character Assessment (LUC, 2010) and Scottish Landscape Character Types Map and Descriptions (Nature Scot, 2019);
 - information available from: the Development Plan covering the Study Area; Scotland’s Environment database; NatureScot database; and Historic Environment Scotland Pastmap.
- 3.27 Information regarding designated environmental sites/areas, features and infrastructure in the proposed development site and surrounding area is summarised below and illustrated in **Figure 3.1**.

Landscape Features and Character Baseline

- 3.28 The proposed development is located to the immediate north of the existing Coalburn Substation and 400kV overhead line. The site is located less than 1km to the south of the settlement of Lesmahagow and approximately 1.5 km north east of Coalburn. To the east is a dismantled railway line forming the edges of Coalburn Moss, the B7078 Carlisle Road with the M74 beyond. To the west are the farmhouses of Neuk and Johnshill, and retirement village of Auchenlochan Garden Village.

²⁷ SLLDP Vol 1 (2021) p 35

²⁸ SLLDP Vol 2 (2021) p 69

²⁹ SLLDP Vol 2 (2021) p 71

Landform

- 3.29 The landform encompassing the proposed development site is a low lying gently undulating area containing a basin of low flat ground. Through this topography the River Nethan to the west and Douglas Water to the south east are aligned along meandering shallow valleys.
- 3.30 The proposed development site is gently sloping ground descending to the south and east. To the west the land rises to a high point of 241m AOD. This low ridge of higher ground has a general north- south orientation.
- 3.31 To the east the ground descends to 217m AOD and is contained by the manmade embankment of a dismantled railway line leading to the settlement of Coalburn. The top of this embankment is approximately 2m above surrounding ground levels. Beyond, to the east is the flat low-lying expanse of Coalburn Moss which then rises to higher ground encompassing Broken Cross Muir.
- 3.32 To the south Coalburn Moss and the adjacent gently undulating ground is punctuated by manmade spoil heaps. Beyond the settlement of Coalburn the land rises to a plateau of rounded hills with a high point of Common Hill (488 m AOD).
- 3.33 To the north and west the gently undulating ground descends to a narrow valley containing the River Nethan along which the settlement of Lesmahagow and Auchenlochan Garden Village is located. Beyond the land rises to a series of rounded hills with high points of Warlaw Hill (338 m AOD) to the west and Black Hill (290 m AOD) to the north.

Landcover

- 3.34 The landcover of the proposed development site is a young coniferous plantation of Sitka species and area of Birch and Oak broadleaved plantation to the east. This was planted by Forest Land Scotland (FLS) in 2012 following the purchase of seven farms owned by Auchlochan Estate and now forms part of the Lesmahagow Land Management Plan (2023). Lines of mature Beech trees on drystone walls, Hawthorn hedges and fences delineate the former agricultural fields of improved pasture.
- 3.35 To the immediate north of the site is an area of broadleaved woodland which has been identified as a Long Established Woodland of Plantation Origin (LEWPO). This historic woodland shelterbelt which extends to the north and east was reinforced as part of the existing Substation landscape works and protected by a deer fence. The new planting species mix included: Alder; Hazel; Hawthorn; Ash; Holly; Cherry; Blackthorn; Oak and Rowan. The other areas of LEWPO and Ancient Woodland in the study area are located primarily along the River Nethan valley and Douglas Water.
- 3.36 To the east and south in the low lying marsh and bog areas, is rough grassland and wet heath. Scattered along the dismantled railway line are areas of self seeded trees.
- 3.37 Other woodland in the immediate surroundings are primarily coniferous and mixed plantations associated with the Lesmahagow Forest Plan (FLS, 2023), larger plantations encompassing Broken Cross Muir to the east and the upland plateau to the south.

Landuse

- 3.38 The landuse of the proposed development site and surrounding ground to the north and west is commercial plantation. To the immediate south are the towers of the 400kV overhead line aligned to the west and east, and existing Coalburn Substation. Along the wayleave corridor for the overhead line is open pasture fields which also form the immediate surroundings of the farmsteads of Neuk and Johnshill.
- 3.39 To the east of the proposed development is a dismantled railway line along which an aspirational core path is aligned. Further east is Carlisle Road B7078 and the major transport corridor of the M74. An aspirational core path is also aligned along the eastern edge of Coalburn Moss, and a further footpath and national cycle route along Carlisle Road.
- 3.40 Further to the north is the settlement of Lesmahagow, and Coalburn to the south. To the west is Hollandbush Golf Course and Auchenlochan Garden Village. Encompassing the elevated open ground is improved pastureland, large commercial forest plantations and wind farms. To the east wind turbines are currently under construction forming Broken Cross Wind Farm which was consented in 2021.
- 3.41 In the wider area there are further footpaths around the settlements of Lesmahagow and Coalburn, and crossing the higher ground to the east and west.

Designations

- 3.42 To the north and east of Lesmahagow is designated the Middle Clyde Valley Special Landscape Area (SLA). The significance of this area which encompasses New Lanark World Heritage Site “lies in a combination of landscape qualities and uniquely important sites”.³⁰
- 3.43 To the south east of the study area is designated the Douglas Valley SLA. The significance of this area is noted to relate “combination of scenic and cultural features”³¹. Special Landscape Areas are protected by Policy NH16 of the SLLDP2 which notes that both “Within the SLAs and the wider landscape of South Lanarkshire, development proposals should maintain and enhance landscape character”.³²
- 3.44 The proposed Substation is located within “Rural Area” protected by Policy 4 of the SLLDP (2021), where “the Council seeks to protect the amenity of the countryside”.³³
- 3.45 There are few designated heritage features in the surrounding area. Listed Buildings are associated with Birkwood House non inventory house designed landscape to the north west and at Auchlochan Bridge to the west. A Scheduled monument is at Craigend to the north east of Lesmahagow.
- 3.46 Reference to historic maps³⁴ encompassing the proposed development site indicate specimen trees following field boundaries and the area of mixed woodland to the north which is now identified as a Long Established Woodland of Plantation Origin (LEWPO). A general orientation

³⁰ Ironside Farrar (2010) Validating Local Landscape Designations p 10

³¹ Ironside Farrar (2010) Validating Local Landscape Designations p 21

³² SLLDP Vol 2 (2021) p 69

³³ SLLDP (2021) p 16.

³⁴ Ordnance Survey 1858 6 inches to 1 mile.

north-west to south east is a distinctive feature in the alignment of many of the former shelterbelts reflecting the prevailing wind direction. Areas of marsh and bog in addition to Coalburn Moss are also indicated in the historic maps. The historic map notes a coal pit to the east of the existing Coalburn Substation associated with the former Auldton Colliery which was located to the north of the LEWPO and west of Auldtonheight Cottages.

3.47 The proposed Substation site does not fall within the boundary of a statutory or non statutory designated site for nature conservation. To the east of the proposed Substation is the boundary of Coalburn Moss Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). Coalburn Moss qualifies for both national and international designation due to the presence of lowland raised bog habitat.

3.48 To the immediate north is an existing mixed woodland and former shelter identified as Long Established Woodland of Plantation Origin (LEWPO) in the Ancient Woodland Inventory (AWI). These are woodland plantations “that were apparently planted before 1860”.³⁵

3.49 Ancient and Long Established Semi Natural Woodland is defined as land that is currently wooded and has been continually wooded at least since 1750. The AWI notes ‘the most important woodlands in natural heritage terms are those which are defined as ancient and semi natural’.³⁶ There is no legislation specifically protecting ancient woodland, but current NPF 4 Policy 6 and the SLLDP2 Planning Policy 14 aim to protect and enhance such areas.

3.50 The identified LEWPO to the north of the proposed development site extended eastwards to the dismantled railway line and had almost completely disappeared when the existing Substation and access road was constructed. As part of this development, reinforcement planting of the shelterbelt was undertaken to the west of the existing Substation access road.

Landscape Character Types (LCT)

3.51 NatureScot (NS) formerly Scottish Natural Heritage (SNH) undertook a series of Regional Landscape Character Assessments (LCAs) in the 1990s covering the whole of Scotland following established guidance.³⁷ The South Lanarkshire Local Landscape Character Assessment (2010) updated the Glasgow and the Clyde Landscape Character Assessment (1999) which covered the Study Area.

3.52 Building on the original Landscape Character Assessment studies, this information has now been further updated by NatureScot at the level of Landscape Character Type (LCT) to create a single dataset³⁸ for the review of development proposals, plans and strategies. LCTs are “areas of consistent and recognisable landscape character”.³⁹

3.53 The LCTs in the Study Area are indicated in **Figure 3.2**. For reference, the full LCT description has been extracted and placed in **Appendix 2.0**, Section 1.4. The proposed new Substation is located in the Plateau Farmland- Glasgow and Clyde Valley LCT (201). To the west and

³⁵ SNH (1997) The inventory of Ancient and Long Established Woodland Sites and the Inventory of Semi Natural Woodlands

³⁶ SNH (1997) The inventory of Ancient and Long Established Woodland Sites and the Inventory of Semi Natural Woodlands

³⁷ Landuse Consultants (1991) Landscape Assessment Principles and Practice & Countryside Commission (1993) Landscape Assessment Guidance (CCP423).

³⁸ NatureScot (2019) Scottish Landscape Character Types Map and Descriptions.

³⁹ <https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/landscape-character-assessment-scotland>

east is Upland River Valley LCT (207) encompassing the River Nethan and Douglas Water. To the south east of the Study Area the Upland River Valley LCT links to the north to Broad Valley Upland LCT (208).

- 3.54 The Plateau Farmland LCT (201) encompasses the proposed Substation and surrounds. This LCT is described as being a transitional landscape between the sheltered farmed lowlands and broad valleys, and the exposed uplands and moorlands. It is noted that a key characteristic of this LCT is that the rural character “has reduced as tree cover has declined and the visual influence of settlements, transport infrastructure and mineral working has increased”.⁴⁰ In terms of perception it is noted “the area appears in the foreground when seen in views from or towards adjacent moorland and hills.....There are some rural areas which have a tranquil character”.⁴¹
- 3.55 To the west of the proposed Substation, the River Nethan valley is encompassed by the Upland River Valley LCT (207). This LCT encompasses areas where tributaries of the Clyde have cut shallow valleys into the plateau moorland and farmland. Such landscapes provide “a strong contrast between the wooded and settled character of the valleys and the exposed enclosing uplands”⁴². In terms of landcover a characteristic pattern “is that of lines of field boundary trees (often beech), together with small to medium scale woodland belts (often coniferous) which extend up the slopes often following drainage channels, hugging gullies and framing terraces. The woodlands are predominantly broadleaf, although small conifer plantations (usually distinctive pine belts), occupy sites on the valley slopes”.⁴³

Landscape Character

- 3.56 The landscape character of the proposed Substation site forms part of an area undergoing transition from an open, medium scale managed agricultural landscape to enclosed commercial forest plantation. The adjacent existing Substation, overhead line, and man made embankment of the dismantled railway contrast with the rural landscape character.
- 3.57 To the east is the large scale open and flat natural landscape of Coalburn Moss. This is a simple and calm landscape of muted colours, rough texture and in places scattered groups of trees. Beyond Coalburn Moss to the east is the busy communication corridor of the M74 introducing colour and noise. On the surrounding hills to the south and west are a number of large wind farms adding movement and further emphasising the managed landscape character of this area.
- 3.58 The forestry and pastureland surrounding the proposed development site creates contrasting colour, textures and enclosure. The few landscape features include the mature trees on drystone walls defining the regular pattern of former field boundaries, rows of new specimen trees, mixed woodland and shelterbelts, remnant hedges, stone walls and post and wire fencing.
- 3.59 The current use of the surrounding landscape for forestry and pastureland appears well managed.

⁴⁰ NatureScot (2019) Scottish Landscape Character Types Map and Descriptions. LCT 201 p 1.

⁴¹ NatureScot (2019) Scottish Landscape Character Types Map and Descriptions. LCT 201 p 3.

⁴² NatureScot (2019) Scottish Landscape Character Types Map and Descriptions. LCT 207 p 1.

⁴³ NatureScot (2019) Scottish Landscape Character Types Map and Descriptions. LCT 207 p 2.

- 3.60 The existing landscape character and quality of the immediate countryside is protected by SLLDP Policy 4 Rural Area, and to be maintained and enhanced by SLLDP Policy NHE 16.
- 3.61 The area surrounding the proposed development site is experienced by a few residential properties, recreational users of the footpath along the dismantled railway and surrounding footpaths, cyclists, vehicle drivers using Carlisle Road, M74 and adjacent minor and major roads. The value of this landscape adjacent the existing Substation, relates primarily to forming part of a wider settled, managed agricultural landscape with man made features encompassing transport infrastructure, dismantled railways lines, mineral workings, spoil heaps and wind farms, and the contrast to the natural expanse of Coalburn Moss.

Summary

- 3.62 In summary, the proposed new Substation is located in an area of young coniferous and broadleaved plantation adjacent the existing Coalburn Substation. This is a landscape which has changed recently in character from open agriculture to enclosed commercial forestry plantation adjacent existing electrical infrastructure. The wider landscape encompassing the natural, calm and open character of Coalburn Moss is also in transition with the surrounding rural pastoral landscape becoming more managed and busier with the expansion of surrounding wind farm development. The landscape of the proposed development site is experienced from a few residential properties, footpaths, cycle paths and roads. Overall, it is considered that the remaining landscape features of the proposed development site are of **medium** sensitivity to change, and the landscape character of **low** sensitivity to change.

Views and Visual Baseline

- 3.63 The visual appraisal of the proposed new Substation is based on an understanding of the extent of visibility with reference to computer generated information and site survey work, identification of visual receptors, and grading of degrees of visibility.
- 3.64 The computer generated Zone of Theoretical Visibility (ZTV) of the proposed development site is shown in **Figure 3.3**. This indicates the extent of theoretical visibility of the proposed new Substation incorporating screening by existing buildings and large woodland blocks⁴⁴. The difference in predicted visibility for the proposed development only compared to the existing Coalburn Substation is indicated in red.
- 3.65 The ZTV has been reviewed and refined by a site survey of potential visibility, which takes account of localised detailed screening provided for by example, walls, hedges, scattered trees and small woodlands. In this Study area, detailed screening is afforded in many places by existing Beech and Hawthorn hedges, and lines of large mature trees along field boundaries. The representative range of viewpoint photographs are located in **Figure 3.3** and indicated in **Figure 3.4**. The viewpoint photographs are annotated with key features.

Visibility

- 3.66 To the north and east visibility of the proposed Substation extends to encompass Carlisle Road, M74, network of rural lanes on higher ground, scattered residential properties and

⁴⁴ A standard height of 8m for buildings and 8m for woodland has been adopted for the ZTV. Buildings and tree blocks have been taken from the OS 1:25 open map dataset.

farmsteads. Visibility from the north is restricted and limited by the undulating topography and intervening woodland.

- 3.67 The screening effect of the intervening commercial forest plantation will change when harvested and replanted, but the mixed woodland shelterbelt to the immediate north of the proposed development site will remain safeguarded as this has been identified as a Long Established Woodland of Plantation Origin. The view afforded from this area is indicated in **Figure 3.4** Viewpoint 1, at Righead to the south of Devonburn from the minor road and designated footpath.
- 3.68 To the east, views are more open due to the flat foreground topography of Coalburn Moss and lack of intervening screening. From this orientation the proposed Substation site is backgrounded in part by the gently rising topography and adjacent woodland. Existing views from this area encompass the existing Substation and overhead line. The view afforded across Coalburn Moss from Carlisle Road which is also a designated footpath and cycle path is indicated Viewpoint 2, **Figure 3.4**.
- 3.69 To the south, visibility extends to the settlement of Coalburn and encompasses a number of properties along Bellfield Road. Beyond distant views will be afforded from the rising ground and hills enclosing the Coalburn Moss basin. From this orientation the existing Substation and overhead towers will form the immediate foreground of the proposed Substation, with a background of woodland and hills beyond. Intervening tree planting undertaken as part of the Lesmahagow LMP, scattered trees along the dismantled railway and mixed woodland to the immediate south of the existing Substation provide screening. The view afforded from this area is indicated in **Figure 3.4** Viewpoint 3 from Bellfield Road a recognised footpath, and adjacent residential properties.
- 3.70 To the west, visibility encompasses a few properties and extends beyond Coalburn Road to encompass the slopes of Warlaw Hill and the network of rural lanes, scattered properties and farmsteads located on this higher ground. Views from this area encompass the existing Substation and overhead line. Distant views are afforded across undulating woodland with the rising ground of Broken Cross forming the background where wind turbines are currently under construction. Screening is provided by the undulating topography, lines of field boundary trees and woodland. The view afforded from the Coalburn Road and footpath adjacent the residential property of Johnshill is indicated in **Figure 3.4** Viewpoint 4.

Visual Receptors

- 3.71 Visual receptors identified in the surrounding area and description of views in relation to the proposed development site are listed in **Table 3.1**. For the purposes of the assessment, visual receptors include residents, visitors, recreational, road users and other groups of viewers (such as those for example with a special interest in cultural heritage), which have the potential to be affected by the proposed development.
- 3.72 The description of the degree of visibility of the proposed development from any location has been divided into four categories as follows:

No View: no view or difficult to perceive.

Glimpse View: a transient view or distant view of part of proposed Substation in the context of a wider view.

Partial View: a clear view of part of the proposed Substation; a partial view of most of it; or a distant view in which the proposed development forms a relatively small proportion of a wider view.

Open View: a panoramic view of most of the proposed Substation, occupying most of the field of vision.

- 3.73 No open views of the proposed development site are afforded, as from all directions the proposed Substation will be viewed in the context of the existing Substation and overhead line.
- 3.74 To the north and north east, glimpse views will be afforded from Carlisle Road and minor road leading to Righead. Both roads are recognised footpaths and Carlisle Road forms part of the national cycle route network. Few residential properties may have glimpse views but the majority are considered to have none of the proposed development site due to screening afforded by intervening woodland, trees, hedges and planting within the curtilage of the property.
- 3.75 To the east, partial and glimpses views will be afforded from the M74, Carlisle Road, industrial properties and aspirational core footpaths aligned along the western and eastern edges of Coalburn Moss. Many longer distance views are restricted by intervening scattered trees.
- 3.76 To the south, glimpse views will be afforded from a few residential properties along Bellfield Road, edge of Coalburn settlement and footpaths aligned through this area. The rising topography allows distant views northwards encompassing Coalburn Moss, spoil heaps and the M74. Views are restricted by intervening woodland, spoil heaps and the existing Substation which screens part the proposed development site.
- 3.77 To the west, partial and glimpse views will be afforded encompassing the residential property of Johnshill, minor roads and network of footpaths crossing higher ground. It is considered that Neuk Farm will have a glimpse or no view of the proposed development due to the intervening topography and woodland. Views are generally restricted by woodland, undulating topography, remnant mature trees along field boundaries and to the south east spoil heaps.
- 3.78 Overall, the extent of visibility is limited, restricted by the topography, existing coniferous and mixed woodland to the north and west, to the east the scattered trees along the dismantled railway line, across Coalburn Moss and along Carlisle Road, and to the south the existing Substation. Visibility extends to encompass the slopes of higher ground to the east, south and west. Partial and glimpse views of the proposed development will be afforded from a few residential properties, recreational users of footpaths and cycle paths and Coalburn Moss which are receptors of **high** sensitivity. Partial and glimpse views of the proposed development will also be afforded by users of the surrounding roads which are considered to be receptors of **low** sensitivity.

Potential Effects of Proposed Development

Loss of Landscape Features

- 3.79 The proposed Substation will necessitate the permanent removal of: approximately six mature Beech trees; approximately twenty eight young specimen trees and 130m length of mixed hedge planted as part of the existing Substation; an area of young coniferous and broadleaved plantation (8.245 Ha); and associated earthworks to achieve the required levels for the compound, access road and detention pond and landscape bunds to retain all material on site.
- 3.80 Overall, it is considered that the landscape features of the proposed development site are of **medium** sensitivity to change. The magnitude of change on landscape features is considered to be **low** during construction and operation reflecting the permanent loss of a few mature trees, young specimen trees, hedge, and coniferous and broadleaved plantation, which overall will have a **minor adverse** significance of effect.

Landscape Character

- 3.81 The proposed development site is in a semi enclosed forested landscape adjacent an existing Substation and overhead line. This is a settled and managed rural area with many man made features including mineral workings, the busy corridor of the M74, and wind farms, encompassing a simple low lying areas of open moss. Beyond the site, the landscape is experienced by: a few residents; users of footpaths and cycle paths; minor and major roads.
- 3.82 Overall, it is considered that the landscape character of the proposed development site is of **low** sensitivity to change. On review of the proposed development construction and operational works it is considered that these will have a **low** magnitude of change upon the landscape character. The proposed Substation and temporary compound and car park area is considered overall to represent a **minor adverse effect** to the existing landscape character.

Visual Amenity

- 3.83 Within the visual envelope, a number of sensitive and less sensitive receptors will have partial, glimpse and transient views of the proposed development and existing Substation from: a few residential properties; cycle route to the east; footpaths to the east, south and west; and surrounding roads to the east, south and west. Views from all areas encompass the existing Substation and 400kV overhead line routed through the area.
- 3.84 The ZTV indicates that potential views of the proposed development not encompassing the existing Substation are limited and restricted to the north along Devonburn Road and to the east along part of Carlisle Road, and a few areas to the south west and north west.
- 3.85 Overall, it is considered that during the construction and operation of the proposed Substation, the magnitude of change to views and visual amenity will be **low** for the majority of receptors located within the visual envelope of the proposed development.
- 3.86 The viewpoint locations and photographs are indicated in **Figures 3.3** and **3.4**. The appraisal of visibility and visual effect of the proposed development without mitigation on visual receptors and viewpoints is detailed in **Table 3.1** below.

Table 3.1: Visibility and Visual Effects ⁴⁵

Receptor Type	Visual Receptor	Sensitivity	Description of Visibility	Magnitude of Change	Appraisal of Visual Effect
Property					
North	Auldtonheights (3 No), Auldton Cottages, Lesmahagow, scattered properties/ farmsteads on higher ground to north west	high	glimpse/ none	low	minor
North	Righead VP 1 , Devonburn, scattered properties/ farmsteads on higher ground to north east	high	glimpse/ none	low	minor
East	Annfield, Industrial premises on Carlisle Road B7078	high/ medium	partial/ glimpse/ none	low	minor
South	Bellfield Road (12 no) VP 3 , Coalburn	high	glimpse/none	low	minor
West	Johnshill VP4	high	partial/glimpse	low	minor
West	Neuk	high	glimpse/none	low	minor
West	Greystone/ scattered properties/ farmsteads on Warlaw Hill	high	glimpse/none	low	minor
Designated Recreation/ Footpaths & Cycle Routes (transient)					
North	Core paths, aspirational Core Paths and wider network footpaths, Cycle Path VP 1	high	glimpse/none transient	low	minor
East	Carlisle Road Cycle Path, wider network footpath, aspirational Core path along Coalburn Moss edges VP 2	high	partial, glimpse/none transient	low	minor
South	Wider network footpaths, Core Paths, and aspirational Core Paths VP 3	high	glimpse/none transient	low	minor
West	Wider network footpaths, Core Paths, and aspirational Core Paths VP 4	high	partial/ glimpse/ none transient	low	minor
Protected Sites					
North	Middle Clyde Special Landscape Area (SLA)	high	none	none	n/a
North	Lesmahagow Conservation Area	high	none	none	n/a
North	Craighead SM	high	none	none	n/a
East	Coalburn Moss SAC, SSSI	high	partial/ glimpse	low	minor
South	Douglas Water SLA	high	none	none	n/a
South	Coalburn Moss SAC, SSSI	high	partial/ glimpse	low	minor
Roads (transient)					
North	Carlisle Road B7078, M74 VP 1	low	glimpse/none transient	low	minor
East	Carlisle Road B7078, M74 VP 2	low	partial, glimpse/ none transient	low	minor
South	Bellfield Road VP 3	low	glimpse/none transient	low	minor

⁴⁵ Note: Visibility has been surveyed from the closest point to receptor without the need to enter upon private land. Survey findings are therefore approximate only.

Receptor Type	Visual Receptor	Sensitivity	Description of Visibility	Magnitude of Change	Appraisal of Visual Effect
West	Coalburn Road VP 4 , Auchlochan Road and Warlaw Hill Road	low	glimpse/none transient	low	minor

3.87 On review of the receptors and selected viewpoints, the proposed Substation is considered to have a **minor adverse** effect. This assessment reflects the limited visibility of proposed development site and visual context adjacent the existing Substation and 400kV overhead line.

Mitigation Measures

3.88 The landscape mitigation measures proposed in relation to the likely construction and operational effects of the proposed development are indicated in **Figure 2.1**. In summary the landscape design aim is to: provide screening and enhance biodiversity whilst reinforcing the existing landscape features and character; and integrate the proposed development into the surrounding countryside. As advised by Nature Scot with reference to the existing Substation and extension landscape mitigation measures, no Birch species shall be used in the proposed mixed woodland planting given the proximity to Coalburn Moss.

3.89 Landscape mitigation shall also include: the protection for the duration of the works the identified LEWPO to the north of the proposed development, retention of as many of the mature trees on drystone walls delineating former field boundaries as possible to the west and area of dense scrub to the south. The Landscape Restoration Scheme shall be implemented as soon as practicable following completion of the proposed development works.

3.90 The opportunity to undertake remedial works to the existing Substation landscape planting shall also be undertaken as part of the proposed development. This will include: removal of redundant protective shelters and stakes; and removal of wire mesh to fences to allow animal movement and improve nature network linkages (posts shall be retained as woodland edge markers).

3.91 The Construction Environmental Management Plan (CEMP) identifies those responsible for the management and reporting on the environmental aspects during construction and the reinstatement works. The CEMP will include the approved Landscape Restoration Scheme outlining the requirements for new planting, management and future maintenance works to the new Substation, temporary construction compound, car park and soil storage area post-construction. For information, the draft structure of headings for the CEMP has been placed in **Appendix 1.0**.

Residual and Cumulative Effects

Summary of Effect on Landscape and Visual Amenity

Effect on Landscape Features and Character

3.92 The sensitivity of the landscape features to change is considered to be medium and the magnitude of change low during construction and operation. Overall, the significance of effect upon the immediate local landscape features is considered to be **minor adverse** during construction and operation. The implementation of the Landscape Restoration Scheme and associated remedial works to enhance existing landscape features is considered to be **minor beneficial**. The overall permanent effect is considered to be **negligible**.

3.93 The sensitivity of the landscape character to change is considered to be low and the magnitude of change low during construction and operation. Overall, the significance of effect upon the landscape character is considered to be **minor adverse** during construction and operation.

Effect on Visual Amenity

3.94 The greatest change in the character of views and visual amenity will be very limited and localised, encompassing sensitive and less sensitive receptors to the east, south and west. The overall significance of visual effect for sensitive receptors is considered to be **minor adverse** during construction and operation.

Significance

3.95 In summary, the overall significance of landscape and visual effects of the proposed new Substation, temporary compound and car park area is assessed to be **minor** adverse during construction. This effect will be temporary and localised. On completion, it is assessed that the overall permanent landscape and visual effect of the proposed development will on balance be **minor**. This effect will decrease as the Outline Landscape Restoration Scheme becomes established.

3.96 The evaluation of significance of landscape and visual effects associated with the proposed new Substation is summarised in **Table 3.2**.

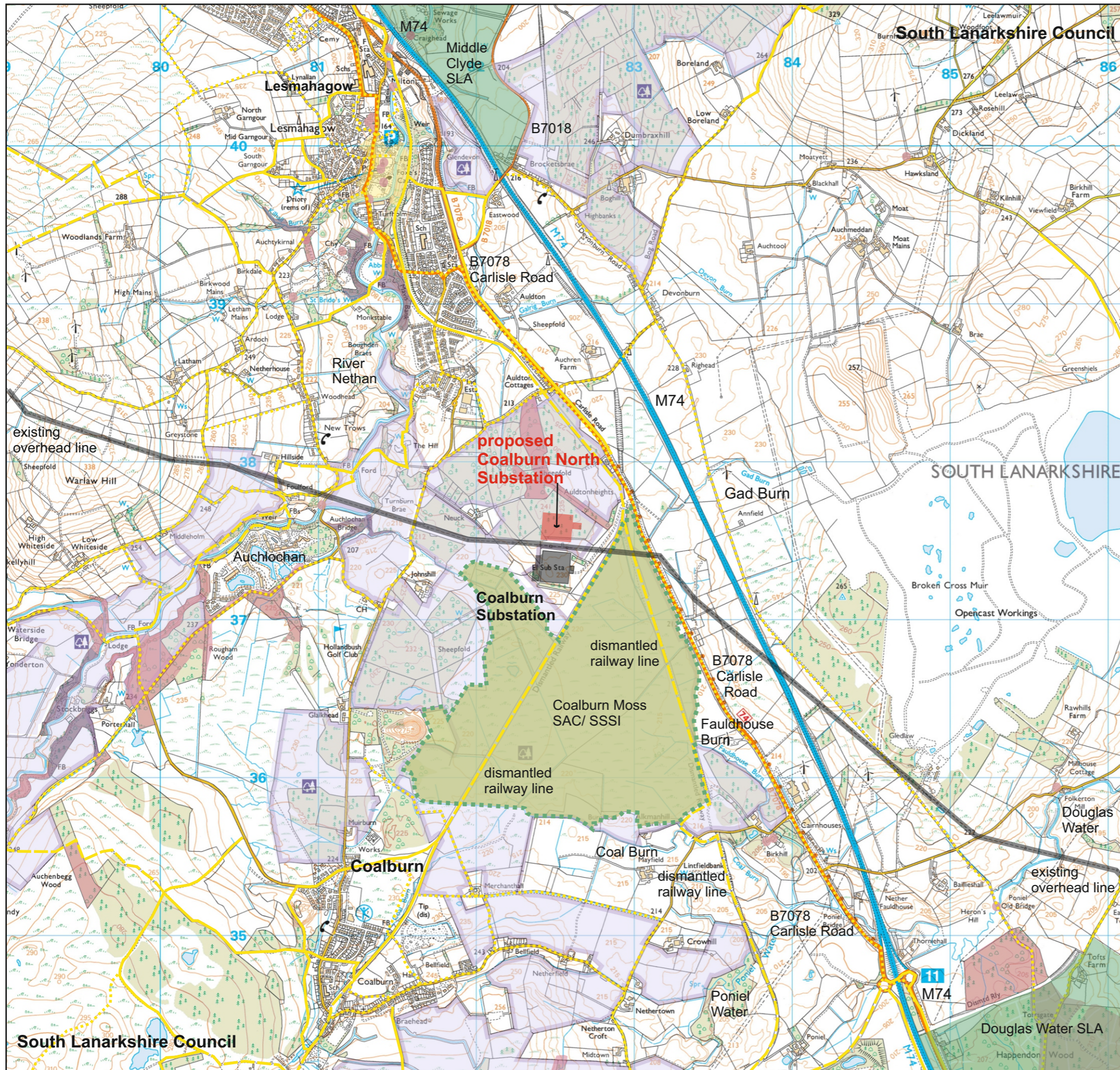
3.97 On review of proposed development in the Study Area it is considered there are no likely significant cumulative effects which prevent the proposed new substation.

3.98 Implementation of the landscape remedial works to the existing Substation is a minor positive beneficial effect of the proposed development.











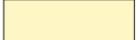



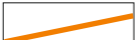

Table 3.2: Summary of Evaluation of Landscape & Visual Effects

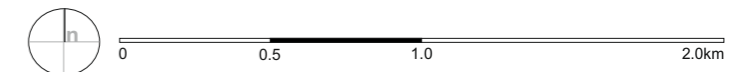
Landscape Receptor	Effect			Significance		Rationale
	Sensitivity	Magnitude of Change		Level of Construction /Operation Effect	Level of Permanent Effect	
		Construction	Permanent			
Landscape Features	medium	medium	low	minor	negligible	<p>Construction: Permanent loss of approximately 6No mature Beech former field boundary trees, 28 No young specimen trees, 130m mixed hedge, young coniferous and broadleaved plantation (8.245 Ha). Earthworks to form compound, access road and detention pond levels, and landscape bunds to retain all material on site.</p> <p>Permanent: Overall, on balance considered following implementation of Outline Landscape Restoration Scheme considered negligible effect.</p>
Landscape Character	low	low	low	minor	minor	<p>Construction: Alteration of the local appearance and landscape character of the site during construction.</p> <p>Permanent: Proposed Substation located adjacent existing Substation and OHL in a settled managed rural landscape character area. Overall, on balance considered to be a minor adverse effect.</p>

Visual Receptor	Effect			Significance		Rationale
	Sensitivity	Magnitude of Change		Level of Construction Effect	Level of Permanent Effect	
		Construction/ Operation	Permanent			
Receptors within Visual Envelope/ Viewpoints 1-4	high-low	low	low	minor	minor	<p>Construction: Temporary localised alteration of available views of the site and character during construction.</p> <p>Permanent: Limited change in character of views and visual amenity which encompasses the existing Substation and overhead line. Overall, on balance considered minor adverse effect.</p>



Key

-  Proposed Coalburn North Substation
-  Existing Coalburn Substation
-  Existing 400kV Overhead Line (SLA)
-  Special Landscape Area
-  Special Area of Conservation (SAC)
-  Site of Scientific Interest (SSSI)
-  Ancient Woodland (of Semi Natural Origin)
-  Long Established Woodland (of Plantation Origin)
-  Scheduled Monument (SM)
-  Listed Building (LB)
-  Conservation Area
-  Core Footpath
-  Aspirational Core Path
-  Wider Network
-  Cycle Path - Traffic Free & On Road
-  Lesmahagow Land Management Plan Area (FLS)



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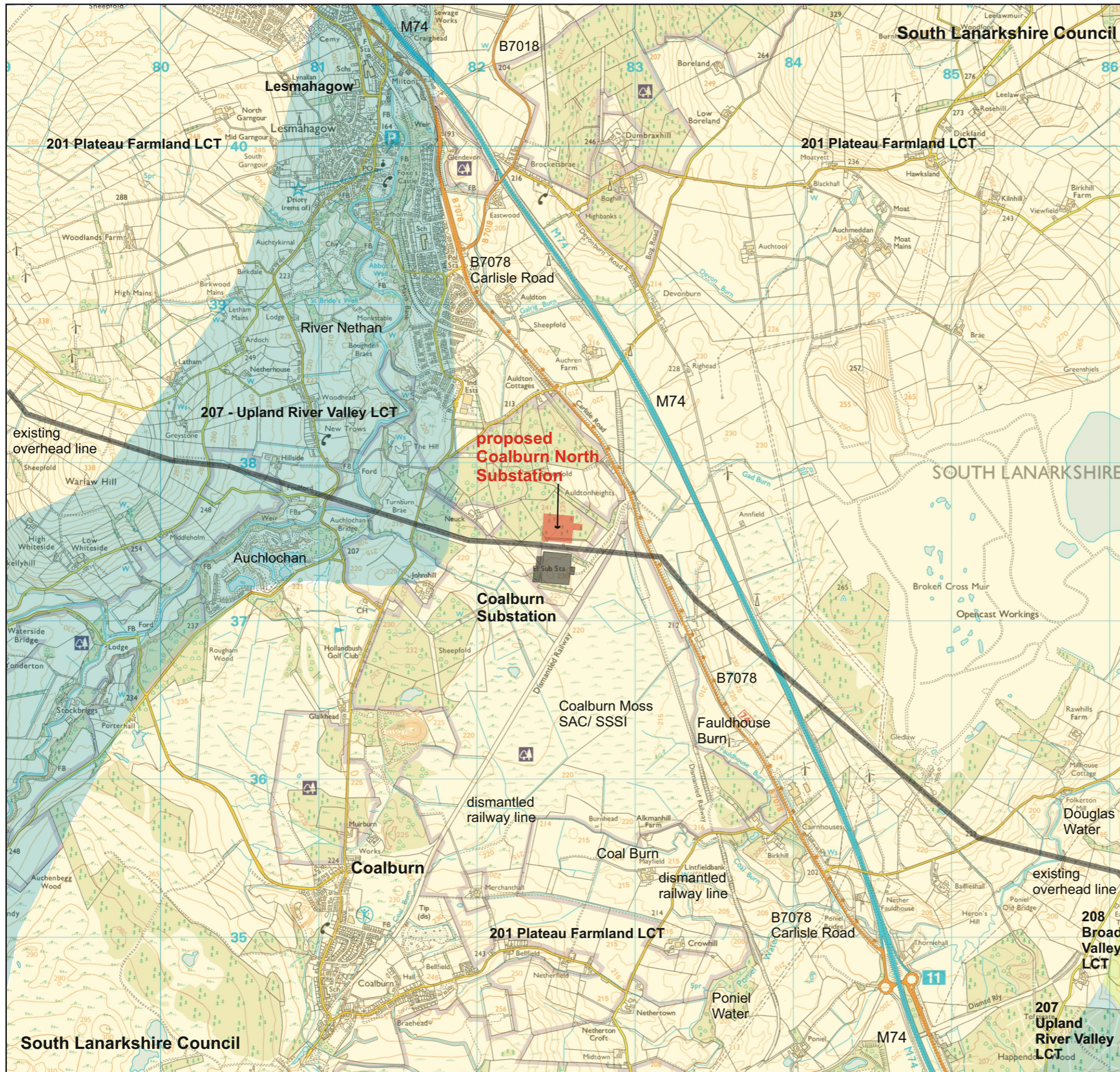
figure 3.1

Title:
Designated Sites/ Areas, Features & Infrastructure




Project:
Proposed Coalburn North Substation

Scale: 1:25,000 @A3/ Bar Scale

Date: Jan 2024



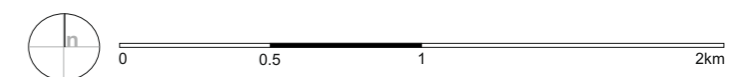
Key

-  Proposed Coalburn North Substation
-  Existing Coalburn Substation
-  Existing 400kV Overhead Line

Landscape Character Types

-  201- Plateau Farmland - Glasgow & Clyde Valley
-  207- Upland River Valley-Glasgow & Clyde Valley
-  208- Broad Valley Upland

Note: Information based on NatureScot (2019) Scottish Landscape Character Types Map and Descriptions



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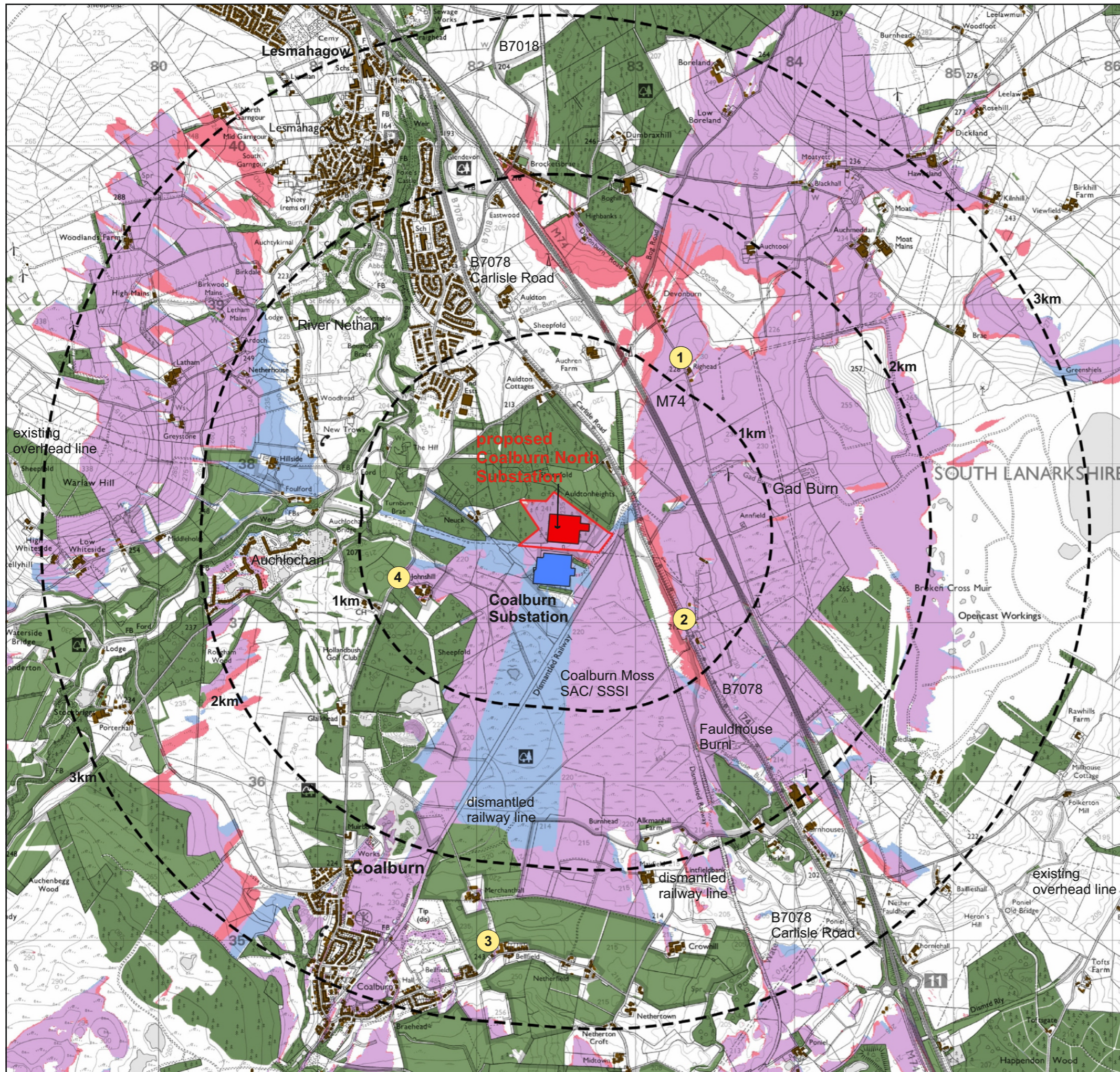
figure 3.2

Title:
Landscape Character Types
extract NatureScot (2019) LCTs Map & Descriptions




Project:
Proposed Coalburn North Substation

Scale: 1:25,000 @A3/ Bar Scale





Date: Nov 2023



Key

-  Proposed Coalburn North Substation
-  Existing Coalburn Substation
-  Existing 400kV Overhead Line

Zone of Theoretical Visibility with Screening (ZTV)

- Buildings & Woodland Blocks at 8m Height
-  ZTV of Existing Substation & Proposed Substation
 -  ZTV difference_Proposed Substation Only
 -  ZTV difference_Existing Substation Only
 -  Viewpoint Photograph Locations

NOTES:

Based on SPEN Dwg BT3091-2-5200-I0-SPENEC-0127. Area within development site boundary bareground with no landscape bunds for ZTV. Existing Substation 227m AOD, maximum height of equipment 13.5m. Proposed Substation 231m AOD, maximum height of equipment 13.5m.

