Volume 5: Appendix 6.5 – Peatland

Carbon Emissions Assessment

CONTENTS

1. INTRODUCTION

1.1 Summary of Engagement

1.1.1 This Peatland Carbon Emission Assessment (PCEA) is an Appendix to **Volume 1, Chapter 6: Scope and Consultation** and uses calculations prepared on behalf of the Applicant to support the Environmental Impact Assessment Report (EIAR) for the Kintore to Tealing 400 kV OHL (the 'Proposed Development') due to identification of the presence of peat in the area of Durris Forest in Aberdeenshire (between Towers N77 and N83). This Appendix is not intended to be read as a standalone assessment and reference should be made to the introductory chapters of this EIAR (**Volume 1, Chapters 1-6**), **Volume 2, Chapter 13: Hydrology, Hydrogeology, Geology and Soils, Volume 5, Appendix 13.3: Peat Depth Survey Report, Appendix 13.4: Outline Peat Management Plan and Appendix 13.6 Peat Landslide Hazard and Risk Assessment (PLHRA)**.

1.1.2 This PCEA has been developed in alignment with **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)** which addresses the management of peat during the construction phase of the Proposed Development and the restoration of the site both during construction and post-construction. In accordance with SEPA guidance, as much peat as possible is to be re-used in restoration on site. Following discussion with FLS, an opportunity has been identified to support objectives of the Durris (Forest) Land Management Plan (LMP) 2024-2034 by reusing peat extracted for the Proposed Development in areas where it has the potential to deliver the best outcomes for peatland restoration in proximity to the Proposed Development.

1.1.3 The **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)** will be further developed and implemented in consultation with SEPA, NatureScot and Aberdeenshire Council as statutory consultees and Forestry and Land Scotland (FLS) as landowner. Further details and specific plans will be determined during the detailed design process and once further site investigations have been undertaken. These details will then be included in a detailed Peatland Management Plan as a part of the Principal Contractors Construction Environmental Management Plan (CEMP). The responsibility for the implementation of the Peat Management Plan will be with the Principal Contractors.

1.1.4 The potential volumes of carbon emitted due to the Proposed Development are based on the volumes of peat predicated to be extracted and re-used, and have been calculated using a modelled peat contour plan developed on a high-density probing grid where excavations are proposed to be undertaken (see **Volume 5, Appendix 13.3: Peat Depth Survey Report)**.

1.2 Objectives

1.2.1 This PCEA has been developed to quantify the carbon emissions from the disturbance of peat as a result of the construction and operation of the Proposed Development.

1.2.2 In line with the National Planning Framework (NPF4)[1], in particular Policy 5 Soils which aims to protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development (see **Section 2.2 Relevant Policy and Background** for further details), this assessment and the accompanying assessments propose mitigation measures in line with **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)** that will minimise any impacts to peat and management methods to protect excavated peat, and therefore reduce the lifecycle greenhouse gas emissions as far as possible.

1.3 Structure

The structure of the PCEA is as follows:

- Section 2 provides more detail on the Proposed Development and the importance of peatlands to carbon sequestration;
- Section 3 sets out the assessment methodology for the Peatland Carbon Emissions Assessment;
- Section 4 presents the baseline conditions for peatland across the Proposed Development;

[1] Scottish Government, (2023). *National Planning Framework 4.* [Online] Available at: https://www.gov.scot/publications/national-planning-framework-4/

- Section 5 sets out the results of the assessment of effects of the Proposed Development on peat carbon emissions; and
- Section 6 presents the summary of the assessment and conclusions.

2. BACKGROUND

2.1 Peatlands

2.1.1 Peatlands are environments in which waterlogged conditions prevent the complete decomposition of organic material, leading to the accumulation of peat. This process contributes to carbon sequestration, as the 'locking away' of peat or partially decomposed organic matter into the soil prevents the carbon from being released into the atmosphere as carbon dioxide (CO_2). Peatlands are therefore important environments when considering climate change mitigation, in addition to their importance in terms of biodiversity and the hydrological environment.

2.1.2 In the UK, peatlands cover approximately 12% of the nation's land area (approximately 3 million hectares), and store approximately 3.2 billion tonnes of carbon. Approximately 80% of these peatlands have been impacted by human activity, for example through drainage, peat harvesting, burn management and livestock grazing. However, the importance of these environments has started to be recognised more recently, and now the impacts of infrastructure developments on peatland and carbon-rich soils must be assessed in order to avoid possible disturbance to these environments where possible.