FIGURE DATA:

This figure has been based on the following data:

Layout file: obv-proposed-site-T5-DSM-3km.shp;
 obv-existing-site-T5-DSM-3km.shp
 Terrain data: T5-DSM-231m-proposed-227m-existing.asc;
 T5-DSM-231m-proposed-240_5m-existing.asc
 Viewer's eye height: 2m above ground level
 Calculation grid size: 2m

NOTES:

This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.

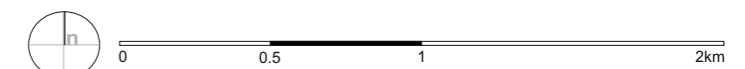
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.

A digital surface model (DSM) has been derived from OS Terrain 5 height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Buildings have been modelled with an assumed height of 8m and woodland an assumed height of 8m, representing a conservative estimate of average heights within the study area.

The model does not take into account some localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.

The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 2m² resolution.

Projected Coordinate System: British National Grid



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figure 3.3

Title:
Zone of Theoretical Visibility
 Stephenson Halliday

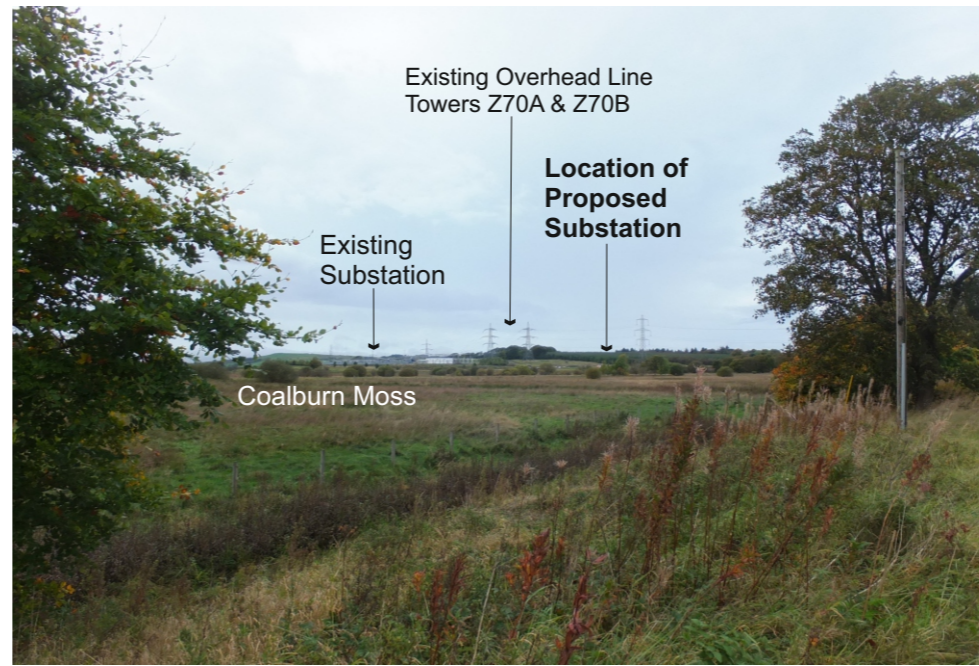
Project:
 Proposed Coalburn North Substation

Scale: 1:25,000 @A3/ Bar Scale

Date: Nov 2023



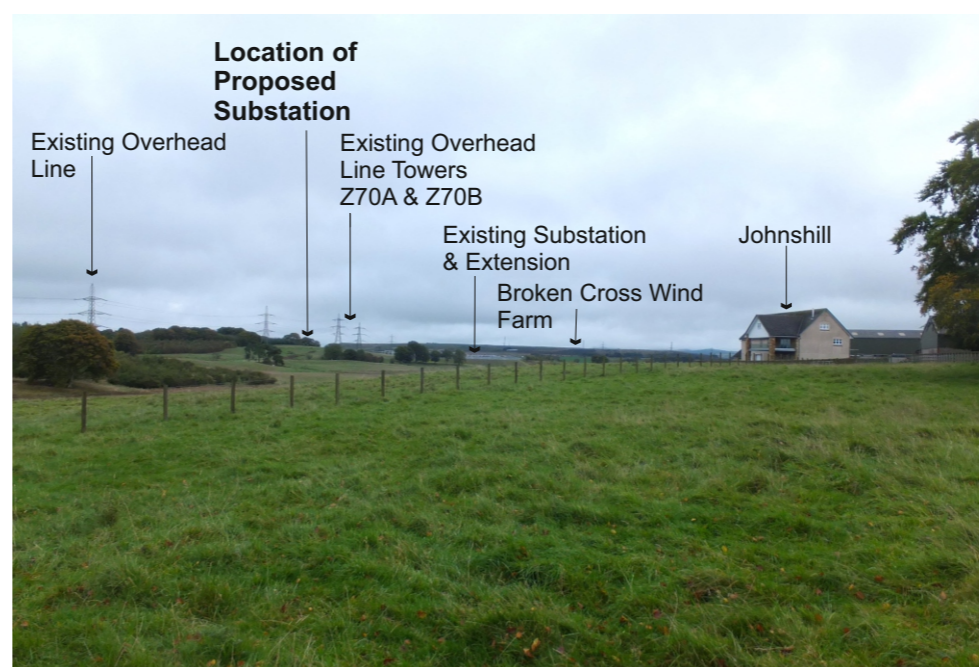
Viewpoint 1_Righead



Viewpoint 2_Carlisle Road B7078






Viewpoint 3_Bellfield Road, Coalburn






Viewpoint 4_Johnshill, Coalburn Road

Key

-  Proposed Coalburn North Substation
-  Existing Coalburn Substation
-  Existing 400kV Overhead Line

Zone of Theoretical Visibility with Screening (ZTV)

Buildings at & Woodland Blocks at 8m Height

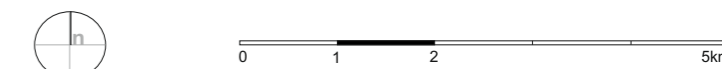
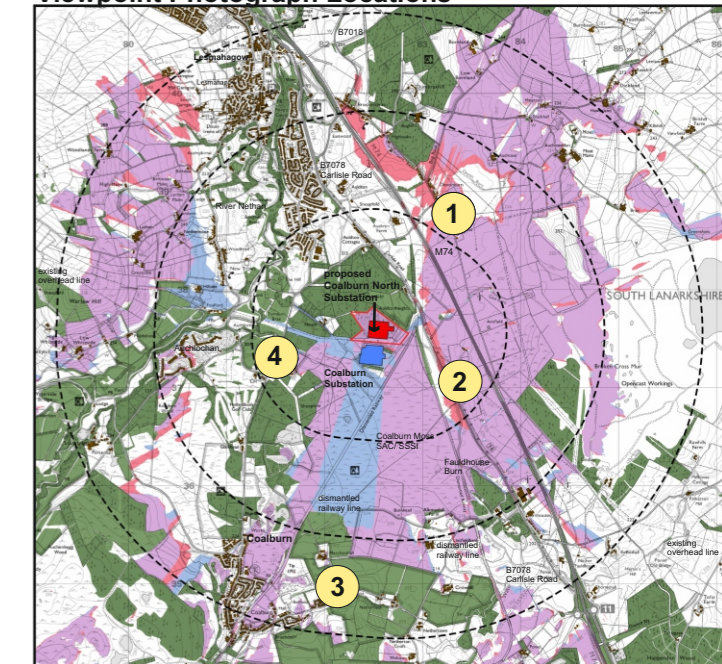
-  ZTV of Existing Substation & Proposed Substation
-  ZTV difference_Proposed Substation Only
-  ZTV difference_Existing Substation Only

Based on SPEN Dwg BT3091-2-5200-10-SPENEC-0127. Area within development site boundary bare ground with no landscape bunds for ZTV. Existing Substation 227m AOD, maximum height of equipment 13.5m. Proposed Substation 231m AOD, maximum height of equipment 13.5m.

Viewpoint Photographs

-  VP1_Righead
-  VP2_Carlisle Road B7078
-  VP3_Bellfield Road, Coalburn
-  VP4_Johnshill, Coalburn Road

Viewpoint Photograph Locations



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figure 3.4

Title:
Viewpoint Photographs

Project:
Proposed Coalburn North Substation

Scale: Bar Scale

Date: Nov 2023

Introduction

- 4.1 This Chapter has been prepared by BSG Ecology and examines the likely significant ecological effects of the proposed Coalburn North Substation development, including the temporary construction compound, car park and soil storage area as shown in **Figure 1.2**. The ecological impact assessment (EclA) has been carried out with reference to the guidance produced by the Chartered Institute of Ecology and Environmental Management⁴⁶ (CIEEM, 2018 updated 2019), which is recognised nationally as current best practice.
- 4.2 The approach adopted in this Chapter follows the EclA process from baseline data gathering through to the assessment of residual impacts. It starts by describing the results of the desk study and field survey, which have been carried out to gather data on flora and fauna, and the habitats present within the site. It also identifies any statutory and non-statutory designated sites of nature conservation interest in the area. Collectively these data establish the baseline conditions.
- 4.3 The collated baseline information has then been evaluated to identify which important ecological features (i.e., designated sites, habitats and species) may potentially be impacted by the proposed Coalburn North Substation development, including the temporary construction compound and car park area. The potential impacts on important ecological features are then outlined and an assessment made of their ecological significance. The assessment has been based on the avoid-mitigate-compensate hierarchy.
- 4.4 In the final stages, the potential for measures to mitigate significant adverse impacts is investigated and, where this is not possible, the need for compensatory measures is identified. The likely post-mitigation / post-compensation residual impacts are discussed, and the implications of these residual impacts are examined with regard to Planning Policy.

Scope and Methodology

Defining the Study Area

- 4.5 The Study Area ('zone of influence') for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).
- 4.6 For this assessment the zone of influence is defined as follows for relevant important ecological features:
- The development footprint together with a buffer up to 30 m from the proposed development for habitats (extending further where there are pathways of effect, e.g., via watercourses);
 - The development footprint together with a buffer up to 30 m for protected species; and

⁴⁶ Chartered Institute of Ecology and Environmental Management (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Published September 2018.

- A search radius of 2 km for designated sites (a search was made for any Special Area of Conservation (SAC), Special Protection Area (SPA) or Ramsar site within 10 km of the site extended to 20 km for SPAs designated for wintering geese/swans).

4.7 Areas beyond these distances are considered unlikely to be significantly affected by the proposed development.

Desk Study

4.8 Previous developments at Coalburn Substation have included Preliminary Ecological Assessments (PEAs) and these provide a useful source of desk study and survey data. Reference has been made to ecological information submitted to South Lanarkshire Council in association with the following Planning Applications:

- P/21/1618, Construction of hardstanding platform with associated drainage and temporary access road and storage area for extension to electrical substation.
- P/23/0042, Installation of approximately 17km of 132kV overhead line (section 37 consent) from Kennoxhead Wind Farm.

4.9 A data request was previously submitted to Glasgow Museum Biological Records Centre (GMBRC) by AECOM on 10 August 2022 to inform a Preliminary Ecological Appraisal (PEA - AECOM, 2022) for the proposed Coalburn North Substation. Reference has been made to the results of this desk study, which are considered to be valid for the purpose of informing the ecological impact assessment.

4.10 The PEA prepared for the proposed Coalburn North Substation (AECOM, 2022) included an ecological desk study that identified statutory international designations, such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites, within 10 km of the Site boundary. This was extended to 20 km for SPAs designated for wintering geese/swans. Additionally, statutory national and local designations, such as Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs) were identified within 2 km of the site. Non-statutory designations including Sites of Interest for Nature Conservation (SINCs), ancient woodland listed on the Ancient Woodland Inventory (AWI) and native woodland listed in the Native Woodland Survey of Scotland (NWSS) were identified within 1 km of the Site (AECOM, 2022).

4.11 The desk study undertaken by AECOM also considered data obtained from the NatureScot SiteLink website to establish the location and nature of any designated sites located within the study area.

4.12 The South Lanarkshire Council strategy map (file:///C:/Users/steve/Downloads/LDP2_Strategy_Environment_map.pdf, accessed 5 September 2023) was searched for designated sites and to identify any relevant ecological policies that covered the site and the surrounding area.

4.13 Reference has also been made to the Scottish Government's Scottish Environment Web (<https://map.environment.gov.scot/sewebmap/>, accessed on 5 September 2023), which includes a range of habitat data sets including ancient woodland and peatland.

Field Survey

- 4.14 The ecological baseline for the site has been derived with reference to an extended Phase 1 Habitat Survey carried out in September 2023 (Solway Ecology, unpublished) as indicated in **Figure 4.1**. This survey involved a walkover assessment of the habitats present, and consideration of habitat suitability for a range of protected species including badger *Meles meles*, bats, breeding birds and reptiles. The results of the survey carried out in 2023 complemented the results of surveys completed in 2022 (AECOM, 2022).
- 4.15 A bat roost suitability assessment was completed in 2022 (AECOM, 2023). The assessment covered all trees and buildings within the Site plus a minimum 100 m buffer. The assessment followed guidance published by the Bat Conservation Trust (Collins, 2016) and was conducted on 26 July 2022.
- 4.16 Bat activity surveys were carried out in 2022 (AECOM, 2023) following industry guidance (Collins, 2016). Walked transects were completed where a single transect route was used to cover all areas of habitat which could be used by bats for commuting and/or foraging. The transect was walked by experienced AECOM surveyors on three occasions throughout the bat activity season. Following guidance (Collins, 2016), the transect surveys commenced around sunset and ended approximately two hours after sunset.
- 4.17 One Wildlife Acoustics SM4 static detector was deployed by AECOM at a location along the southern edge of the site at OS grid reference NS 82509 37512 (AECOM, 2023). The detector was deployed from 26 July 2022 to 13 September 2022.
- 4.18 Details of the survey method, weather conditions, data analysis and results, as well as survey limitations, are presented in a separate report (AECOM, 2023).

Survey limitations

- 4.19 Ecological survey work was carried out in September 2023, which is at the end of the optimum period for vegetation surveys. This is not considered to be a limitation as a previous survey was completed in July 2022 (AECOM, 2022), which is in the middle of the optimum period for vegetation surveys. The results of the survey in 2023 were compared with the results of the survey in 2022 to see if there have been any significant changes during the intervening period.
- 4.20 The timing of the survey in September 2023 meant that the opportunity to complete survey work in the spring and early summer was missed, including breeding bird characterisation surveys; however, this is not considered to be a significant constraint as the habitats present within the site are assessed as having limited suitability for breeding birds (see AECOM, 2022 & 2023). Reference has also been made to previous desk study and survey work, which has included an assessment for birds (AECOM, 2022 & 2023). The results of a habitat appraisal for breeding birds are considered to be sufficient to inform a robust impact assessment.

Assessment of Effects

- 4.21 To determine the potential for ecological impacts and the significance of the resultant ecological effects, a standard process has been used to assess each important ecological feature. This process consists of the following steps:
1. Evaluate the importance of ecological features at the appropriate geographical scale.

2. Identify ecological impacts and effects.
3. Determine confidence in the ecological effects.
4. Determine the significance of the effects.
5. Identify appropriate and proportionate mitigation and compensation measures.
6. Determine residual effects and their significance.

4.22 The predicted impacts may be direct or indirect in nature, and may occur in one or more of the construction, operation or decommissioning phases of the scheme. The impacts identified to be acting on each ecological receptor are assessed with consideration of the relevant factors listed below:

- Direction (positive, negative or neutral impact).
- Magnitude (the amount or level of impact).
- Extent (e.g., area in hectares, linear metres).
- Duration (e.g., in time or related to species life-cycles).
- Reversibility (i.e., is the impact permanent or temporary).
- Timing and frequency (e.g., related to breeding seasons).
- Cumulative effects (between impacts from a number of sources).

4.23 CIEEM guidance states that a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features or for biodiversity in general' (Box 3, page 11, CIEEM, 2018 [updated 2019]).

4.24 The importance of an ecological feature is considered within a defined geographical context. The following frame of reference has been used in this assessment:

- International (European);
- National (Scotland);
- Regional (South-western Scotland)
- County (South Lanarkshire);
- Local (Lesmahagow/ Coalburn); and
- Site.

4.25 Using the information gathered, together with professional judgement, it is determined whether the effects will be significant or not for the integrity (of a site / ecosystem) or conservation status (of a habitat / species) for each important ecological feature. The impact significance is determined at the appropriate geographical scale.

4.26 Following the application of the mitigation hierarchy (i.e., avoidance, mitigation or compensation) the residual impacts are identified. The residual impacts are then assessed to determine whether they comply with the prevailing policy, guidance, and legislation. A decision is then made whether the identified impact is contrary to any policies and whether the development is significant in planning terms.

4.27 The relative significance of effects has been assessed in accordance with CIEEM guidance. In addition, the following terms have been used, which is consistent with the approach adopted for other technical disciplines in this assessment:

- Major - a fundamental change to the environment.
- Moderate - a material but non-fundamental change to the environment.
- Minor - a detectable but non-material change to the environment.

- None - no detectable change to the environment.

Policy and Legal Context

4.28 This Chapter has regard to the requirements of and advice given in the following documents:

Legislation:

- The Wildlife and Countryside Act 1981 (as amended);
- The Conservation (Natural habitats &c.) Regulations 1994 (as amended in Scotland);
- Environment Act 1995;
- The Wild Mammals (Protection) Act 1996;
- Protection of Wild Mammals (Scotland) Act 2002;
- Nature Conservation (Scotland) Act 2004;
- Wildlife and Natural Environment (Scotland) Act 2011;
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
- UK Withdrawal from the European Union (Continuity) (Scotland) Act 2021;

Planning Policy:

- National Planning Framework 4 (2023);
- South Lanarkshire Local Development Plan 2 (South Lanarkshire Council, 2021).
- Scottish Biodiversity List (SBL);

Guidance:

- Code of Practice on Non-Native Species (Scottish Government, 2012);
- Scotland's biodiversity: it's in your hands (Scottish Government, 2004); and
- The UK Post-2010 Biodiversity Framework (2011-2020).

4.29 **Table 4.1** provides an overview of the key policy and legislation considering the important ecological features present in the proposed development site, temporary soil storage area within the development site, temporary construction compound and car park area.

Table 4.1: Relevant Planning Policy

Planning Policy / Legislation	Summary
NPF4 Policy 3a	Development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and buildings and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions, where possible.
NPF4 Policy 3c	Proposals for local development will include appropriate measures to conserve, restore and enhance biodiversity, in accordance with national and local guidance. Measures should be proportionate to the nature and scale of development.
NPF4 Policy 3d	Any potential adverse impacts, including cumulative impacts, of development proposals on biodiversity, nature networks and the natural environment will be minimised through careful planning and design.
NPF4 Policy 4a	Development proposals which by virtue of type, location or scale will have an unacceptable impact on the natural environment, will not be supported.
NPF4 Policy 4e	The precautionary principle will be applied in accordance with relevant legislation and Scottish Government guidance.

NPF4 Policy 4f	Development proposals that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present on a site or may be affected by a proposed development, steps must be taken to establish its presence.
SLLDP Volume 1 Policy 13	Policy protection of: green network and greenspace, i.e., green network, priority greenspace, and green infrastructure.
SLLDP Volume 1 Policy 14	Policy protection of the natural and historic environment, i.e., designated sites, protected species, local nature conservation and landscape.
SLLDP Volume 2 Policy NHE7	Policy protection of Natura 2000 sites.
SLLDP Volume 1 Policy NHE8	Policy protection of National Nature Reserves and Sites of Special Scientific Interest.
SLLDP Volume 1 Policy NHE9	Policy protection of Protected Species.
SLLDP Volume 1 Policy NHE12	Policy protection of the Water Environment and Biodiversity.
SLLDP Volume 1 Policy NHE13	Policy protection of Forestry and Woodland.
SLLDP Volume 1 Policy NHE20	Policy protection of Biodiversity.
WCA	All nesting birds are protected from intentional killing, injury or taking of any wild bird or taking, damaging or destroying its nest whilst in use or being built or taking or destroying its eggs. In addition, it is an offence to disturb any wild bird listed on Schedule 1 of WCA.
WCA	Animals listed on Schedule 5 of the WCA are protected from intentional or reckless killing, injury or taking, or damaging, destroying or obstructing access to any structure or place which such an animal uses for shelter or protection or to disturb such an animal when it is occupying a structure or place for that purpose.
WCA	It is an offence to allow species listed in Schedule 9 of the WCA to spread and grow in the wild. These are considered to be invasive species.

Baseline Conditions

- 4.30 The following section describes the baseline conditions of the proposed Coalburn North Substation development, including the temporary construction compound and car park area, derived from surveys completed in 2022 and 2023 (AECOM, 2022; Solway Ecology, 2023 unpublished).

Designated Sites

- 4.31 There are four statutory designated sites for nature conservation within the Study Area. Further details of these sites, including the reason for their designation, are provided in **Table 4.2** below.

Table 4.2: Statutory Designated Sites within the Study Area

Site name and designation	Reason for designation
Coalburn Moss SAC (c.50 m south)	Active raised bog and degraded raised bog. Species associated with the bog include bog moss <i>Sphagnum cuspidatum</i> , <i>S. magellanicum</i> , <i>S. capillifolium</i> , <i>S. papillosum</i> , and <i>S. tenellum</i> , common cottongrass,

	hare's-tail cottongrass, round-leaved sundew, cranberry, heather and the lichen <i>Cladonia portentosa</i> .
Coalburn Moss SSSI (c.50 m south)	SSSI boundary is the same as the SAC boundary. See above for reason for designation.
Clyde Valley Woods SAC (c.6 km north)	Mixed woodland on base-rich soils associated with rocky slopes.
Muirkirk and North Lowther Uplands SPA (c.7.3 km south-west)	Five moorland breeding birds: golden plover <i>Pluvialis apricaria</i> ; hen harrier <i>Circus cyaneus</i> ; merlin <i>Falco columbarius</i> ; peregrine <i>Falco peregrinus</i> ; and short-eared owl <i>Asio flammeus</i> . Hen harrier also qualifies as a non-breeding species.

- 4.32 The desk study completed in 2022 (AECOM, 2022) did not identify any statutory local designations within 1 km of the Site.
- 4.33 The desk study identified two areas of Ancient Woodland within 1 km of the Site: a large area of Long-Established Woodland of Plantation Origin immediately to the north of the site; and a smaller area of Ancient Semi-Natural Woodland 920 m west of the site.
- 4.34 The desk study completed in 2022 (AECOM, 2022 Figure 3) presents the following information in relation to native woodland habitat: 'There are five areas of woodland within 1km of the Site which are on the Native Woodland Survey of Scotland. The majority of the AWI Long-Established Plantation described above is classed as 'native' by the NWSS with the native section of the woodland lying, at closest, 63 m from the Proposed Development. Three other small areas of woodland lie to the north-east and north-west of the Proposed Development, at closest 370 m from the Proposed Development. The AWI Semi-Natural Ancient Woodland identified above is also classified as 'nearly-native' by the NWSS.'

Habitats

- 4.35 Habitat survey completed in 2022 (AECOM, 2022) and in 2023 (Solway Ecology, unpublished) identified the following habitats within the proposed development site: plantation woodland; neutral grassland; scattered trees; dense / continuous scrub; and hardstanding. The survey also identified the following habitats outside but adjacent to the proposed development site: woodland; dense / continuous scrub, scattered scrub and trees; marshy grassland; open water / swamp; acid grassland; neutral grassland; and hardstanding. The repeat habitat survey completed in 2023 (Solway Ecology, unpublished) confirmed that there have been no significant changes in the habitat structure and composition since the survey was completed by AECOM in 2022.
- 4.36 Summary habitat descriptions are provided below with more detailed accounts provided in a separate report (AECOM, 2022). The results of the survey completed in 2023 for the proposed Coalburn North Substation site confirm that these descriptions remain valid for the purpose of informing an impact assessment. **Figure 4.1** shows the habitats that are present within the proposed development site.

Woodland

- 4.37 A significant part of the site comprises dense immature Sitka spruce *Picea sitchensis* plantation (trees are estimated to be up to approximately 8 m high). To the east of the proposed

Substation is a smaller area of broadleaved plantation woodland (mostly Silver Birch *Betula pendula* with some *Oak*). Outside the site to the north is an area of immature broadleaved plantation with rowan *Sorbus aucuparia* and occasional silver birch *Betula pendula* and beech *Fagus sylvatica*.

Dense / Continuous Scrub, Scattered Scrub and Trees

- 4.38 There are no areas of dense / continuous scrub present within the site but an area of hawthorn *Crataegus monogyna* and grey willow *Salix cinerea* dominated scrub is present outside the site to the north-east.
- 4.39 A small patch of dense gorse *Ulex europaeus* scrub with common nettle *Urtica dioica* is present to the north of the existing Substation.
- 4.40 Lines of scattered Beech trees on drystone walls are present to the west of the Sitka spruce plantation. The Beech trees are mature, but some appear to be stunted and most have features of senescence (e.g. rot holes).
- 4.41 A row of approximately 28 young trees at 6-8m height and a length of mix hedge is aligned along the south boundary of the development site. These were planted in 2008 as part of the existing Substation landscape mitigation measures.

Marsh / Marshy Grassland

- 4.42 Marshy grassland is not present within the proposed development site but is present to the east of the site (to the east of the access road to Coalburn Substation). One area was previously identified as NVC type MG10 *Holcus lanatus*-*Juncus effusus* rush pasture (AECOM, 2022). A second area of marshy grassland to the east of the existing access track was classified as NVC type M23a *Juncus effusus/acutiflorus*-*Galium palustre* rush pasture *Juncus acutiflorus* sub-community.

Open Water / Swamp

- 4.43 There is no open water / swamp within the site but there is an area of shallow standing water to the south-east of the access road. AECOM reported that this was dry at the time of the survey in 2022, but considered that it is likely to contain some water for the majority of the year. AECOM has classified the habitat as NVC type S9 *Carex rostrata* swamp.

Acid Grassland

- 4.44 Outside the site to the north of the Sitka spruce plantation is an area of semi-improved acid grassland. It is un-grazed and in a partially shaded forestry ride. The habitat was reported to resemble the semi-natural U4 *Festuca ovina*-*Agrostis capillaris*-*Galium saxatile* grassland (AECOM, 2022). In damper areas, the habitat transitions to MG9 *Holcus-lanatus*-*Deschampsia cespitosa* grassland.

Neutral Grassland

- 4.45 Rides within the Sitka spruce plantation and areas of pasture adjacent to the plantation are characterised by semi-improved neutral grassland. These grassland areas are generally species-poor and dominated by false oat-grass: other species present include cock's-foot *Dactylis glomerata*, Yorkshire-fog *Holcus-lanatus*, common bent *Agrostis capillaris*, and more rarely tufted hair-grass *Deschampsia cespitosa*. This habitat is described as corresponding to a species-poor form of NVC type MG1 (AECOM, 2022). In damp areas, where soft rush is

abundant, the grassland was considered to correspond to NVC type MG10 and NVC type MG13 *Agrostis stolonifera-Alopecurus geniculatus* grassland (AECOM, 2022).

- 4.46 Poor semi-improved neutral grassland is present on an un-grazed area developed from hardstanding bordered by a breeze block boundary wall to the north of the existing Substation. False oat-grass and red fescue *Festuca rubra* co-dominate with common nettle abundant.
- 4.47 Improved grassland is not present within the proposed development site, but is present in relatively small areas to the east of the access road and to the west of the existing Substation. The improved grassland is heavily sheep-grazed species-poor nutrient improved pasture.

Hardstanding

- 4.48 Hardstanding habitats are not present within the proposed development site, but are present at the existing Substation, access road and tower bases. The proposed temporary construction car park will be located in an area of hard-standing adjacent to the existing Substation access road. The temporary construction compound will be located in area of bare / disturbed ground adjacent to the eastern boundary of the existing Substation. Both sites are currently being used for the existing Coalburn Substation extension construction works.

Groundwater Dependent Terrestrial Ecosystems

- 4.49 The survey completed by Solway Ecology in 2023 did not identify any habitats within the proposed development site that could potentially be Ground Water Dependent Terrestrial Ecosystems (GWDTEs) (Appendix 4 of SEPA, 2017). Previous surveys carried out in 2022 of the wider area (AECOM, 2022) identified areas of marshy grassland to the east of the access road; however, this habitat is located outside the site.
- 4.50 One area of marshy grassland was described as having the characteristics of NVC type MG10 and one area was described as having the characteristics of NVC type MG23. Depending on the hydrological setting, NVC type MG10 is likely to be moderately groundwater dependent and M23 is likely to be highly ground water dependent (SEPA, 2017). However, it was previously noted (AECOM, 2022) that these areas of marshy grassland may be sustained by rain / surface water flows as no obvious supply of groundwater was identified during the field survey. It is also likely that the presence of the access road between the proposed development site and the areas of marshy grassland will reduce the likelihood of any hydrological connectivity.
- 4.51 Site hydrology is likely to be influenced by drainage associated with land management. The forestry consultant RTS⁴⁷ has advised that the plantation was established in 2012 and examination of aerial imagery on Google Earth Pro (<http://www.earth.google.com>, accessed 24 August 2023) supports this. It is likely that the planting of trees will have affected site drainage. Prior to this aerial imagery indicates that this area was improved or poor semi-improved grassland, i.e., not groundwater dependent habitats.

Habitat evaluation

- 4.52 The proposed development site does not support any priority habitats or notable plant species or GWDTEs. Overall, the habitats within the proposed development site are evaluated as being of importance at the Site level.

⁴⁷ RTS Forestry January 2023

Breeding Bird Habitat

- 4.53 The field survey took place outside the breeding bird season (typically March to August, with seasonal and geographical variations). The habitats within the proposed development site are dominated by young Sitka spruce and broadleaved plantation and semi-improved neutral grassland. These habitats are considered to have limited suitability for nesting birds. The assessment completed in 2022 (AECOM, 2022) also concluded that there is very little potential within the site for nesting by birds other than by species which are common and widespread.
- 4.54 The assessment completed in 2022 (AECOM, 2022) identified two NBN Atlas records of barn owl (WCA Schedule 1 species) spanning from 2005 to 2011 (recorded by RSPB) with no accurate location information. GMBRC also returned one record of barn owl road traffic casualty on the M74, at Lesmahagow in 2020.
- 4.55 Several records of species on the BoCC Red List (Stanbury *et. al.*, 2021) and the Scottish Biodiversity List (SBL) were returned by GMBRC and are shown in Table 7 of the AECOM Report, 2022. In summary, the species recorded were: barn owl *Tyto alba*; black-headed gull *Chroicocephalus ridibundus*; bullfinch *Pyrrhula pyrrhula*; cuckoo *Cuculus canorus*; fieldfare *Turdus pilaris*; grasshopper warbler *Locustella naevia*; greenfinch *Chloris chloris*; herring gull *Larus argentatus*; house martin *Delichon urbica*; house sparrow *Passer domesticus*; mistle thrush *Turdus viscivorus*; siskin *Spinus spinus*; song thrush *Turdus philomelos*; starling *Sturnus vulgaris*; swift *Apus apus*.
- 4.56 The assessment concludes that there is no suitable habitat on site for the majority of these species to breed and that there is very low potential for specially protected bird species listed on Schedule 1 of the WCA to nest in proximity to the proposed development site. It is most likely that only common and widespread bird species breed within the site, which contains only low diversity habitats with few features to support any other type of bird.
- 4.57 During the site visit in 2023 Solway Ecology recorded the following species. Two buzzards were circling overhead for the duration of the visit. Crow, jackdaw, meadow pipit, goldfinch and linnet were recorded within or near areas of scrub. No trees with suitability for nesting or roosting barn owl were noted within the site and no signs of barn owl presence were recorded.
- 4.58 A Preliminary Ecological Appraisal completed by AECOM (AECOM, 2022) concluded that 'Barn owl could hunt in the rough and marshy grasslands outside the Site, and further afield across the raised bog, but there are no apparent roosting / nesting opportunities'. Although breeding bird surveys were not carried out, a bat roost suitability assessment was completed, which involved the inspection of trees to identify any voids that may be used as roosts. Whilst not a stated aim of the assessment, it is likely that any signs of barn owl nesting or roosting would have been recorded, if present. It is concluded that barn owl is not nesting or roosting within the proposed development site.
- 4.59 Whilst a breeding bird survey has not been completed for the site, a habitat appraisal has been completed and this has been complemented by desk study data. Professional judgement has been used to determine the breeding bird assemblage that might reasonably be expected within the site based on the habitat present. Overall, the bird assemblage within the proposed development site is evaluated as likely to be of importance at the Site level.

Bats

- 4.60 Previous survey (AECOM, 2023) concluded that the proposed development site and the immediate area surrounding the site contains relatively poor quality bat habitat. Based on the habitat and features present, geographical context and previous survey data, it has been assessed that the survey area is of Low suitability to bats for commuting and foraging (AECOM, 2023). A significant proportion of the site is coniferous plantation that was established in 2012 (prior to this aerial imagery indicates that this area was improved or poor semi-improved grassland). Aerial imagery and observations made on the ground indicate that this is a dense stand that lacks rides, paths and other features that might provide 'edge habitat' for feeding bats.
- 4.61 There are few features suitable for roosting bats within or adjacent to the proposed development site (including the temporary soil storage area), temporary construction compound and car park area. The plantation woodland that dominates the site has no trees with potential roost features for bats. There is likely to be foraging potential for bats within and around the site; however, as previously noted, the plantation is a monoculture comprising young trees and consequently is unlikely to provide an important feeding area for bats.
- 4.62 The bat roost suitability assessment (AECOM, 2023) identified eight mature beech trees in the south-west of the survey area. Six trees were classified as having Low suitability for roosting bats. One tree was assessed as having Moderate bat roost suitability - it has a large hole just above ground level that extends up into the trunk (AECOM, 2023 Reference T06). One tree located near an area of dense scrub was previously identified as a roost for a single noctule (AECOM, 2023 Reference T08). The roost was assessed as not suitable for use as a maternity roost.
- 4.63 Walked transect surveys recorded common pipistrelle and soprano pipistrelle bats during the surveys in July, August, and September 2022. The highest encounter rate was in August with 151 registrations of common pipistrelle *Pipistrellus pipistrellus* and 78 of soprano pipistrelle *Pipistrellus pygmaeus* (it is important to note that a registration does not equate to a bat as multiple passes by one bat can result in multiple registrations). A single noctule *Nyctalus noctule* registration was recorded in July and a single *Myotis* sp. registration was recorded in September (neither species was recorded on any other occasion).
- 4.64 Bat activity was focussed in the following main areas along the transect route (see Figure 2 in AECOM, 2023):
- In the west, outside the site, in a forestry ride with a line of mature trees;
 - At the southern end of the site with a line of mature trees adjacent to rough grassland;
 - In the north-east, outside the Site, in a forestry ride adjacent to dense scrubland.
- 4.65 A static bat detector was deployed in the southern part of the site at a location approximately 50 m from the tree where a small noctule roost had been identified (T08). The detector surveyed bat activity over six consecutive nights in July and six consecutive nights in August 2022. This detector recorded at least six bat species: soprano pipistrelle, common pipistrelle, unidentified *Myotis* sp., Leisler's bat *Nyctalus leisleri*, noctule and brown long-eared bat *Plecotus auritus*. In July a total of 325 registrations were recorded and in August the total recorded was 307. No bats were recorded in September.

- 4.66 Only 9 noctule registrations were recorded in July and 7 were recorded in August 2022. Taking into account the results of the static bat detector surveys and the walked transect surveys (where there was only one noctule recording), it is concluded that noctule is a rare visitor. Whilst a single bat was previously recorded roosting in a tree near the southern boundary of the site, AECOM has previously assessed the tree as being unsuitable for a maternity roost (AECOM, 2023 Reference T08). It is therefore considered likely that the tree supported a day roost.
- 4.67 In correspondence dated 5 December 2023 (reference CPA173264) regarding the proposed development NatureScot advises that Core Sustenance Zones for bats should be considered. The Bat Conservation Trust states that ‘A Core Sustenance Zone (CSZ), as applied to bats, refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost’. As noted above, the available evidence indicates that the identified roost was likely to be a day roost and not a maternity roost. Consequently, the consideration of CSZ for noctule is possibly limited in this situation. Nevertheless, the assessment has considered CSZ for all bat species recorded within the site.
- 4.68 **Table 4.3** presents the CSZ for each of the bat species recorded within the site (AECOM, 2023). For each species the loss of habitat as a result of the proposed development is considered as a proportion of the total CSZ. This calculation is based on the assumption that the footprint of the proposed Substation will be 280 m by 180 m (5.04 ha or 0.05 km²). For all species the predicted habitat loss is less than 1% of the total habitat area in the CSZ for a given species. As previously noted, the habitat loss will mostly be of young conifer plantation, which is densely planted with limited edge habitat. Extensive areas of woodland will be retained outside the site to the north and west, the woodland to the west providing a habitat link to the River Nethan corridor, which is likely to provide good foraging opportunities for bats.
- 4.69 Whilst the proposed development will result in the loss of young conifer plantation, this will be offset by the creation of new mixed species woodland as indicated in the Outline Landscape Restoration Scheme (**Figure 2.1**).

Table 4.3: Habitat loss within Core Sustenance Zones for Bats within the Site

Species	Occurrence	CSZ	Consideration of Habitat Loss
Common pipistrelle	Frequently recorded during walked transect and static bat detector survey.	2 km (area is 12.56 km ²)	Habitat loss is 0.4% of the CSZ
Soprano pipistrelle	Frequently recorded during walked transect and static bat detector survey.	3 km (area is 18.85 km ²)	Habitat loss is 0.3% of the CSZ
Myotis sp.	Recorded once during a walked transect. A total of 64 bat passes during 12 monitoring nights.	1 km (whiskered / Brandt's bat) (area is 6.28 km ²)	Habitat loss is 0.8% of the CSZ
Brown long-eared	A total of 9 bat passes during 12 monitoring nights.	3 km (area is 18.85 km ²)	Habitat loss is 0.3% of the CSZ
Noctule	Recorded once during a walked transect. A total of 16 bat passes during 12 monitoring nights.	4 km (area is 50.26 km ²)	Habitat loss is 0.1% of the CSZ
Leisler's	A total of 24 bat passes during 12 monitoring nights.	3 km (area is 18.85 km ²)	Habitat loss is 0.3% of the CSZ
Nyctalus sp.	A total of 39 bat passes during 12 monitoring nights.	n/a	n/a

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4.70 Overall, the proposed development site has been evaluated as only being of importance at the Site level for bats, as it is only likely to be used on an occasional basis by small numbers of foraging bats.

Badger

4.71 No badger setts were identified during the survey of the proposed development site (including the temporary soil storage area) and temporary construction compound. No signs of badger presence were found.

4.72 There is no evidence that badger is resident within or adjacent to the site. Badger is considered to be absent and is not considered further in this assessment.

Red squirrel

4.73 No evidence of red squirrel was noted during any of the surveys (AECOM, 2022; Solway Ecology, unpublished). Evaluation of the habitat has led to the conclusion that no optimal feeding opportunities are present as the conifer and broadleaved plantation that dominates the site contains trees that are too young to support red squirrels.

4.74 There is no evidence that red squirrel is resident within or adjacent to the site. Red squirrel is considered to be absent and is not considered further in this assessment.

Reptiles

4.75 The grassland, woodland and scrub edge habitats may provide some suitable habitat for reptiles such as common lizard *Zootoca vivipara*. However, as previously noted, the forestry consultant RTS has advised that the Sitka spruce and broadleaved plantation was established in 2012. Prior to this aerial imagery indicates that this area was improved or poor semi-improved grassland, which is unlikely to have provided good quality habitat for reptiles.

4.76 If reptiles have subsequently colonised the site, this must have occurred in the last six years. Whilst this cannot be ruled out, the likelihood of it happening is significantly reduced by the low abundance of good reptile habitat in the surrounding area (i.e., it is unlikely that there is a significant reptile population outside the site from which colonisation could have occurred).

4.77 In the absence of survey data, a precautionary approach has been adopted for the assessment. It has been assumed that a small reptile population is present within the proposed development site, and this has been evaluated as only being of importance at the Site level.

Summary of Baseline Conditions

4.78 **Table 4.4** presents a summary of the evaluation of each of the ecological receptors that have been identified within the proposed development site (including the temporary soil storage area), temporary construction compound and car park area. For each receptor a brief rationale is provided to explain how the evaluation has been reached.