2.1.3 Developments have the potential to adversely impact the amount of carbon sequestered / stored in peat through direct disturbance and excavation during construction, and through indirect impacts to peatland functioning. Peat restoration and reuse associated with developments can also improve carbon stores. These impacts have implications for future climate change, as a reduction in carbon sequestration in peatlands allows more carbon dioxide to accumulate in the atmosphere, resulting in enhance climate change, or vice versa, improvement of carbon stores in peatland can mitigate climate change.

2.2 Relevant Policy and Guidance

2.2.1 Relevant policy and guidance documents have been reviewed and considered as part of this assessment.

Policy - National Planning Framework 4

2.2.2 National Planning Framework 4[1] (NPF4) is the Scottish Government's national spatial strategy, which sets out spatial principles, regional priorities, national developments, and national planning policy. Adopted in February 2023, it emphasises the importance of peatland and carbon-rich soils in sustainable development through changes to the national planning policy.

2.2.3 Policy 5 – Soils aims to protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development:

"c) Development proposals on peatland, carbon-rich soils and priority peatland habitat will only be supported for: Essential infrastructure and there is a specific locational need and no other suitable site;

[…]

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."

2.2.4 This Policy indicates new understanding and consideration of the potential impacts on peatland, carbon-rich soils and potential loss of carbon from these carbon stores, and their association with climate change, required for consent applications. This Appendix has therefore been produced to consider these potential impacts in line with planning policy.

2.2.5 Policy 2 – Climate Mitigation and Adaptation is also relevant as it aims to encourage, promote and facilitate development that minimises emissions and adapts to the current and future impacts of climate change:

"a) Development proposals will be sited and designed to minimise lifecycle greenhouse gas emissions as far as possible.

b) Development proposals will be sited and designed to adapt to current and future risks from climate change.

c) Development proposals to retrofit measures to existing developments that reduce emissions or support adaptation to climate change will be supported."

2.2.6 Part a) of Policy 2 is of particular relevance to this assessment, as although a full lifecycle assessment of greenhouse gas emissions is not being completed for the Proposed Development (please see **Section 14.6.5** in **Volume 5, Appendix 6.1 Scoping Report** for further details), potential emissions from peatland disturbance would be included in that assessment and therefore should be minimised as far as possible.

Guidance - Advising on Peatland, Carbon-rich Soils and Priority Peatland Habitats in Development Management (NatureScot, 2023)[2]

2.2.7 NatureScot's 2023 guidance on Peatland, Carbon-rich Soils, and Priority Peatland Habitat was published in order to provide developers and decision makers with consistent advice on the assessment of effects of any development proposals on the aforementioned habitats or environments. The guidance was produced to support NPF4, and should be used for proposals affecting land which is not protected for its peatland interest.

2.2.8 To support this assessment, this guidance provides definitions for carbon-rich soils and priority peatland habitat, as well as detailing potential direct and indirect impacts from development on peatland.

2.3 The Proposed Development

2.3.1 The construction and operation of the Proposed Development has the potential to impact peatlands and carbon-rich soils.

2.3.2 The Proposed Development is described in full in **Volume 1, Chapter 3: Project Description.** The following works, required as part of the Proposed Development, or to facilitate its construction and operation, are of relevance to the potential impact on peat and carbon-rich soils through excavation and disturbance and are therefore included in this PCEA:

- New steel lattice towers, as well as the temporary tower pads required for their construction, have the potential to impact peat and carbon-rich soils through excavation and disturbance, and are therefore included in this peat carbon assessment.
- The formation of access tracks (permanent and temporary) and the installation of watercourse crossings to facilitate access;
- Temporary working areas and Equipotential Zones (EPZs) around infrastructure to facilitate construction; and
- Permanent realignment works required to existing 132 kV and 275 kV OHLs to enable the construction of the Proposed Development including the temporary diversion works required to construct the permanent realignments.