Table 4.4: Summary of Evaluation of Ecological Receptors

Receptor	Evaluation	Rationale
Designated Sites	National	The site is not subject to any designation for its importance to wildlife. Two statutory designated sites are present c50 m south of the site: Coalburn Moss SAC and Coalburn Moss SSSI.
Coniferous & Broadleaved Plantation Woodland	Site level	Habitat does not conform to a priority habitat description. Habitat is not on the Scottish Biodiversity List.
Scattered trees	Site level	Habitat does not conform to a priority habitat description. Habitat is not on the Scottish Biodiversity List.
Dense continuous scrub	Site level	Habitat does not conform to a priority habitat description. Habitat is not on the Scottish Biodiversity List.
Neutral grassland	Site level	Habitat does not conform to a priority habitat description. Habitat is not on the Scottish Biodiversity List.
Hardstanding	Site level	Habitat does not conform to a priority habitat description. Habitat is not on the Scottish Biodiversity List.
Bats	Site level	There are limited roosting opportunities within the site and the habitat is poor for foraging / commuting bats. Survey has found a limited range of species and low levels of bat activity.
Breeding Birds	Site level	The habitats present are only likely to support a limited range of nesting birds. The young plantation woodland will limit the number of nesting birds that are present.
Reptiles	Site level	No reptiles have been observed but, whilst there is some potentially suitable habitat, this is very limited in its extent. Presence is assumed on a precautionary basis.

Potential Effects of Proposed Development

Construction Phase

Effects on Designated Sites

- 4.79 There are two statutorily designated sites located c.50 m to the south of the site: Coalburn Moss SAC and Coalburn Moss SSSI. The access road and dismantled railway separates the development site from the nearest part of the SAC and SSSI to the east. Existing development (the existing Substation and associated hardstanding) separates the development site from the nearest part of the SAC and SSSI to the south.
- 4.80 Impacts on the SAC and SSSI are unlikely due to the separation distance, which means that dust-related impacts are unlikely to occur. Current guidance (Holman *et al*, 2014) advises that construction-related dust impacts only need to be considered for important ecological features within 50 m of the proposed development boundary.
- 4.81 Examination of 1:25,000 scale Ordnance Survey mapping of the site indicates that there are no surface water drainage features that connect the proposed development site with the SAC / SSSI to the east or south. A previous assessment (AECOM, 2021) concluded that Coalburn Moss SAC is downslope of the proposed development 'meaning that run-off from certain construction areas could flow in the direction of the site'.

- 4.82 Whilst there are no major watercourses within the SAC, there is a network of drainage ditches, the nearest of which are to the west of the access road that leads to the existing Substation, and to the west of the existing Substation extension.
- 4.83 The Hydrology, Geology and Hydrogeology assessment (see **Chapter 6.0**) has concluded that potential impacts could result from changes in local surface water drainage patterns and flows, including those associated with Coalburn Moss SAC.
- 4.84 No other potential impact mechanism has been identified.
- 4.85 The desk study identified two other statutory designated sites within the study area: Clyde Valley Woods SAC (c.6 km north) and Muirkirk and North Lowther Uplands SPA (c.7.3 km south-west). Both sites are sufficiently distant that impacts are highly unlikely as a result of the proposed development.
- 4.86 No non-statutory designated sites have been identified within 1 km of the Site. A 'Long Established Woodland of Plantation Origin' forms the northern boundary of the proposed development site (<https://www.nature.scot/doc/guide-understanding-scottish-ancient-woodland-inventory-awj>, accessed 2 November 2023)

Effects on Habitats

- 4.87 The proposed development site (including the temporary soil storage area), temporary construction compound and car park area support the following habitats that are assessed to be of ecological importance at the Site level only: coniferous plantation woodland, broadleaved plantation woodland, dense continuous scrub, neutral grassland, mixed hedge, scattered trees and hardstanding. The proposed development will also require the removal of some mature Beech trees and a row of young field boundary trees and hedge along the southern boundary (planted in 2008 as part of the existing Substation landscape mitigation measures). These habitats are relatively common and widespread, and the examples of these habitats present within the development site do not correspond to any priority habitat descriptions⁴⁸. The loss or disturbance of these habitats is therefore not likely to be significant in ecological terms and is not likely to conflict with any policy protection or legislative considerations.
- 4.88 The construction activities within the proposed development site (including the temporary soil storage area), temporary construction compound and car park area will result in the permanent loss of habitat within the development footprint and may potentially result in the disturbance of adjacent habitat (for example, as a result of the movement of mobile plant or temporary material storage). Any habitat disturbance will be restored following the completion of the work.
- 4.89 Permanent habitat loss is only likely in the proposed development site. The temporary construction compound, temporary soil storage area and car park are only required during the construction phase: the use of these areas will be a temporary construction impact. Significant habitat loss is not likely as a result of these works as these areas have been impacted by previous development. The temporary compound, soil storage and car park area, and any other peripheral construction areas subject to habitat disturbance will be restored to meadow habitat following the completion of the works (**Figure 2.1**).

⁴⁸ <http://www.biodiversityscotland.gov.uk/advice-and-resources/habitat-definitions/priority/>

- 4.90 Construction activities will result in the exposure of bare ground, which increases the risk of silt run-off particularly during periods of high rainfall. In the absence of mitigation this could result in siltation impacts on the nearest watercourse. Whilst this is a possibility, it is noted that the nearest surface water drainage features to the development site are a ditch to the west of the access road (c.80 m east of the site) and a ditch to the west of the existing Substation (c.140 m south of the site).
- 4.91 In the absence of mitigation, the loss or disturbance of habitats evaluated as being of low ecological importance is assessed as being significant at the Site level only, i.e., Minor significance.

Effects on GWDTEs

- 4.92 The results of ecological survey work carried out in 2022 and 2023 indicate that the site does not support GWDTEs. No GWDTE have been identified within the footprint of the new Substation. The Hydrology, Geology and Hydrogeology assessment (see **Chapter 6.0**) has also concluded that no impacts on GWDTEs are considered likely as they have not been identified within the proposed development site. GWDTEs are not considered further in this assessment.

Effects on Species

- 4.93 Survey has found that the site and surrounding area are used by a limited range of bat species for foraging and commuting. Roosting opportunities are limited to a small number of trees in the south west part of the site.
- 4.94 One tree located along the southern edge of the site has previously been found to support a roost with a single noctule bat present; however, survey in 2022 (AECOM, 2023 Reference TO8) found that a hole was still present where previously there was a confirmed noctule roost, but no evidence of use was noted.
- 4.95 A second tree was assessed as having moderate suitability for roosting bats due to the presence of a large hole just above ground level extending up into the trunk. No evidence of use was noted (AECOM, 2023 Reference TO6).
- 4.96 Both trees need to be removed to accommodate the proposed development. Their removal may result in the loss of bat roosts, if present. In the absence of mitigation, the site preparatory work has the potential to impact on roosting bats. This may result in the death or injury of bats and the destruction of roosts. As bats and their roosts are legally protected it will be necessary to secure a European Protected Species Licence from NatureScot before works impacting the trees commences.
- 4.97 Previous assessment (AECOM, 2023) has concluded that the trees are not suitable for maternity roosts due to the nature of the features present and their exposure. If bat roosts are present, it is likely that these will be day roosts, i.e., roosts of low conservation importance (Mitchell-Jones, 2004). In the absence of mitigation / compensation, the predicted impacts on roosting bats are assessed as being of significance at the Local level only, i.e., Minor significance.

- 4.98 Survey has not found any evidence that other protected species or Scottish Biodiversity List priority species are present within the site, although the presence of small numbers of reptiles has not been ruled out on a precautionary basis. Small numbers of nesting birds may be present; however, the habitats are assessed to have low suitability for nesting birds.
- 4.99 In the absence of mitigation, the vegetation clearance, soil stripping and earthworks that will take place during the construction of the proposed development site, temporary soil storage area, temporary construction compound and car park area, and has the potential to impact on nesting birds. This may result in the death or injury of birds and their young, the destruction of nests and the displacement of birds as a result of disturbance. There may also be the loss of habitat that supports nesting birds. In the absence of mitigation, the predicted impacts on breeding birds are assessed as being of significance at the Site level only, i.e., Minor significance.
- 4.100 No evidence of reptile presence has been found within the site, although reptile surveys have not been completed. As some suitable habitat is present, the presence of a small population has not been ruled out on a precautionary basis. As noted above for breeding birds, the habitat losses associated with the construction phase works have the potential to impact on reptiles, resulting in the death or injury of animals, and the loss of habitat that supports those animals. In the absence of mitigation, the predicted impacts on reptiles are all assessed as being of significance at the Site level only, i.e., Minor significance.
- 4.101 **Table 4.5** presents a summary of the construction phase effects on important ecological receptors in the absence of mitigation and compensation.

Table 4.5: Significance of Effects (Construction)

Receptor	Effect	Significance
Coalburn Moss SAC /SSSI	Surface water pollution migrating from the site to the designated site.	Moderate
Coniferous & Broadleaved Plantation Woodland & Mixed Hedge	Loss / disturbance of habitat of low ecological importance within the development footprint.	Minor
Dense continuous Scrub	Loss / disturbance of habitat of low ecological importance within the development footprint.	Minor
Neutral grassland	Loss / disturbance of habitat of low ecological importance within the development footprint.	Minor
Scattered trees	Loss / disturbance of habitat of low ecological importance within the development footprint.	Minor
Bats	Roosting bats only likely to be present in two trees; small numbers of foraging bats may be present and so may be affected by loss of foraging habitat of low importance.	Minor
Breeding Birds	Small numbers of nesting birds may be present and so may be affected by loss of nesting and foraging habitat of low importance.	Minor

Reptiles	Small numbers of reptiles are assumed to be present in areas of suitable habitat that may be subject to disturbance.	Minor
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Operational Phase

Effects on Designated Sites

- 4.102 No impacts are likely on designated sites during the operation phase of the development. No impact mechanisms have been identified whereby the proposed development could impact on any of the designated sites located within 2 km of the development.

Effects on Habitats

- 4.103 All habitat loss will take place during the construction phase of the development with no further habitat loss likely during the operational phase. No impacts are likely on habitats during the operational phase of the development.

Effects on Species

- 4.104 No further impacts on species are likely during the operational phase of the development. No impacts are likely on badger, bats, breeding birds, and reptiles.

Summary of Operation Phase Effects

- 4.105 No significant operational phase effects are likely on any important ecological features (designated sites, habitats and species).

Decommissioning Phase

Effects on Designated Sites

- 4.106 No impacts are likely on designated sites during the decommissioning phase of the development. No impact mechanisms have been identified whereby the proposed development could impact on any of the designated sites located within 2 km of the development.

Effects on Habitats

- 4.107 No further habitat loss is likely during the decommissioning phase of the development as works are expected to be limited to within the development boundary of the site (where vegetation is likely to be absent or limited in its extent). No impacts are likely on habitats during the decommissioning phase of the development.

Effects on Species

- 4.108 No further impacts on species are likely during the decommissioning phase of the development. No impacts are likely on badger, bats, and reptiles as it is unlikely that any of these species will have colonised the site during the operational phase.
- 4.109 It is possible that breeding birds may be present at the time that decommissioning takes place, and therefore the associated works may result in the disturbance of nesting birds. The decommissioning works will necessarily be preceded by ecological surveys, which will confirm the status of breeding birds within the site. If breeding birds are present then appropriate measures will need to be adopted to mitigate impacts on these species. In the absence of

mitigation, the predicted impacts on nesting birds are assessed as being of significance at the Site level, i.e., Minor significance.

Summary of Decommissioning Phase Effects

- 4.110 No decommissioning phase effects are likely on any important ecological features, with the possible exception of breeding birds, if they are using the site at the time the decommissioning works takes place. If breeding birds are present, in the absence of mitigation, the predicted impact on these species is assessed as being of significance at the Site level, i.e., Minor significance.

Proposed Mitigation and Compensation

Effects on Designated Sites

- 4.111 To mitigate pollution related impacts on the nearest ditches to the site (and thereby mitigating pollution related impacts on the Coalburn Moss SAC / SSSI), the construction contractors will adhere to the appropriate Guidance for Pollution Prevention (GPPs) published by SEPA, which will be incorporated into the Construction Environmental Management Plan (CEMP) for the development. Site discharges will be restricted to greenfield run-off rates and an appropriate discharge standard for suspended solids will be adopted, which together with the adoption of pollution prevention measures that will be incorporated into a CEMP, lead to the conclusion that water quality impacts will be fully mitigated.
- 4.112 All mitigation measures as outlined in the Environmental Appraisal and any Planning Consent Conditions, will be detailed, and implemented by a CEMP and Pollution Prevention Plan (PPP) prepared specifically for the proposed development site, temporary soil storage area, temporary construction compound and car park.
- 4.113 The following additional measures are proposed to mitigate impacts on the Coalburn Moss SAC / SSSI. The drainage system for the new Substation will be tied into the existing Coalburn Substation drainage system, thereby minimising the risk of pollution reaching the SAC / SSSI.
- 4.114 The proposed measures will mitigate pollution-related impacts on Coalburn Moss SAC / SSSI. This residual impact is assessed as being 'none'.

Effects on Habitats

- 4.115 Where possible habitat loss and disturbance will be limited by clearly defining the extent of the construction footprint and the areas that can be accessed by construction vehicles. This will be achieved using, for example, appropriate fencing to demarcate the construction area and by restricting access onto adjacent habitats.
- 4.116 As noted previously, the construction contractors will adhere to the appropriate GPPs published by SEPA, which will be incorporated into the CEMP for the development. Site discharges will be restricted to greenfield run-off rates and an appropriate discharge standard for suspended solids will be adopted. Collectively these measures will ensure that water quality impacts will be fully mitigated. All mitigation measures will be detailed and implemented by a CEMP and PPP.
- 4.117 The Outline Landscape Restoration Scheme for the proposed development will include the following:
- Creation of mixed native woodland.

- Creation of meadow grassland.
- Creation of a detention pond with wet meadow grassland.
- Planting of specimen trees.
- Protection of retained woodland, mature trees on drystone walls and existing scrub.
- Removal of fencing containing existing woodland planted as part of the existing Substation development.

4.118 Following completion of the works it is proposed to restore the temporary soil storage area, temporary construction compound and car park area to Meadow (**Figure 2.1**).

4.119 The SSE Biodiversity Project Toolkit V3 has been used to assess the habitat losses and gains and this shows that the proposed habitat restoration and enhancement will result in a biodiversity net gain.

4.120 Whilst the proposed measures will mitigate pollution and disturbance-related impacts on habitats outside the development footprint, there will be a residual impact arising from habitat loss within the proposed development site. This residual impact is assessed as being of significance at the Site level only, i.e., Minor significance, for all habitats affected.

Effects on Species

4.121 The PEA produced by AECOM in 2022 included the following recommendations for mitigation / compensation measures:

- Planting of native scrub and/or use of heather *Calluna vulgaris* seed on the Substation landscaped area, dressed with a suitable layer of soil, to provide habitat for plants, birds and reptiles;
- provision of bat / bird boxes within the existing woodland;
- installation of a drainage basin or specifically designed wildlife pond to improve habitat for plants, invertebrates and amphibians; and,
- installation of several small areas (1 x 1 x 0.5 m) of buried crushed stone and woody debris, seeded or dressed with turf, to create reptile hibernacula.

4.122 Works affecting trees that have suitability for roosting bats will be surveyed at an appropriate time of the year to determine whether or not roosting bats are present. If they are present then a European Protected Species Licence will need to be obtained from NatureScot prior to tree works commencing. As part of the licensing process appropriate compensation measures will need to be provided. Given that the only roosting opportunities available within the site are associated with trees, appropriate compensation will be provided by installing bat boxes on retained trees within the site.

4.123 If the tree where the noctule roost was identified needs to be felled (T08), compensation for the loss of a day roost will be provided using suitable bat boxes (i.e., designs that have been shown to be utilised by noctule bats). If survey finds that a noctule maternity roost is present, additional compensation will be provided by preserving the roost feature by section-felling above and below. The section of tree supporting the roost feature will then be removed and attached to a suitable retained tree nearby. This approach has been shown to be successful⁴⁹.

4.124 If roosting bats are present within the proposed development site, then the proposed removal of trees supporting those roosts will result in an adverse residual effect that is assessed as being of significance at the Site level only, i.e., Minor significance (due to the loss of roost

⁴⁹ See for example <https://www.bats.org.uk/our-work/buildings-planning-and-development/roost-replacement-and-enhancement/case-studies/rapid-response-mitigation-to-noctule-nyctalus-noctula-roost-damage-in-milton-keynes>

sites). However, the licensing process will require that suitable compensation is provided such that there will be a neutral effect on bats, i.e., the residual effect will be 'none'.

- 4.125 A number of measures are proposed to mitigate impacts and provide enhancements for bats:
- The proposed landscaping scheme includes the creation of an area of mixed species woodland that will strengthen the habitat links between retained areas of woodland to the north and west. The habitat link to the River Nethan to the west will be maintained.
 - The proposed SuDS attenuation basin will be enhanced so that it provides additional feeding habitat for bats.
 - Roost boxes for bats, which are suitable for a range of tree-dwelling bats including noctule, will be attached to retained trees at suitable locations where bats can easily access them.
- 4.126 Vegetation clearance, soil stripping and earthworks during the construction of the proposed development site, temporary construction compound, car park and soil storage area should ideally be undertaken outside of the main breeding bird season, i.e., March to August. If this is not possible a pre-construction bird survey will be required to ensure that any active nest sites are identified and protected from disturbance and damage to ensure that the works proceed lawfully.
- 4.127 Bird boxes will be provided as compensation for the loss of vegetation that might be used by nesting birds. A range of bird boxes will be provided that will also deliver enhancement by providing nesting sites where they were previously absent. This will include a barn owl nest box, which will be erected at a suitable location.
- 4.128 If nesting birds are present within the proposed development site, temporary construction compound, car park and soil storage area prior to works commencing, then the proposed habitat loss will result in an adverse residual effect that is assessed as being of significance at the Site level only, i.e., Minor significance (due to the loss of nesting habitat).
- 4.129 The following measures will be adopted to minimise impacts on reptiles. Vegetation that may potentially support reptiles, i.e., tall ruderal vegetation and scrub edge habitat, will be strimmed to a height of c.10 cm at least a week before site preparatory works are due to start. The strimmed area will be left for at least a day to allow reptiles to disperse (if present), and then the area will be strimmed for a second time to reduce the vegetation height to <5 cm. The area will then be left for at least one additional day before work commences to allow any reptiles present to relocate (the objective of reducing the height of the vegetation is to remove any vegetation cover thereby encouraging reptiles to leave the area). If reptiles are present, then the proposed habitat loss will result in an adverse residual effect that is assessed as being of significance at the Site level only, i.e., Minor significance.
- 4.130 Within the proposed meadow area (**Figure 2.1**) a number of small mounded areas of crushed stone and woody debris (1 x 1 x 0.5m) will be created for reptile hibernacula.
- 4.131 It is proposed that the following best practice mitigation measures will be adopted to protect mammals (if present): a temporary ramp to be placed in deep excavations over 0.5 m deep to allow trapped animals to exit. All deep excavations will be checked at the start of each working day for the presence of trapped mammals (if trapped mammals are present then advice will be sought from the Project Ecologist).

- 4.132 It is also proposed that lighting, if required, will be directed into working areas to avoid impacts on nesting birds and foraging bats. If this is not possible then lighting should be designed to reduce light spillage, for example by using hoods or shields (Institution of Lighting Professionals & Bat Conservation Trust, 2023).
- 4.133 As some mobile species may potentially use the site in the future, Contractors will be made aware of the potential presence of badger, reptiles and breeding birds on site, and the legal protection afforded them. Should any sightings or signs of these species be noted on site, the project Ecologist will be contacted for advice.

Assessment of Residual Effects

- 4.134 The proposed development will result in the loss or disturbance of habitats that are considered to be of low ecological importance, and which commonly occur in the wider area. The loss of habitat to accommodate the proposed development is not likely to have a significant effect on the local conservation status of any of the affected habitats. Habitat creation, restoration and enhancement that is proposed following completion of the proposed works have been shown to deliver a biodiversity gain (using the SSE Biodiversity Project Toolkit V3). The residual effects are beneficial and of **Minor** significance: they do not conflict with any local or national planning policies.
- 4.135 Impacts arising during the construction phase of the development will be controlled through the preparation and adoption of a CEMP. This will ensure that impacts are minimised as far as possible; whilst some habitat loss or disturbance is still likely, the residual effect has been evaluated as being of **Minor** significance and does not conflict with any local or national Planning Policies.
- 4.136 The proposed measures are expected to mitigate impacts on bats, breeding birds and reptiles. Consequently, it is concluded that the residual effects are of **Minor** significance or less and do not conflict with any local or national planning policies.
- 4.137 The development and the associated proposed Outline Landscape Restoration Scheme (**Figure 2.1**) will deliver a number of ecological enhancements. The landscaping will introduce habitats that are either currently absent or poorly represented in the local landscape, i.e., mixed woodland, meadow grassland and a water feature. The use of a metric demonstrates that a net gain for habitats can be achieved by the proposed landscape restoration works.
- 4.138 The proposed landscape restoration scheme will be complemented by the installation of features that benefits a range of species. These include the provision of bat / bird boxes within the retained woodland, and the installation of reptile hibernacula.

Cumulative Effects

- 4.139 As part of the assessment, other plans and projects with potential to result in cumulative effects have also been considered. The scope of the 'in-combination' assessment has been derived with reference to the source-pathway-receptor model, which highlights whether there is any potential pathway that connects the proposed development to other sites.
- 4.140 A review of the on-line planning resources hosted by South Lanarkshire Council (<https://publicaccess.southlanarkshire.gov.uk/online-applications/search.do?action=simple&searchType=Application>, accessed 20 September 2023) identified three Planning Applications that need to be considered in the assessment of

cumulative effects (for completeness a fourth Planning Application has also been included, but this was later withdrawn). The relevant Planning Applications are discussed below.

- 4.141 Planning reference P/20/1837 for the ‘Construction of hardstanding platform with associated drainage and temporary access road and storage area for extension to electrical sub-station’. This application was withdrawn and so no cumulative effects are likely.
- 4.142 Planning reference P/21/1618 for the ‘Construction of hardstanding platform with associated drainage and temporary access road and storage area for extension to electrical sub-station’. This application has been consented and is currently under construction. An Ecological Impact Assessment Report (EIAR) was submitted as part of the Planning Application, which detailed mitigation measures to ensure there is no impact upon protected species. NatureScot confirmed that they are content with the mitigation proposed. The EIAR concluded that there were not expected to be any significant residual effects on any ecological receptors as long as the proposed mitigation measures are adopted in full.
- 4.143 Planning reference P/23/0042 for the ‘Installation of approx. 17 km of 132kV overhead line (section 37 consent)’. A decision is awaited for this application. An Environmental Impact Assessment (EIA) has been completed and this concluded that there are no significant residual effects on any ecological or ornithological receptors as long as the proposed mitigation measures are adopted in full.
- 4.144 Planning reference P/21/0888 for the ‘Installation of a synchronous compensator to enable electricity grid stability (EIA screening opinion request)’. This application is for an EIA screening opinion and has not been supported by the results of any ecological survey work. The Council has confirmed that EIA is not required for the proposed development.
- 4.145 Ecological assessments completed for the above developments have not identified any important ecological features (designated sites, habitats, and species) that were likely to be significantly affected by any of the proposed developments (subject to the adoption of proposed mitigation measures). In light of the findings and conclusions of these ecological assessments it is concluded that cumulative effects are unlikely when the Planning Applications are considered together.
- 4.146 No cumulative effects are predicted for any other plan or project and so the residual effects remain the same as described in the previous section. The residual impacts are not considered to be contrary to any national or local planning policies. A summary of the residual effects is presented in **Table 4.6**.

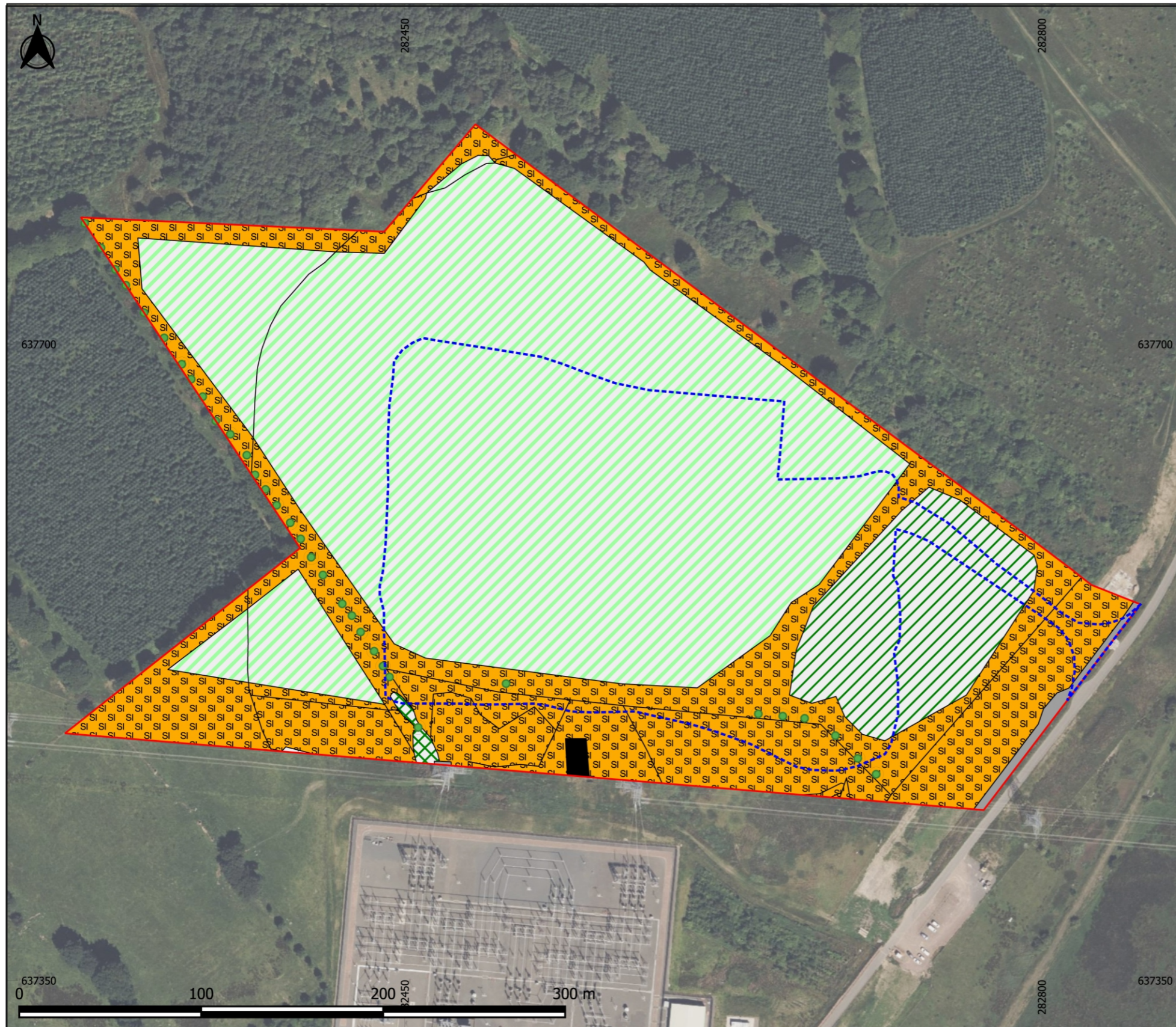
Table 4.6: Residual Effects following Adoption of Mitigation Measures











Receptor	Effect following mitigation	Significance
Coalburn Moss SAC / SSSI	Low likelihood of surface water pollution migrating from the development site to the designated site.	None
Coniferous/ Broadleaved Plantation Woodland and Hedge	Loss / disturbance of habitat of low ecological importance within the development footprint. Compensation with creation of new woodland and grassland habitats.	Minor beneficial
Dense Continuous	Loss / disturbance of habitat of low ecological importance within the development footprint.	Minor beneficial


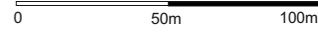
scrub	Compensation with creation of new woodland and grassland habitats.	
Neutral grassland	Loss / disturbance of habitat of low ecological importance within the development footprint. Compensation with creation of new woodland and grassland habitats.	Minor beneficial
Scattered trees	Loss / disturbance of habitat of low ecological importance within the development footprint. Compensation with creation of new grassland habitat.	Minor beneficial
Bats	No important bat habitats will be affected by the proposed development. Work affecting a tree roost will require a NatureScot licence and appropriate mitigation and compensation. Bat boxes will be provided as compensation / enhancement.	None
Breeding Birds	Pre-development checking survey will minimise risk of impacts occurring. Bat boxes will be provided as compensation / enhancement.	None
Reptiles	Proposed mitigation measures will minimise risk of impacts occurring (vegetation strimming & translocation).	None

Conclusion

- 4.133 The construction phase of the proposed development and the use of the temporary construction compound and car park area will result in the loss of habitats which have been evaluated as being of low ecological importance.
- 4.134 A range of measures are proposed that will mitigate pollution impacts, ensuring that no adverse effects are likely on the nearest ditch, which is along the eastern boundary of the development site. The proposed measures will also protect the habitats adjacent to the site from damage and disturbance.
- 4.135 The proposed works may result in the displacement of a small number of nesting birds and a small reptile population (if present on site), however suitable alternative bird nesting habitat and reptile habitat is present in the wider area. Measures are proposed that will mitigate impacts on nesting birds and reptiles, if present.
- 4.136 The proposed works will require the removal of trees, some of which have suitability for roosting bats. As bats are highly mobile species it is recommended that a checking survey is undertaken prior to the removal of trees with suitability for roosting bats. If bat roosts are confirmed to be present a licence will need to be secured from NatureScot before works commence that will impact on a bat roost.
- 4.137 Measures will be adopted that will ensure that significant impacts on other species are not likely. This includes precautionary mitigation that recognises that some mobile species may use the site in the future.
- 4.138 In accordance with the significance criteria that have been adopted within this Chapter, the ecological assessment of the proposed development indicates that the residual effects will be **Minor beneficial** or **None** for all identified ecological receptors. Taking into account the proposed mitigation measures, the residual impacts are considered to be **Not Significant** in planning terms. The proposed works are not contrary to any planning policy, where the objective is to protect biodiversity.



- Key**
-  Development Footprint
 -  Site boundary
 -  Broadleaved woodland - plantation
 -  Coniferous woodland - plantation
 -  Scrub - dense/continuous
 -  Neutral grassland - semi-improved
 -  Improved grassland
 -  Hardstanding
 -  Buildings
 -  Existing tree

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figure 4.1

Title:
Pre- Development Habitat Plan
 BSG Ecology Ltd

Project:
 Proposed Coalburn North Substation

Scale: 1:2500 Date: Nov 2023

Introduction

- 5.1 This Chapter provides an assessment of the predicted effects of the construction and operation of the proposed Coalburn North Substation (the Proposed Development Site⁵⁰/ new Substation), on cultural heritage assets (hereafter “heritage assets”). The specific objectives of the study were to:
- Identify the cultural heritage baseline within and in the vicinity of the Proposed Development Site.
 - Assess the Proposed Development Site in terms of its archaeological potential.
 - Consider the effects of the construction of the Proposed Development Site on heritage assets, within the context of the relevant legislation and planning guidance.
- 5.2 The assessment considers the potential direct effects on heritage assets within the Proposed Development Site and the effect on the settings of heritage assets in the wider landscape (Outer Study Area) as defined below.
- 5.3 The assessment is supported by two figures and three appendices.
- **Figure 5.1:** Cultural Heritage: Inner Study Area
 - **Figure 5.2:** Cultural Heritage: Outer Study Area
 - **Appendix 3.1:** Heritage Assets and Previous Archaeological Investigations (Events) within the Proposed Development Site
 - **Appendix 3.2:** Heritage Assets and Previous Archaeological Investigations (Events) within the Inner Study Area
 - **Appendix 3.3:** Designated Heritage Assets in the Outer Study Area

Scope and Methodology

Proposed Study Area

- 5.4 The following Study Areas, as indicated in **Figures 5.1** and **5.2**, have been employed for the archaeological desk-based assessment:
- Proposed Development Site (**Figure 5.1**): this forms the Study Area for the identification of cultural heritage assets that could receive direct impacts arising from the construction of the new Substation.
 - Inner Study Area, (**Figure 5.1**): a buffer extending to 1 km from the proposed development site boundary, forms the Study Area for the identification of cultural heritage assets and previous archaeological events that have taken place in the local area. This data has been used to inform the assessment of the archaeological potential of the proposed development site and to consider options for any mitigation that may be necessary.
 - Outer Study Area, (**Figure 5.2**): a buffer extending 2 km from the proposed development site boundary, forms the Study Area for the identification of designated heritage assets whose settings may be affected.

⁵⁰ In this Chapter the proposed Coalburn North Substation is referred to as the “Proposed Development Site”.

Desk-based Assessment Method

- 5.5 The following information sources were consulted as part of the desk-based assessment:
- WoSAS (West of Scotland Archaeology Service) Historic Environment Record (HER), (digital extract received August 2023). Information was taken from the HER mapping for an area extending 1 km from the Proposed Development Site boundary, sufficient to provide information on known constraints within the site and on the local archaeological context.
 - The National Record for the Historic Environment (NRHE; Canmore) (HES, 2023a): for any information additional to that contained in the HER.
 - Historic Environment Scotland Spatial Data Warehouse (HES, 2023b): provided up-to-date data on the locations and extents of Scheduled Monuments, Listed Buildings, Conservation Areas, Inventory status Garden and Designed Landscapes and Inventory status Historic Battlefields.
 - Relevant bibliographic references were consulted to provide background and historic information.
 - Map Library of the National Library of Scotland: for Ordnance Survey maps and other historical map resources.
 - Modern aerial photographs covering the Proposed Development Site and available online via Google Earth and Bing Maps.
 - Scottish Remote Sensing Portal (Scottish Government, 2023): for 1 m DTM Lidar data covering the Proposed Development Site.
 - Historic Land-Use Assessment Data for Scotland (HLAMap) (HES, 2023c): for information on the historic land use character of the site and the surrounding area.

Field Survey

- 5.6 A site visit was carried out on the 30th August 2023, the purpose of which was to identify any previously unrecorded assets within the Proposed Development Site, and to assess the current ground conditions, to better understand its archaeological potential. The areas of the Proposed Development Site covered by dense commercial plantation forestry and scrub woodland were not surveyed due to limited accessibility.

Assessment Method

- 5.7 The effects of the proposed development on heritage assets are assessed on the basis of their type (direct effects, indirect impacts, setting impacts, and cumulative impacts) and nature (adverse or beneficial). The assessment takes into account the value/sensitivity of the heritage asset, and its setting, and the magnitude of the predicted impact.
- Direct impacts: occur where the physical fabric of the asset is removed or damaged, or where it is preserved or conserved, as a direct result of the proposal. Such impacts are most likely to occur during the construction phase and are most likely to be permanent.
 - Indirect impacts: occur where the fabric of an asset, or buried archaeological remains, are removed or damaged, or where it is preserved or conserved, as an indirect result of the

proposal even though the asset may lie some distance from the proposal. Such impacts are most likely to occur during the construction phase and are most likely to be permanent.

- **Setting impacts:** these are generally direct and result from the proposal causing change within the setting of a heritage asset that affects its cultural significance or the way in which it is understood, appreciated, and experienced. Such impacts are generally, but not exclusively, visual, occurring directly as a result of the appearance of the proposal in the surroundings of the asset. However, they may relate to other senses or factors, such as noise, odour or emissions, or historical relationships that do not relate entirely to intervisibility, such as historic patterns of land-use and related historic features. Such impacts may occur at any stage of a proposal’s lifespan and may be permanent, reversible, or temporary.
- **Cumulative impacts:** can relate to the physical fabric or setting of assets. They may arise as a result of impact interactions, either of different impacts of the proposal itself, or additive impacts resulting from incremental changes caused by the proposal together with other projects already in the Planning system or allocated in a Local Development Plan.
- **Adverse effects:** are those that detract from or reduce cultural significance or special interest of heritage assets or their settings.
- **Beneficial effects:** are those that preserve, enhance or better reveal the cultural significance or special interest of heritage assets or their settings.

Assigning Sensitivity to Heritage Assets

5.8 Cultural heritage assets are assigned value/importance through the designation process. Designation ensures that sites and places are recognised and protected by law through the Planning system and other regulatory processes. The level of protection and how a site or place is managed varies depending on the type of designation, and the laws and policies that apply to it (HES, 2019).

5.9 **Table 5.1** summarises the relative sensitivity of heritage assets (including their settings) relevant to the proposed development, based on the guidance set out in the SNH/HES EIA Handbook (version 5; 2018).

Table 5.1: Sensitivity of Heritage Assets

Sensitivity of Asset	Definition / Criteria
High	Assets valued at an international or national level, including: <ul style="list-style-type: none"> ▪ Scheduled Monuments ▪ Category A Listed Buildings ▪ Inventory Gardens and Designed Landscapes ▪ Inventory Historic Battlefields ▪ Non-designated assets that meet the relevant criteria for designation (including sites recorded in HERs as non-statutory register (NSR) sites of presumed national importance)

Medium	Assets valued at a regional level, including: <ul style="list-style-type: none"> ▪ Archaeological Sites and Areas that have regional value (contributing to the aims of regional research frameworks) ▪ Archaeologically Sensitive Areas (ASA) (where these are identified in Local Authority records) ▪ Non-Inventory Designed Landscapes (NIDL) (where these are identified in Local Authority records) ▪ Category B Listed Buildings ▪ Conservation Area
Low	Assets valued at a local level, including: <ul style="list-style-type: none"> ▪ Archaeological Sites that have local heritage value ▪ Category C Listed Buildings ▪ Unlisted historic buildings and townscapes with local (vernacular) characteristics
Negligible	Assets of little or no intrinsic heritage value, including: <ul style="list-style-type: none"> ▪ Artefact find-spots (where the artefacts are no longer in situ and where their provenance is uncertain) ▪ Poorly preserved examples of particular types of features (e.g. quarries and gravel pits, dilapidated sheepfolds, etc)

Criteria for Assessing the Significance of Effects

5.10 The magnitude of impact (adverse or beneficial) will be assessed in the categories, high, medium, low, and negligible and described in **Table 5.2**.

Table 5.2: Magnitude of Impact

Magnitude	Definition/ Criteria	
	Adverse	Beneficial
High	<p>Changes to the fabric or setting of a heritage asset resulting in the complete or near-complete loss of the asset's cultural significance.</p> <p>Changes that substantially detract from how a heritage asset is understood, appreciated, and experienced.</p>	<p>Preservation of a heritage asset in situ where it would otherwise be completely or almost completely lost.</p> <p>Changes that appreciably enhance the cultural significance of a heritage asset and how it is understood, appreciated, and experienced.</p>
Medium	<p>Changes to those elements of the fabric or setting of a heritage asset that contributes to its cultural significance such that this quality is appreciably altered.</p> <p>Changes that appreciably detract from how a heritage asset is understood, appreciated, and experienced.</p>	<p>Changes to important elements of a heritage asset's fabric or setting, resulting in its cultural significance being preserved (where this would otherwise be lost) or restored.</p> <p>Changes that improve the way in which the heritage asset is understood, appreciated, and experienced.</p>
Low	<p>Changes to those elements of the fabric or setting of a heritage asset that contribute to its</p>	<p>Changes that result in elements of a heritage asset's fabric or setting detracting from its cultural significance being removed.</p>

Magnitude	Definition/ Criteria	
	Adverse	Beneficial
	cultural significance such that this quality is slightly altered. Changes that slightly detract from how a heritage asset is understood, appreciated, and experienced.	Changes that result in a slight improvement in the way a heritage asset is understood, appreciated, and experienced.
Negligible	Changes to fabric or setting of a heritage asset that leave its cultural significance unchanged and do not affect how it is understood, appreciated, and experienced	

Assessment of Effects on Setting

- 5.11 The SNH/HES EIA Handbook (2018) Appendix 1, paragraph 42 advises that:
 “In the context of cultural heritage impact assessment, the receptors are the heritage assets and impacts will be considered in terms of the change in their cultural significance”.
- 5.12 Historic Environment Scotland’s guidance document, 'Managing Change in the Historic Environment: Setting' (HES, 2016), notes that:
 “Setting can be important to the way in which historic structures or places are understood, appreciated and experienced. It can often be integral to a historic asset’s cultural significance.”
- “Setting often extends beyond the property boundary or ‘curtilage’ of an individual historic asset into a broader landscape context”.
- 5.13 The guidance also advises that:
 “If proposed development is likely to affect the setting of a key historic asset, an objective written assessment should be prepared by the applicant to inform the decision-making process. The conclusions should take into account the significance of the asset and its setting and attempt to quantify the extent of any impact. The methodology and level of information should be tailored to the circumstances of each case”.
- 5.14 The guidance recommends that there are three stages in assessing the impact of a development on the setting of a historic asset or place:
- Stage 1: identify the historic assets that might be affected by the proposed development;
 - Stage 2: define and analyse the setting by establishing how the surroundings contribute to the ways in which the historic asset or place is understood, appreciated, and experienced; and,
 - Stage 3: evaluate the potential impact of the proposed changes on the setting, and the extent to which any negative impacts can be mitigated.
- 5.15 The SNH/HES EIA Handbook (2018) Appendix 1, paragraph 43 advises that:
 “When considering setting impacts, visual change should not be equated directly with adverse impact. Rather the impact should be assessed with reference to the degree that the proposal affects those aspects of setting that contribute to the asset’s cultural significance”.