2.3.3 The assessment focuses on the Limit of Deviation (LOD) for the OHL as described in **Volume 1, Chapter 3: Project Description.** This represents the area within which impacts to peat are most likely, particularly from direct excavation or disturbance during construction. The assessment then considers the proposed infrastructure footprint within the LOD, where the infrastructure is located on peat, to determine the potential impact on the peat carbon characteristics of the Proposed Development

2.3.4 Within the EIAR, **Volume 5, Appendix 13.3: Peat Depth Survey Report**, **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)** and **Volume 5, Appendix 13.6 Peat Landslide and Hazard Risk Assessment (PLHRA)** detail the surveys and assessments undertaken to consider peat depth, peat excavation and reuse, and peat slide risk. These appendices inform the assessment of the potential impact of the Proposed Development on carbon sequestration or storage.

---

[2] NatureScot, (2023). *Advising on Peatland, Carbon-Rich Soils and Priority Peatland Habitats in Development Management.* [Online] Available at: https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management (Accessed: May 2025)

2.3.5 The peat carbon assessment evaluates the potential impact of the Proposed Development on the following aspects of peat:

- Peat Carbon Storage – the total quantity of carbon stored within the peatland, measured in tonnes of carbon dioxide equivalent (tCO_2e); and
- Peat Carbon Flux Rate – the carbon emission (loss) or sequestration (uptake) rate of the peatland, measured in tonnes of carbon dioxide equivalent per five years (tCO_2e per 5 years).

2.3.6 This Appendix includes a peat carbon assessment for the sections of the Proposed Development where peat and carbon-rich soils are present, specifically between Towers N77 and N83 in Durris Forest where peat probing has identified Class 4 and 5 peat, see **Volume 5, Appendix 13.3: Peat Depth Survey Report**. The assessment follows national guidance on peatland management and carbon-rich soils, including SEPA and Scottish Government best practice. It includes detailed peat depth probing, excavation volume calculations, and a peat reuse and restoration strategy. Although no Outstanding Universal Value (OUV) designation applies to the peatlands along this alignment, the principles of carbon conservation and minimisation of peat disturbance have been applied throughout the design and assessment process.

3. ASSESSMENT METHODOLOGY

3.1 Scope of Assessment

3.1.1 The scope of the peat carbon assessment solely includes the potential impact of the Proposed Development on peat carbon storage and peat carbon flux rate. This assessment does not constitute a full life cycle or embodied carbon assessment, which has been scoped out of the EIA, as it is assumed that the total carbon emissions embedded into material and components associated with infrastructure is not predicted to be significant in relation to the carbon savings of the Proposed Development as it supports carbon reduction targets at a national level (please see **Section 14.6.5** in **Volume 5, Appendix 6.1: Scoping Report** for further details).

3.2 Study Area

3.2.1 The baseline peat carbon store of the Proposed Development's LOD has been assessed. These constitute the maximum extent within which the Proposed Development can be built, in terms of the key components of the project, in this case each of the new steel lattice towers being installed and access tracks.

3.2.2 The horizontal LOD (relevant to the areas of the Proposed Development in which peat is present), for which consent is sought, is as follows:

- OHL (steel lattice) – approximately 200 m total LOD (100 m either side of the centre line) for suspension towers; and
- Access tracks – approximately 200 m total LOD (100 m either side of the centre line) for new access tracks.

For the assessment of direct impacts, the PCEA assessment utilises the data collected for the EIAR (detailed in **Volume 5, Appendix 13.3 Peat Depth Survey Report** and **Volume 5, Appendix 13.4 Outline Peat Management Plan (PMP)**) to inform the calculations. The methods and extent of the field data are detailed in those Appendices.

3.2.3 The peat carbon assessment only includes areas within the LOD that are designated as Class 4 and Class 5 peat soils on the SNH Carbon and Peatland 2016 Map[3]. Areas of peat likely to be of high conservation value (Class 1, 2, and 3 peatland areas) were avoided through design. The assessment focuses on areas where peat is present and potentially impacted by the Proposed Development, particularly in Section E (Durris Forest).

3.3 Methodology

3.3.1 The methodology for the peat carbon assessment has been developed by WSP and is used within the EIAs for SSEN Transmission's Accelerated Strategic Transmission Investment (ASTI) projects where relevant. The methodology is described in more detail in the following sections.

Part 1: Impact Screening

3.3.2 The initial part of the assessment relates to completing a desk study to identify whether the Proposed Development is likely to have 'direct' or 'indirect' impacts on peatlands. This should consider all likely direct and indirect impacts, from both permanent and temporary infrastructure. This part of the methodology should constitute use of site-specific information (for example, results of other field surveys) and mapping, such as the Carbon and Peatland 2016 Map.

Part 2: Peat Surveys & Site Probing

3.3.3 Once it has been determined that there is the potential for the Proposed Development to impact peatland, peatland surveys and peat probing should be conducted in order to collect the required data to quantify and assess the potential impact on peat carbon. These surveys allow the understanding of the baseline peat depths, peat condition, and peat stability, and the results inform the baseline peat carbon values within the peat carbon assessment. The peat surveys completed for the Proposed Development are detailed in **Volume 5, Appendix 13.3 Peat Depth**

[3] SNH, (2016). *Carbon and Peatland 2016 map* [Online] Available at Carbon and Peatland 2016 map | NatureScot (Accessed: April 2025).

Survey Report and **Volume 5, Appendix 13.4 Outline Peat Management Plan (PMP)** and their methodologies and results are not repeated within this Appendix.

Part 3: Peat Carbon Assessment

Peat Carbon Calculator

3.3.4 The peat carbon assessment has been completed using a bespoke 'Peat Carbon Calculator' developed by WSP for use in the SSEN Transmission ASTI EIA Framework, to support the assessment of carbon emissions from peatland disturbance.

3.3.5 The Peat Carbon Calculator draws on input from the Scottish Government's Carbon Calculator Tool for Wind Farm Developments on Peatlands[4], in order to estimate carbon stores lost through peatland removal using the tool's peat-related coefficients. The calculator also utilises input from the Peatland Code Emissions Calculator[5] to determine the changes in carbon emissions due to impacts on peatland condition.

3.3.6 The Peat Carbon Calculator includes consideration of both direct and indirect impacts to peatland. NatureScot's 2023 guidance on peatland and carbon-rich soils define direct and indirect impacts to peatland as follows:

- Direct Impacts – comprise a loss of resource and habitat lost or damaged during construction and operation; and
- Indirect Impacts – comprise the loss of function, which may arise from temporary or permanent changes in drainage patterns and the quality or quantity of surface and ground water.

3.3.7 The Peat Carbon Calculator provides values for two scenarios:

- No Impact Scenario – baseline storage and emissions with no project impact; and
- Project Impact Scenario – storage and emissions including the impact of the project over four timeframes (pre-construction, during construction, post construction at 2-5 years, and post construction at 50 years).

3.3.8 The 'No Impact Scenario' determines the pre-construction baseline condition of the peatland (as informed by site surveys) and then predicts the future peatland emissions over the lifetime of the project under a no intervention scenario.

3.3.9 The 'Project Impact Scenario' takes the pre-construction baseline condition of the peatland, and then predicts the impact of the scheme design and temporary construction on the baseline (during construction stage), the impact of the scheme design and post construction enhancement in the short-term (post construction at 2-5 years), and the impact of the scheme design and post construction enhancement in the long-term (post construction at 50 years).

Carbon Storage

3.3.10 The following data is used to quantify the impact of the Proposed Development on peat carbon storage:

- Total area of peat (m^2) not impacted by the Proposed Development;
- Average depth of peat (m) that is not impacted by the Proposed Development;
- Total area of peat (m^2) directly impacted by the Proposed Development;
- Average depth of peat (m) that is directly impacted by the Proposed Development;
- Total area of peat (m^2) indirectly impacted by the Proposed Development;
- Average depth of peat (m) that is indirectly impacted by the Proposed Development;
- Total area of peat (m^2) to be restored following construction of the Proposed Development;
- Average depth of peat (m) to be restored following construction of the Proposed Development;
- Carbon content of dry peat (%) for all not impacted, directly / indirectly impacted, and restored peat; and

[4] Scottish Government, (2022). *Carbon Calculator for Wind Farms on Scottish Peatlands: Factsheet.* [Online] Available at: https://www.gov.scot/publications/carbon-calculator-for-wind-farms-on-scottish-peatlands-factsheet/(Accessed: April 2025)
[5] IUCN UK Peatland Programme, (2023) *Peatland Code Emissions Calculator (Version 2).* [Online] Available at: https://ofgorganic.org/certification/peatland-code (Accessed: April 2025).