- 5.16 Following this approach, the Zone of Theoretical Visibility (ZTV) has been used to identify those designated heritage assets from which there would be theoretical visibility of the proposed development.

Policy Context

- 5.17 The main policies and guidance relevant to cultural heritage are summarised below in **Table 5.3**.

Table 5.3 Policies and Guidance

Planning Policy Legislation	Summary
The Ancient Monuments and Archaeological Areas Act (1979)	<p>Scheduled Monuments are protected under statute, the detail of which is contained within The Ancient Monuments and Archaeological Areas Act 1979, Part 1, Section 2 Control of works affecting Scheduled Monuments, which states (in part):</p> <p><i>“If any person executes or causes or permits to be executed any works to which this section applies he shall be guilty of an offence unless the works are authorised under this Part of this Act.”</i></p>
Planning (Listed Buildings and Conservation Areas) (Scotland) Act (1997)	<p>Legislation regarding Listed Buildings and Conservation Areas is contained in The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997(as amended by Town and Country Planning (Historic Environment Scotland) Amendment Regulations 2015).</p> <p>The 1997 Act places a duty on the Planning Authority with respect to Listed Buildings and Conservation Areas, and their settings. Section 59 of the 1997 Act states (in part):</p> <p><i>“In considering whether to grant planning permission for development which affects a Listed Building or its setting, a Planning Authority or the Secretary of State, as the case may be, shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.”</i></p> <p>Section 64 states:</p> <p><i>“(1) In the exercise, with respect to any buildings or other land in a conservation area, of any powers under any of the provisions in subsection (2), special attention shall be paid to the desirability of preserving or enhancing the character or appearance of that area.</i></p> <p><i>(2) Those provisions are -</i></p> <ul style="list-style-type: none"> <i>a) The Planning Acts, and</i> <i>b) Part I of the Historic Buildings and Ancient monuments Act 1953.”</i>
The Historic Environment Scotland Act (2014)	<p>The Historic Environment Scotland Act 2014 defines the role of, Historic Environment Scotland (HES), and the processes for the designation of heritage assets, consents, and rights of appeal. Part 1, Section 2, states in part:</p> <p><i>“In exercising its general function, Historic Environment Scotland has the following particular functions -</i></p> <ul style="list-style-type: none"> <i>c) identifying and recording the historic environment,</i> <i>d) understanding and interpreting the historic environment,</i> <i>e) learning about, and educating others about, the historic environment,</i> <i>f) protecting and managing the historic environment,</i> <i>g) conserving and enhancing the historic environment.”</i>

<p>The Electricity Act (1989)</p>	<p>The Electricity Act (1989) covers cultural heritage in Schedule 9 (paragraph 3), which states (in part):</p> <p><i>“In formulating any relevant proposals, a licence holder or a person authorised by an exemption to generate or supply electricity -</i></p> <p><i>a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and</i></p> <p><i>b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.”</i></p>
<p>Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013</p>	<p>Cultural heritage is also covered under the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 (as amended by Town and Country Planning (Historic Environment Scotland) Amendment Regulations 2015), in Schedule 5 which requires consultation with Historic Environment Scotland where:</p> <p><i>“a) development of land which is situated within 800 metres from any Royal Palace or Park, and might affect the amenities of that Palace or Park;</i></p> <p><i>b) development which may affect -</i></p> <p><i>(i) a World Heritage Site;</i></p> <p><i>(ii) a historic garden or designed landscape;</i></p> <p><i>(iii) the site of a scheduled monument or its setting; or</i></p> <p><i>(iv) a category A listed building or its setting; or</i></p> <p><i>c) development (other than householder development) which may affect a historic battlefield.”</i></p>
<p>Electricity Works (Environmental Impact Assessment) (Scotland) Regulations (2017)</p>	<p>The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 Schedule 3 requires screening to take consideration of:</p> <p><i>“landscapes and sites of historical, cultural or archaeological significance”</i> as part of the environmental sensitivity of geographical areas likely to be affected by development.</p> <p>In Schedule 4 (paragraph 4) it requires, for inclusion in Environmental Impact Assessment Reports, <i>“A description of the factors specified in regulation 4(3) likely to be significantly affected by the development.”</i> included in this list is <i>“cultural heritage, including architectural and archaeological aspects”</i>.</p> <p>Schedule 4 (paragraph 5) requires <i>“a description of the likely significant effects of the development on the environment resulting from, inter alia: ... the risks to human health, cultural heritage or the environment.”</i></p>
<p>Planning Policy</p>	
<p>National Planning Framework 4 (NPF4 2023)</p>	<p>The key policy of NPF4 in respect of the historic environment is Policy 7: Historic Assets and Places of NPF4 (p45) which intends to:</p> <p><i>“protect and enhance historic environment assets and places, and to enable positive change as a catalyst for the regeneration of places.”</i></p> <p>NPF4 suggests this is to be achieved by:</p> <p><i>“a) Development proposals with a potentially significant impact on historic assets or places will be accompanied by an assessment which is based on an understanding of the cultural significance of the historic asset and/or place. The assessment should identify the likely visual or physical impact of any proposals for change, including cumulative effects and provide a sound basis for managing the impacts of change. Proposals should also be informed by national policy and guidance on managing change in the historic environment, and information held within Historic Environment Records.”</i></p>

<p>Historic Environment Policy for Scotland (HEPS) (2019)</p>	<p>HEPS is a policy statement directing decision-making that affects the historic environment. It is non-statutory, which means that it is not required to be followed as a matter of law or statute, but it is relevant to a wide range of decision-making at national and local levels and is supported by detailed policy and related guidance.</p> <p>HEPS contains six policies and core principles (HEP1 to HEP6) for managing the historic environment. These core principles are reflected in national and local policies.</p>
<p>Planning Advice Note 2/2011: Planning and Archaeology (PAN 2/2011)</p>	<p>Planning Advice Note 2/2011 (PAN 2) advises that, in determining Planning Applications, Planning Authorities should take into account the relative importance of archaeological sites (para 5).</p> <p>It also notes that, in determining Planning Applications that may impact on archaeological features or their setting, Planning Authorities may on occasion have to balance the benefits of development against the importance of archaeological features (para 6).</p> <p>The desirability of preserving a monument (whether scheduled or not) is a material consideration and the objective should be to assure the protection and enhancement of monuments by preservation in situ, in an appropriate setting. When preservation in situ is not possible, recording and/or excavation followed by analysis and publication of the results (para 14).</p>
<p>Regional and Local Plan</p>	
<p>South Lanarkshire Local Development Plan 2 (SLLDP 2) 2021.</p>	<p>The Policy of relevance within the SLLDP 2 is:</p> <ul style="list-style-type: none"> ▪ Policy 14 Natural and Historic Environment
<p>Guidance</p>	
<p>Environmental Impact Assessment Handbook (SNH and HES, 2018)</p>	<p>The Handbook provides those involved in the Environmental Impact Assessment (EIA) process with practical guidance and a ready source of information about the process.</p> <p>It illustrates and concentrates on the treatment of natural and cultural heritage issues but, even where there is such a focus, the principles are often more widely applicable to other environmental topics.</p> <p>It is intended to help all of those involved in the process to make it more effective and therefore lead to better informed decisions.</p> <p>Appendix 1 provides guidance relating to the assessment of a proposal's impacts upon cultural heritage in the context of the EIA process.</p>
<p>Standard and Guidance for Historic Environment Desk-Based Assessment (ClfA, 2014, updated 2020)</p>	<p>This guidance seeks to define good practice for the execution and reporting of desk-based assessment in line with the regulations of ClfA, in particular the Code of conduct.</p>
<p>Principles of Cultural Heritage Impact Assessment in the UK (IEMA, 2021)</p>	<p>This document provides guidance for cultural heritage practitioners in regard to the principles of Cultural Heritage Impact Assessment. These are:</p> <ul style="list-style-type: none"> a) understanding cultural heritage assets; and b) evaluating the consequences of change
<p>Designation Policy and Selection</p>	<p>This document sets out the policy and selection guidance used by HES when they designate historic sites and places at the national level.</p>

Guidance (HES, 2019)	This document stands alongside the Historic Environment Policy for Scotland (2019) (HEPS). It aims to deliver the vision and objectives of the Historic Environment Strategy for Scotland Our Place in Time (2015), the National Outcomes, and National Planning Policies.
Managing Change in the Historic Environment: Setting (HES, 2016)	<p>This document is part of a series by HES the aim of which is to identify the main issues which can arise in different situations, to advise how best to deal with these, and to offer further sources of information. They are also intended to inform Planning Policies and the determination of applications relating to the historic environment.</p> <p>This note sets out the principles that apply to developments affecting the setting of historic assets or places, including Scheduled Monuments, Listed Buildings, Inventory of Historic Gardens and Designed Landscapes, World Heritage Sites, Conservation Areas, Historic Battlefields, Historic Marine Protected Areas, and undesignated sites.</p>

Baseline Conditions

- 5.17 Numbers in brackets in the following text refer to heritage asset numbers depicted on **Figures 5.1** and **Figure 5.2** and listed in **Appendices 3.1** and **3.2**.

Character of the Proposed Development Site

- 5.18 The proposed development site is largely an area of commercial coniferous plantation forestry, with some areas of rough pasture and native woodland. To the immediate south is the operational existing Coalburn Substation, to the north and west there is further plantation forestry and woodland, and to the east is the access road to Coalburn Substation, which parallels part of the route of the dismantled Lesmahagow Branch of the Caledonian Railway.
- 5.19 HLAmap describes the land use of the proposed development site as 'Rectilinear Fields and Farms', which it describes as being "Rectilinear field boundaries and associated farm steadings and other buildings are typical of agricultural improvements since 1700s. Recent amalgamation of these fields is common" (HLAmap accessed 06/09/2023).
- 5.20 Roy's 'Military Survey of Scotland' map of 1747-55 is the first map to show the area in any detail, with the surrounding place names of 'Hill', 'Birkwood' and 'Ochron' (sic Auchron) recognisable. On Roy's map the proposed development site is an area shown as unenclosed moorland.
- 5.21 The first edition Ordnance Survey Map (1864) depicts the proposed development site as two large fields with a small, roofed farmstead **(1)** surrounded by a small enclosure. The succeeding Ordnance Survey maps (1898 and 1911) show little change within the proposed development site and the farmstead **(1)** remains roofed on these maps.
- 5.22 On current Ordnance Survey maps (2023), the farmstead **(1)** is no longer shown and an enclosure **(2)** is instead shown in the area. The field boundaries **(3)** within the proposed development site appear to remain relatively unchanged from those on the first edition Ordnance Survey map (1864) but, rather than enclosing agricultural fields, they are shown within an area of commercial plantation forestry.

- 5.23 Examination of Lidar imagery picked up the modern enclosure (2), the field bank associated with the farmstead (1) and the boundary walls (3). With the exception of fence lines and modern OHL towers, there are no obvious features that could be interpreted as being of archaeological interest, within the proposed development site.

Designated Heritage Assets in the Inner Study Area

- 5.24 There are no designated heritage assets within the proposed development site, and none within the rest of the Inner Study Area.

Non-designated Heritage Assets in the Inner Study Area

- 5.25 No prehistoric to medieval heritage assets are recorded within the Inner Study Area.
- 5.26 There are four post medieval to modern heritage assets within the proposed development site (**Appendix 3.1**).
- A small farmstead (1) shown on the first edition Ordnance Survey map (1864), this farmstead has subsequently been removed and only the remains of its associated enclosure bank visible. As little or no remains survive of this post medieval farmstead it is considered to be of little or no intrinsic heritage value and of negligible sensitivity.
 - A modern enclosure (2) survives upstanding to the immediate south of the former farmstead (1). Its outer walls are embanked by a turf covered mound of soil. This is a modern structure possibly associated with surrounding electrical infrastructure, agricultural or forestry activities. As a modern enclosure this asset is considered to be of no intrinsic heritage value and of negligible sensitivity.
 - Two post-medieval stone boundary walls (3) cross the Proposed Development Site, running at an oblique angle from northwest to southeast. The walls are shown on the first edition Ordnance Survey map (1864) and remain upstanding, surmounted by mature deciduous trees. As a common site type, found throughout rural Scotland, these walls are considered to be of little intrinsic heritage value and of negligible sensitivity.
- 5.27 In the wider Inner Study Area the archaeological record (**Appendix 3.2**) is dominated by assets related to post medieval to modern agrarian activity and mineral extraction, and includes farmsteads, (**HER 41275, HER 41282, HER 58082, HER 58083, HER 69687 & HER 69867**), a possible mill (**HER 69685**), a lime works (**HER 69866**), lime kilns and quarry (**HER 69686**), and Auldton Colliery (**HER 41039**).

Previous Archaeological Events in the Inner Study Area

- 5.28 The HER records six previous archaeological events (**EV 191, EV 3749, EV 4047, EV 4418, EV 6867 & EV 7137, Figure 5.1**) in the Inner Study Area. These all comprised desk-based assessments and walkover surveys in advance of proposed developments in the surrounding area.
- 5.29 Two of the archaeological walkovers and desk-based assessments (**EV 4047 & EV 7137, Appendix 3.1**) partly cover the proposed development site and were carried out in advance of grid connections between Andershaw Windfarm (**EV 4047**, Faber Maunsell 2009) and Kennoxhead Windfarm (**EV 7137**, Somerville 2022). Neither of these archaeological assessments recorded archaeological features within the proposed development site.

- 5.30 The remaining archaeological events (**EV 191, EV 3749, EV 4418 & EV 6867, Appendix 3.2**) largely reflect the post medieval to modern agrarian landscape and the industrialisation brought by the coal mines and railway.

Archaeological Potential of the Proposed Development Site

- 5.31 The evidence of the desk-based assessment has shown that the site of a post medieval farmstead **(1)**, a modern enclosure **(2)** and two post medieval to modern field walls **(3)** are located within the proposed development site.
- 5.32 Within the Inner Study Area, most evidence is related to post medieval to modern agriculture and industrial activity; there is no evidence of prehistoric activity within the Study Area. The result of the desk-based assessment suggests that, prior to planting of commercial forestry, the area has been in agricultural use since the medieval period. None of the previous archaeological events have identified any evidence for any archaeological sites or finds of any great antiquity and it is therefore assessed that there is a low potential for hitherto undiscovered archaeological remains to be present within the proposed development site.

Outer Study Area

- 5.33 There are six Listed Buildings within the Outer Study Area (**Figure 5.2, Appendix 3.3**). Of these, four are associated with the Birkwood Estate, including four Category B Listed Buildings (**LB 7698, LB 7699, LB 11727 & LB 11728**) and a Category C Listed Building (**LB 11726**). Also, within the Outer Study Area, and not part of the Birkwood Estate, is the Category B Listed Building, Auchlochan Bridge (**LB 7688**). The Category B Listed Buildings are of heritage value at regional level and of medium sensitivity and the Category C Listed Buildings are of heritage value at a local level and of low sensitivity.
- 5.34 There are no further designated heritage assets (World Heritage Sites, Scheduled Monuments, Inventory Gardens and Designed Landscapes, Inventory Battlefields or Conservation Areas) within the Outer Study Area.

Potential Effects of Proposed Development

Direct Impacts

- 5.35 Any ground-breaking activities associated with the construction of the proposed development have the potential to disturb or destroy archaeological deposits located within the site.
- 5.36 There is potential for direct construction impacts as a result of the proposed development on three cultural heritage assets: the site of a farmstead **(1)**, a modern enclosure **(2)** and part of the field walls **(3)**. These are assets of little or no intrinsic heritage value and a direct impact on these assets would not result in a significant effect.
- 5.37 There is low potential for the presence of buried archaeological remains to survive below the present ground surface. Development that requires the total removal of the surface topsoil could have an adverse impact on any buried remains that may be present. Mitigation may be required by the WoSAS to identify and offset by record the loss of any such remains that might be present.

Setting Impacts

- 5.38 The proposed development, a new Substation adjacent an existing Substation, would occupy a site that is currently largely commercial coniferous and broadleaved plantation forestry. The

proposed development has the potential to impact on the setting of assets in the surrounding area as the Site changes from commercial forestry to one of a more industrial character. The proposed development is however sited immediately north of, and adjoining, the existing Coalburn Substation and will appear as an integral part of this electricity infrastructure complex.

- 5.39 The nearest Listed Building is the Category B listed Auchlochan Bridge (**LB 7688**), 1.4 km to the west of the proposed development site. This asset is a late 18th century road bridge, which is still in use today crossing the River Nethan. The bridge is surrounded by deciduous woodland and, as a largely functional asset designed to carry vehicles over the river, the key views of cultural significance to this asset are local to the river it crosses and the route of the road. Views towards the proposed development are currently blocked by intervening woodland and there is no potential for an adverse impact on the integrity of the localised setting of this bridge as a result of the proposed development.
- 5.40 The Listed Buildings associated with the Birkwood Estate (**LB 7698, LB 7699, LB 11726, LB 11727 & LB 11728**) lie approximately 1.8 km to the northwest of the proposed development site. These assets are located in the former Non-Inventory Designed Landscape of Birkwood House which remains today as an area of mixed woodland planting and grassland, to the east of the River Nethan and the town of Lesmahagow. Taking into account the distance from the proposed development site from this group of Listed Buildings, the local topography, intervening buildings and woodlands, it is considered that it is unlikely that there will be any visibility of the proposed development. If the proposed development were to become visible (through tree felling) it would be sufficiently distant that it would appear as part of the existing Coalburn Substation and be a minimal change to the baseline conditions. It is therefore assessed that there is no potential for an adverse impact on the integrity of the setting of the Birkwood Estate Listed Buildings.
- 5.41 No other designated heritage assets in the wider area (beyond the Outer Study Area), have been identified which have settings that are susceptible to adverse effects from the Proposed Development.

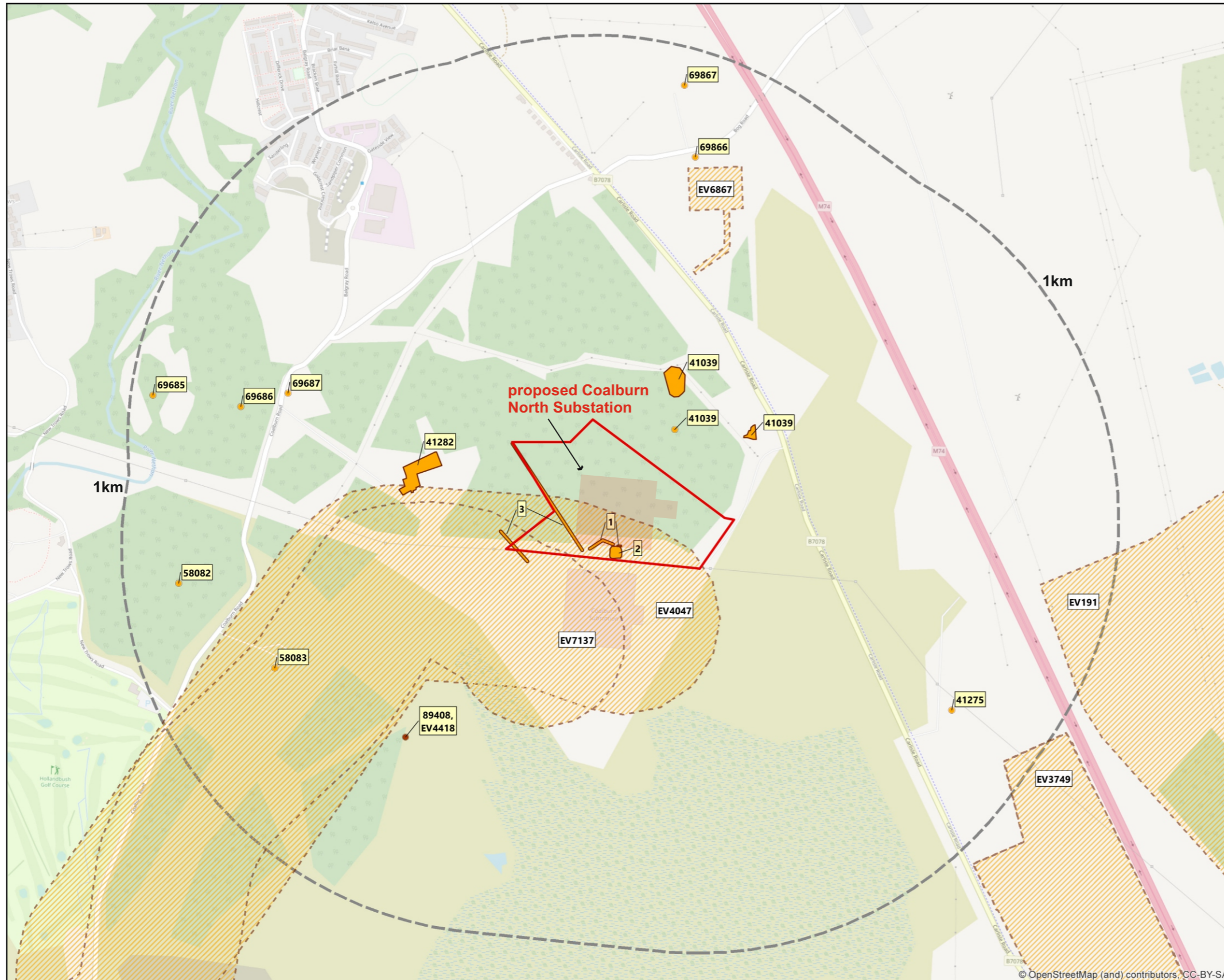
Mitigation

- 5.42 The emphasis in Planning Advice Note (PAN) 2/2011: Planning and Archaeology (PAN2) is for the preservation of important remains in situ where practicable and by record where preservation is not possible.
- 5.43 No mitigation is proposed for the direct construction impacts on three cultural heritage assets the site of a farmstead **(1)**, a modern enclosure **(2)** and part of the field walls **(3)**.
- 5.44 The assessment has established that there is a low potential that there are any surviving archaeological remains or deposits within the proposed development site. The requirement for a programme of archaeological mitigation, would be at the discretion of WoSAS, acting on behalf of the Council and would follow determination of the Planning Application, as a condition applied to the consent. This work may take the form of a trial trenching evaluation exercise ahead of development or an archaeological watching brief during topsoil stripping.
- 5.45 Any mitigation measures that are required would be set out in one or more Written Schemes of Investigation (WSI(s)), presented for approval by the Planning Authority, and carried out

prior to or during construction, as appropriate. The WSI(s) would make provision for further excavation, post-excavation analyses and dissemination of the results of the mitigation works, as well as for archiving of the project materials and records, as appropriate.

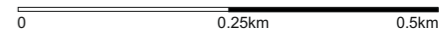
Conclusion

- 5.45 A desk-based study has been carried out to assess the potential impact of the proposed development on cultural heritage interests. The assessment has considered the potential for direct and indirect effects on heritage assets likely to arise from construction of the proposed development and to affect the settings of designated heritage assets in its surroundings.
- 5.46 The assessment has determined that there will be **direct impacts** on three heritage assets of **negligible sensitivity** within the proposed development site. Given the nature and extent of survival of the heritage assets it is considered that a direct impact on them would **not result in a significant adverse effect** and no mitigation is proposed.
- 5.47 The proposed development site is in an area of low archaeological potential and the requirement for mitigation will be at the discretion of WoSAS as archaeological advisors to South Lanarkshire Council.
- 5.48 The potential for setting impacts on designated assets in the surrounding area has been assessed. It is concluded that there is **no potential for significant impacts** on the setting of designated assets as a result of the proposed development.
- 5.49 No residual adverse effects are anticipated in relation to cultural heritage interests and the development proposals are considered, therefore, to conform to the aims of national, regional, and local planning policy as regards archaeology and cultural heritage.



Key

- Proposed Development Site
- Inner Study Area
- Heritage Asset (point)
- Heritage Asset (linear)
- Heritage Asset (area)
- Previous Archaeological Event (area)
- Previous Archaeological Event (point)



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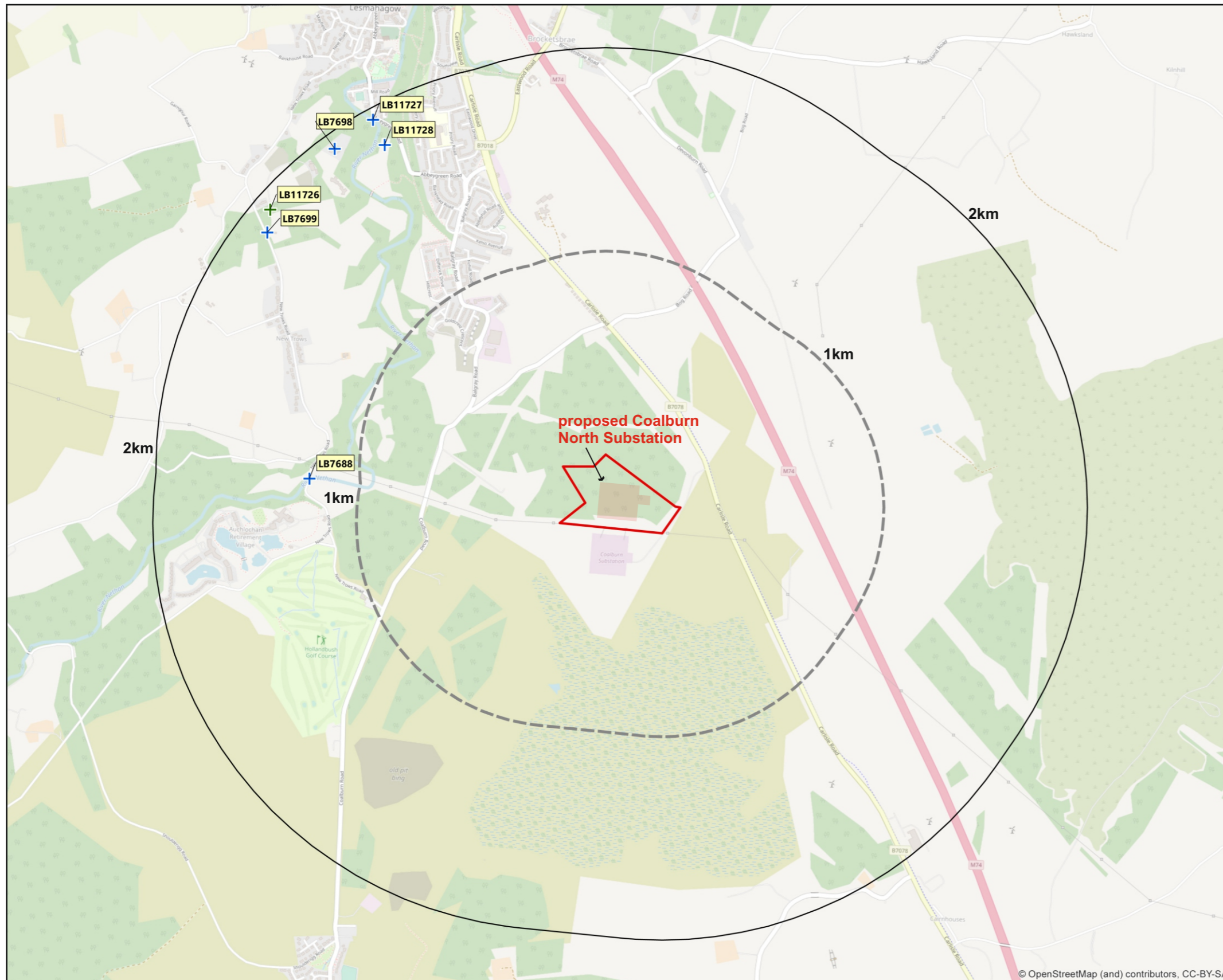
figure 5.1

Title:
Heritage_ 1km Inner Study Area
CFA Archaeology Ltd

Project:
Proposed Coalburn North Substation

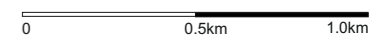
Scale: Bar Scale

Date: Nov 2023



Key

- Proposed Development Site
- Inner Study Area
- Outer Study Area
- + Category B Listed Building
- + Category C Listed Building



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figure 5.2

Title:
Heritage_ 2km Outer Study Area
CFA Archaeology Ltd

Project:
Proposed Coalburn North Substation

Scale: Bar Scale

Date: Nov 2023

Introduction

- 6.1 This Chapter considers the potential effects of the proposed Coalburn North Substation (“the new Substation”) with respect to geology, hydrogeology, and hydrology (including flooding) and is supported by a Technical Annex (**Appendix 4.0**). To assist the reader, a glossary of terminology is provided at the end of the EA.

Scope and Methodology

Technical Scope

- 6.2 The purpose of this Chapter is to consider the potential impacts and associated effects of the new Substation on hydrology, hydrogeology (including potential groundwater dependent terrestrial ecosystems (GWDTE), soils, geology (including peat) and flooding.

Temporal Scope

- 6.3 The assessment addresses the potential effects of the proposed Coalburn North Substation during the construction and operational phases only.
- 6.4 Decommissioning effects are not considered because future water conditions (including future water users) cannot be defined and the plans for decommissioning are unknown at this stage. What is assumed about decommissioning is that:
- Debris from construction, operation and/or decommissioning activities will be prevented from entering watercourses and removed immediately, should this occur.
 - A decommissioning plan (much like the Construction Environmental Management Plan (CEMP)) would be developed in line with guidance at that time and followed.
- 6.5 On this basis, it is likely that the effects associated with decommissioning would be the same or less than those associated with construction and are therefore not evaluated separately in this assessment.

Study Area

- 6.6 With respect to soils, geology, geologically designated sites and potential GWDTE, the Study Area used to inform the baseline environmental setting encompasses the new Substation footprint, the temporary compound and car park area, plus a 250m strip around its perimeter.
- 6.7 The Study Area is extended out to 1 km from the site boundary for consideration of the potential effect on the water environment (including water dependent designated sites and water supplies).
- 6.8 Consultation responses were received in 2021 for the Coalburn Substation Extension. These consultations responses are still considered relevant with regard to the new Substation and are detailed in **Table 6.1**.

Table 6.1: Consultation Responses

Consultee	Issue	How/ where this is addressed
Nature Scot (2 nd February 2021)	The new Substation is located close to the Coalburn Moss SAC. This is designated for its active raised bogs and degraded raised bogs still capable of natural regeneration. There is a potential connection between drainage from the new Substation and the SAC.	Refer to the mitigation section of this Chapter.
Nature Scot (5 th December 2023)	Request for an appraisal of dust impacts on the SAC.	This will be included within the Construction Environmental Management Plan agreement with NatureScot, prior to construction.
Scottish Environment Protection Agency (11th January 2024)	Recommend a peat survey is undertaken. SEPA confirms no further consideration of GWDTE's is required. SEPA provided the Triage Framework Guidance.	Information regarding the ground investigations undertaken is provided in the Baseline Conditions section below. No peat was identified. The information contained within the Triage Framework has been incorporated into this assessment.

Assessment Methodology

- 6.9 Using the existing baseline conditions in the Study Area described previously, and the description of the new Substation (**Chapter 2.0**), the potential impacts and associated effects resulting from the proposed development are identified. A qualitative assessment methodology has been used to assess the magnitude of the potential impacts and the significance of the effects.
- 6.10 Two factors have been considered in using this approach: 1) the sensitivity of the receiving environment; and 2) the magnitude of the impact should it occur. This approach provides a mechanism for identifying the areas where mitigation measures are required, and for identifying mitigation measures appropriate to the significance of the effects presented to the existing environment by the proposed new Substation.
- 6.11 The sensitivity classification of the receiving environment is defined in **Table 6.2**. Criteria for determining the magnitude of the impacts are provided in **Table 6.3**. The sensitivity of the receiving environment together with the magnitude of the impacts defines the significance of the effect, as identified within **Table 6.4**. The discussion of each potential effect also defines if it is considered to be beneficial or adverse, permanent or temporary, and reversible or irreversible. For the purposes of this assessment, a temporary impact and associated effect is considered to be one that originates in the construction phase and would cease once construction is complete. A more permanent or long-term impact is one that would persist past the construction phase without intervention. A reversible impact would either reverse itself naturally over time or with human intervention.

Table 6.2: Sensitivity Criteria for Receptor

Sensitivity	Definition
Very High	<ul style="list-style-type: none"> ▪ International importance. ▪ Receptor of high quality and rarity, regional or national scale and limited potential for substitution/replacement. ▪ Human Health.
High	<ul style="list-style-type: none"> ▪ National importance. ▪ Receptor with a high quality or rarity, local scale and limited potential for substitution/ replacement; or ▪ Receptor of medium quality and rarity, regional or national scale and limited potential for substitution / replacement.
Medium	<ul style="list-style-type: none"> ▪ Regional importance. ▪ Receptor with a medium quality and rarity, local scale and limited potential for substitution/replacement; or ▪ Receptor of low quality and rarity, regional or national scale and limited potential for substitution/replacement.
Low	<ul style="list-style-type: none"> ▪ Local importance. ▪ Receptor with a low quality and rarity, local scale. ▪ Environmental equilibrium is stable and is resilient to changes that are greater than natural fluctuations, without detriment to its present character.

Table 6.3: Magnitude of Impacts Criteria and Definitions

Magnitude	Definition	
	Adverse	Beneficial
High	<p>Loss of resource/receptor, loss of quality and integrity of the resource/receptor, severe damage to key characteristics, features, or elements.</p> <p>Harm to human health - death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions.</p> <p>Harm to buildings - Structural failure, substantial damage, or substantial interference with any right of occupation.</p> <p>Pollution of the water environment as per the measures of “significant water pollution” in section A.46 of The Scottish Executive’s Contaminated Land Statutory Guidance (Edition 2, dated May 2006), is defined by:</p> <ul style="list-style-type: none"> ▪ A breach of, or failure to meet, any statutory quality standard for the water environment at an appropriate pollution assessment point. ▪ A breach of, or a failure to meet, any operational standard adopted by SEPA for the protection of the water environment. ▪ Pollution results in an increase in treatment required for an existing drinking water supply. ▪ Pollution results in an increase level of treatment required of water abstracted for industrial purposes. 	<p>Large scale or major improvement to resource/receptor quality, extensive restoration, or enhancement.</p>

	<ul style="list-style-type: none"> ▪ Pollution results in deterioration in the status of a water body, failure to meet good status objectives defined by the Water Framework Directive, or failure of a protected drinking water area to meet its objectives as defined by the Water Framework Directive. ▪ There is a significant and sustained upwards trend in concentration of pollutants in groundwater being affected by the land in question. ▪ There is a material and adverse impact on the economic, social and/or amenity use associated with a particular water environment. 	
Medium	Partial loss of resource/receptor, partial loss of quality and integrity of the resource/receptor, damage to key characteristics, features, or elements.	Improvement to resource/receptor quality, some restoration or enhancement, addition of key characteristics, features, or elements.
Low	Some measurable change in/damage to attributes, quality, or vulnerability. Minor loss of, or alteration to, key characteristics, features, or elements.	Minor benefit to, or addition of, one or more key characteristics, features, or elements. Some beneficial impact on the attribute or reduction in the negative impact.
Very Low	Very minor (immeasurable) change to one or more characteristics, features, or elements.	Very minor (immeasurable) benefit to, or positive addition of, one or more characteristics, features or elements.
Negligible	No change to characteristics, features, or elements.	

Table 6.4: Significance of Effect

Receptor Sensitivity	Magnitude of Impact				
	Negligible	Very Low	Low	Medium	High
Low	None	None	Minor	Minor	Minor
Medium	None	Minor	Minor	Minor	Moderate
High	None	Minor	Minor	Moderate	Major
Very High	None	Minor	Moderate	Major	Major

6.12 The relative significance of effects presented in **Table 6.4** can be described in the following terms:

- Major - a fundamental change to the environment.
- Moderate - a material but non-fundamental change to the environment.
- Minor - a detectable but non-material change to the environment.
- None - no detectable change to the environment.

- 6.13 Any effect of the proposed development assessed as “major” or “moderate” (in terms of the criteria above) would be considered to be “significant”.

Policy Context

- 6.14 A summary of the national and local policy context in relation to the water environment, soils and geology is presented in the table below. Some specific policy wording has been shortened to focus on relevant topics.

Table 6.5: Summary of Relevant Planning Policy

Planning Policy	Summary
National Planning Policy Framework 4 (NPF4, 2023)	<p>NPF4 focuses on outlining six key spatial principles to aid in meeting the United Nations (UN) Sustainable Development Goals (SDGs) and national outcomes. Amongst these are principles incorporating the concepts of net zero, sustainable development, conservation and recycling, carbon storage, flood risk management, and biodiversity.</p> <p>Policy 1 states that <i>“When considering all development proposals significant weight will be given to the global climate and nature crises”</i> (page 37), while Policy 2 notes that <i>“c) Any potential adverse impacts, including cumulative impacts, of development proposals on biodiversity, nature networks and the natural environment will be minimised through careful planning and design...”</i> (page 38).</p> <p>Policy 4 relates to protection, restoration and enhancement of natural places/assets and notes that <i>“e) The precautionary principle will be applied in accordance with relevant legislation and Scottish Government guidance”</i> (page 40), while Policy 11 (Energy) notes that <i>“d) Development proposals that impact on national or international designations will be assessed in relation to Policy 4”</i> (page 53).</p> <p>Policy 5 intends <i>“To protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development”</i> and notes that: <i>“a) Development proposals will only be supported if they are designed and constructed:</i></p> <ul style="list-style-type: none"> <i>i. In accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land; and, ii. In a manner that protects soil from damage including from compaction and erosion, and that minimises soil sealing”</i> and that <i>“c) Development proposals on peatland, carbon-rich soils and priority peatland habitat will only be supported for: i. Essential infrastructure and there is a specific locational need and no other suitable site; ii. The generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets...”</i> (page 42)
South Lanarkshire Council Local Development Plan 2 (SLLDP2, 2021)	<p>The second volume of South Lanarkshire Council’s Local Development Plan (LDP2, 2021) sets out the council’s strategic spatial strategy to facilitate and encourage sustainable, low-carbon economic growth whilst also protecting the natural and historic environment, including against climate change.</p> <p>Various policies laid out in LDP2 seek to allow the balance of economic growth versus environmental protection. Several policies indicate that all proposals will be assessed based on their impact to the natural and historic environments and that developments should not have any significant effect.</p>

	<p>Policy SDCC2 Flood Risk notes that any development that will lead to an increase in flooding risk will not be considered.</p> <p>Policy NHE11 Peatland and Carbon Rich Soils notes that where peat or other carbon rich soils are present these should be protected during development, with assessments made to determine likely effects on carbon dioxide emissions. It also notes applications should be accompanied by a schedule of mitigation measures, method statements for re-instatement of disturbed peat, and peatland management plan (Volume 2, page 64-65).</p> <p>Policy NHE12 Water Environment and Biodiversity states that “development proposals should protect and where possible enhance the water environment in accordance with the Water Framework Directive. Development proposals which will have a significant adverse impact on the water environment will not be permitted. Consideration will be given to water levels, flows, quality, features, flood risk and biodiversity...” (Volume 2, page 66).</p>
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Relevant Legislation and Guidance

6.15 The legislation, guidance and advice that has been considered relevant to this topic includes the following:

- The Water Framework Directive (2000/60/EC);
- The Water Environment and Water Services (Scotland) Act 2003;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (and subsequent amendments of 2013 and 2017);
- The Flood Risk Management (Scotland) Act 2009;
- The Scottish Government Flood Risk Planning Advice, June 2015;
- SEPA Land Use Planning System Development Guidance Note 2a – Development Management Guidance on Flood Risk, 2018;
- SEPA Land Use Planning System Guidance Note 2b – Development Plan Guidance on the Water Environment, 2017;
- SEPA Land Use Planning System Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems, 2017 (Version 3);
- UK Technical Advisory Group on the Water Framework Directive: Technical report on groundwater dependent terrestrial ecosystem (GWDTE) threshold values;
- SEPA Engineering Good Practice Guides; and
- SEPA Pollution Prevention Guidelines and Guidance for Pollution Prevention documents.

Baseline Conditions

6.16 This Section provides a summary of baseline data gathered using publicly available resources and site observations. Further details are provided in **Appendix 4.1**.

Landuse

- 6.17 The majority of the Site comprises young coniferous plantation woodland. To the immediate north there is an area of mixed woodland (Long Established Woodland of Plantation Origin) and further plantation beyond. To the west there is coniferous plantation and to the east an area of scattered young broadleaved trees. Rough grassland is present on the southern and eastern fringes of the Site.

Soils and Peat

- 6.18 Within the Site and 250m Study Area, soils are indicated to comprise the Rowanhill series, with the component soils being peaty gleys with dystrophic blanket peat (Scotland's Soils, 2023).
- 6.19 British Geological Survey (BGS) Mapping and Historic Borehole records (2023) indicates that the Site and 250m Study Area are underlain by Glacial Till. No peat is indicated as being present.
- 6.20 The Carbon and Peatland Map (Scotland's Environment, 2023) indicates that the Site and 250m Study Area are underlain by mineral soils. This suggests an absence of peat, deep peat, or priority peatland habitat.
- 6.21 A site walkover and peat probing over a 100m grid, undertaken with a 3 metre extendable aluminium probe, was carried out on 5th September 2023. Bedrock was encountered at 0.1 to 0.4m below ground level (bgl). No peat was identified.
- 6.22 The detailed ground investigation works for the design and construction of the proposed Coalburn North Substation (Raeburn, 2023) notes that topsoil, glacial till and granular deposits were encountered⁵². No peat was encountered.

Superficial Geology

- 6.23 As noted previously, the superficial deposits within the footprint of the Site and 250m Study Area are mapped as comprising Glacial Till deposits (BGS, 2023). Such deposits can be highly variable in composition and are made up of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape.

Bedrock Geology

- 6.24 The bedrock beneath the Site and 250m Study Area is indicated to comprise the Clackmannan Group Limestone Coal Formation (BGS, 2023). This type of bedrock is formed by cyclic marine bands and contains coal seams.

Hydrogeology

- 6.25 A review of BGS Hydrogeological mapping indicates that the Site and 250m Study Area is underlain by the Clackmannan Group which is characterised as a moderately productive aquifer. Flow is virtually all through fractures and other discontinuities within the bedrock.

⁵² Raeburn (2023) Ground Investigation Report. p 12

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

- 6.26 No GWDTE has been identified within the Site boundary. Coalburn Moss SSSI/SAC is located approximately 190m to the southeast of the Site and is therefore located within the 250m Study Area. SEPA Guidance LUPS31 (2017) suggests that potential GWDTE within 250m of excavations deeper than 1m should be considered with regards to construction and operational impacts.
- 6.27 Further details regarding the designation and characteristics of the Coalburn Moss SSSI/SAC are provided in **Appendix 4.1**. Mitigation measures to protect the SAC are provided later in this Chapter.

Surface Watercourses

- 6.28 The closest named surface watercourse to the Site is the Fauldhouse Burn, which is located approximately 280m north east from the proposed development and approximately 450m north east of the existing Substation.
- 6.29 The permanent drainage design for the new Substation will be based on Sustainable Drainage System (SuDs) principals and agreed with SEPA. A SuDs pond is proposed to the south of the new Substation access road. The new drainage scheme will link to the existing Coalburn Substation system, and collect and treat surface water runoff prior to discharge.
- 6.30 The existing Coalburn Substation drainage scheme outfalls to a ditch aligned along the west side of the access road, which drains north eastwards into the Fauldhouse Burn to the north east of Carlisle Road. The existing drainage ditch is located to the east of the new Substation.
- 6.31 The largest watercourse present within the 1km hydrology study area is the River Nethan. This is located approximately 940m west of the proposed development boundary. As the Site slopes down to the east and southeast, it is unlikely to be hydrologically connected to the river.
- 6.32 The Gad Burn is located approximately 240m east of the proposed development boundary and approximately 490m east of the new Substation. This has been significantly modified and flows into the Fauldhouse Burn to the north east of Carlisle Road. There is no hydrological connectivity between the new Substation and the Gad Burn.
- 6.33 There is an unnamed burn approximately 200m to the northeast of the proposed development boundary and approximately 450m northeast of the new Substation. As this watercourse is upslope of the new Substation, there is no hydrological connectivity.

Flood Risk

- 6.34 A review of the SEPA online flood mapping (2023) indicates that there is no likelihood of surface water or river flooding within the Site. Within the 1km Study Area, there are small areas of potential surface water flooding to the south and west of the existing Coalburn Substation. The River Nethan is indicated to have a high likelihood of localised flooding, as does the Fauldhouse Burn approximately 1.1km to the south east of the new Substation.

Water Users

- 6.35 The Site slopes down to the south east towards the existing access road to the Coalburn Substation. Other than the existing Substation, there are no residential or commercial

properties likely to have any Private Water Supply within 250m of the Site, a buffer distance specified within SEPA guidance GU-LUPS 31 (2017).

Future Environment

- 6.36 The future ground conditions are unlikely to change notably. The geology will remain unchanged, and the presence of certain soil types will only change if they are removed by future development, or are impacted by changes in temperature, water availability, or erosion/inundation due to changes in run-off regimes or flooding. The Study Area is not coastal, so sea level changes have not been considered.
- 6.37 The impact of climate change and population changes are considered to be the main factors behind variations in the future baseline. Climate change in the UK has been predicted to result in a greater chance of hotter, drier summers and warmer, wetter winters by 2070 (Met Office, 2023). For central Scotland, the predictions in changes relating to rainfall and temperatures are as follows:
- Summer rainfall change: 30% drier to 6% wetter (low emissions scenario) and 40% drier to 8% wetter (high emissions scenario).
 - Winter rainfall change: 4% drier to 9% wetter (low emissions scenario) and 3% drier to 12% wetter (high emissions scenario).
 - Rainfall patterns across the UK are not uniform currently and vary on seasonal and regional scales. This will continue in the future.
 - Summer temperature change: -0.1°C cooler to 2.8°C warmer (low emissions scenario) and 0.6°C warmer to 4.8°C warmer (high emissions scenario).
 - Winter temperature change: -0.3°C cooler to 2.7°C warmer (low emissions scenario) and 0.6°C warmer to 4.5°C warmer (high emissions scenario).
- 6.38 Increases in short, intense rainfall events can lead to more frequent pluvial/surface flooding because run-off overwhelms small catchments. Increases in run-off can result in increased erosion of soils, which in turn can result in poorer water quality in receiving waters due to increases in suspended solids and other substances washed off the land.

Identification of Receptors

- 6.39 The baseline information indicates that the potential environmental aspects of interest within the Study Area are:
- Coalburn Moss SAC/SSSI (High Sensitivity); and
 - Fauldhouse Burn (Medium Sensitivity).
- 6.40 There are no prime agricultural soils at the Site, so loss of such soils has been scoped out of further assessment.
- 6.41 No peat has been identified within the Site. Therefore, consideration of loss of peat deposits has been scoped out of further assessment.
- 6.42 No GWDTE have been identified within the footprint of the new Substation development, so these have been scoped out of further assessment.

- 6.43 The proposed new Substation infrastructure is not located in a mapped area of current or future flood risk, so the potential impact to the development from flooding has not been considered.
- 6.44 The Site is not located within 250m of any residential or commercial properties. Therefore, the potential impact on current water supply users has not been considered further.

Potential Effects of Proposed Development

Project Design Elements, Construction Methods and Operational Maintenance

- 6.45 This section details the design elements and good practice that are embedded in the new Substation development at the construction and operational phases that are relevant to the consideration of impacts to geology, hydrogeology and the water environment. These are taken into account when evaluating the initial impacts and effects.

Project Design Elements

- 6.46 Temporary measures to control drainage during construction will be agreed with SEPA and South Lanarkshire Council (SLC) prior to implementation. This would include track-side ditches and silt traps adjacent to the access road to collect and treat runoff. Cut-off drains will be installed around the temporary soil storage area. For the new Substation platform, cut-off drains and settlement lagoons would be installed to collect and treat runoff from the works area.
- 6.47 Where cut and fill is required, cut off ditches will be aligned along the top and bottom of embankments with check dams to slow surface water flow and allow sediment to settle. Clean water runoff will then discharge via an engineered headwall into existing ground.
- 6.48 The permanent drainage design for the new Substation will be based on Sustainable Drainage System (SuDs) principals, and agreed with SEPA and SLC. A SuDs Pond is proposed to the south of the new Substation access road.
- 6.49 The existing Coalburn Substation drainage scheme outfalls to a ditch aligned along the access road which then drains into the Fauldhouse Burn at Carlisle Road. The new drainage scheme will link to the existing Coalburn Substation system and collect and treat surface water runoff prior to discharge. The drainage design will include oil interceptors to collect any fuels contained in runoff. Concrete bunded oil containment systems will be installed to collect any potential fuel leaks from electrical equipment which contain oil as an insulating medium.

Construction Methodology

- 6.50 The final drainage design will be agreed with SEPA and SLC.
- 6.51 The new Substation will include power transformers (which contain oil as an insulating medium), which will be bunded and rainwater that falls in the bunds will be kept separate from other direct rainfall and will be directed to the oil interceptors. Water that does not have contact with equipment will be directed and discharged through the same route as 'clean' water via the SuDS system described above. All detailed design drainage proposals will be discussed and agreed with SEPA and SLC prior to commencement of any construction works.
- 6.52 A Pollution Prevention Plan (PPP) will be prepared for the new Substation and associated temporary compound and car park area. This document shall be used to control and guide the working practices of the Contractor for the duration of the construction works.

- 6.53 The Construction Environmental Management Plan (CEMP) will include protocols for managing suspended soils, handling and storing hazardous substances, and dealing with leaks and spills. The CEMP will also include measures to control dust from construction activities.
- 6.54 Good soil management practice methods will be set out in the CEMP and agreed with SEPA, such as use of bunds around the construction area and settlement ponds (or other water filtering method) if required. For example:
- Keep soils disturbance to a minimum;
 - Minimise areas uncovered at any one time;
 - Soils from on-site will be reused where possible;
 - Stripped soils and sub-soils will be stored separately before reinstatement; and
 - No soils will be brought to site unless from a similar source.
- 6.55 Good chemical storage practice will be set out in the CEMP and may include measures such as areas of hardstanding, bunded storage, adequate storage capacity (e.g. 110%), and located at least 50 m from watercourses. An Oil Spill Prevention and Response Plan will be established as part of the CEMP.
- 6.56 There will be no disposal of foul sewage on site during construction. All foul water will be discharged into an approved above-ground collection tank within a proprietary temporary toilet cabin. The tank will be regularly emptied and removed for off-site disposal by a licensed contractor. Welfare waste from the temporary construction compound and car park area will be taken off site and disposed of at an appropriate licensed facility.
- 6.57 Management of any waste will be in accordance with statutory and licencing requirements, accepted good practice and to ensure that wherever possible materials are reduced, reused or recycled in preference to disposal. Any waste that does require disposal will be collected in predetermined areas on site and transferred to a licenced site by a registered waste carrier in accordance with the Site Waste Management Plan.
- 6.58 Pollution management measures will be implemented to prevent surface water and groundwater contamination by machinery pollutants, such as fuels, oils and lubricants during construction and operation activities. These measures will be informed by guidance provided in the relevant SEPA Pollution Prevention Guidelines (PPGs) or Guidance for Pollution Prevention (GPPs) where the PPGs have been replaced. The relevant PPGs or GPP may include the following:
- GPP 1 Good environmental practices;
 - GPP 2 Above ground oil storage tanks;
 - GPP 3 Use and design of oil separators in surface water drainage systems;
 - GPP 5 Works and maintenance in or near water;
 - PPG 6 Working at construction and demolition sites;

- GPP 8 Safe storage and disposal of used oils;
- GPP 13 Vehicle washing and cleaning;
- GPP 21 Pollution incident response planning;
- GPP 22 Dealing with spills; and
- GPP 26 Safe storage - drums and intermediate bulk containers.

Operational Maintenance

6.59 Access for inspection and maintenance will be required. Access will be via the new access road. The inspection and maintenance regime, and accompanying operational activity method statements, will limit the potential for leaks and spills to result in pollution events. No regular bulk deliveries of material will be required during operation.

Assessment of Potential Initial Effects

- 6.60 Potential impacts to the geological or hydrological receptors during construction could result from the following:
- Changes in surface water or groundwater quality; and
 - Changes in local surface water drainage patterns and flows, including those associated with Coalburn Moss SAC/SSSI.
- 6.61 Construction activities that could affect surface water and groundwater quality, might include suspended solids generation originating from the excavation, movement and storage of weather sensitive materials, construction and use of access roads and tracks, import and placement of materials (including for landscaping), and excavation of new drainage. Other sources of potential contamination could, for example, include leaks/spills of fuel/oils whilst being stored, transferred, or used, foul waste from welfare units, temporary storage of general construction waste, pH changes due to use of cement, and bringing in a source of contamination with materials used for land raising.
- 6.62 The CEMP and PPP will be followed to manage the potential impacts to surface and groundwater quality from construction activities.
- 6.63 Considering the design and good practice working methods, the magnitude of the potential impact to surface water and groundwater quality is predicted to be **low (adverse)**. The resultant significance of effect for surface water and bedrock groundwater quality is **minor (short-term adverse)** and the resultant significance of effect for groundwater in the superficial deposits is **none**.
- 6.64 Construction activities that could affect surface water drainage include localised changes in topography due to soil removal or profiling, and the creation of temporary barriers to flow from construction materials, tracks and / or equipment. The installation of new drainage at the construction stage will alter drainage and flow paths and will remain as features of the operational development. Changes in flow paths and drainage can have an impact on downstream flows and flood risk in surface watercourses if the location of discharge or rate of discharge is changed significantly.

- 6.65 Good construction practice (including the method set out in the CEMP) will be followed to manage the potential impacts to surface water drainage from construction activities. Drainage from the new Substation will tie into the existing drainage system utilised by the Coalburn Substation.
- 6.66 Taking into account the design and good practice working methods, the magnitude of potential impacts to surface water drainage patterns, flows and downstream flood risk, are considered to be **low (adverse)**. The resultant significance of effect is **minor (short-term adverse)**.
- 6.67 Operational activities that could affect surface water and groundwater quality, and in turn water users, include general maintenance activities and leaks from Substation equipment. However, there are no new sources of impact on top of those already present within the existing Coalburn Substation due to existing maintenance activities and storage of materials.
- 6.68 The pollution prevention measures detailed in operational activity method statements or operational management plans will be followed to manage the potential impacts to surface and groundwater quality from operational activities.
- 6.69 The magnitude of the potential impact to surface water and groundwater quality, along with the secondary impact to water quality for water users, is predicted to be **low (adverse)**. The resultant significance of effect for surface water and bedrock groundwater quality is **minor (long-term adverse)**. The resultant significance of effect for groundwater in the superficial deposits is **none**.

Additional Mitigation

- 6.70 None of the predicted effect significance levels are higher than **minor** (i.e. a detectable but non-material change to the environment), so additional mitigation to reduce the magnitude of the impact further is not considered to be required.

Assessment of Residual and Cumulative Effects

- 6.71 The initial assessment of impacts and effects does not require further mitigation. Therefore, no assessment of residual effects is required. A summary of the impacts and effects considered in this assessment is presented in **Table 6.6**. All effects are either classified as '**none**' or '**minor**' (adverse) and **not significant**.
- 6.72 The only in-construction development in the vicinity of the new Substation is the extension works to Coalburn Substation. This extension is due to be completed in late 2023 and therefore no assessment of cumulative effects with regards to the new Substation on water quality has been made.

Table 6.6: Summary of Impacts and Effects

Issue	Mitigation Measure	Input
Generation of suspended solids	Design and good practice working methods.	CEMP / PPP
Changes to surface water drainage, including to Coalburn Moss SAC/SSSI	Design and good practice working methods. Tie into existing Coalburn Substation drainage system.	CEMP
Pollution of surface waters or groundwater	Ongoing maintenance and good practice.	PPP

Introduction

7.1 This Chapter assesses the potential effects of noise and vibration on nearby Noise Sensitive Receptors (NSRs) associated with the construction and operation of the proposed Coalburn North Substation (“the Project/ new Substation”). This details the procedure, results, and findings of the noise impact assessment. To assist the reader, a glossary of acoustic terminology is provided at the end of the EA.

Scope and Methodology

7.2 The noise impact assessment considers effects on:

- Potential construction noise effects on Noise Sensitive Receptors (NSRs) in the vicinity of the Project; and
- Potential operational noise effects on NSRs in the vicinity of the Project.

7.3 The scope of the assessment has been informed by consultations conducted in 2021 for the extension of the existing Coalburn Substation which is now under construction. The consultations conducted are considered relevant to the proposed Coalburn North Substation development and the responses are summarised in **Table 7.1** below. This noise impact assessment has also been prepared with reference to the applicable legislative framework, and National and Local Planning Policy.

Table 7.1: Consultations

Consultee	Issue	How/ where this is addressed
South Lanarkshire Council - 2021	<p>The developer shall ensure that the neighbourhood noise levels at any noise sensitive receptors associated and in connection with the extension to the electrical sub-station shall comply with the following:</p> <p>Part 1 Between the hours of 08:00 and 20:00 the measured noise rating level emitted from the development (LAr,1hr) shall not exceed the background noise level (LA90,30 min) by more than 4dB within the curtilage of any noise sensitive receptor. This shall be measured in accordance with British Standard BS 4142:2014 - Method for Rating and Assessing Industrial and Commercial Sound at the proposed development. Between the hours of 20:00 and 08:00 the noise rating level emitted from the development (LAr,15 min) shall not exceed the background noise level (LA90,30min) by more than 4dB within the curtilage of any noise sensitive receptor. This shall be measured in accordance with BS4142:2014 at the proposed development.</p> <p>Part 2 The internal noise levels from the development at any residential noise sensitive receptor shall comply with BS 8233:2014 Guidance on sound</p>	<p>Baseline noise measurements conducted to obtain the background noise level for surrounding noise sensitive receptors.</p> <p>A noise impact assessment performed to BS4142 standard to assess external noise level to the limits imposed by the Council.</p> <p>Internal noise levels have been calculated with guidance from BS8233 to assess internal noise levels against limits imposed by the Council.</p>

	<p>insulation and noise reduction for buildings as follows-</p> <p>a) The internal levels with windows open do not exceed an LAeq,16hr of 40dB daytime (07:00 - 23:00)</p> <p>b) The internal levels with windows open do not exceed an LAeq,8hr of 30dB night-time (23:00 - 07:00).</p> <p>c) The external levels shall not exceed an LAeq,16hr of 55dB daytime in any garden amenity areas, when measured free-field.</p> <p>Part 3</p> <p>The Internal Noise Rating Values, from the development, as measured within any residential property shall not exceed-</p> <ul style="list-style-type: none"> ▪ NR25 between 23.00hrs and 08.00hrs ▪ NR35 between 08.00hrs and 23.00hrs 	
South Lanarkshire Council - 2021	<p>The applicant is advised that all works carried out on site must be carried out in accordance with BS 5228 Parts 1-4 1997, 'Noise Control on Construction and Open Sites'.</p> <p>The applicant is further advised that audible construction activities should be limited to: Monday to Friday 8.00am to 7.00pm, Saturday 8.00am to 1.00pm and Sunday - No audible activity. The applicant is advised that Environmental Services may consider formally imposing these hours of operation by way of statutory notice should complaints be received relating to audible construction activity outwith these recommended hours and should such complaints be deemed justifiable by Officers from this Service.</p>	A construction noise impact assessment conducted to BS5228 standard to assess construction noise levels are within limits advised by the Council.
South Lanarkshire Council - 2021	<p>The applicant is advised that the harmonics associated with electrical plant at the proposed site are elevated. The distance attenuation and sound reduction within structures is poor for such frequencies and as such NRs may be elevated. Subject to further development of the site where reasonably practicable attenuation should be put in place utilising best available technology.</p>	Tonality accounted for within the BS4142 assessment.

Construction

- 7.4 Construction noise levels arising from the proposed development have been investigated by conducting a noise impact assessment with guidance from BS 5228. A preliminary construction schedule has been assumed for the purposes of the assessment. It must be noted however that a specific construction schedule is not available at this project stage, therefore the construction noise assessment and management plan must be revisited by the principal contractor once appointed and when the specific schedule is known.

Operation

- 7.5 Operational noise arising from the existing Coalburn Substation and the proposed development have been investigated by conducting a noise impact assessment, consisting of a baseline noise survey, British Standard (BS) 4142: 2014 assessment at Noise Sensitive Receptors (NSRs) and a digital noise propagation model informed by measured and specified equipment Sound Power Levels (SWLs).
- 7.6 A detailed model of the site and surrounding area has been constructed in SoundPLAN 8, allowing for analysis of the impact of the site for NSRs and correlation with measured levels. All modelling events are for worst case scenarios and are expected to result in higher levels than those measured.
- 7.7 The following equipment has been modelled as part of the existing Coalburn Substation:
- x3 Supergrid Transformers (SGTs)
 - x2 Auxiliary Transformer
 - x3 Shunt Reactor (1 set)
- 7.8 The following equipment has been modelled as part of the Coalburn Substation extension currently under construction:
- x1 SGT
 - x3 Shunt Reactor (1 set)
- 7.9 The following equipment has been modelled as part of the proposed Coalburn North Substation:
- x1 SGT
- 7.10 Elevation data at 50 m resolution have been used to create a digital ground model. This resolution is appropriate due to the topography of the site. Plans for the proposed development have been used to model the Coalburn North Substation site⁵¹. Satellite imagery and Ordnance Survey maps have been used to aid the modelling of the surrounding area.
- 7.11 Propagation was modelled using ISO 9613-2⁵², with the following parameters:
- Ground absorption: 0.0 on paved surfaces, 0.6 elsewhere.
 - Receiver height: 1.5 m above ground / floor
 - Temperature: 10°C
 - Relative humidity: 70%

Effects Scoped Out

Noise from Operational Maintenance

- 7.12 Any operational maintenance works required will be short-term and intermittent and are not expected to give rise to significant effects relating to noise and vibration. Therefore, this aspect is scoped out of the EA.

⁵¹ SPEN Dwg BT3091-2-5200-10-SPENEC-0127. Landscape bunds to retain all material on site not included in modelling.

⁵² ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation, ISO, 15 December 1996.nsisit

Vibration

- 7.13 There are no known vibrational noise issues associated with the operation of the Project at nearby NSRs. Therefore, vibration is scoped out of the assessment.

Construction Traffic

- 7.14 Based on the scope and duration of construction activities required, it is expected that construction traffic noise impacts and construction traffic vibration impacts would be negligible; therefore, no detailed assessment of construction traffic noise and vibration is proposed as part of the EA.

Policy Context

- 7.15 A summary of the relevant Planning Policy, Guidance Documents and British Standards is included in the following **Table 7.2**.

Table 7.2: Policy and Guidance

Planning Policy	Summary
Planning Advice Note (PAN) 1/2011: 'Planning and Noise'	<p>Published in March 2011⁵³, this document provides advice on the role of the Planning System in helping to prevent and limit adverse effects of noise (Scottish Government, 2011). Information and advice on noise assessment methods are provided in the accompanying Technical Advice Note (TAN): Assessment of Noise. Included within the PAN document and the accompanying TAN are details of the legislation, technical standards, and codes of practice for specific noise issues.</p> <p>Neither PAN 1/2011 nor the associated TAN provides specific guidance on the assessment of noise from fixed plant, but the TAN includes an example assessment scenario for 'New noisy development (incl. commercial and recreation) affecting a noise sensitive building', which is based on British Standard (BS) 4142:1997: Method for rating industrial noise affecting mixed residential and industrial areas. This British Standard has been replaced with BS 4142:2014: Methods for Rating and Assessing Industrial and Commercial Sound.</p>
British Standard 4142: 2014: Methods for Rating and Assessing Industrial and Commercial Sound (BS 4142)	<p>British Standard (BS) 4142: 2014⁵⁴, describes methods for rating and assessing the following:</p> <ul style="list-style-type: none">▪ Sound from industrial and manufacturing processes;▪ Sound from fixed installations which comprise mechanical and electrical plant and equipment;▪ Sound from the loading and unloading of goods and materials at industrial and/or commercial premises;▪ Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site. <p>The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.</p> <p>In accordance with the assessment methodology, the specific sound level (LAeq,T) of the noise source being assessed is corrected, by the application of corrections for acoustic features, such as tonal qualities and/or distinct impulses, to give a "rating level" (LAr,Tr). The British Standard effectively</p>

⁵³ Planning Advice Note, PAN 1/2011, Planning and Noise. The Scottish Government, 2011

⁵⁴ British Standard Institution, *BS 4142: 2014 Method for rating industrial noise affecting mixed residential and industrial areas*, British Standards Institution, October 2014.

	<p>compares and rates the difference between the rating level and the typical background sound level ($L_{A90,T}$) in the absence of the noise source being assessed.</p> <p>The British Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) when the noise source in question is likely to operate or is proposed to operate in the future.</p>
British Standard 5228-1:2009 +A1:2014 (BS 5228), Code of Practice for Noise and Vibration Control on Construction and Open Sites ⁵⁵	<p>Guidance on the prediction and assessment of noise and vibration from construction sites is provided in BS 5228 2009 +A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise. BS5228-1 provides recommended limits for noise from construction sites.</p> <p>The construction noise impact assessment (CNIA) has been carried out according to the ABC method specified in Table E.1 of BS5228-1, in which noise sensitive receptors (NSRs) are classified in categories A, B or C according to their measured or estimated background noise level.</p>
Noise Rating Curves and BS8233:2014	<p>The Noise Rating - NR - curve is developed by the International Organization for Standardization (ISO 1973) to determine the acceptable indoor environment for hearing preservation, speech communication and annoyance.</p> <p>The noise rating graphs for different sound pressure levels are plotted as acceptable sound pressure levels at different frequencies. Acceptable sound pressure level varies with the room and the use of it. Different curves are obtained for each type of use. Each curve is referenced by an NR number.</p> <p>British Standard 8233:2014: Guidance on Sound Insulation and Noise Reduction for Buildings provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building. The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings exposed to steady external noise sources.</p> <p>With respect to external amenity space such as gardens and patios, the standard states that it is desirable that the noise level not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. Higher external noise criteria may be appropriate under certain circumstances such as within city centres, other urban areas and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.</p>

Significance Criteria

7.16 The relative significance of effects is assessed using the following terms:

- **Major** - a fundamental change to the environment.
- **Moderate** - a material but non-fundamental change to the environment.
- **Minor** - a detectable but non-material change to the environment.
- **None** - no detectable change to the environment.

⁵⁵ British Standard 5228: Code of practice for noise and vibration control on construction and open sites (BS 5228), BSI, 2009, amended 2014

Construction

- 7.17 A Construction Noise Impact Assessment (CNIA) has been carried out according to the ABC method specified in Table E.1 of BS 5228-1, in which Noise Sensitive Receptors (NSRs) are classified in categories A, B or C according to their measured or estimated background noise during construction activities. BS 5228-1 recommends limits based on the local environment and time of day. The criteria provided for the ABC method detailed in BS 5228-1 are shown in **Table 7.3**.

Table 7.3 Construction Noise Impact Assessment Criteria

Assessment category and threshold value period	Threshold value, LAeq (dB)		
	Category A	Category B	Category C
Night-time	45	50	55
Evenings and Weekends	55	60	65
Daytime and Saturdays	65	70	75

- 7.19 Night time is defined to be between 23:00 and 07:00. Evenings and weekends are defined to be 19:00 – 23:00 on weekdays, 13:00 – 23:00 on Saturdays and 07:00 – 23:00 on Sundays. Daytime is defined to be 07:00 – 19:00 on weekdays and 07:00 – 13:00 on Saturdays.
- 7.20 Ambient noise levels for all receptors are below those stated in Category A. Therefore, all NSRs are defined as Category A.
- 7.21 Excess noise over Category A criteria will result in a **Major** impact. Where construction noise is above the determined background noise level this would result in **Moderate** impact. Noise levels below the criteria thresholds results in **None/Minor** impact.

Operation

- 7.22 Comparing the rating level with the background sound level, BS 4142 states:
"Typically, the greater this difference, the greater the magnitude of impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context".

- 7.23 From previous consultation for the existing Coalburn Substation extension, the Council have stated that the noise rating level emitted from the development (LAr,1hr) shall not exceed the background noise level (LA90,30 min) by more than 4dB within the curtilage of any noise sensitive receptor. An excess of more than 4 dB will result in **Major** impact.
- 7.24 Additionally, any excess above the following conditions will result in **Major** impact.

- The internal levels with windows open do not exceed an LAeq,16hr of 40dB daytime (07:00 - 23:00).
- The internal levels with windows open do not exceed an LAeq,8hr of 30dB night-time (23:00 - 07:00).
- The external levels shall not exceed an LAeq,16hr of 55dB daytime in any garden amenity areas, when measured free-field.
- The Internal Noise Rating Values, from the development, as measured within any residential property shall not exceed NR25.

7.25 The previous consultation is considered relevant for the proposed Coalburn North Substation and it is assumed the same noise limits will apply.

Baseline Conditions

Background Noise

7.26 A baseline noise survey was carried out in surrounding area of the existing Coalburn Substation on the night of 8th October 2020. Baseline noise monitoring was conducted as part of the Coalburn Substation extension that is currently under construction. The baseline noise levels collected during this survey are expected to be relevant and applicable for use for the assessment of the proposed Coalburn North Substation, as there is no reason to suspect a material change to the background noise environment since the survey was conducted.

7.27 At the time of the survey, the site consisted of three Supergrid Transformers (SGTs), two auxiliary Transformers, and two sets of 3 Shunt Reactors forming Coalburn Substation. This survey was conducted before the implementation of a fourth SGT and second set of Shunt Reactors forming the extension to the existing Coalburn Substation site.

7.28 The surrounding area of the Project was dominated by road traffic noise from the M74, noise from local traffic and farming activity and other noise from anthropogenic sources, farm animals and dogs. Some small wind turbines are located in the vicinity which may increase noise level at certain environmental conditions when they begin operation.

7.29 The full details of the baseline noise survey are contained in **Appendix 5.0** (Annex 1.0). A summary of results at nearby NSRs are presented in **Table 7.4**.

Table 7.4 - Measured Noise Levels

Location	L _{Aeq} (dB)	L _{A90} (dB)
NSR 1- Carlisle Road	41.8	39.4
NSR 2- Johnshill	31.7	29.8
NSR 3- Neuk	46.3	37.4
NSR 4- Auldtoneheights	51.3	47.7
Background Noise (BGN)	41.3	38.1

- 7.30 Due to the dominance of the M74 in the surrounding area on noise levels, it is unlikely that there will be any anticipated differences between existing baseline and future baseline conditions.

Existing Equipment

- 7.31 Conformal surface measurements were carried out around the existing equipment at the time of survey, to determine their sound power level (SWL) in accordance with the International Electrotechnical Commission (IEC) standard IEC 60076-10⁵⁶.
- 7.32 The measurement procedure and results are detailed in **Appendix 5.0** (Annex 2.0). A summary of results is presented in **Table 7.5** below.

Table 7.5 – Measured Equipment Sound Power Level

Equipment	Surface Area (m ²)	Averaged SPL (dB(A))	SWL (dB(A))
SG Transformer 1	144.0	69.1	90.7
SG Transformer 2	144.0	70.9	92.5
SG Transformer 3	161.0	61.0	83.1
Shunt Reactors	315.2	59.5	84.5

- 7.33 SGT 4 was not installed at Coalburn Substation at the time of survey. For the purpose of this assessment for the proposed Coalburn North Substation, it is assumed that any new SGTs (including SGT 4 as part of the Coalburn Substation extension under construction) will operate at a level of 84 dB(A). The new Shunt Reactors installed on site as part of the Coalburn Substation extension under construction are assumed to operate at the same level of the existing equipment measured during this survey.

Existing Coalburn Substation Impact

- 7.34 The existing Coalburn Substation and extension under construction has been modelled and assessed in a previous study. The levels predicted by the model relate to the outdoor amenity of the same NSRs considered in the baseline noise survey. The predicted noise levels received at the NSRs are detailed in **Table 7.6**. Deviations between modelled and measured results are expected. The modelling parameters represent conservative worst-case results. Modelled levels have been logarithmically subtracted from the measured ambient L_{A90} levels to approximate a background noise for each receptor.

Table 7.6: Existing Site Modelled Noise Levels at NSRs

Receptor	Modelled Specific Noise	Measured LA90	Calculated BGN
NSR 1- Carlisle Road	23.5	39.4	39
NSR 2- Johnshill	24.4	29.8	29
NSR 3- Neuk	26.3	37.4	37 (29*)
NSR 4- Auldtonheights	23.9	47.7	48

* Due to an invalid measurement at NSR 3 from barking dogs, the background noise for NSR 2 which was in close proximity has been used for further assessment.

- 7.35 The modelled worst case levels are significantly below the measured LA90 measured at each location; therefore, background noise is dominant at each location. With the modelled specific

⁵⁶ IEC 60076-10, Power transformers – Part 10: Determination of sound levels, Edition 2.0, March 2016.

noise subtracted from LA90, a small correction has been made to estimate the BGN for each location.

- 7.36 The highest specific noise level modelled is at NSR 3 at 26 dB(A). NSR 3 is the closest receptor to the site. The modelled levels for the existing site show low impact.

Potential Effects of Proposed Development

Construction Noise

- 7.37 A desk-based construction noise appraisal has been prepared for the purpose of assessing the effects of the land levelling works, civil works, transformer installation, and balance of plant work on any nearby residents. This appraisal has been produced in line with British Standard 5228-1:2009 +A1:2014 (BS5228), Code of Practice for Noise and Vibration Control on Construction and Open Sites. The full assessment is detailed in **Appendix 5.0** -Annex 3.
- 7.38 The results of the calculation and assessment against the noise limits for the closest NSR are shown in **Table 7.7**.

Table 7.7: BS 5228-1 Assessment – All Construction Works

Receptor	Distance from site (km)	Category A - Construction Noise Limit (dB)	Construction Noise LAeq (dB)	Construction Noise Limit Exceedance
NSR 1- Carlisle Road	0.95	65 (Daytime & Saturdays)	47	-18
NSR 2- Neuk	0.78	65 (Daytime & Saturdays)	48	-17
NSR 3- Johnshill	0.43	65 (Daytime & Saturdays)	54	-11
NSR 4- Auldtonheights	0.36	65 (Daytime & Saturdays)	56	-9

- 7.39 Based on the calculations, the construction noise at each NSR is comfortably below the 65 dB daytime but not the 55 dB evening and weekends criteria, nor the 45 dB night time criterion. The construction schedule indicates that works are to only commence during daytime, and sometimes at evenings or weekends when required. Therefore, construction noise is assessed as **Minor** significance during daytime, and **Moderate** during evening and weekends.

Operational Noise – External

- 7.40 To predict the possible effects of the proposed development, a situation has been modelled for the implementation of the new transformer which is the only noise source as part of the proposed Coalburn North Substation. At the time of modelling, the platform height is assumed to be at a consistent level of 231 m AOD. The scenario contains all equipment from the existing Coalburn Substation and extension, and the proposed Coalburn North Substation.
- 7.41 The transformer additional transformer for Coalburn North Substation has been modelled at a level of 84 dB(A), this level is an assumed maximum noise level for normal operation taken from SPEN document TRANS-03-024. The model has only considered ONAN (no forced cooling), as the use of the cooling systems outwith normal operation is likely to be a rare occurrence.

- 7.42 The results are presented in **Table 7.8** with a comparison to existing modelled levels.
- 7.43 The full external noise assessment and a grid noise map of proposed development is presented in **Appendix 5.0** -Annex 4.

Table 7.8: Proposed Development Modelled Noise Levels at NSRs

Receptor	Predicted Existing Specific Noise	Predicted Future Specific Noise	Increase
NSR 1- Carlisle Road	23.5	23.5	0
NSR 2- Neuk	24.4	24.4	0
NSR 3- Johnshill	26.3	26.3	0
NSR 4- Auldtonheights	23.9	24.0	+0.1

- 7.44 The increase in levels from those of the current site for all receptors is extremely low. For all receptors the increase is less than 3dB, which is the smallest increase in noise level for it to be perceived as a louder level. NSR 4 has reduced noise. This is likely due to the addition of screening from the more dominant noise sources of the existing Substation site that is provided by the new buildings of the proposed development.
- 7.45 A BS4142 assessment has been performed, including a 6 dB penalty for tonality. A summary of results is provided in **Table 7.9**.

Table 7.9: BS4142 Assessment of the Proposed Development

Receptor	Specific Noise Level (dB(A))	Acoustic Feature - Tonal Penalty	Rating Level (dB(A))	Calculated Background Noise Level (dB(A))	Excess
NSR 1- Carlisle Road	23.5	6	30	39	-9
NSR 2- Neuk	24.4	6	30	29	1
NSR 3- Johnshill	26.3	6	32	29	3
NSR 4- Auldtonheights	24.0	6	30	48	-18

- 7.46 All NSRs fall below the limit of no more than 4 dB excess set by the Council. The specific noise is below background noise. Impact from the BS4142 assessment is predicted as **Minor**.
- 7.47 While the measurements conducted for this report were taken over a limited timeframe, both the night-time measured ambient noise levels and the specific modelled noise levels fall comfortably below the limit that the external levels shall not exceed an $L_{Aeq,16hr}$ of 55dB. Absolute external noise levels are predicted as **Minor**.

Operational Noise – Internal

- 7.48 An internal noise assessment has been carried out in accordance with BS 8233:2014.
- 7.49 Using NANR116 as referred to in BS8233:2014, attenuation through the open window of a property can be predicted. By applying this attenuation to the specific noise spectra from the noise model, the indoor levels and spectra have been calculated. The full internal noise assessment is detailed in **Appendix 5.0**- Annex 4. A summary of results is presented in **Table 7.10**.

Table 7.10: Existing Site Modelled Noise Levels at NSRs

Receptor	Internal Noise Level (dBA)
NSR 1- Carlisle Road	24.1
NSR 2- Neuk	22.8
NSR 3- Johnshill	23.3
NSR 4- Auldtonheights	26.7

7.50 The total internal noise level is below the 30 dB criteria. When comparing octave spectra against NR curve ratings, it is found that noise levels meet a NR20 rating. Therefore, internal noise from the proposed development is predicted as **Minor** impact.

Mitigation

7.51 As part of the impact assessment process, mitigation measures are suggested to minimise the significance of the identified potential impacts. Two types of measures can be distinguished, as follows:

- Mitigation measures, aimed at managing potential impacts of moderate or major significance to reduce residual impacts to an acceptable level.
- Recommendations and good practices aimed at managing potential impacts of minor significance.

Construction

7.52 No specific mitigation is required as the assessment indicates **minor** impact significance during day and weekend conditions.

7.53 Construction noise will be above background noise, yet, the limit is met according to BS 5228. Although the limit is met, it is best practice that construction noise should continue to be controlled with a Construction Noise Management Plan (CNMP), in accordance with the guidance and procedures outlined in BS 5228-1. The CNMP will form part of the CEMP. Procedures will include:

- Minimising the noise as much as is reasonably practicable at source.
- Attenuation of noise propagation.
- Carrying out identified high noise level activities at a time when they are least likely to cause a nuisance to residents.
- Providing advance notice of unavoidable periods of high noise levels to residents

7.54 In order to maintain low impact on the noise environment, consideration will be given to attenuation of construction noise at source by means of the following:

- Giving due consideration to the effect of noise, in selection of construction methods.
- Avoidance of vehicles waiting or queuing, particularly on public highways or in residential areas with their engines running.

- Scheduling of deliveries to arrive during daytime hours only. Care should be taken to minimise noise while unloading delivery vehicles. Delivery vehicles should follow routes that minimise use of residential roads.
- Ensure plant and equipment are regularly and properly maintained. All plant should be situated to sufficiently minimise noise impact at nearby properties.
- Fit and maintain silencers to plant, machinery, and vehicles where appropriate and necessary.
- Operate plant and equipment in modes of operation that minimise noise, and power down plant when not in use.
- Use electrically powered plant rather than diesel or petrol driven, where this is practicable.
- Working typically will not take place at the weekends, or outside of daytime defined hours.

7.55 Consideration will be given to the attenuation of construction noise in the transmission path by means of the following:

- Locate plant and equipment liable to create noise as far from noise sensitive receptors as is reasonably practicable or use natural land topography to reduce line of sight noise transmission.
- Noise screens, hoardings and barriers should be erected where appropriate and necessary to shield high-noise level activities.
- Provide lined acoustic enclosures for equipment such as static generators and when applicable portable generators, compressors and pumps.

7.56 In setting working hours, consideration is given to the fact that the level of noise through the normal working day is more easily tolerated than during the evening and night-time. Construction works should not occur during night.

Operation

7.57 No specific mitigation is required as the assessment indicates **minor** impact significance during day and weekend conditions.

7.58 It is advised that the transformer is mounted on suitable anti-vibration fastenings to the bunding or platform, to ensure no unforeseen noise and vibration issues.

7.59 If cooling systems are to operating for testing scenarios, it should be tested during daytime hours. This is because elevated noise levels due to operation outwith normal operation hours is likely to be tolerated during the day rather than at night.

7.60 A summary of mitigation measures is provided in **Table 7.11**.

Table 7.11: Summary of Noise Mitigation

Issue	Mitigation Measure	Input
Construction	Implementation of a construction noise management plan adhering to the guidance of BS5228.	CEMP
Construction	Construction noise should be re-assessed once a construction schedule is determined by the Principal Contractor.	CEMP
Operation	Ensure transformer is mounted on suitable anti-vibration fastenings to the bunding or platform, to ensure no unforeseen noise and vibration issues.	CEMP

Residual and Cumulative Effects

- 7.61 With the implementation of a CNMP as part of the CEMP, followed by an updated assessment when the specific construction schedule is known, the residual effects for construction noise is predicted as **Minor**.
- 7.62 Ensuring the noise specification of the new transformer is no higher than assumed in this assessment, and that it is mounted on suitable anti-vibration mounts, the residual effects for operational noise is predicted as **Minor**.

Cumulative Effects

- 7.63 The assessment has considered the impacts of the proposed Coalburn North Substation and the existing Coalburn Substation in parallel (assumed as the same development). No additional cumulative impacts have been identified at this stage of the assessment. In summary cumulative effects are predicted as **None**.