- Bulk density (kg/m^3) for all not impacted, directly / indirectly impacted, and restored peat.

3.3.11 This data is used to determine:

- The volume of peat and carbon stored in the 'no impact' scenario or baseline for the Proposed Development for the short, medium and long term.
- The volume of peat directly / indirectly impacted as a result of the Proposed Development.
- This value is then used to calculate the carbon loss in kilograms associated with this volume of peat being disturbed, which is then converted into tonnes of CO_2 equivalent. This value is subtracted from the 'no impact' scenario baseline to provide a 'During Construction' baseline.

3.3.12 Restoration is considered by adding the amount restored peat carbon storage to this 'During Construction' baseline to result in a 'Post Construction' baseline for the short- and long-term.

Carbon Flux Rate

3.3.13 Potential impacts to the peat carbon flux rate is calculated in the Peat Carbon Calculator using information on the peatland condition, which is sourced from peatland condition surveys.

3.3.14 The Peat Carbon Calculator utilises the peatland condition categories detailed in the Peatland Code Field Protocol[6] which constitute:

- Actively Eroding: Hagg / Gully – A linear feature of bare peat that is actively eroding within hagg / gully system that needs reprofiling or artificial drains which have opened up to the point that they are bare and actively eroding and require reprofiling.
- Actively Eroding: Flat Bare – Bare peat that is actively eroding and requires intervention to revegetate.
- Drained: Artificial – Within 30 m of an active artificial drain.
- Drained: Hagg / Gully – Within 30 m of an actively eroding hagg / gully drainage system or within 30 m of a vegetated hagg / gully drainage system.
- Modified – Evidence present that it is still a degraded system, with exhibiting features that show sub-optimal condition such as no / little Sphagnum, Calluna vulgaris or other non-bog vegetation extensive, and small discrete patches of bare peat frequent.
- Near Natural – Sphagnum dominated, Calluna vulgaris absent or scarce, and little or no bare peat.

3.3.15 These peatland condition categories are used in the Peat Carbon Calculator to determine the change in the peat carbon flux rate due to the Proposed Development. The following data is used to quantify the impact of the Proposed Development on the peat carbon flux rate:

- Total area of peat (m^2) within each condition category that will not be impacted by the Proposed Development;
- Total area of peat (m^2) within each condition category that will be directly impacted by the Proposed Development;
- Total area of peat (m^2) within each condition category that will be indirectly impacted by the Proposed Development; and
- Total area of peat (m^2) within each condition category that will be restored following construction of the Proposed Development.

3.3.16 As with the peat carbon storage assessment, the areas of each of the peatland condition categories and associated emission factors are used to establish the baseline peat carbon flux rate of the peatland by totalling the peat carbon flux rate values of the directly impacted, indirectly impacted and not impacted peat.

3.3.17 The impact on the peat carbon flux rate due to the Proposed Development is calculated by subtracting the peat carbon flux rate value from the directly impacted peat from this baseline resulting in the 'During Construction'

[6] IUCN UK Peatland Programme, (2023) *Peatland Code Field Protocol (Version 2).* [Online] Available at: https://ofgorganic.org/certification/peatland-code (Accessed: May 2025).

baseline. Restoration is considered by adding the peat carbon flux rate value of restored peat to this ‘During Construction’ baseline to result in a ‘Post Construction’ baseline for the short- and long-term.

Peat Carbon Assessment

Baseline Conditions

3.3.18 Given the length of the Proposed Development (approximately 105.2 km of new 400 kV double circuit OHL), and the targeted avoidance of Class 1, 2, and 3 peatland areas, the peat carbon assessment focuses on areas designated as Class 4 and Class 5 peat soils within the LOD, as identified using the Carbon and Peatland 2016 Map. The depth of the peat across the LOD has been assumed to be the average peat depth collected through the peat probing surveys. This total area has been used in the Peat Carbon Calculator to determine the baseline peat carbon store of the peatland within the LOD of the Proposed Development. The baseline peat carbon flux rate has been calculated using available peatland condition data from surveyed areas, particularly in Section E (Durris Forest), where peat is present.