Environmental Appraisal

- 8.1 This Environmental Appraisal has been prepared to accompany the Planning Application for the proposed Coalburn North Substation which will be submitted to South Lanarkshire Council. An assessment of the environmental effects of the proposed development has been undertaken by specialists.
- 8.2 In terms of the statutory and licence duties, SPEN needs to balance technical, economic, and environmental considerations as part of the process of developing proposals for the transmission of electricity. As part of this balancing exercise and reflecting its duties under Schedule 9 of the Electricity Act, SPEN has made every effort to mitigate the environmental effects of the proposed new Coalburn North Substation, and associated temporary compound, car park and soil storage area from the outset, and this commitment will continue through construction and ongoing operation.
- 8.3 In addition to the mitigation measures outlined in this Environmental Appraisal, further draft measures proposed by SPEN to mitigate potential environmental effects, and an outline structure of the Construction Environmental Management Plan (CEMP) has been placed for information in **Appendix 1.0**. The CEMP will also refer to the requirements for restoration and reinstatement of the site post-construction as indicated in the Outline Landscape Restoration Scheme (**Figure 2.1**).
- 8.4 All mitigation measures as outlined in the Environmental Appraisal and any Planning Consent Conditions will be detailed and implemented by the CEMP and Pollution Prevention Plan (PPP) prepared specifically for the proposed Coalburn North Substation, and associated temporary construction compound, car park and soil storage area. These documents shall control and guide the working practices of the Contractor for the duration of the construction works and reflect current best practice and guidance in protecting the environment and safeguarding community interests.
- 8.5 On review, at this project stage it is considered that **no significant** environmental effects are predicted by the proposed Coalburn North Substation, temporary construction compound, car park and soil storage area.

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Transmission Equipment

The following are general definitions of terms used in relation to transmission equipment.

Term	Explanation
kV	Kilovolt (one thousand (1000) volts)
MW	Megawatt (one million watts or one thousand kilowatts)
Overhead Line	An electric line installed above ground, usually supported by lattice steel towers or wooden poles.
SPT	Scottish Power Transmission Plc. Licence holder under the Electricity Act 1989.
Substations	Controls the flow and voltage of electricity by means of transformers and switchgear, with facilities for control, fault protection and communications.
Switchgear	Combination of electrical disconnect switches, fuses or circuit breakers used to control, protect, and isolate electrical equipment.
Transformer	Substation components used to increase or decrease the voltage of electricity.

Landscape and Visual Assessment

The following are terms as defined by the Landscape Institute and Institute of Environmental Management and Assessment, in the Guidelines for Landscape and Visual Assessment (2013).

Term	Explanation
Ancient Woodland	Land that is currently wooded and has been continually wooded at least since 1750. Long Established Woodland of Plantation Origin are shown as plantation in 1860 but not shown as woodland at all in 1750.
Baseline Studies	Work done to determine and describe the environmental conditions against which future changes can be measured or predicted and assessed.
Enhancement	Proposals that seek to improve the landscape resource and visual amenity of the proposed development site and its wider setting, over and above its baseline condition.
Landscape	An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.
Landscape Capacity	The degree to which a particular landscape character type or area is able to accommodate change without unacceptable adverse effects on its character. Capacity is likely to vary according to the type and nature of change being proposed.
Landscape Character	A distinct recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape Effects	Effects on the landscape as a resource in its own right.
Landscape Receptors	Defined aspects of the landscape resource that have the potential to be affected by the proposal.

Landscape Quality (Condition)	A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Landscape Value	The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.
Magnitude (of effect)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration.
Sensitivity (of receptor)	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Significance	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Visual Amenity	The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop to the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.
Visual Effects	Effects on specific views and on the general visual amenity experienced by people.
Visual Receptors	Individuals and/ or defined groups of people who have the potential to be affected by a proposal.

Cultural Heritage

The following are general definitions of terms used in relation to Cultural Heritage.

Term	Explanation
GDL	Garden and Designed Landscape
HER	Historic Environment Record
HLA	Historic Land-use Assessment
HES	Historic Environment Scotland
WSI	Written Scheme of Investigation
WoSAS	West of Scotland Archaeology Service

Hydrology

The following are general definitions of terms used in relation to Hydrology.

Term	Explanation
Attenuation	to reduce the effect of something.
Aquifer	a body rock that contains or transmits groundwater and releases it in sufficient quantities for use.
Baseflow	the portion of flow in a surface watercourse that comes from the input from deep subsurface flow and delayed shallow subsurface flow.
Bedrock	Bedrock Geology (formally known as solid geology) is the solid rock that is either exposed at the surface or located beneath superficial material.
Bund	an embankment typically constructed from earth or stone.
Catchment	the area of land, usually delineated by topography, over which all precipitation that falls ends up in specific waterbody. Also referred to as a drainage basin.
CEMP (Construction Environment Management Plan)	document that defines how a project will be managed to meet environmental objectives. Details the targets, objectives and procedures that will be adopted.
Glacial Till	unsorted material deposited directly by glacial ice and showing no stratification. Till is sometimes called boulder clay because it is composed of clay, boulders of intermediate sizes, or a mixture of these.
Gley	widespread throughout Scotland, a gley is a sticky soil that developed under conditions of intermittent or permanent waterlogging. They tend to be greyish or bluey-grey in colour with orange mottling. The colour is a result of the low levels of oxygen present during their formation.
Greenfield	denoting the state prior to development.
GWDTE	Groundwater Dependent Terrestrial Ecosystems are wetlands that critically depend on groundwater flows and /or chemistries.
Limestone Coal Formation	Bedrock formed by cyclic marine bands and containing coal seams.
Precipitation	rain, snow, sleet, or hail that falls to or condenses on the ground.
Receptor	something that could be adversely affected by a change to its environment.
Settlement Pond	also commonly referred to as a settling basin. An open feature used to manage surface water pollution and runoff from earth works. Used to allow settlement of suspended solids before slowly releasing discharge at the desired rate.
Silt Fence	a temporary sediment management device made of a porous fabric attached to posts in the ground and used on construction sites to protect water quality in nearby watercourses/waterbodies.
Soakaway	a pit, typically filled with permeable material, into which waste water is piped so that it drains slowly out into the surrounding soil.
Special Area of Conservation	important high-quality conservation sites that will make a significant contribution to conserving the habitats and species identified in Annexes I and II, respectively, of European Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, known as the Habitats Directive.
SUDS (Sustainable Urban Drainage System)	provide a natural approach to managing drainage in and around developments and aim to prevent water pollution and flooding. Techniques include green roofs, permeable surfaces, infiltration trenches, swales, wetlands and water detention basins.

Superficial Deposits	Superficial deposits (formerly known as 'drift') are the youngest geological deposits formed during the most recent period of geological time (the Quaternary). Most superficial deposits are unconsolidated (loose, not cemented) sediments such as gravel, sand, silt and clay.
Swale	a shallow drainage channels in the ground where water running off a site can be channeled to another location or collect and soak away.
Topsoil	the top layer of soil; commonly fertile and dark coloured surface soil where plants root themselves.
Wacke	an impure sandstone comprising poorly sorted mineral and rock fragments in a finer silt and clay matrix.
Water assets	Scottish Water's assets, including pipelines, treatment works and reservoirs.

Noise

The following are general definitions of terms used in relation to Noise Assessment.

Term	Explanation
	<p>Noise is defined as unwanted sound. Human ears can respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.</p> <p>Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.</p> <p>The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or LAeq, LA90 etc., according to the parameter being measured.</p> <p>The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.</p>
dB (decibel)	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value and the scale on which sound pressure level is expressed. Sound pressure level is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2x10 ⁻⁵ Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
LAeq,T	LAeq is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.
L10 & L90	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L10 is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L90 is the

	'average minimum level' and is often used to describe the background noise. It is common practice to use the L10 index to describe traffic noise.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally as measured outside and away from buildings.
Façade Level	A sound field determined at a distance of 1 m in front of a large sound reflecting object such as a building façade.
Ambient Noise Level	The all encompassing noise level measured in LAeq,T. The Ambient Noise Level incorporates background sounds as well as the industrial source noise under consideration.
Residual Noise Level	The Ambient Noise Level in the absence of the industrial source noise under consideration, measured in LAeq,T.
Specific Noise Level	The noise level measured in LAeq,T attributed to the industrial noise source under consideration alone.
Background Noise Level	The noise level in the absence of the industrial source noise under consideration, measured in LA90.
CNIA	Construction noise impact assessment.
NSR	Noise sensitive receptor.
NR	Noise rating.
SWL	Sound power level.

Appendix 1.0: Draft Mitigation Measures & CEMP Headings

This Appendix identifies a preliminary draft of actions that SPEN shall implement to reduce, offset, prevent or compensate for identified potential adverse effects on the environment that may otherwise result as a consequence of proposed development of the Coalburn North Substation, temporary construction compound, car park and soil storage area.

For information the standard headings of the Construction Environmental Management Plan (CEMP) are also outlined.

Draft Schedule of Mitigation Measures

No.	Draft Schedule of Mitigation Measures	
General		
1	CEMP & PPP	<p><u>All mitigation measures as outlined in the Landscape and Visual, Ecology, Heritage, Hydrology and Noise Appraisals in this Environmental Appraisal and any Planning Consent Conditions will be detailed and implemented by a Construction Environmental Management Plan (CEMP), Construction Noise Management Plan (CNMP) and Pollution Prevention Plan (PPP) prepared specifically for the proposed Coalburn North Substation, temporary construction compound, car park and soil storage area.</u></p> <p>These documents shall control and guide the working practices of the Contractor for the duration of the construction works and shall reflect current best practice and guidance in protecting the environment.</p>
2	SWMP	A Site Waste Management Plan shall detail the requirements for management of any waste in accordance with statutory and licencing requirements, accepted good practice and to ensure that wherever possible materials are reduced, reused or recycled in preference to disposal. This will include toilet facilities, soils/ stone/ peat from excavations, concrete from washout areas, municipal type wastes etc.
Agricultural Land		
3	CEMP	On Site Construction Works. Reinstatement agreed with landowner and works undertaken in accordance with CEMP.
Air Quality/ Carbon Emissions/EMF		
4	CEMP/GPP	Control measures shall be put in place in accordance with the CEMP, Dust Control and Management Plan, and Guidance for Pollution Prevention (GPP).
Recreation and Tourism		
6	CEMP	Control measures shall be put in place in accordance with the CEMP to ensure all footpaths/ cycle routes are retained during works.
Traffic and Transport		
7	Traffic Management Plan	<p>A Traffic Management Plan shall be prepared and include all information as requested by the Council and indicate agreed transport route for construction traffic and abnormal loads, management measures and programme for restoration etc.</p> <p>In addition, any Planning Consent Conditions required by the Council shall be undertaken e.g. a Dilapidation Survey, Road Repairs and Swept Path Analysis.</p>
Utilities and Infrastructure		
8	CEMP	Control measures shall be put in place in accordance with the CEMP and GPP.
Waste and Resource Use		
9	CEMP/GPP	Control measures shall be put in place in accordance with the CEMP, SWMP and GPP.

Standard Headings of a Construction Environmental Management Plan

No.	Title	Description of Content
1	Introduction	Provides background information about this document its objectives and content.
2	The Project	Provides details of the Development including a description of construction methods and facilities.
3	Roles and Responsibilities	Sets out the roles and responsibilities of the parties involved in the construction of the Development.
4	Communications, Reporting and Training	Sets out the requirements for regular communications and reporting as well as staff training.
5	General Environmental Management Requirements	Sets out the general requirements with respect to environmental management during construction.
6	Subject Specific Requirements	Provides an overview of the subject specific requirements to be addressed.
7	Species Protection Plans	Sets out the general requirements with regard to protected species.
8	Mammal Mitigation and Management Plan	Sets out the requirements with regard to protection of otter, water vole, and badger if required.
10	Bats - Mitigation and Management Plan	Sets out the requirements with regard to protection of bats.
11	Common Reptile - Mitigation and Management Plan	Sets out the requirements with regard to protection of common reptile.
12	Endangered Reptiles - Mitigation and Management Plan	Sets out the requirements with regard to protection of endangered reptile.
13	Birds - Mitigation and Management Plan	Sets out the requirements with regard to protection of birds.
14	Habitat Management Plan	Sets out the requirements with regard to protection and reinstatement of habitats.
15	Pollution Prevention Plan	Sets out the requirements with regard to pollution prevention and protection of the water environment.
16	Drainage Management Plan	Sets out the requirements with regard to drainage and protection of the water environment (Surface Water Drainage Strategy).
17	Private Water Supply Protection Plan	Sets out the requirements with regard to drainage and protection of the water environment.
18	Watercourse Crossing Register	Sets out a watercourse crossing strategy and structure of a detailed crossing register.
19	Concrete Batching Management Plan	Sets out the requirements with regard to concrete batching and protection of the water environment.
20	Borrow Pit Scheme of Works	Sets out a framework to be followed in developing detailed method statements for borrow pits.

No.	Title	Description of Content
21	Dust Control and Management Plan	Sets out the requirements with regard to the prevention and control of dust related impacts.
24	Archaeological Management Plan	Sets out the requirements with regard to protection and of archaeological interests.
25	Traffic Management Plan	Sets out the requirements with regard to the routing and management of construction-related traffic and abnormal loads.
26	Soil Storage and Management Plan	Sets out the requirements with regard to handling and storage of soil.
27	Peat Management Plan	Sets out the requirements with regard to handling and storage of peat and related peat-slide risks (SPMP).
28	Felling and Tree Management Plan	Sets out the requirements with regard to tree felling and reinstatement.
29	Site Waste Management Plan	Sets out the requirements with regard to the management and disposal of waste.
30	Noise Management Plan	Sets out the requirements with regard to the management of construction noise (CNMP).
31	Restoration and Reinstatement Plan	Sets out the requirements for restoration and reinstatement of sites post-construction (Outline Landscape Restoration Scheme)

1.1 LVIA Methodology

Guidelines for Landscape and Visual Assessment

Good practice described in the “*Guidelines for Landscape and Visual Impact Assessment*” as summarised below, is followed “*to identify and assess the significance of the effects of change resulting from development on both the landscape as an environmental resource in its own right and on people’s views and visual amenity*” (LI, IEMA, 2013).

The first stage in undertaking a Landscape and Visual Impact Assessment (LVIA) is to establish the landscape and visual conditions.

- *“For the landscape baseline, the aim is to provide an understanding of the landscape in the area that may be affected- its constituent elements, its character and the way this varies spatially, its geographic extent, its history (which may require its own specialist study), its condition, the way the landscape is experienced, and the value attached to it.*

- *For the visual baseline, the aim is to establish the area in which the development may be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points.” (para 3.15, p32)*

Establishment of baseline conditions and the key relevant landscape and visual aspects of the proposed development, allows the likely significant effects to be predicted. “*LVIA, in common with other topics in EIA, tends to rely on linking judgements about the sensitivity of the receptor and about the magnitude of the effects to arrive at conclusions about the significance of the effects. These terms are effectively a shorthand way of describing the wider array of factors that underlie the **nature of the receptor likely to be affected** (sensitivity) and **the nature of the effect likely to occur** (magnitude)”(para 3.24, p.37).*

In accordance with the LVIA Guidance each effect is considered “*in terms firstly of its **sensitivity**, made up of judgements about:*

- *The susceptibility of the receptor to the type of change arising from the specific proposal; and*
- *The value attached to the receptor.*

*And secondly its **magnitude**, made up of judgements about:*

- *The size and scale of effect - for example, whether there is complete loss of a particular element of the landscape or a minor change;*
- *The geographical extent of the area that will be affected; and*
- *The duration of the effect and its reversibility.” (para 3.26, p.38)*

An assessment of the likely landscape and visual effects on the landscape as a resource in its own right and on specific views and on the general visual amenity experienced by people is then undertaken. This embraces all types of effects and includes for example those that are positive/beneficial and negative/adverse, direct and indirect, and long and short term, as well as cumulative effects. Current guidance notes, “*Assessing the significance of landscape and visual effects is a matter of judgement*”. (p.46)

Mitigation measures are prepared to prevent/ avoid, reduce and where possible offset any significant landscape and visual effects identified. Enhancement measures may also be identified which are not specifically related to the mitigation of adverse landscape and visual effects, but are “*proposals*

that seek to improve the landscape of the site and its wider setting beyond its baseline condition".(p.47)

In summary, a key requirement of a LVIA is that the basis of judgements *"is transparent and understandable, so that the underlying assumptions and reasoning can be examined by others".* (p.46)

Methodology

The adopted methodology for this Landscape and Visual Impact Assessment is outlined below.

The relative **significance of effects** is assessed using the following terms:

Major - a fundamental change to the environment

Moderate - a material but non-fundamental change to the environment;

Minor - a detectable but non-material change to the environment.

None- no detectable change to the environment.

Landscape and Visual Baseline Survey and Analysis

Understanding the site and surroundings: Collation and review of baseline information covering key features of the physical environment, planning allocation, natural and cultural heritage of the site and surroundings.

Review of the landscape and features: The character, condition and value of the landscape are determined through a combination of desk and field study. Relevant designations are identified from a review of planning policies and other designations relating to the area. The nature and sensitivity of landscape features and character is then assessed.

Review of the existing visibility and visual amenity: Visibility of the proposed development, visual amenity and potential visual receptors are identified for example, residential properties, public footpaths, transport routes, key viewpoints, etc. The visual baseline including extent of the visibility is determined by using a combination of fieldwork and specialist computer mapping. The nature and sensitivity of views and visual amenity is then assessed.

Landscape and Visual Impact Assessment

Landscape and Visual effects are reviewed and identified with reference to: the identification of the **potential sources of effect** of the proposed development; **sensitivity** of the landscape and visual resources (nature of receptors): and **magnitude of change** to the existing landscape and visual environment (*nature of effects*).

Landscape sensitivity is assessed with reference to the degree to which a particular landscape type or area can accommodate change arising from the proposed development, without detrimental effects on its character. The degree to which a particular landscape type or area can accommodate change arising from a particular development is considered to vary with:

- existing landuse
- the pattern and scale of the landscape;
- visual enclosure/ openness of views, and distribution of visual receptors;
- the scope for mitigation, which would be in character with the existing landscape;
- the value placed on the landscape.

The **sensitivity of visual receptors and views** is considered to be dependent on:

- the location and context of the viewpoint;
- the expectations and occupation of the receptors;
- the importance of the view (which maybe determined with respect to its popularity or numbers of people affected, its appearance in guidebooks, on tourist maps, and in the facilities provided for its enjoyment and references to it in literature and art).

For the purposes of assessment **visual receptors** are divided into several types, which are considered to be of differing **sensitivity**, as follows:

Residential: Highly sensitive, as they experience prolonged often highly valued views.

Recreational: Highly sensitive, for users of recreational facilities including public rights of way, as their attention or interest may be focussed on the landscape and views are often part of their recreational experience (e.g. walkers, cyclists etc). Less sensitive or moderate are people engaged in an outdoor sport or recreation.

Workers: Medium to low sensitivity, as may not receive prolonged views, and will be distracted by work.

Travellers: Low sensitivity, as their views are constantly changing and attention is focussed on that activity (e.g. motorists). Where travel involves scenic routes awareness of views will be high.

Magnitude of change is assessed with reference to the scale or degree of change to the landscape and visual resource, the nature of the effect and its duration.

Evaluation of Significance of Effects

An assessment of the likely effects is reviewed with reference to landscape features, character, views and visual amenity. Professional judgement and evaluation of the **nature** or **magnitude of effect** and the environmental **sensitivity of the receptor or location** allows the different thresholds of significance of effect to be determined and described using the terms **major, moderate, minor or none**.

1.2 National Planning Framework 4 (2023)

National Development

No 3: Strategic Renewable Electricity Generation and Transmission Infrastructure supports electricity generation and associated grid infrastructure throughout Scotland, providing employment and opportunities for community benefit, helping to reduce emissions and improve security of supply.

Designation and classes of development

“A development contributing to ‘Strategic Renewable Electricity Generation and Transmission’ in the location described, within one or more of the Classes of Development described below and that is of a scale or type that would otherwise have been classified as ‘major’ by ‘The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009’, is designated a national development:

- a) On and off shore electricity generation, including electricity storage, from renewables exceeding 50 megawatts capacity;*
- b) New and/or replacement upgraded on and offshore high voltage electricity transmission lines, cables and interconnectors of 132kv or more; and*
- c) New and/or upgraded Infrastructure directly supporting on and offshore high voltage electricity lines, cables and interconnectors including converter stations, switching stations and substations.”⁵⁷*

National Planning Policy

Policy 3_Biodiversity

- a) Development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions, where possible.
- b) Development proposals for national or major development, or for development that requires an Environmental Impact Assessment will only be supported where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention. This will include future management. To inform this, best practice assessment methods should be used. Proposals within these categories will demonstrate how they have met all of the following criteria:
 - i. the proposal is based on an understanding of the existing characteristics of the site and its local, regional and national ecological context prior to development, including the presence of any irreplaceable habitats;
 - ii. wherever feasible, nature-based solutions have been integrated and made best use of;
 - iii. an assessment of potential negative effects which should be fully mitigated in line with the mitigation hierarchy prior to identifying enhancements;
 - iv. significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty. Management arrangements for their long-term retention and monitoring should be included, wherever appropriate; and
 - v. local community benefits of the biodiversity and/or nature networks have been considered.
- c) Proposals for local development will include appropriate measures to conserve, restore and enhance biodiversity, in accordance with national and local guidance. Measures should be proportionate to the nature and scale of development. Applications for individual householder development, or which fall within scope of (b) above, are excluded from this requirement.
- d) Any potential adverse impacts, including cumulative impacts, of development proposals on biodiversity, nature networks and the natural environment will be minimised through careful planning and design. This will take into account the need to reverse biodiversity loss, safeguard the

⁵⁷ Scottish Government (2023) National Planning Framework 4. P 103

ecosystem services that the natural environment provides, and build resilience by enhancing nature networks and maximising the potential for restoration.

Policy 4_Natural Places

- a) Development proposals which by virtue of type, location or scale will have an unacceptable impact on the natural environment, will not be supported.
- b) Development proposals that are likely to have a significant effect on an existing or proposed European site (Special Area of Conservation or Special Protection Areas) and are not directly connected with or necessary to their conservation management are required to be subject to an “appropriate assessment” of the implications for the conservation objectives.
- c) Development proposals that will affect a National Park, National Scenic Area, Site of Special Scientific Interest or a National Nature Reserve will only be supported where:
 - i. The objectives of designation and the overall integrity of the areas will not be compromised; or
 - ii. Any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance.All Ramsar sites are also European sites and/ or Sites of Special Scientific Interest and are extended protection under the relevant statutory regimes.
- d) Development proposals that affect a site designated as a local nature conservation site or landscape area in the LDP will only be supported where:
 - i. Development will not have significant adverse effects on the integrity of the area or the qualities for which it has been identified; or
 - ii. Any significant adverse effects on the integrity of the area are clearly outweighed by social, environmental or economic benefits of at least local importance.
- e) The precautionary principle will be applied in accordance with relevant legislation and Scottish Government guidance.
- f) Development proposals that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present on a site or may be affected by a proposed development, steps must be taken to establish its presence. The level of protection required by legislation must be factored into the planning and design of development, and potential impacts must be fully considered prior to the determination of any application.
- g) Development proposals in areas identified as wild land in the Nature Scot Wild Land Areas map will only be supported where the proposal:
 - i. will support meeting renewable energy targets; or,
 - ii. is for small scale development directly linked to a rural business or croft, or is required to support a fragile community in a rural area.

All such proposals must be accompanied by a wild land impact assessment which sets out how design, siting, or other mitigation measures have been and will be used to minimise significant impacts on the qualities of the wild land, as well as any management and monitoring arrangements where appropriate. Buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration.

Policy 5 Soils

- a) Development proposals will only be supported if they are designed and constructed:
 - i. In accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land; and
 - ii. In a manner that protects soil from damage including from compaction and erosion, and that minimises soil sealing.

- b) Development proposals on prime agricultural land, or land of lesser quality that is culturally or locally important for primary use, as identified by the LDP, will only be supported where it is for:
- i. Essential infrastructure and there is a specific locational need and no other suitable site;
 - ii. Small-scale development directly linked to a rural business, farm or croft or for essential workers for the rural business to be able to live onsite;
 - iii. The development of production and processing facilities associated with the land produce where no other local site is suitable;
 - iv. The generation of energy from renewable sources or the extraction of minerals and there is secure provision for restoration; and

In all of the above exceptions, the layout and design of the proposal minimises the amount of protected land that is required.

- c) Development proposals on peatland, carbon-rich soils and priority peatland habitat will only be supported for:
- i. Essential infrastructure and there is a specific locational need and no other suitable site;
 - ii. The generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets;
 - iii. Small-scale development directly linked to a rural business, farm or croft;
 - iv. Supporting a fragile community in a rural or island area; or
 - v. Restoration of peatland habitats.

d) Where development on peatland, carbon-rich soils or priority peatland habitat is proposed, a detailed site specific assessment will be required to identify:

- i. the baseline depth, habitat condition, quality and stability of carbon rich soils;
- ii. the likely effects of the development on peatland, including on soil disturbance; and
- iii. the likely net effects of the development on climate emissions and loss of carbon.

National Planning Framework 4 – Revised Draft **43** This assessment should inform careful project design and ensure, in accordance with relevant guidance and the mitigation hierarchy, that adverse impacts are first avoided and then minimised through best practice. A peat management plan will be required to demonstrate that this approach has been followed, alongside other appropriate plans required for restoring and/ or enhancing the site into a functioning peatland system capable of achieving carbon sequestration.

- e) Development proposals for new commercial peat extraction, including extensions to existing sites, will only be supported where:
- i. the extracted peat is supporting the Scottish whisky industry;
 - ii. there is no reasonable substitute;
 - iii. the area of extraction is the minimum necessary and the proposal retains an in-situ residual depth of part of at least 1 metre across the whole site, including drainage features;
 - iv. the time period for extraction is the minimum necessary; and
 - v. there is an agreed comprehensive site restoration plan which will progressively restore, over a reasonable timescale, the area of extraction to a functioning peatland system capable of achieving carbon sequestration.

Policy 6 Forestry, Woodland and Trees

- a) Development proposals that enhance, expand and improve woodland and tree cover will be supported.
- b) Development proposals will not be supported where they will result in:
- i. Any loss of ancient woodlands, ancient and veteran trees, or adverse impact on their ecological condition;
 - ii. Adverse impacts on native woodlands, hedgerows and individual trees of high biodiversity value, or identified for protection in the Forestry and Woodland Strategy;
 - iii. Fragmenting or severing woodland habitats, unless appropriate mitigation measures are identified and implemented in line with the mitigation hierarchy;

iv. Conflict with Restocking Direction, Remedial Notice or Registered Notice to Comply issued by Scottish Forestry.

c) Development proposals involving woodland removal will only be supported where they will achieve significant and clearly defined additional public benefits in accordance with relevant Scottish Government policy on woodland removal. Where woodland is removed, compensatory planting will most likely be expected to be delivered.

d) Development proposals on sites which include an area of existing woodland or land identified in the Forestry and Woodland Strategy as being suitable for woodland creation will only be supported where the enhancement and improvement of woodlands and the planting of new trees on the site (in accordance with the Forestry and Woodland Strategy).

Policy 7_Historic Assets and Places

a) Development proposals with a potentially significant impact on historic assets or places will be accompanied by an assessment which is based on an understanding of the cultural significance of the historic asset and/or place. The assessment should identify the likely visual or physical impact of any proposals for change, including cumulative effects and provide a sound basis for managing the impacts of change.

Proposals should also be informed by national policy and guidance on managing change in the historic environment, and information held within Historic Environment Records.

b) Development proposals for the demolition of listed buildings will not be supported unless it has been demonstrated that there are exceptional circumstances and that all reasonable efforts have been made to retain, reuse and/or adapt the listed building. Considerations include whether the:

i. building is no longer of special interest;

ii. building is incapable of physical repair and re-use as verified through a detailed structural condition survey report;

iii. repair of the building is not economically viable and there has been adequate marketing for existing and/or new uses at a price reflecting its location and condition for a reasonable period to attract interest from potential restoring purchasers; or

iv. demolition of the building is essential to delivering significant benefits to economic growth or the wider community.

c) Development proposals for the reuse, alteration or extension of a listed building will only be supported where they will preserve its character, special architectural or historic interest and setting. Development proposals affecting the setting of a listed building should preserve its character, and its special architectural or historic interest.

d) Development proposals in or affecting conservation areas will only be supported where the character and appearance of the conservation area and its setting is preserved or enhanced. Relevant considerations include the:

i. architectural and historic character of the area;

ii. existing density, built form and layout; and

iii. context and siting, quality of design and suitable materials.

e) Development proposals in conservation areas will ensure that existing natural and built features which contribute to the character of the conservation area and its setting, including structures, boundary walls, railings, trees and hedges, are retained.

f) Demolition of buildings in a conservation area which make a positive contribution to its character will only be supported where it has been demonstrated that:

i. reasonable efforts have been made to retain, repair and reuse the building;

ii. the building is of little townscape value;

iii. the structural condition of the building prevents its retention at a reasonable cost; or

iv. the form or location of the building makes its reuse extremely difficult.

- g) Where demolition within a conservation area is to be followed by redevelopment, consent to demolish will only be supported when an acceptable design, layout and materials are being used for the replacement development.
- h) Development proposals affecting scheduled monuments will only be supported where:
 - i. direct impacts on the scheduled monument are avoided;
 - ii. significant adverse impacts on the integrity of the setting of a scheduled monument are avoided; or
 - iii. exceptional circumstances have been demonstrated to justify the impact on a scheduled monument and its setting and impacts on the monument or its setting have been minimised.
- i) Development proposals affecting nationally important Gardens and Designed Landscapes will be supported where they protect, preserve or enhance their cultural significance, character and integrity and where proposals will not significantly impact on important views to, from and within the site, or its setting.
- j) Development proposals affecting nationally important Historic Battlefields will only be supported where they protect and, where appropriate, enhance their cultural significance, key landscape characteristics, physical remains and special qualities.
- k) Development proposals at the coast edge or that extend offshore will only be supported where proposals do not significantly hinder the preservation objectives of Historic Marine Protected Areas.
- l) Development proposals affecting a World Heritage Site or its setting will only be supported where their Outstanding Universal Value is protected and preserved.
- m) Development proposals which sensitively repair, enhance and bring historic buildings, as identified as being at risk locally or on the national Buildings at Risk Register, back into beneficial use will be supported.
- n) Enabling development for historic environment assets or places that would otherwise be unacceptable in planning terms, will only be supported when it has been demonstrated that the enabling development proposed is:
 - i. essential to secure the future of an historic environment asset or place which is at risk of serious deterioration or loss; and
 - ii. the minimum necessary to secure the restoration, adaptation and long-term future of the historic environment asset or place.

The beneficial outcomes for the historic environment asset or place should be secured early in the phasing of the development, and will be ensured through the use of conditions and/or legal agreements.
- o) Non-designated historic environment assets, places and their setting should be protected and preserved in situ wherever feasible. Where there is potential for non-designated buried archaeological remains to exist below a site, developers will provide an evaluation of the archaeological resource at an early stage so that planning authorities can assess impacts. Historic buildings may also have archaeological significance which is not understood and may require assessment.

Where impacts cannot be avoided they should be minimised. Where it has been demonstrated that avoidance or retention is not possible, excavation, recording, analysis, archiving, publication and activities to provide public benefit may be required through the use of conditions or legal/planning obligations.

When new archaeological discoveries are made during the course of development works, they must be reported to the planning authority to enable agreement on appropriate inspection, recording and mitigation measures.

Energy Policy 11

- a) Development proposals for all forms of renewable, low-carbon and zero emissions technologies will be supported. These include:

- i. wind farms including repowering, extending, expanding and extending the life of existing wind farms;
 - ii. enabling works, such as grid transmission and distribution infrastructure;
 - iii. energy storage, such as battery storage and pumped storage hydro;
 - iv. small scale renewable energy generation technology;
 - v. solar arrays;
 - vi. proposals associated with negative emissions technologies and carbon capture; and
 - vii. proposals including co-location of these technologies.
- b) Development proposals for wind farms in National Parks and National Scenic Areas will not be supported.
- c) Development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities.
- d) Development proposals that impact on international or national designations will be assessed in relation to Policy 4.
- e) In addition, project design and mitigation will demonstrate how the following impacts are addressed:
- i. impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and shadow flicker;
 - ii. significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/ or appropriate design mitigation has been applied, they will generally be considered to be acceptable;
 - iii. public access, including impact on long distance walking and cycling routes and scenic routes;
 - iv. impacts on aviation and defence interests including seismological recording;
 - v. impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised;
 - vi. impacts on road traffic and on adjacent trunk roads, including during construction;
 - vii. impacts on historic environment;
 - viii. effects on hydrology, the water environment and flood risk;
 - ix. biodiversity including impacts on birds;
 - x. impacts on trees, woods and forests;
 - xi. proposals for the decommissioning of developments, including ancillary infrastructure, and site restoration;
 - xii. the quality of site restoration plans including the measures in place to safeguard or guarantee availability of finances to effectively implement those plans; and
 - xiii. cumulative impacts.

In considering these impacts, significant weight will be placed on the contribution of the proposal to renewable energy generation targets and on greenhouse gas emissions reduction targets.

Grid capacity should not constrain renewable energy development. It is for developers to agree connections to the grid with the relevant network operator. In the case of proposals for grid infrastructure, consideration should be given to underground connections where possible.

- f) Consents for development proposals may be time-limited. Areas identified for wind farms are, however, expected to be suitable for use in perpetuity.

1.3 Local Development Plan Extracts

Glasgow and Clyde Valley Strategic Development Plan (2017)

Policy 10

Delivering Heat and Electricity

In support of the transition to a low carbon economy and realisation of the Vision and Spatial Development Strategy, support should be given, where appropriate, to alternative renewable technologies and associated infrastructure.

Policy 13

Forestry and Woodland

In support of the Vision and Spatial Development Strategy and to achieve the national woodland coverage targets set out in the Scottish Forestry Strategy (2006), development proposals, where appropriate, should:

- Support the retention and expansion of forestry and woodland (or multi functional woodland resource) in keeping with the Forestry and Woodland Strategy and related Spatial Framework (Background Report 12); and
- Minimise the loss of existing trees and include where appropriate, the planting of new trees, woodlands and forestry in support of the Scottish Governments Control of Woodland Removal Policy or as replaced by Supplementary Guidance referred to below.

Supplementary Guidance will be produced to replace the Forestry and Woodland Strategy (Background Report 12). This will update the information and guidance currently contained within it, including that set out at paragraph 8.12. The Supplementary Guidance should be submitted to Ministers within 1 year of the date of approval of this plan.

Policy 16

Improving the Water Quality Environment and Managing Flood Risk and Drainage

To support the Vision and Spatial Development Strategy and to achieve the objectives set out in paragraph 8.28 Local Development Plans and development proposals should protect and enhance the water environment by:

- Adopting a precautionary approach to the reduction of flood risk;
- Supporting the delivery of the Metropolitan Glasgow Strategic Drainage Plan;
- Supporting the delivery of the Glasgow and the Clyde Valley Green Network; and
- Safeguarding the storage capacity of the functional floodplain and higher lying areas for attenuation.

South Lanarkshire Local Development Plan 2 (2021)

Volume 1

Policy 1 Spatial Strategy

The spatial strategy of LDP2 will encourage sustainable economic growth and regeneration, move towards a low carbon economy, protect the natural and historic environment and mitigate against the impacts of climate change. To achieve this the spatial strategy will:

1. Direct larger developments to sustainable urban locations (Cambuslang / Rutherglen, Hamilton/ Blantyre, Larkhall, East Kilbride, Carluke, Lanark) and ensure that any development proposals for smaller villages are of a compatible scale.
2. Promote the 'City Deal' initiative, including the provision and improvement of strategic transport infrastructure and development of the Community Growth Areas.
3. Support regeneration, including the development of the Clyde Gateway and the redevelopment of appropriate brownfield sites.
4. Support proposals and initiatives relating to the Local Outcomes Improvement Plan.
5. Ensure that proposals for new development seek to minimise and mitigate against the effects of climate change, including flood risk.
6. Promote the use of district heating systems and the use of heat mapping to identify areas where this is demonstrated to be feasible.

7. Safeguard and protect town, neighbourhood and village centres in accordance with the town centres first principle.
8. Ensure an adequate, flexible and generous supply of land for housing, industry and business in appropriate locations.
9. Protect and enhance the natural and historic environment.
10. Protect and enhance the green network within and around settlements, and encourage new forestry and woodland creation.
11. Support renewable energy developments in appropriate locations.
12. Continue to ensure an adequate and steady supply of minerals and maintain a minimum ten year land bank of aggregates.

Table 3.1 includes a list of all the projects that are appropriate to the spatial strategy, with full details included in Appendix 3.

Development proposals must also accord with other relevant policies and proposals in the development plan. Refer to Appendix 1 for relevant Volume 2 policies and additional guidance.

Policy 2 Climate Change

In order to fulfil the plans overall strategic vision, as defined in paragraph 3.2, and to meet Scottish Government targets relating to climate change and the reduction of greenhouse gases, any new development proposals should seek to minimise and mitigate against such effects by ensuring that they;

1. Are sustainably located;
2. Where appropriate involve the reuse of vacant and derelict land;
3. Utilise renewable energy sources;
4. Incorporate low and zero carbon energy generating technologies at an early design stage, and therefore reduce predicted carbon dioxide emissions inline with current building standards;
5. Avoid areas of medium to high flood risk;
6. Protect ecosystem services by ensuring no significant adverse impacts on the water and soil environment, air quality, biodiversity and blue/green networks, have no adverse impact on the integrity of any Natura 2000 sites and identify opportunities for enhancement of the natural heritage;
7. Include opportunities for active travel routes and provide for trips by public transport;
8. Include opportunities for the creation and enhancement of green infrastructure;
9. Include opportunities for the greening of vacant and derelict land;
10. Provide electric vehicle recharging infrastructure to encourage greater use of low carbon vehicles;
11. Minimise waste through the provision of appropriate recycling, storage and collection points within developments;
12. Where appropriate, development proposals should ensure that they can be connected to heat networks, including district heating, which maybe developed in the future, and
13. Avoid or minimise disturbance of carbon rich soils and, where appropriate, include provision for restoration of damaged peatlands.

Where an applicant is able to demonstrate that a proposal has significant technical constraints in the use of low and zero-carbon generating technologies other solutions will be considered.

Development proposals must also accord with other relevant policies and proposals in the development plan. Refer to Appendix 1 for relevant Volume 2 policies and additional guidance.

Policy 4 Green Belt and Rural Area

Green Belt

The purpose of the Green Belt is to:

- direct development to the most appropriate locations and support regeneration,
- protect and enhance the character, landscape setting and identity of the settlement,
- protect and provide access to open space.

Development in the Green Belt will be strictly controlled and any proposals should accord with the appropriate uses set out in SPP.

Rural Area

Within the Rural Area the Council seeks to protect the amenity of the countryside while, at the same time, supporting small scale development in the right places that is appropriate in landuse terms and is of high environmental quality that will support the needs of communities.

Green Belt and Rural Area

Both the Green Belt and the Rural Area function primarily for agriculture, forestry, recreation and other uses appropriate to the countryside. Development which does not require to locate in the countryside will be expected to be accommodated within the settlements identified on the proposals map. Isolated and sporadic development will not be supported.

The scale of renewable energy developments will be governed by considerations set out in Policy 18- Renewable Energy.

Development proposals must also accord with other relevant policies and proposals in the development plan. Refer to Appendix 1 for relevant Volume 2 policies and additional guidance.

Policy 14 Natural and Historic Environment

The Council will assess all development proposals in terms of their impact on the natural and historic environment, including biodiversity, geodiversity, landscape and townscape.

The Council will seek to protect important natural and historic sites and features, as listed in Table 6.2 Natural and Historic Environment Designations, and shown on the proposals map, from adverse impacts resulting from development, including cumulative impacts.

Category 1, 2 and 3 Designations

In Category 1 areas:

1. Development which would have a likely significant effect on a Special Protection Area (SPAs) or Special Area of Conservation (SACs) (Natura 2000 sites) will only be permitted where an appropriate assessment of the proposal demonstrates that there will be no adverse effect on the integrity of the site, following the implementation of any mitigation measures. Where it cannot be ascertained that there will be no adverse effect on the integrity of the site, proposals will only be permitted where there are no alternative solutions, there are imperative reasons of overriding public interest and compensatory measures are provided to ensure that the overall coherence of the Natura network is protected.

2. The Council will seek to protect and preserve the outstanding universal value of New Lanark World Heritage Site. Development proposals affecting the World Heritage Site and its setting will be assessed against the detailed criteria contained in Volume 2. Development proposals within the buffer zone will be assessed for their potential impact on the site's outstanding universal value.

In Category 2 areas, development will only be permitted where the objectives of the designation and the overall integrity of the area can be shown not to be compromised following the implementation of any mitigation measures. Any significant adverse effects must be clearly outweighed by social or economic benefits of national importance.

In Category 3 areas, development which would have a significant adverse impact following the implementation of mitigation measures will only be permitted where the effects are outweighed by significant social or economic benefits.

Where possible, any development proposals which affect natural and historic designations should include measures to enhance the conservation value of the site affected.

Protected Species

Development affecting protected species will not be permitted unless it can be justified in accordance with the relevant protected species legislation.

Local Nature Conservation

Development proposals which affect the existing and potential Local Nature Reserves listed in Table 6.1 will require to demonstrate that there is no significant adverse effect on the site's natural heritage, amenity or educational value following the implementation of appropriate mitigation measures.

The Council will seek to progress the identification of Local Nature Conservation Sites and produce planning guidance accordingly.

Development proposals should seek to manage, protect and enhance existing trees and woodland, in accordance with the Council's Tree Strategy.

Landscape

Development proposals should take account of the guidance in the South Lanarkshire Landscape Character Assessment 2010 and, where relevant, the Landscape Capacity Study for Wind Energy 2016 and its Addendum Tall Wind Turbines Landscape Capacity, Siting and Design Guidance 2019.

Development proposals must also accord with other relevant policies and proposals in the development plan. Refer to Appendix 1 for relevant Volume 2 policies and additional guidance.