Direct and Indirect Impacts on Peat Carbon

3.3.19 The assessment of direct impacts on peat carbon storage for the Proposed Development has utilised peat depth and infrastructure area data consistent with the peat balance calculations presented in **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP).** The assessment of direct impacts on peat carbon flux rate has used available peat condition data from surveyed areas, particularly in Section E (Durris Forest), where peat is present and condition was assessed.

3.3.20 The average peat depth in these areas is 0.75 m, based on core data from the **Volume 5, Appendix 13.3: Peat Depth Survey Report** (Core IDs 10 and 11). As site-specific data for bulk density and carbon content of dry peat were not available, the Peat Carbon Calculator default values of 175 kg/m³ and 55% respectively were used. The infrastructure area directly impacting peat carbon storage includes tower foundations and temporary working areas at Towers N77 and N78, totalling 7,626.32 m².

3.3.21 The following infrastructure types located on peat have been included in the assessment of direct impacts on peat carbon storage:

- Permanent tower bases;
- Permanent access tracks;
- Temporary tower pads; and
- Temporary access tracks

3.3.22 To improve consistency between the peat balance calculations and the Peat Carbon Calculator outputs, minor adjustments were made to the average peat depths used for certain infrastructure types. These adjustments ensured that the calculated volumes of impacted peat aligned more closely with those derived from infrastructure-specific peat depth data, as detailed in **Table 13.4.1: Peat Excavation Volumes for Scenario 3** of **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)**.

3.3.23 The Peat Carbon Calculator uses peatland condition categories defined by the Peatland Code Field Protocol. Where condition data was not available, conservative assumptions were applied using categories with higher emission factors (eg “Modified”) to represent a worst-case scenario. For the directly impacted area, 11.3% was classified as Modified peatland, and the remainder as Forested/Previously Forested (37.3%) or Not Peatland (51.4%), based on the distribution of 2,826 probe points in the **Volume 5, Appendix 13.3: Peat Depth Survey Report**.

3.3.24 Indirect impacts on peat carbon storage were assessed based on the infrastructure areas adjacent to Towers N77 and N78, which total 13,512 m² (6,850 m² at N77 and 6,662 m² at N78). The peat areas that fall within the LOD and are considered indirectly impacted due to potential hydrological changes. The average peat depth in these areas was also assumed to be 0.75 m, consistent with the core data. The Carbon and Peatland 2016 Map was used to confirm the presence of Class 4 and 5 peat in these zones.

3.3.25 Due to insufficient peatland condition data for indirectly impacted peatland areas, the conservative assumptions used for direct impacts were applied to the indirectly impacted area in the calculator, with 11.3% of the area assumed to be Modified peatland.

3.3.26 Peatland restoration included in the peat carbon assessment comprises the redressing and reinstatement of peat around permanent and temporary infrastructure, as detailed in **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)**. The restored area was recorded as 426.32 m², with a peat depth of 0.3 m, and was included in the Peat Carbon Calculator to estimate the restoration benefit.

3.4 Embedded Mitigation

3.4.1 Embedded mitigation has been incorporated throughout the design of the Proposed Development, from route selection through alignment refinement and EIA stages. Measures to minimise peat disturbance are embedded in the design and construction methodology, in line with SSEN Transmission's standard practices and relevant guidance. These measures are detailed in **Volume 1, Chapter 3: Project Description** and **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)**. The following embedded mitigation measures have been applied to the Proposed Development:

- Avoidance of peatland where feasible during route selection, informed by peat depth probing and the Carbon and Peatland 2016 Map, as documented in **Volume 5, Appendix 13.3: Peat Depth Survey Report**.
- Use of existing access tracks where practicable to reduce new ground disturbance.
- Floating stone roads proposed in areas of deeper peat to avoid excavation, subject to ground investigation and design validation.
- Minimisation of excavation volumes through micrositing and design optimisation, particularly at tower locations N77 and N78 where peat depths exceed 0.5 m.
- On-site reuse of excavated peat, with separate handling of acrotelmic and catotelmic layers, and reinstatement around infrastructure footprints.
- Avoidance of off-site disposal of peat, in line with SEPA guidance.
- Implementation of best practice for peat handling, storage, and reinstatement, as outlined in **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)**.
- Drainage design to maintain hydrological function and avoid concentrated flows.
- Environmental management measures, including the development of a Construction Environmental Management Plan (CEMP), to be implemented during construction.