Policy 16 Water Environment and Flooding

Any development proposals which will have an unacceptable impact on the water environment will not be permitted. This includes engineering works such as culverting. In determining proposals consideration shall be given to water levels, flows, quality, features, flood risk and biodiversity within the water environment. The use of buffer and no development zones will be introduced to protect the riparian zone. These measures have been identified as having a key role to play in ensuring that protection and improvement of the water environment accords with the Water Framework Directive and the underlying aims of the River Basin Management Plans.

The avoidance principle of flood risk management as set out in SPP must be met. This approach is key to the delivery of sustainable flood management. Within areas identified as functional floodplain the Council will not support any development proposals, except where a specific location is essential for operational reasons and appropriate mitigation measures can be taken that meet the principles of flood risk management. All development must take account of the requirements in SEPA's development plan guidance on flood risk.

Sites where flood risk maybe an issue (due to one or more of the following):-

1. watercourse or culvert capacity is exceeded and out of bank flow occurs;
2. sewer flooding;
3. surface water and runoff, and
4. impact of the proposal on groundwater.

shall be the subject of a local flood risk management assessment. Where the flood risk cannot be appropriately managed to prevent a significant adverse increase in the risk of flooding, either on the site or elsewhere, development will not be permitted.

The plan will take a precautionary approach to managing flood risk by considering flooding from all sources and working towards sustainable flood management.

Development proposals must also accord with other relevant policies and proposals in the development plan. Refer to Appendix 1 for relevant Volume 2 policies and additional guidance.

Volume 2

Policy Sustainable development and climate change(SDCC): Sustainable Drainage Systems-

The Water Environment and Water Services (Scotland) Act 2003 made it a legal requirement to utilise Sustainable Drainage Systems (SuDS) on all new developments and construction SuDS with the exception of a single dwelling or those developments discharging to coastal waters.

Where surface water is proposed to be drained by a sustainable drainage system, shared by the Roads Authority and Scottish Water, an agreement under Section 7 of the Sewerage (Scotland) Act 1968 should be progressed during the initial design stages. The design of SuDS should be considered an integral part of any development and should be considered early in the design process. The design of these systems should be in accordance with the following documents; CIRIA C753 The SuDS Manual; South Lanarkshire Council's Developer Design Criteria; and Sewers for Scotland (latest edition) by Scottish Water.

Where the drainage scheme is not to be maintained by Scottish Water or a Roads Authority, the developer must indicate how the scheme will be maintained in the long term.

Where more than one development drains into the same catchment a co-ordinated approach to SuDS provision should be taken where practicable. This will involve considering what is happening at the catchment level rather than what is happening within a development boundary.

Policy Green Belt & Rural Area (GBRA): 1- Rural Design and Development

Within the Green Belt and Rural Area all proposed developments will require to adhere to the following criteria:

1. Developments shall be sited in a manner that respects existing built form, landform and local landscape character and setting.
2. Proposed developments shall be well related to locally traditional patterns of scale and shall avoid the introduction of suburban-style developments into the rural environment. Proposals specifically for residential development should not be isolated or sporadic.
3. Proposals shall be of a high quality, of either traditional or contemporary innovative design which interprets and adapts traditional principles and features.
4. Proposals shall make use of appropriate materials which respect and reinforce local character and identity.
5. Developments shall have no adverse impacts on existing residential amenity, particularly in terms of overlooking or overshadowing of existing residential properties.
6. Proposals relating to residential development, including extensions and alterations, shall conform to the requirements of the Council's Residential Design Guide and, in particular, shall ensure the provision of appropriate private amenity space to all existing and proposed residential properties.

7. Development proposals shall incorporate suitable boundary treatment and landscaping proposals to minimise the visual impact of the development on the surrounding landscape. Existing trees, woodland and boundary features such as beech and hawthorn hedgerows and stone dykes, shall be retained on site. A landscape framework shall be provided, where appropriate, to demonstrate how the development would fit into the landscape and improve the overall appearance of the site.

8. Proposals shall be readily served by all necessary infrastructure including water, sewerage and electricity as required to accommodate the development.

9. Proposals shall comply with all required parking and access standards and have no adverse impact in terms of road or public safety.

10. Proposals shall not have a significant adverse environmental impact on the amenity of the surrounding area. In particular, 'bad neighbour' uses which by virtue of visual impact, noise, smell, air and light pollution, disturbance, traffic or public safety are detrimental to local amenity, will not be permitted.

11. Proposals shall have no significant adverse impact on the natural and historic environment and no adverse impact on the integrity of any Natura 2000 sites.

12. In the case of a Listed Building or a property within a designated Conservation Area, proposals shall comply with all relevant policy and guidance relating to the historic environment.

Policy Development Management (DM): 20- Supporting Information

All applications submitted to the Council must be accompanied by sufficient information and supporting documents to enable the application to be assessed and determined. This will vary depending on the scale and nature of the proposal.

Early engagement with the Council on the likely scope and content of supporting information is recommended. This should prevent subsequent delay, ensure unnecessary work is not carried out, and establish if specific surveys or assessments are required.

Policy Natural and Historic Environment (NHE): 2-Archaeological Sites and Monuments Scheduled Monuments and their Setting

Scheduled monuments and other identified nationally important archaeological resources shall be preserved in situ and in an appropriate setting.

Developments which have an adverse effect on scheduled monuments or the integrity of their setting shall not be permitted unless there are exceptional circumstances.

Non-Scheduled Archaeological Sites and Monuments

All non-scheduled archaeological resources shall be preserved in situ wherever feasible. The Council will weigh the significance of any impacts on archaeological resources and their settings against other merits of the development proposals in the determination of planning applications.

The developer may be requested to supply a report of an archaeological evaluation prior to determination of the planning application. Where the case for preservation does not prevail, the developer shall be required to make appropriate and satisfactory provision for archaeological excavation, recording, analysis and publication, in advance of development.

Policy NHE7 Natura 2000 Sites

Development which would likely have a significant effect on a Natura 2000 site will be subject to an appropriate assessment. Where an appropriate assessment is unable to conclude that a development will not adversely affect the integrity of the site, subject to agreement by Scottish Ministers, development will only be permitted where:

- there are no alternative solutions,

- there are imperative reasons of overriding public interest, including those of a social or economic nature,
- compensatory measures are provided to ensure that the overall coherence of the Natura network is protected.

For sites hosting a priority habitat or species (as defined in Article 1 of the Habitats Directive), prior consultation with the European Commission via Scottish Ministers is required unless either the proposal is necessary for public health or safety reasons, or it will have beneficial consequences of primary importance to the environment.

The requirements of this policy apply to all proposed or designated Natura 2000 sites which could be affected by a proposal, including those which adjoin, or are located outwith the boundary of South Lanarkshire.

Policy NHE 8 National Nature Reserves and Sites of Special Scientific Interest

Development that affects a Site of Special Scientific Interest / National Nature Reserve will only be permitted where an appraisal has demonstrated:

- a) the objectives of designation and the overall integrity of the area will not be compromised; or
- b) any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance.

Policy NHE9 Protected Species

a) Development that would impact on a European Protected Species will not be permitted unless it can be shown that:

- the development is required for preserving public health or public safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment,
- there is no satisfactory alternative,
- the development would not be detrimental to the maintenance of the population of the species at a favourable conservation status in its natural range.

b) Development that would be likely to have an adverse effect on a species protected under the Wildlife and Countryside Act 1981 (as amended) will not be permitted unless it can be shown that:

- the development will contribute to significant social, economic or environmental benefit,
- there is no other satisfactory solution,
- there will be no significant negative impact on the conservation status of the species.

c) Development likely to have a significant effect on any other protected species following the implementation of any mitigation measures will not be permitted unless it can be justified in accordance with the relevant legislation.

d) Where Invasive Non-Native Species (INNS) are present on a development site, or where planting is proposed as part of the development, planning permission will only be granted where developers can demonstrate that the provisions of the Wildlife and Countryside Act 1981 (as amended) relating to non-native species have been fully accounted for.

All these requirements will be given full consideration in the assessment of development proposals and developments that cannot meet the terms of the above policy shall be judged not to accord with the plan.

Policy NHE 11 Peatland and Carbon Rich Soils

The Council shall seek to protect peatland and carbon rich soils from adverse impacts resulting from development. Where peat and other carbon rich soils are present, applicants should assess the likely effects of development on carbon dioxide (CO₂) emissions. Where peatland is drained or

otherwise disturbed, there is likely to be a release of CO₂ to the atmosphere. Developments should aim to minimise this release.

The Scottish Natural Heritage Carbon and Peatland map can be accessed by clicking [here](#).

Proposals for the commercial extraction of peat will be assessed under policy MIN4.

Any other development proposals affecting peat must be accompanied by a full peat survey and assessment, carried out in accordance with current Scottish Government Guidance on Developments on Peatland, and a peatland habitat assessment.

Proposals must demonstrate how the peat survey and habitat assessment have been used to avoid or minimise impacts of peat and peatland habitats. Where appropriate, applications should be accompanied by:

- A schedule of mitigation measures to minimise impact on peat.
- A method statement for post-construction re-instatement of disturbed peatland, and,
- A peatland management and/ or enhancement plan showing how any significant losses of peatland habitat are to be compensated for.

Renewable energy proposals will be assessed on the basis of the specific criteria on peat contained in the renewable energy assessment checklist and the requirements set out in planning guidance for renewable energy.

For ancillary extraction of peat associated with other developments, the Council will seek to ensure that best practice is used for the handling, storage and restoration of the peat, in order to minimise potential degradation and promote active peat formation, and, where appropriate, the creation of habitats of nature conservation interest.

Policy NHE12 Water Environment and Biodiversity

Development proposals should protect and where possible enhance the water environment in accordance with the Water Framework Directive. Development proposals which will have a significant adverse impact on the water environment will not be permitted. Consideration will be given to water levels, flows, quality, features, flood risk and biodiversity within the water environment.

New development proposals should be designed to minimise impact on the water environment. This should include, where appropriate, blue/ green network links incorporating provision of SuDS and adequately sized buffer strips between developments and watercourses to protect the riparian zone. Physical changes to the water environment should be avoided (for example culverting for land gain).

Policy NHE 13 Forestry and Woodland

Development proposals should seek to manage, protect and enhance existing Ancient Semi-Natural Woodland (ASNW), other woodlands, hedgerows and individual trees. Proposals likely to impact on woodlands, hedgerows or individual trees should be accompanied by a full tree survey and written justification for any losses. Proposals should accord with the Council's Tree Strategy.

In all cases involving the proposed removal of existing woodland, the acceptability of woodland removal and the requirement for compensatory planting will be assessed against the criteria set out in the Scottish Government's Policy on Control of Woodland Removal. Removal for development purposes will only be permitted where it would achieve significant and clearly defined public benefits. Where the woodland proposed to be removed is ASNW, such public benefits should be of national importance. In all cases, developers will generally be expected to deliver compensatory planting.

New amenity tree planting will be encouraged, where appropriate, through a requirement to submit and implement a landscaping scheme for new developments. Priority should be given to the use of native species. Further information is contained in supporting planning guidance on Green Networks and Greenspace.

The Council supports the creation of new woodlands in accordance with national forestry policy and the guidance in the Glasgow and the Clyde Valley Forestry and Woodland Framework.

Policy NHE 16 Landscape

Special Landscape Areas

Development proposals within the Special Landscape Areas (SLA) identified on the Strategy Map will only be permitted if;

1. they accord with LDP2 policies and guidance on Green Belt and Rural Area, and
2. they can be accommodated without having a significant adverse effect on the landscape character, scenic interest and special qualities and features for which the area has been designated.

All development proposals within or adjacent to an SLA shall take into account the guidance within the Council's Report on Validating Local Landscape Designations (2010).

Landscape Protection and Enhancement

Within the SLAs and the wider landscape of South Lanarkshire, development proposals should maintain and enhance landscape character including:

- the scale, design and location of development within the landscape,
- the setting of settlements and buildings within the landscape,
- the pattern of woodland, fields, trees, hedgerows, waterbodies and other features, particularly where they define / create a positive settlement/ urban edge,
- the historical qualities of the area and its sensitivity to change,
- landform features including key/ notable skylines and hill and views to and from them.

Development proposals should take account of the South Lanarkshire Landscape Assessment 2010 and where relevant the Landscape Capacity Study for Wind Energy 2016 and Tall Wind Turbines Landscape Capacity, Siting and Design Guidance 2019.

Policy NHE18 Walking, Cycling and Riding Routes

The Council will seek to safeguard existing and proposed walking, cycling and riding routes, core water routes and water access /egress points within South Lanarkshire as identified in the Core Paths Plan. Particular support is given to the development of the Clyde Walkway and National Cycle Network Routes 74 and 75 on or around the lines identified.

Where appropriate, linear routes, such as former railway lines, will be safeguarded to provide walking, cycling and riding opportunities.

Development proposals adjacent to or on the line of any route will require to take account of the route in the design and layout of their scheme. Developments should seek to connect to the wider network and where appropriate, developer contributions will be sought for the provision or upgrading of the route.

Policy NHE 20 Biodiversity

In order to further the conservation of biodiversity;

- i. Development proposals should demonstrate that they have no significant adverse impact on biodiversity, including cumulative impacts.
- ii. Development proposals likely to lead to significant loss of biodiversity will only be supported if adequate mitigation and offsetting measures are agreed with the Council. Development

proposals affecting designated nature conservation sites shall be assessed against the requirements set out in the relevant LDP2 policy for that designation.

- iii. Development proposals should consider opportunities to contribute positively to biodiversity conservation and enhancement, proportionate to the scale and nature of the proposal.

1.4 Landscape Character Assessment

NatureScot formerly Scottish Natural Heritage (SNH) undertook a series of Regional Landscape Character Assessments (LCAs) in the 1990s. This information has now been updated to create a single dataset of areas of consistent and recognisable landscape character⁵⁸ known as Landscape Character Types.

The key characteristics and perception of the Landscape Character Types within the Study Area has been extracted from the Scottish Landscape Character Types Map and Descriptions (NatureScot 2019) and placed below. The coverage of the LCT's in the Study Area are indicated in **Figure 3.2**.

LCT 201- Plateau Farmland- Glasgow & Clyde Valley

Key Characteristics

- Extensive, open, flat or gently undulating landform.
- Dominance of pastoral farming, but with some mosses surviving.
- Limited and declining tree cover.
- Visually prominent settlements and activities such as mineral working.
- Rural character of the Plateau Farmland has reduced as tree cover has declined and the visual influence of settlements, transport infrastructure and mineral working has increased.

Perception

There are wide views across this open, transitional Landscape Character Type, but few visual foci. The area appears in the foreground when seen in views from or towards adjacent moorland and hills. The edges of this landscape are visible from within the Clyde Valley, forming the backdrop to the valley lowlands. There are some rural areas which have a tranquil character.

LCT 207 Upland River Valley- Glasgow and Clyde Valley

Key Characteristics

- A series of valleys formed along faultlines through the Plateau Moorlands and paired with valleys to the south and west in Ayrshire.
- South-west to north-east orientation of the valleys.
- Strong contrast between the wooded and settled character of the valleys and the exposed enclosing uplands.
- Transition from the exposed upper reaches to more sheltered lowland areas.

Perception

The influence of settlement decreases through the valleys moving north to south, away from denser areas of population. Some parts of the upper reaches are undeveloped, perceived as having wild character.

LCT 208 Broad Valley Upland- Glasgow and Clyde Valley

Key Characteristics

- Medium to large scale landscape comprising a broad, flat bottomed, basin-like valley enclosed by the rounded hills to the north and the *Southern Uplands - Glasgow & Clyde Valley* to the south.
- Distinctive pattern of tree cover comprising shelterbelts on lower hill slopes and lines of mature trees along field boundaries.
- Medium to large agricultural field in central areas.
- Scattered pattern of rural settlement.

⁵⁸ NatureScot (2019) Scottish Landscape Character Types Map and Descriptions.

- Important navigation route evidenced by Roman camps and a road, which significant modern transport routes follow.
- Views predominantly focussed along the valley.

Perception

Views tend to be channelled along the length of the valley, with some broad views across wider parts. The key focus of views tends to be towards lower parts of the Landscape Character Type, and along the rivers and roads which pass through it. The area has an important visual relationship with surrounding high ground, particularly the *Undulating Farmland and Hills* and *Southern Uplands – Glasgow & Clyde Valley*.

Appendix 3.1: Heritage Assets and Previous Archaeological Investigations (Events) within the Proposed Development Site

Asset / Event Ref	Asset Name/ Description	Easting	Northing	Source	Asset Description	Sensitivity of Asset
1	Farmstead	282555	637495	Historic Maps, Site Visit	<p>The Ordnance Survey Maps (1864, 1898 and 1911) show a small farmstead comprising one roofed building and an enclosure. The farmstead is not shown on the current Ordnance Survey map (2023).</p> <p>Examination of lidar imagery and the results of field survey suggest that the farmstead building has been largely if not completely removed by construction of a modern enclosure (2). Part of the boundary wall of the farmstead survives upstanding.</p>	Negligible
2	Enclosure	282545	637475	Historic Maps, Site Visit	<p>Field survey identified and recorded a modern enclosure built of breeze blocks with its outer walls embanked by a turf covered mound of soil. This is a structure possibly associated with surrounding electrical infrastructure, agricultural or forestry activities.</p>	Negligible
3	Field Boundary	282405 282285	637555 282285	Historic Maps, Site Visit	<p>Two post-medieval boundary walls are depicted on the first edition of the Ordnance Survey Map (1864). They run at an oblique angle from northwest to southeast.</p> <p>Field survey confirmed that the stone walls remain upstanding, with mature deciduous trees growing on top of them.</p>	Negligible
EV 4047	Archaeological Desk-Based Assessment and Walkover Survey: Environmental Statement for 132kV Overhead Line Connections between Andershaw Windfarm and Coalburn Substation	281413	632161	HER	<p>The HER records that a desk-based assessment and walkover survey was undertaken on a 250m wide corridor on either side of a proposed new overhead powerline running between Andershaw Windfarm and the substation at Coalburn (Faber Maunsell, 2009).</p> <p>Forty-four sites were identified from within the route corridor. Some were previously recorded, some were identified from historic maps and aerial photos, and some were identified during the walkover.</p>	N/A (event)

Asset / Event Ref	Asset Name/ Description	Easting	Northing	Source	Asset Description	Sensitivity of Asset
EV 7137	Desk-Based Assessment and Walkover Survey: Kennoxhead Windfarm to Coalburn Substation 132 kV Overhead Line	276555	623984	HER	The HER records that a desk-based assessment and walkover survey were carried out to accompany the cultural heritage and archaeology chapter of the Kennoxhead Windfarm to Coalburn Substation 132 kV Overhead Line EIA report (Somerville, 2022). The assessment identified 59 heritage assets within the study area.	N/A (event)

Appendix 3.2: Heritage Assets and Previous Archaeological Investigations (Events) within the Inner Study Area

Asset / Event Ref	Asset Name/ Description	Easting	Northing	Source	Asset Description
41039	Auldton Colliery / Auldton 2 And 3	282700	637800	HES	The NHRE (Canmore) entry records that Auldton 1, 2 and 3 Collieries commenced production in 1941 and closed in 1963. The works comprised of three surface mines; the first was sunk in 1942 and closed in 1949, the others were developed 1951-4.
41275	Newfield Inn, farmstead /building	283420	637070	HER	The HER records that two unroofed buildings are depicted on the first edition of the Ordnance Survey Map (1864), but they are not shown on the current edition of the Ordnance Survey map.
41282	Neuk Farmstead	282020	637650	HER	The HER records that a courtyard farmstead, comprising four roofed buildings, one unroofed building, one unroofed structure and three enclosures is depicted on the first edition of the Ordnance Survey Map (1864). A farmstead remains in use on this site to date.
58082	Old Johnshill, Farmstead	281410	637400	HER	The HER records that Old Johnshill farmstead shown on the first edition of the Ordnance Survey Map (1864), but it is not shown on the current edition of the Ordnance Survey map.
58083	Johnshill Farmstead	281660	637180	HER	The HER records a farm depicted on the first edition of the Ordnance Survey Map (1864). A farmstead remains in use on this site to date.
69685	Hillmill, mill (possible)	281343	637889	HER	The HER records that a single building annotated as 'Hillmill' is depicted on the first edition of the Ordnance Survey Map (1864), on the eastern side of the river Nethan. Although not specifically identified as a mill, the place-name suggests that it is likely to have operated as such, particularly as the first edition map appears to show a lade running from the river around to the south of the building, and returning to the main channel around 315m to the north of it. Neither the building nor the lade appear on current Ordnance Survey maps of the area.
69686	Hill Lime Kilns; Quarry	281572	637859	HER	The HER records that a reasonably extensive limestone quarry is shown on the first edition of the Ordnance Survey Map (1864). Two banks of lime kilns are also shown, one on the southern side of the quarry, the other on the north. Neither the

Asset / Event Ref	Asset Name/ Description	Easting	Northing	Source	Asset Description
					quarry nor the kilns are specifically marked on current Ordnance Survey maps, though the 1:10,000 raster map does show hachures at the north-western end of the former quarry, suggesting that some visible remains survive.
69687	Hill farmstead	281694	637894	HER	The HER records that a farmstead named 'Hill' and comprising two roofed buildings is shown on the first edition of the Ordnance Survey Map (1864). It is not shown on the current edition of the Ordnance Survey map (2023), it was however visible as upstanding remains during a walkover survey in 2009 (Turner 2009).
69866	Auchren Lime Works	282753	638508	HER	<p>The HER records that Auchren Lime Works is shown on the second edition Ordnance Survey map (1898), as comprising of two roofed buildings, a number of tramways, an old shaft, two circular structures that are likely to represent kilns, and an area of dumping. The area is shown as unoccupied agricultural ground in the first edition of the Ordnance Survey Map (1864).</p> <p>The 1898 Ordnance Survey map shows a light railway line associated with the lime works, linking into the main railway line. However, the later 1912 Ordnance Survey map shows that any infrastructure such as rail sidings had been removed when the lime works went out of use. On this map, the former kilns are annotated as 'Old Limekilns'. An air shaft shown in the field to the south of the former lime works is likely to relate to coal mining at the former Auldton Colliery, further to the south.</p> <p>The works are not shown on the current Ordnance Survey map (2023).</p>
69867	Auchren Farmstead	282725	638695	HER	<p>The HER records that Auchren is shown on Roy's 1752-1755 Lowlands map, on which it was named as 'Ochren'. Later, Ordnance Survey, maps indicate that the farm complex has been subject to considerable expansion over the course of the 19th and 20th centuries.</p> <p>A farmstead remains in use on this site to date.</p>
EV 191	Walkover survey on Broken Cross Muir	285400	637430	HER	<p>The HER records that a walkover survey was undertaken to identify all archaeological features that might be affected by a proposed opencast development (Halliday, 2001).</p> <p>Eighty features were identified, most relating to agricultural improvements, mineral extraction, and grouse shooting. Four features were of possible archaeological</p>

Asset / Event Ref	Asset Name/ Description	Easting	Northing	Source	Asset Description
					interest, including two circular, banked features that may represent prehistoric occupation.
EV 3749	Archaeological Assessment: Birkhill, Coalburn	283744	636547	HER	<p>The HER records a desk-based assessment was undertaken on the site of a proposed development at Birkhill (Dalglish, 2007).</p> <p>No significant archaeological features were identified from within the proposed development area during the DBA, but a general potential for buried deposits to be present was identified on the basis of the high number of sites in the surrounding landscape.</p>
89408, EV 4418	Johnshill Walkover Survey	282000	637000	HER	<p>The HER records that a walkover survey was conducted in June 2009 in support of a proposed forestry planting scheme (Turner, 2009). The work was centred on the site of the former Auchlochan Colliery, to the north of Coalburn, but also extended westwards along the valley of the River Nethan and north-eastwards to encompass an area to the northeast of Brocketsbrae.</p> <p>The survey helped to confirm the location and condition of a number of sites shown on Ordnance Survey maps of the area. These included a country house, Stockbriggs House, which survived to first floor height in places, and a number of post-medieval farmsteads. Some of these, including Burnhead, Brackenhill, Craigbank and the Hill, could still be identified as upstanding remains. The remains of the Lesmahagow Branch of the Caledonian Railway, which crossed the area in a roughly southwest - northeast direction, were also identified.</p>
EV 6867	Coalburn HPSI, Desk-based assessment	282803	638423	HER	<p>The HER records that a desk-based assessment was carried out to support an application for consent to construct two 125 MVA Stability Islands on land at Coalburn adjacent to the M74 and Bog Road (Brown, 2021).</p> <p>Cartographic evidence from the mid- 18th century onwards indicates that the land within the proposed development area (PDA) had been undisturbed arable land since at least the post-medieval period and likely from the medieval period. The 1888 Ordnance Survey map shows that the woods to the immediate north of the proposed development area were occupied during the late 19th and early 20th centuries by the Auchren Lime Works. The line of the former Caledonian Railway borders the eastern boundary of the PDA. As such it is considered likely that there could be remains associated with these industrial works within the PDA.</p>

Appendix 3.3: Designated Heritage Assets in the Outer Study Area

Designation Ref	Designation Title	Designation	Easting	Northing	Source	Asset Description	Sensitivity of Asset
LB 11727	Abbeygreen Road, Birkwood, Driveway Bridge over River Nethan	Category B Listed Building	281343	639472	HES	HES records this as an early to mid-19th century, single segmental arched bridge carrying the driveway to Birkwood House over River Nethan.	Medium
LB 11728	Birkwood, Walled Garden	Category B Listed Building	281400	639348	HES	HES records this walled garden as early 19th century in appearance. Walled garden, containing a quadrangular area, the gateway central on west wall is gothic-arched with gable over.	Medium
LB 7688	Auchlochan Bridge	Category B Listed Building	281031	637708	HES	HES records this as a single arch bridge spanning River Nethan, built circa 1790.	Medium
LB 7698	Birkwood House	Category B Listed Building	281154	639329	HES, Buildings at Risk Register	<p>HES records Birkwood House as a 19th century large castellated gothic mansion with towers, turrets and crenelated parapets. There are several building phases, beginning with a north-facing Georgian villa (built late 18th/early 19th century).</p> <p>Between the 1920s and 2005 the House was in use as a hospital.</p> <p>In 2023 the Buildings at Risk Register records that a planning application for partial demolition and the erection of dwelling house and associated infrastructure has been submitted (https://www.buildingsatrisk.org.uk/search/keyword/birkwood/event_id/916481/building_name/birkwood-hospital-former-lesmahagow accessed 06/09/2023).</p>	Medium
LB 7699	Birkwood, South Lodge and Gateway, New Trows Road	Category B Listed Building	280823	638917	HES	HES records this as a picturesque castellated gateway with lodge, probably built in the mid-19th century.	Medium

Designation Ref	Designation Title	Designation	Easting	Northing	Source	Asset Description	Sensitivity of Asset
LB 11726	Off New Trows Road, Birkwood South Driveway Bridge	Category C Listed Building	280838	639030	HES	HES records this bridge as probably mid-19th century, and presumably contemporary both with south gateway and with opening of south driveway. The bridge is a small segmental archway over a burn.	Low



Proposed Coalburn North Substation

Appendix_Hydrology, Geology & Hydrogeology Baseline



Ramand Environmental

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1. Introduction

The following Appendix provides further detail regarding hydrology, geology and hydrogeology baseline conditions at the proposed Coalburn North Substation. This supplements the information provided within the Environmental Appraisal Chapter: Hydrology, Geology and Hydrogeology.

2. Historical Land Use

A review of the 1858 to 1967 Ordnance Survey mapping indicates that the Site was generally undeveloped, with a small area of forestry to the north and north west. An old coal pit is indicated to the south west, in the vicinity of the now dismantled railway line. The 1957 and 1967 mapping indicates a mine located to the southeast, on the eastern side of the B7078 Carlisle Road.

3. Soils and Peat

Within the proposed development site and 250m Study Area, soils are indicated to comprise the Rowanhill series, with the component soils being peaty gleys with dystrophic blanket peat (Scotland's Soils, 2023).

Gleys are widespread throughout Scotland, being developed under conditions of intermittent or permanent waterlogging. The greyish or bluey-grey colours and orange mottling, which are characteristic of gley soils, are generally of secondary origin, replacing those inherited from the parent material. They result from the absence or very low levels of oxygen when iron compounds are changed chemically from their usual brown colours (reduction of ferric iron compounds to (mobile) ferrous compounds). Gleys are often confined to depressed or receiving sites where anaerobic conditions result from the periodic or long-term waterlogging, either a direct result of surface water collection or groundwater conditions. They also occur where the soil is dense, and water is prevented from moving through the soil. They are found at all elevations. Where the upper soil horizons are wet for much of the year, they are generally rich in organic matter with intergrades to shallow peat (peat >50cm) being widespread (The James Hutton Institute, 2023).

South of the existing Coalburn Substation, within the Coalburn Moss SAC, soils are identified as dystrophic basin peat. This forms in topographic basins and is fed by waters that are poor in minerals. These peats usually support vegetation communities dominated by heathers and nutrient-poor grasses. Where the bog has risen to the extent that the groundwater has little influence, the dominant vegetation community is heathland (The James Hutton Institute, 2023).

4. Superficial Deposits

The superficial deposits within the footprint of the proposed development site ("the Site") and 250m Study Area are mapped as comprising Glacial Till deposits (BGS, 2023). Such deposits can be highly variable in composition and are made up of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape.

The BGS (2023) describes Tills as consisting of ice-transported material laid down sub-glacially at the base of active glaciers and ice sheets, proglacially and supraglacially at the margins of retreating ice sheets, and paraglacially soon after glaciation when sediment deposited earlier is remobilised. Deposits formed in the proglacial, supraglacial and paraglacial environments

commonly occur at the surface and comprise a metre or so of heterogeneous, very poorly sorted, crudely stratified, gravelly diamicton that is commonly intercalated with gravel, silty sand, silt and clay. These sediments accumulated at ice-sheet margins, mainly as debris flows that were modified and redeposited by ephemeral meltwater streams and sheet wash. They are generally permeable and include large boulders, up to several metres in diameter. In contrast, tills formed in the subglacial environment are relatively homogeneous (massive) and impermeable. In general, it is not practical to map out the various types of till separately. Locally, where proglacial, supraglacial and paraglacial deposits are several metres or more thick and form constructional mounds, they have been mapped out as 'hummocky glacial deposits'.

5. Bedrock Geology

The bedrock beneath the Site and 250m Study Area is indicated to comprise the Clackmannan Group Limestone Coal Formation (BGS, 2023). This type of bedrock is formed by cyclic marine bands and contains coal seams.

The BGS (2023) notes that the formations within the Clackmannan Group are characterised by strongly cyclical, upward-coarsening units of limestone, mudstone, siltstone and sandstone capped by coal and seatearth, the proportions differing in each of the formations. Thus, beds of laterally extensive limestone, with diverse marine faunas, are more conspicuous in the Lower and Upper Limestone formations than elsewhere; coals are most common in the Limestone Coal Formation; and sandstones and seatearths (including some economically important high-alumina seatclay, fireclay and bauxitic clay) are the most prominent constituents of the Passage Formation.

6. Hydrogeology

A review of BGS (2023) Hydrogeological mapping indicates that the Site and 250m Study Area is underlain by the Clackmannan Group which is characterised as a moderately productive aquifer.

It is a multi-layered aquifer with low yields except where disturbed by mining. It could have moderate yields up to 10 L/s. Flow is virtually all through fractures and other discontinuities within the bedrock.

In areas of former underground mining, aquifers may have been contaminated historically by pollutants such as acidic mine drainage.

7. Surface Watercourses

The closest surface watercourse to the Site is a tributary of the Fauldhouse Burn, which is located approximately 60m east southeast from the proposed development site and approximately 170m east southeast of the existing Substation.

The burn does not have a SEPA water quality classification. However, it eventually flows into the Poniel Water, approximately 2.8km to the southeast of the Site, which had an overall status of Moderate in 2020 (the last SEPA classification year). Overall ecology and water quality was classified as Moderate and Hydrology was classified as High.

The Gad Burn is located approximately 240m east of the Site and approximately 490m east of the existing Substation. This has been significantly modified and flows into the road drainage

associated with the B7078 Carlisle Road. There is no hydrological connectivity between the proposed new Substation and the Gad Burn.

The largest watercourse present within the 1km hydrology study area is the River Nethan. This is located approximately 940m west of the proposed development site boundary. This has an overall SEPA classification of Poor. It is likely that this classification is linked to barriers to fish movement.

8. Coalburn Moss Special Area of Conservation (SAC)

NatureScot (2023) provides the following description of Coalburn Moss Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC).

The SSSI and SAC lies less than 1km north-east of Coalburn village, and is one of the best examples of raised bog in the United Kingdom, despite the fact that it is situated within a farming landscape which has been modified extensively by deep and opencast coal mining, road building, sand extraction and has two dismantled railways crossing the site.

Active raised bog is a European priority habitat as it is a globally threatened habitat, with Europe containing a significant proportion of its natural range. Those parts of Coalburn Moss that are degraded raised bog are also considered in a similar light as they have the potential to return to their former active condition.

The raised bog at Coalburn Moss developed over thousands of years of peat accumulation, gradually causing the bog surface to become elevated above the level of the groundwater to form a gently sloping mound. The only source of water and nutrients for plants is rainwater, and this waterlogged, acidic and nutrient-deficient surface supports specialised plant communities, such as sedges, common cottongrass and bog mosses. Subtle variations in these conditions affects the distribution of the individual species on the bog and gives rise to the distinctive undulating surface pattern characteristic of raised bogs. These patterns consist of well-defined hollows, dominated by *Sphagnum cuspidatum* and common cottongrass, within a mosaic of ridges and hummocks of Sphagnum mosses. High ridges are characterised by the bog mosses *Sphagnum capillifolium*, *S. papillosum* and *S. magellanicum* together with hare's-tail cottongrass, round-leaved sundew, cranberry and the lichen *Cladonia portentosa*. Lower ridges are characterised by *S. papillosum* and *S. tenellum*, indicating a surface recovering from past burning and drainage. The higher hummocks are dominated by heather with a mixed ground layer of mosses and lichen.

On the edges of the bog expanse, to the east and west of the dismantled railways, grazing, burning and drainage have modified the habitat. As a consequence, these sections of the bog are degraded with less diversity among moss species than the central part of the bog.

Around the margins of raised bog is the 'lagg', a natural stream fed by runoff from the bog surface. At Coalburn Moss the original lagg has been replaced by a secondary lagg that has arisen as a result of extensive peat cutting in the past, and is dominated by soft rush and tufted hair-grass. The secondary lagg along the southern boundary by Alkmanhill and in the south west corner next to the disused mine supports birch woodland as does the disused railway in the west of the site. As long as the birch trees do not act as a seed source for seedlings colonising the mire, they do not present a threat. The site

also supports areas of wet and dry grassland. Grassland lying over peat is considered to be part of the same hydrological unit as the active raised bog and is therefore important in maintaining the hydrological condition of the site as a whole. Grassland also occurs on some small mineral ridges. The areas of grassland, woodland and the large drainage ditches with bog pool vegetation, add diversity to the site.

The raised bog is considered to be in an unfavourable and declining condition as a result of the network of erosion channels with flowing water and exposed peat, the physical impacts of livestock on the mire surface, and the presence of scrub and mature conifer plantations on the mire surface.

9. References

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Ramand Environmental

1.0 Technical Annex 1 - Baseline Noise Survey

A baseline noise survey was carried out in surrounding area of the existing Coalburn 400kV Substation on the night of 8th October 2020. This survey was conducted for the proposed extension to the west of the existing Coalburn Substation for the installation of the fourth Supergrid Transformer (SGT) and second set of Shunt Reactors now under construction. The baseline noise levels collected during this survey are considered to be relevant and applicable for use for the assessment of the proposed Coalburn North Substation, as there is no reason to suspect a material change to the background noise environment since the survey was conducted.

Free-field measurements were conducted at the nearest Noise Sensitive Receptors (NSRs) in the vicinity of the site to determine the baseline noise and background noise (BGN) in the current environment.

1.1 Instrumentation

Measurements were conducted using a Rion NL-52 sound level meter (SLM) of serial number (S/N) 00542897 which was spot calibrated with a B&K Type 4231 calibrator (S/N 2052327), before and after the measurement campaign. No drift in calibration results was noted for the survey.

Instrument calibration certificates are available on request.

1.2 Measured Parameters

- L_{Aeq} (15 Minutes)
- L_{Aeq} one-third octave band spectrum
- L_{A90} (15 Minutes)
- L_{A90} one-third octave band spectrum

1.3 Meteorological Conditions

Meteorological conditions were compliant with BS4142: 2014 criteria throughout the duration of the survey. Low wind speed conditions were measured through the night with a handheld anemometer. There was a light breeze around 2 m/s, and sporadic gusts up to 4 m/s were recorded. The ambient temperature was approximately 6 degrees Celsius, and the environment was dry, clear night with 0 – 3 oktas cloud cover over the survey period.

1.4 Measurement Positions

Detailed maps and aerial photographs of the area surrounding the existing Substation site were examined and near Noise Sensitive Receptors (NSRs) were identified. Table 1-1 contains a list of NSR locations measured during the survey. These measurements include a surrogate Background Noise (BGN) location deemed to be representative of the ambient noise conditions of the area, in lieu of measurements taken when the substation is out of service. Figure 1.1

shows an annotated map of the survey area.

Table 1-1: Receptor Locations

Location	Easting	Northing	Name/Address
NSR 1	283372	636869	Carlisle Road
NSR 2	281701	637232	Johnshill Farm
NSR 3	281996	637624	Neuk Farm
NSR 4	282882	637940	Auldtonheights
BGN	281709	637963	Coalburn Road

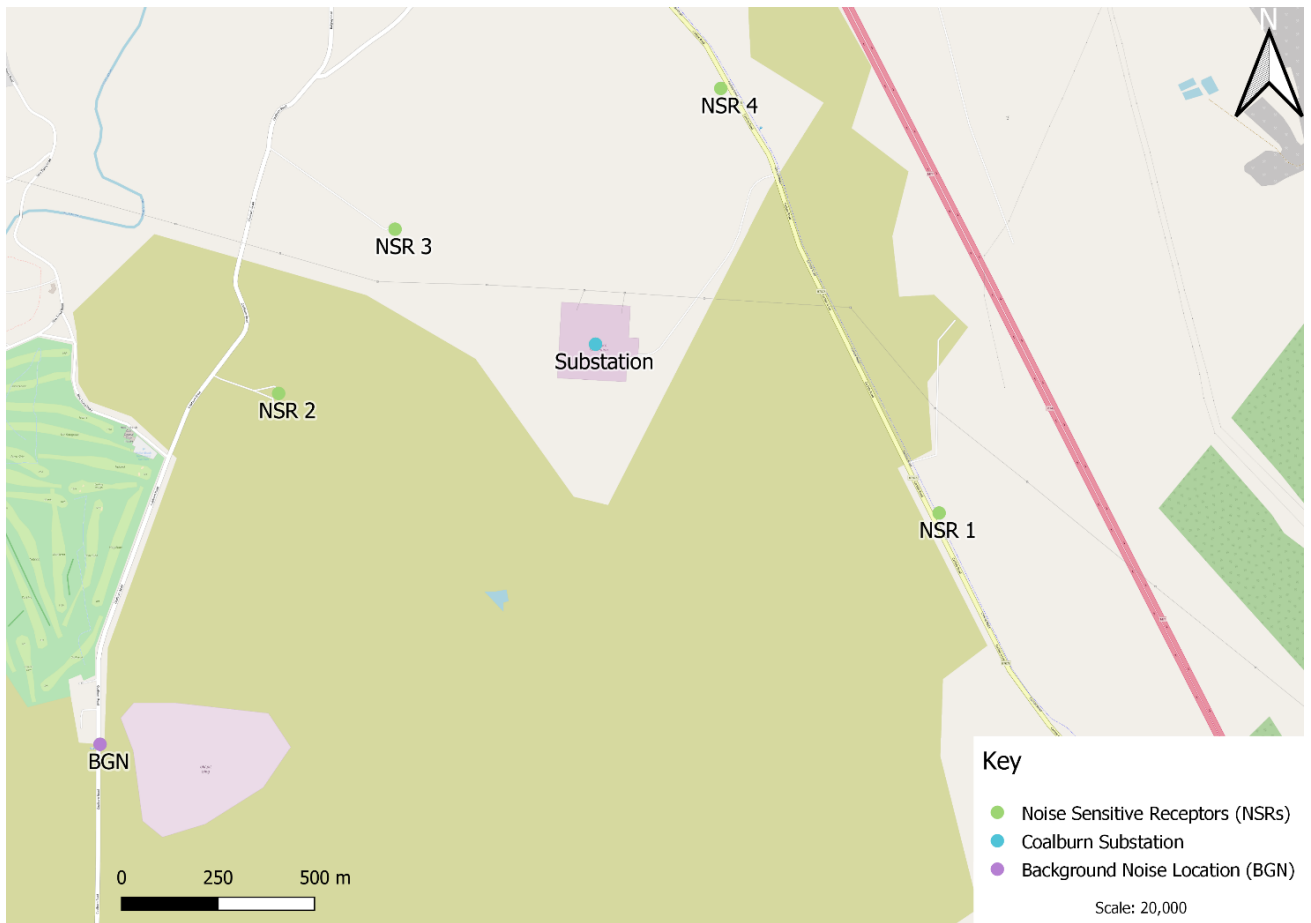


Figure 1.1: Map of the Survey Area

1.5 Acoustic Environment

Table 1-2 provides a subjective description of the acoustical environment for each of the measurement positions, including a description of the measurement position in relation to the property or the existing Substation.

Table 1-2: Measurement Acoustic Environment

Location	Acoustic Description of the Area
NSR 1	Measurement was dominated by noise from the nearby M74. No tonal noise from the Substation could be discerned above the background noise.
NSR 2	Noise from the M74 was diminished at this location, most likely due to topography and shielding by surrounding buildings but remained a dominant site. A nearby small wind turbine to power the farm was present during the measurement. No Substation noise could be discerned above background.
NSR 3	Measurements were dominated by noise from the nearby M74. Dogs from the nearby house and surrounding sheds were barking throughout the measurement, significantly affecting the noise levels measured. This measurement is invalid from the level of unwanted noise.
NSR 4	Measurements were dominated by noise from the nearby M74. No tonal noise from the Substation could be discerned above the background noise.
BGN	Measurements were dominated by noise from the nearby M74. No tonal noise from the Substation could be discerned above the background noise.

1.6 Results

The results of the baseline noise survey are detailed in Table 1-3. The L_{Aeq} and L_{A90} spectra for each NSR are presented in Figure 1.2 and Figure 1.3 respectively.

Table 1-3: Measured Noise Levels

Location	L_{Aeq} (dB)	L_{A90} (dB)
NSR 1	41.8	39.4
NSR 2	31.7	29.8
NSR 3	46.3	37.4
NSR 4	51.3	47.7
BGN	41.3	38.1

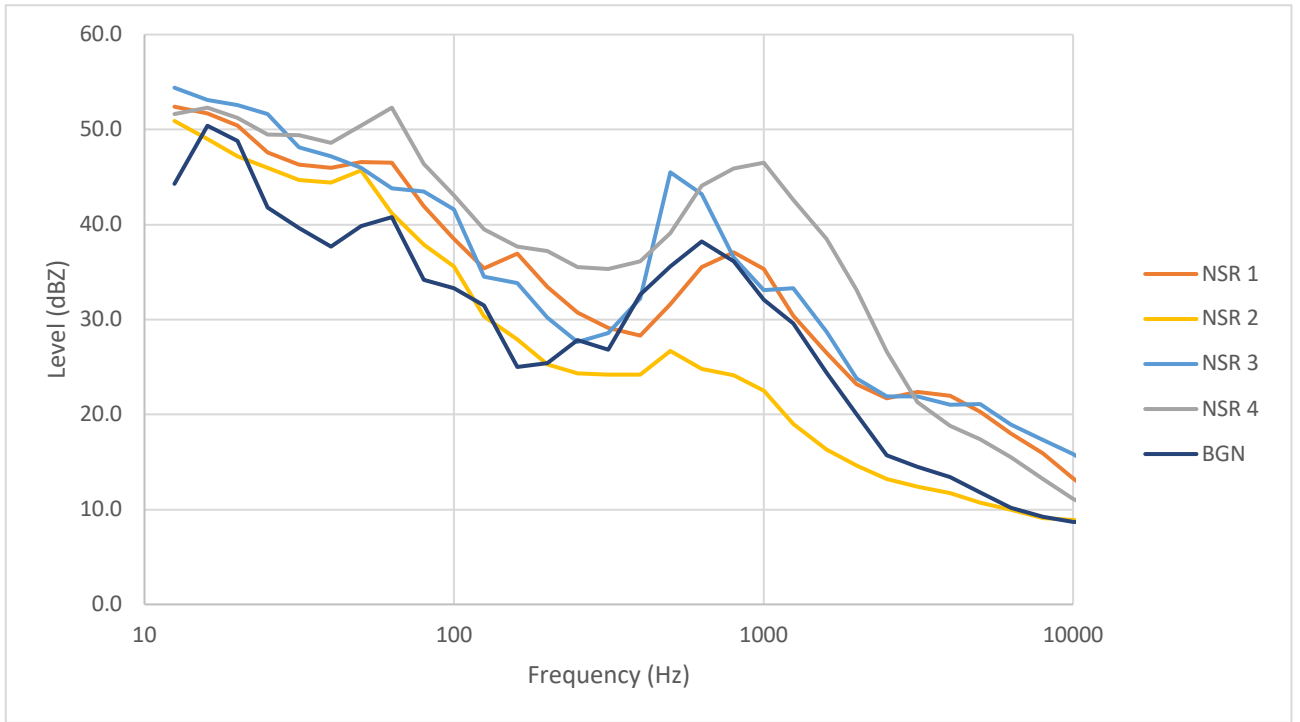


Figure 1.2: Measured Leq Frequency Spectra

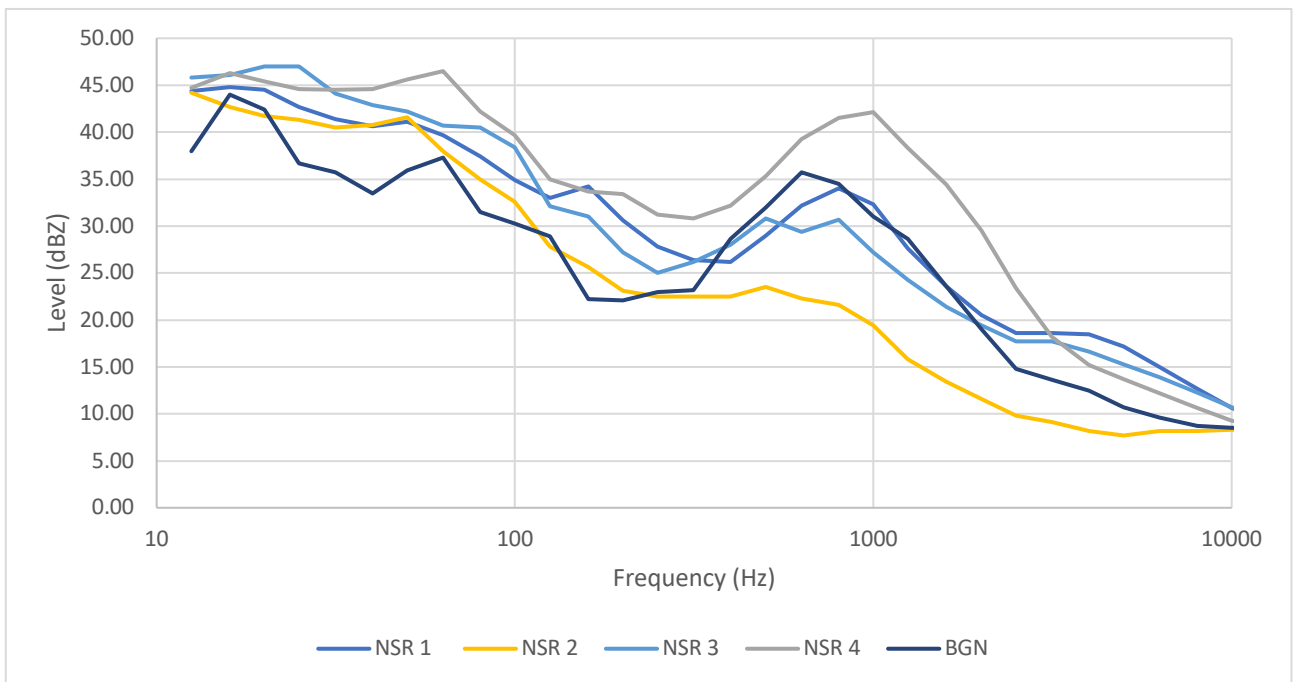


Figure 1.3: Measured L90 Frequency Spectra

2.0 Technical Annex 2 - Equipment Sound Power Level

Conformal surface measurements were carried out around the currently operational transformers to determine their Sound Power Level (SWL) in accordance with the International Electrotechnical Commission (IEC) standard IEC 60076-10¹. The measurements were performed in an approximately free-field environment while the transformers were operational. The measurements were conducted according to the point-by-point sound pressure level (SPL) measurement procedure outlined in the standard.

2.1 Instrumentation

Measurements were conducted using a Rion NL-52 Sound Level Meter (SLM) of serial number (S/N) 00542897 which was spot calibrated with a B&K Type 4231 calibrator (S/N 2052327), before and after the measurement campaign. No drift in calibration results was noted for the survey.

Instrument calibration certificates are available on request.

2.2 Measured Parameters

The following parameters were measured:

- $L_{eq,(10 \text{ seconds})}$.
- One-third octave band spectra.

2.3 Measurement Positions

Measurements were conducted around the transformer at intervals of one metre and at a distance of one metre from the radiating surfaces of the façade at heights of 1.2 m and 2 m.

BGN measurements were also conducted to validate the measurements and also to account for the influence of background conditions. Ideally BGN measurements should be carried along the prescribed contour with the transformer removed from service. However, IEC 60076-10 states that if the BGN level is at least 10 dB below the noise level on the conformal surface around the test object then the BGN can be measured at a single surrogate location. The BGN measurements were carried out at British National Grid (BNG) 282826, 637507.

2.4 Calculation of SWL

2.4.1 Calculation of Surface Area

The area of the measurement surface (S) was calculated using the following formula:

$$S = (h + x)l_m$$

Where:

h is the height of the principal radiating surface in metres;

l_m is the length in metres of the prescribed contour; and

¹ IEC 60076-10, *Power transformers – Part 10: Determination of sound levels*, Edition 2.0, March 2016.

x is the measurement distance in metres from the principal radiating surface to the prescribed contour.

2.4.2 Calculation of Spatially Averaged Sound Pressure Level

The spatially averaged Sound Pressure Levels (SPLs) ($\overline{L_{pA0}}$) were calculated using the following formula:

$$\overline{L_{pA0}} = 10 \times \lg \left(\frac{1}{N} \sum_{i=1}^N 10^{0.1L_{pAi}} \right)$$

Where:

N is the number of microphone positions.

L_{pAi} is the measured total A-weighted SPL of the test measurement at the i^{th} microphone position.

The following formula was used to calculate the level in each one-third octave band, v :

$$\overline{L_{pA0}^v} = 10 \times \lg \left(\frac{1}{N} \sum_{i=1}^N 10^{0.1L_{pAi}^v} \right)$$

The spatially averaged sound pressure levels on the conformal surfaces around the transformers are detailed in Table 2-1.

2.4.3 Measurement Validation

The broadband spatially averaged SPL was compared against background noise levels, L_{bgA} , to validate the measurement. The higher background noise level of 43.5 dB is greater than 10 dB below the spatially averaged SPL, therefore validating the measurements.

2.4.4 Correction for Background Levels

Background noise levels have been accounted for in the calculation, with the lower of the two measurements representing background levels, L_{bgA} . The one-third octave band level values of this representative background level have been logarithmically subtracted from the spatially averaged SPL to give the corrected spatially averaged SPL:

$$\overline{L_{pA}^v} = 10 \times \lg \left(10^{0.1\overline{L_{pA0}^v}} - 10^{0.1L_{bgA}^v} \right)$$

Note that if the background level in a one-third octave band exceeds the spatially averaged SPL, the SWL in that frequency band is taken to be 0 dB(A).

The broadband corrected spatially averaged SPL is calculated through the sum of the one-third octave band values.

$$\overline{L_{pA}} = \sum_{v=20 \text{ Hz}}^{v=20 \text{ kHz}} \overline{L_{pA}^v}$$

The one-third octave band spatially averaged SPL spectra are presented in Figure 2.1 with reference to measured BGN.

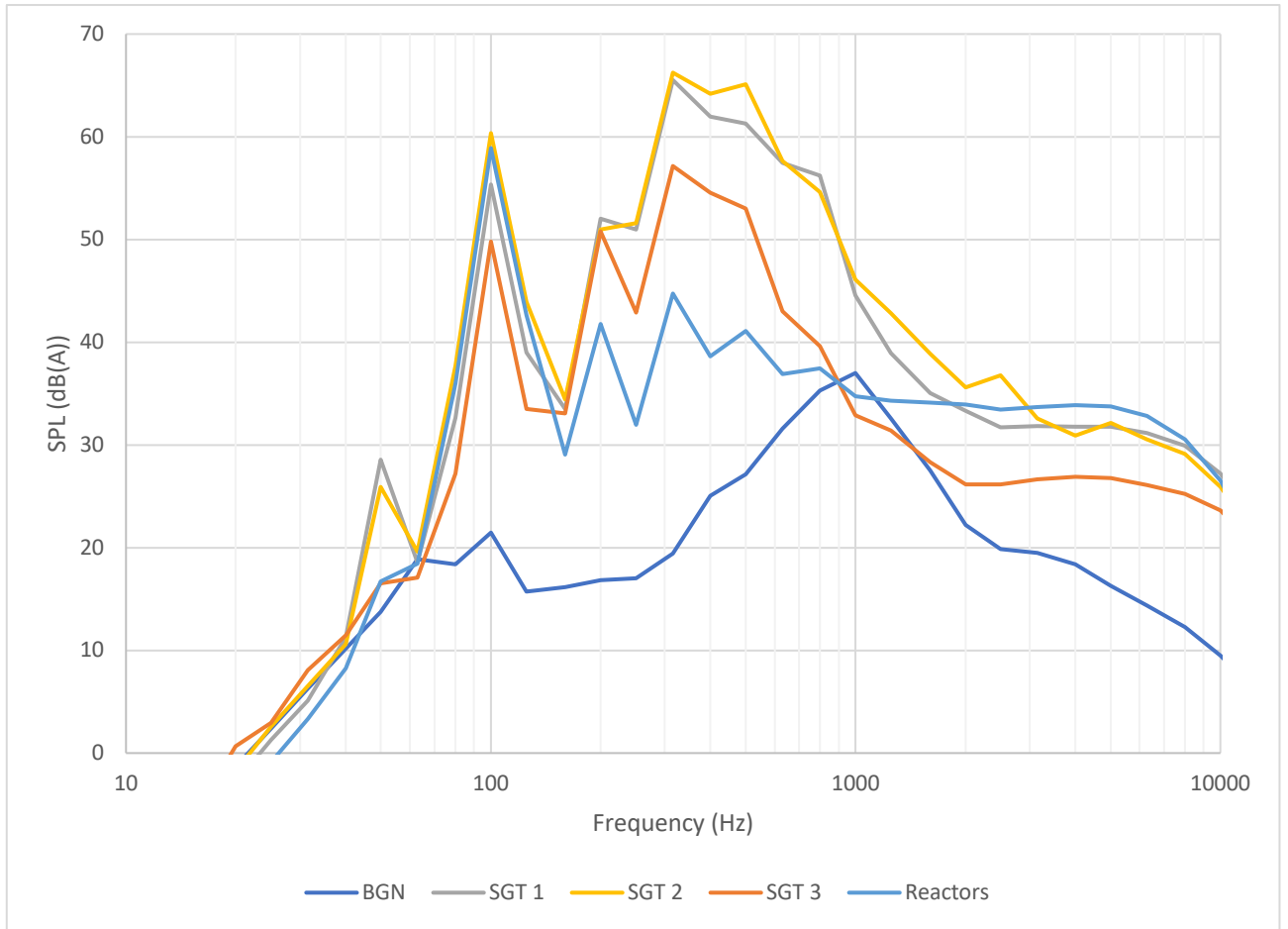


Figure 2.1: Equipment SPL Frequency Spectra

2.4.5 Calculation of Sound Power Level

The total A-weighted SWLs of the transformers (L_{WA}) and the SWL spectra were calculated using the following formulae:

$$L_{WA} = \overline{L_{pA}} + 10 \times \lg \frac{S}{S_0}$$

$$L_{WA}^v = \overline{L_{pA}^v} + 10 \times \lg \frac{S}{S_0}$$

where:

S_0 is the reference area (1 m²).

2.5 Measured Sound Power Levels

The calculated SWLs for the existing transformers at Coalburn 400kV Substation are presented in Table 2-1. The A-weighted SWL spectrum for each transformer is presented in Figure 2.2.

Table 2-1: Equipment SWL Levels

Equipment	Surface Area (m ²)	Background Corrected Spatially Averaged SPL (dB(A))	SWL (dB(A))
SGT 1	144.0	69.1	90.7
SGT 2	144.0	70.9	92.5
SGT 3	161.0	61.0	83.1
Reactors	315.2	59.5	84.5

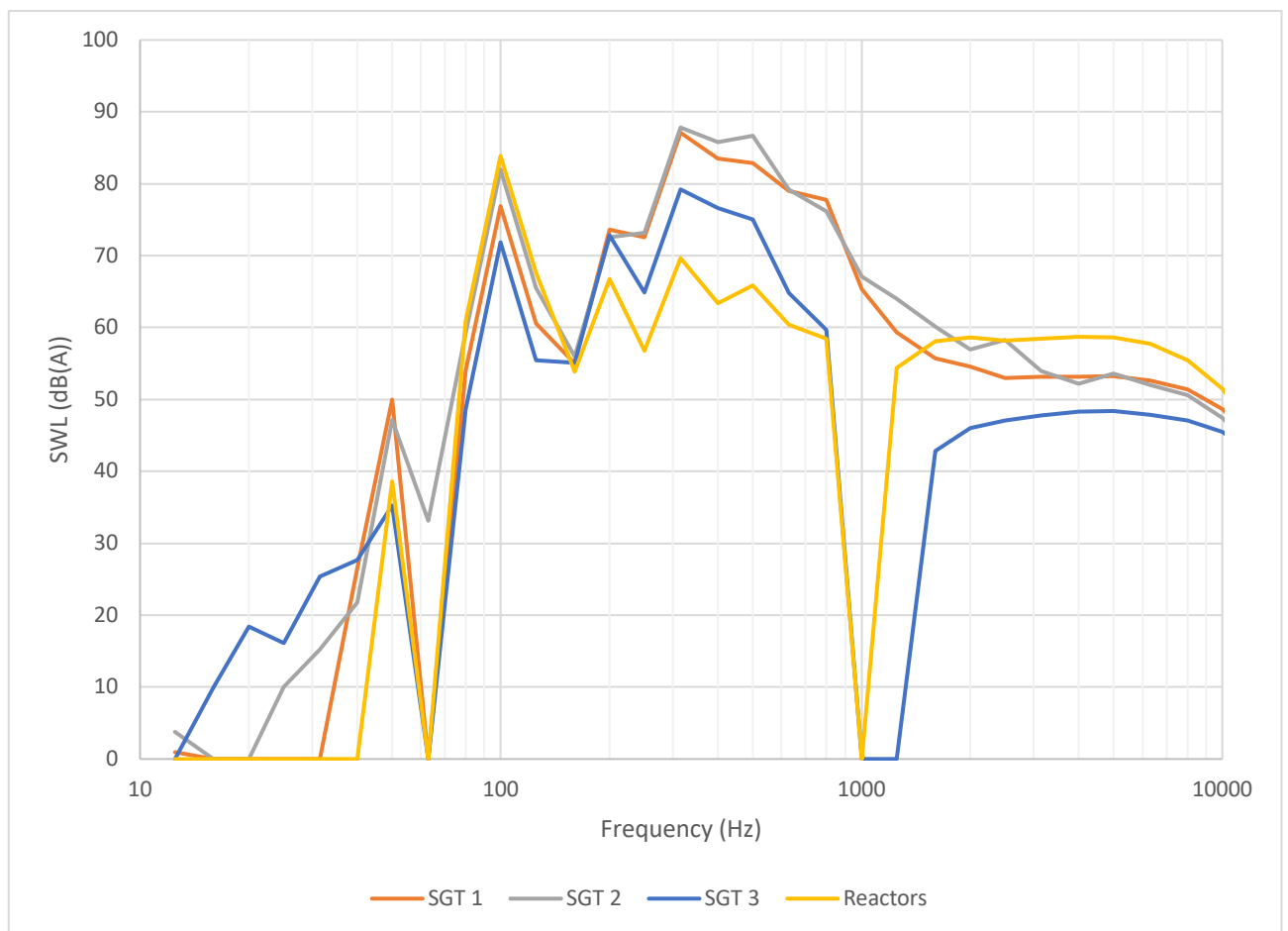


Figure 2.2: SWL Frequency Spectra

Transformers emit noise at frequencies of twice the normal operating current frequency due to magnetostriction of the transformer core. In the UK the supply current frequency is 50 Hz, which results in 100 Hz and harmonics thereof being produced by the transformer. Clear tones at 100 Hz and 200 Hz are observed, and the multiples thereof.

The highest noise emitters on site are SGTs 1 and 2 with a similar SWL of 90.7 and 92.5 dB(A) respectively. These transformers are assumed to be the original and oldest transformers on site.

SGT 3 is the lowest noise emitter on site with a SWL of 83.1. This transformer is assumed as the newest on site, and that SGT 4 will be of similar design.

The Reactors have a SWL of 84.5. This set of equipment have a strong 100 Hz character and less harmonic content than the SGTs.

From the spectral content measured, if elevated levels of 100, 200 and 300 Hz are observed at NSRs this can be linked to substation influence.

It is assumed that any new SGTs (including SGT 4 as part of the Coalburn Substation extension under construction) will operate at a level of 84 dB(A). The new reactors installed on site as part of the Coalburn Substation extension under construction are assumed to operate at the same level of the existing measured during this survey.

3.0 Technical Annex 3 – Construction Noise Impact Assessment

3.1 Scope of Assessment and Methodology

3.1.1 Legislation, Policy and Guidance

British Standard 5228-1:2009 +A1:2014 (BS5228), Code of Practice for Noise and Vibration Control on Construction and Open Sites²

Guidance on the prediction and assessment of noise and vibration from construction sites is provided in British Standard (BS) 5228 2009 +A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise. BS5228-1 provides recommended limits for noise from construction sites.

The Construction Noise Impact Assessment (CNIA) has been carried out according to the ABC method specified in Table E.1 of BS5228-1, in which noise sensitive receptors (NSRs) are classified in categories A, B or C according to their measured or estimated background noise level.

3.1.2 Assessment Modelling

A desk-based construction noise appraisal has been prepared for the purpose of assessing the effects of the land levelling works, civil works, transformer installation, and balance of plant work on any nearby residents. This appraisal has been produced in line with British Standard 5228-1:2009 +A1:2014 (BS5228), Code of Practice for Noise and Vibration Control on Construction and Open Sites.

An estimated construction schedule is outlined in Table 3-1, with likely construction equipment identified in Annex C of BS 5228-1. These works are based upon previous projects of a similar nature due to a schedule not being made available at the time of writing. The activity is analysed to determine the percentage of the construction time each piece of equipment is being used and how many are in use. Using this information, a total equivalent noise level is calculated. The dispersion of this total noise level is then modelled, accounting for distance and ground absorption.

² British Standard 5228: Code of practice for noise and vibration control on construction and open sites (BS 5228), BSI, 2009, amended 2014

Table 3-1: Construction Schedule

Contract Works	Standard Working Hours	Description of Works
1. Platform Works	Mon-Sat 07:00-19:00 Sun 1/2 day (6hrs)	Excavation/material removal and placing at substation extension to create new platform.
2. Civil Works	Mon-Sat 07:00-19:00 Sun 1/2 day (6hrs)	Civils works to create new foundations
3. Buildings	Mon-Sat 07:00-19:00 Sun 1/2 day (6hrs)	Building construction
4. Transformer Installation	Mon-Sat 07:00-19:00 Sun 1/2 day (6hrs)	Transformer installation
5. Balance of Plant Work	Mon-Sat 07:00-19:00 Sun 1/2 day (6hrs)	Equipment installation.
6. Finishing Works	Mon-Sat 07:00-19:00 Sun 1/2 day (6hrs)	Landscaping, fencing etc.

3.1.3 Determining Impact Magnitude and Sensitivity of Receptors

The criteria provided for the ABC method detailed in BS 5228-1 are shown in Table 3-2.

Table 3-2: Construction Noise Impact Assessment Criteria

Assessment category and threshold value period	Threshold value, LAeq (dB)		
	Category A	Category B	Category C
Night time	45	50	55
Evenings and weekends	55	60	65
Daytime and Saturdays	65	70	75

Night time is defined to be between 23:00 and 07:00. Evenings and weekends are defined to be 19:00 – 23:00 on weekdays, 13:00 – 23:00 on Saturdays and 07:00 – 23:00 on Sundays. Daytime is defined to be 07:00 – 19:00 on weekdays and 07:00 – 13:00 on Saturdays.

The NSR is defined as Category A if the ambient noise levels (rounded to the nearest 5 dB) are less than those stated for category A.

The NSR is defined as Category B if the ambient noise levels (rounded to the nearest 5 dB) are equal to those stated for category A.

The NSR is defined as Category C if the ambient noise levels (rounded to the nearest 5 dB) are greater than those stated for category A.

Ambient noise levels for all receptors are below those stated in Category A. Therefore all NSRs are defined as Category A.

3.1.4 Limitations and Assumptions

Estimated noise emissions from the proposed Coalburn North Substation construction noise activities and plant items have been based on previous projects of a similar nature. This assessment considers conservative assumptions with the aim to produce a worst-case assessment. This ensures that in practicality, noise levels would be expected to be lower than the assessment details, and uncertainty is reduced to as minimal as possible.

3.1.5 Assessment of Likely Significant Effects

To calculate the construction noise levels from the work sites for the proposed development, information about the proposed construction activities is needed. The Principal Contractor will be responsible for developing the detailed construction methodology and associated plant requirements following contract award, however, Table 3-3 below shows plant activities, plant items, their quantities, their utilisation, and associated noise levels at a distance of 10 m, based on worst case construction activities at a similar substation construction site. By combining the items' noise levels (LAeq at 10 m (dB)) with the amount of time each will be running (utilisation) and their quantity, the total equivalent noise can be calculated for each row. These are then logarithmically summed to give a total value for the construction noise at 10 m. To ensure a worst-case assessment, it has been assumed that all works will take place simultaneously. Vehicle noise from the access tracks were calculated and assumed to be negligible.

Table 3-3: Worst Case Construction Activities and Associated Noise Levels

Activity	Plant Item	Quantity	Utilisation %	LW (dB(A))	Corrected for quantity and utilisation, LW (dB(A))	Total Equivalent Noise Level at 10 m (dB)
Platform Works	C2.16 tracked excavator	1	50%	103	100	72
	C2.7 tracked excavator	1	50%	98	95	67
	C6.26 articulated dump truck	1	50%	107	104	76
	C1.1 breaker mounted on wheeled backhoe	1	50%	120	117	89
	C5.27 vibratory Roller	1	50%	95	92	64
	C4.88 water pump (diesel)	1	10%	97	87	59
Civil Works	C2.16 tracked excavator	1	50%	103	100	72
	C2.7 tracked excavator	1	50%	98	95	67
	C6.26 articulated dump truck	1	50%	107	104	76
	C4.88 water pump (diesel)	1	10%	97	87	59
Transformer Installation	C4.41 mobile telescopic crane	1	90%	99	79	71
Balance of Plant work	C4.55 telescopic handler	1	50%	99	76	68
Total					118	90

This attenuation has been calculated over mixed hard and soft ground to the F.2.3.2 method in BS 5228. Given the dominance of soft ground in the area surrounding the proposed development, this is slightly conservative. The effects of barriers or topographical screening (landscape bunds) have not been considered.

The assumption of construction activities taking place simultaneously result in an overall sound pressure level at 10 metres to be 90 dB as shown in the bottom row of Table 3-3.

The results of the calculation and assessment against the noise limits for the closest NSR are shown in Table 3-4.

Table 3-4: BS 5228-1 Assessment – All Construction Works

NSR	Distance from site (km)	Category A - Construction Noise Limit (dB)	Construction Noise LAeq (dB)	Construction Noise Limit Exceedance
NSR 1	0.95	65 (Daytime and Saturdays)	47	-18
NSR 2	0.78	65 (Daytime and Saturdays)	48	-17
NSR 3	0.43	65 (Daytime and Saturdays)	54	-11
NSR 4	0.36	65 (Daytime and Saturdays)	56	-9

Based on the calculations, the construction noise at each NSR is comfortably below the 65 dB daytime criteria. NS4 is in excess of the 55 dB evening and weekends criteria by 1 dB, but not the 45 dB night time criterion.

1.1 Mitigation

As part of the impact assessment process, mitigation measures are suggested to minimise the significance of the identified potential impacts. Two types of measures can be distinguished, as follows:

- Mitigation measures, aimed at managing potential impacts of moderate or major significance to reduce residual impacts to an acceptable level.
- Recommendations and good practices aimed at managing potential impacts of minor significance.

No specific mitigation is required as the assessment indicates minor impact significance during day and weekend conditions.

Construction noise will be above background noise, yet, the limit is met according to BS 5228.

Although the limit is met, it is best practice that construction noise should continue to be controlled with a Construction Noise Management Plan (CNMP), in accordance with the guidance and procedures outlined in BS 5228-1. Procedures will include:

- Minimising the noise as much as is reasonably practicable at source.
- Attenuation of noise propagation.
- Carrying out identified high noise level activities at a time when they are least likely to cause a nuisance to residents.
- Providing advance notice of unavoidable periods of high noise levels to residents.

In order to maintain low impact on the noise environment, consideration will be given to attenuation of construction noise at source by means of the following:

- Giving due consideration to the effect of noise, in selection of construction methods.
- Avoidance of vehicles waiting or queuing, particularly on public highways or in residential areas with their engines running.
- Scheduling of deliveries to arrive during daytime hours only. Care should be taken to minimise noise while unloading delivery vehicles. Delivery vehicles should follow routes that minimise use of residential roads.
- Ensure plant and equipment are regularly and properly maintained. All plant should be situated to sufficiently minimise noise impact at nearby properties.
- Fit and maintain silencers to plant, machinery, and vehicles where appropriate and necessary.
- Operate plant and equipment in modes of operation that minimise noise, and power down plant when not in use.
- Use electrically powered plant rather than diesel or petrol driven, where this is practicable.

Working typically will not take place at the weekends, or outside of daytime defined hours.

Consideration will be given to the attenuation of construction noise in the transmission path by means of the following:

- Locate plant and equipment liable to create noise as far from noise sensitive receptors as is reasonably practicable or use natural land topography to reduce line of sight noise transmission.
- Noise screens, hoardings and barriers should be erected where appropriate and necessary to shield high-noise level activities.
- Provide lined acoustic enclosures for equipment such as static generators and when applicable portable generators, compressors and pumps.

In setting working hours, consideration is given to the fact that the level of noise through the normal working day is more easily tolerated than during the evening and night-time. As the work is short term in nature, working can continue into the evenings, as long as the threshold noise levels established in Table 3-2 are adhered to. Construction works should not occur during night.

4.0 Technical Annex 4 – Operational Noise Impact Assessment

4.1 BS4142: 2014 Assessment

4.1.1 Tonality

The main frequencies emitted from transformers are from a 100 Hz tone and harmonics thereof. BS 4142 requires that, when assessing the impact of noise with a tonal component, the noise emitted from the specific sound source is subject to a rating level penalty. Tonal penalties have been determined using the objective 1/3 octave band method. A 6 dB penalty is applicable if the level differences above both of the adjacent 1/3 octaves bands of the tonal element are:

- 15 dB in the low-frequency 1/3 octave bands (25 Hz to 125 Hz)
- 8 dB in the middle frequency 1/3 octave bands (160 Hz to 400 Hz)

From the baseline noise assessment measured data, A-weighted spectra are presented in Figure 4.1. The data show that the sound levels are dominated by broadband noise, due to proximity of the motorway. A small increase in the 100 Hz one-third octave band is observed at NSR 2 and NSR 3; this 100 Hz is likely due to the proposed Coalburn North Substation. The contribution of the substation noise is insignificant in the spectra, and the noise environment is dominated by varying levels of background noise from the nearby motorway and main roads.

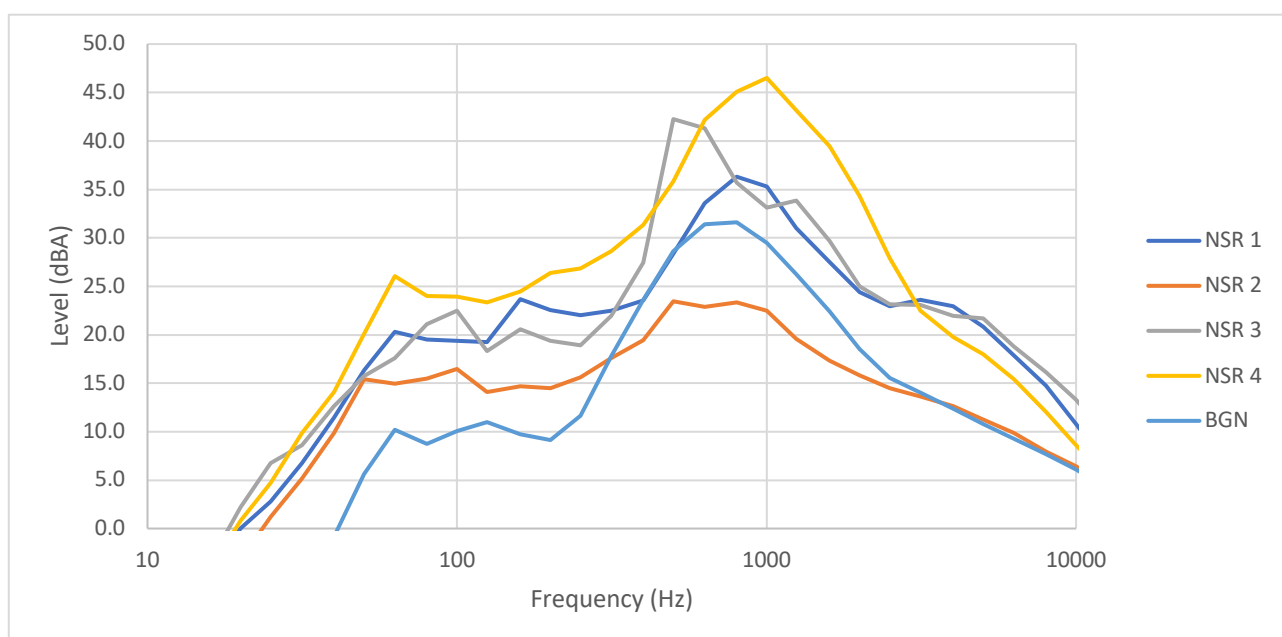


Figure 4.1: A-weighted Spectra

Although no significant tonal noise is identified from the existing Substation, a full 6 dB tonal penalty has been applied to the assessment of the Proposed Development to ensure any tonal noise from new equipment is accounted for. This approach is considered a conservative worst-case method.

4.1.2 BS4142: 2014 Assessment Results

The levels measured at NSRs during the baseline noise survey have been used to inform a BS4142: 2014 assessment. .

BS4142: 2014 states that the greater the excess at receptors, the greater the impact of the specific sound.

- An excess of around 10 dB or more is an indication of significant adverse impact.
- An excess of around 5 dB is an indication of adverse impact.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

A BS4142:2014 assessment of the proposed site has been conducted. A maximum 6 dB tonal penalty has been included to simulate a conservative worst-case approach. The results are presented in Table 4-1.

Table 4-1: BS4142: 2014 Assessment of Proposed North Extension

Receptor	Specific Noise Level (dB(A))	Acoustic Feature - Tonal Penalty	Rating Level (dB(A))	Calculated Background Noise Level (dB(A))	Excess
NSR 1	23.6	6	30	39	-9
NSR 2	24.5	6	31	29	2
NSR 3	26.5	6	32	29	3
NSR 4	23.3	6	30	48	-18

On completion of the planned development works, Coalburn North Substation is predicted to have a maximum excess of 3 dB at NSR 3. This includes a 6 dB tonal penalty that is highly conservative. Even with this penalty the excess is below the 5 dB threshold to be considered an adverse impact. With no tonal penalty, the result would predict all excess values below 0 dB

4.2 Indoor Noise

Indoor noise is assessed in this section. This assessment is carried out in accordance with BS 8233:2014 Guidance on sound insulation and noise reduction for buildings in order to meet limits set out by the local Environmental Health department.

4.2.1 Conditions

Following input from South Lanarkshire Environmental Health undertaken for the Coalburn Substation Extension, the following conditions have been established in relation to indoor noise from the proposed development:

1. The internal noise levels from the development at any residential noise sensitive receptor shall comply with BS 8233:2014 Guidance on sound insulation and noise reduction for buildings as follows-

- The internal levels with windows open do not exceed an $L_{Aeq,16hr}$ of 40 dB daytime (07:00 - 23:00)
 - The internal levels with windows open do not exceed an $L_{Aeq,8hr}$ of 30 dB night-time (23:00 - 07:00).
2. The Internal Noise Rating Values, from the development, as measured within any residential property shall not exceed-
- NR25 between 23.00hrs and 08.00hrs
 - NR35 between 08.00hrs and 23.00hrs

Assessment to these limits is carried out in the following sections.

4.2.2 Internal Levels

The external noise levels and spectra have been considered at each receptor. A external to internal noise calculation has been performed on the basis of a partially opened window. The small element parameter level difference ($D_{n,e}$) has been assumed from NANR116: Sound Insulation through Ventilated Domestic Windows.

The level difference values are taken from a window opening of 200k (mm²) presented in Table 4-2.

Table 4-2: Level Difference Through a Partially Open Window NANR116

Opening Size	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4 kHz	$D_{n,e}$
200k (mm ²)	20	14	14	16	14	17	19	16

The results of the internal noise assessment are presented in Table 4-3.

Table 4-3: Level Difference Through a Partially Open Window NANR116

NSR	Level dB							
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4 kHz	Total
NSR 1	22.4	18.3	12.0	7.0	-4.1	-26.0	-41.9	24.2
NSR 2	20.7	17.9	11.3	6.7	-6.1	-28.0	-47.6	22.9
NSR 3	21.7	17.9	11.1	5.1	-7.6	-30.1	-42.9	23.5
NSR 4	24.2	20.2	14.2	9.0	-1.1	-19.6	-32.8	26.0

4.2.3 Internal Levels With Windows Open

The local Council has set the following limits on internal noise levels:

- should not exceed an $L_{Aeq,16hr}$ of 40dB daytime (07:00 - 23:00)
- should not exceed an $L_{Aeq,8hr}$ of 30dB night-time (23:00 - 07:00).

Both conditions are met for both the existing Substation, the extension and the proposed Coalburn North Substation. A low impact is predicted.

4.2.4 NR Curves

As the noise from the Substation is steady state and continuous, it will not vary between day-time and night-time. The background noise is also not considered in these assessments. For this reason, the lower limit is used here as a worse case assessment (NR25).

For the existing site, the noise rating curves are presented against the octave bands of the specific noise at each receptor in Figure 4.2.

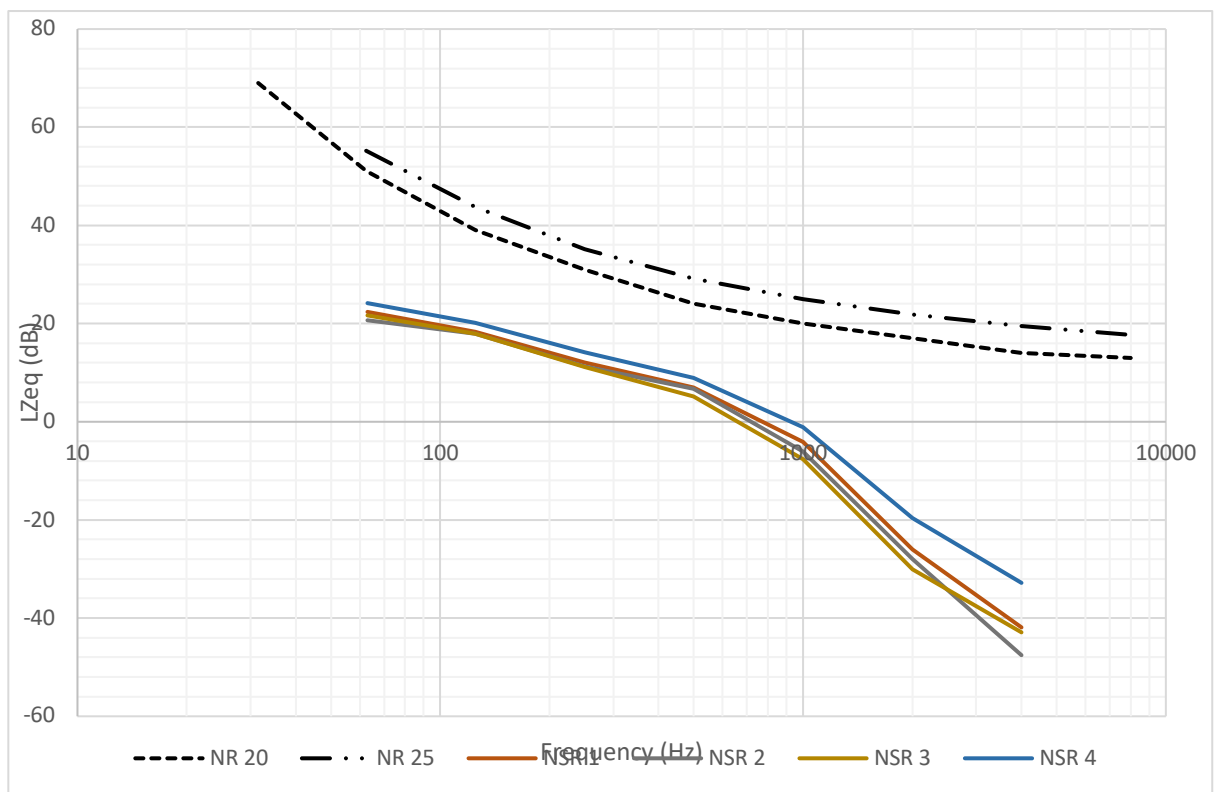


Figure 4.2: NR Curve Assessment

All spectra fall well below NR 25, with the vast majority of the octave bands falling below an NR 20 curve. Negligible impact is predicted in terms of internal noise.

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