3.5 Assumptions

3.5.1 The peat carbon assessment is based on the following assumptions:

- Peat bulk density and carbon content are assumed to be 175 kg/m³ and 55%, respectively, across the full LOD, as site-specific data were not available.
- Temporary infrastructure (eg tower working areas and access tracks) is assumed to result in permanent peat carbon loss for worst-case scenario modelling, although actual impacts may be reversible post-construction.
- Peat restoration is limited to redressing and reuse around infrastructure; no additional restoration or compensation areas are included in the current assessment.
- Restoration is assumed to be fully successful, returning peat to its pre-construction condition.
- Use of peat depth corrections to align with excavation volumes (see **Table 13.4.1: Peat Excavation Volumes for Scenario 3** of **Volume 5, Appendix 13.3 Outline Peat Management Plan**) improves the accuracy of the calculations.
- Peatland condition distribution is based on 2,826 probe points, with 11.3% Modified, 37.3% Forested/Previously Forested, and 51.4% Not Peatland.
- Class 4 and 5 peat from the Carbon and Peatland 2016 Map were used to identify areas of potential indirect impact, consistent with the **Volume 5, Appendix 13.3: Peat Depth Survey Report**.

- Where peatland condition data was not available a conservative assumption was applied using categories with higher emission factors (eg “Modified”) to represent a worst-case scenario as described in **Paragraphs 3.3.22 and 3.3.24**.
- The peatland areas within the LOD were mapped using Carbon and Peatland 2016 Map and site-specific probing was used to identify direct impact zones where peat was present.

4. BASELINE CONDITIONS

4.1 The Proposed Development

4.1.1 The Proposed Development crosses a range of land types including commercial forestry, open moorland, and agricultural land. The route intersects multiple roads, tracks, and watercourses. Peat deposits are primarily concentrated in the central and northern sections of the route, particularly within Section E (Durris Forest), while the southern sections are predominantly underlain by mineral soils. According to the Carbon and Peatland 2016 Map, the route intersects areas of Class 4 and 5 peat, with Class 0 (mineral soils) also present.

4.1.2 A total of 2,826 peat probes were recorded across the surveyed 11.5 km of the Proposed Development (survey areas were determined initially using the Carbon and Peatland 2016 map), as documented in **Volume 5, Appendix 13.3: Peat Depth Survey Report**. The most common peat depths recorded were between 0–0.5 m, followed by 0.5–1.0 m. Localised areas of deeper peat (up to 2.0 m) were identified, particularly near Towers N77 and N78. No peat depths exceeding 2.0 m were recorded in the surveyed section.

4.1.3 The average peat depth across the surveyed corridor is 0.68 m, based on the distribution of probe data. The total surveyed corridor covers approximately 1,150,000 m^2 (11.5 km × 100 m), of which 8.7% (100,050 m^2) is classified as peat (depth > 0.5 m). This peat area was used as the basis for initial carbon storage and emissions calculations.

4.1.4 Following the adoption of a 200 m wide Limit of Deviation (LOD) corridor (100 m either side of the OHL centreline for suspension towers), the total peat area was recalculated as 200,100 m^2. Of this:

- 7,626.32 m^2 is classified as peat directly impacted (eg tower foundations and working areas),
- 13,512 m^2 as peat indirectly impacted (eg adjacent restoration zones), and
- 178,961.68 m^2 as not impacted.

4.1.5 The average peat depths used in the Peat Carbon Calculator are:

- 0.75 m for directly and indirectly impacted areas, based on core data near Towers N77 and N78 (Core IDs 10 and 11), and
- 0.5 m for not impacted areas, applied as a conservative estimate.

4.1.6 Using the Peat Carbon Calculator, the total carbon stored within the peat located in the LOD is estimated at 37,107 tCO_2e, based on the peat depth and condition data collected during the survey. This value represents the pre-construction baseline. However, the calculator projects a gradual decline in carbon storage over time, even in the absence of development. Specifically, carbon storage is expected to reduce to 37,078 tCO_2e after 5 years and to 36,823 tCO_2e after 50 years, resulting in a net loss of 284 tCO_2e over the 50-year period. This decline is attributed to a modelled carbon flux rate of −28 tCO_2e per 5 years, reflecting ongoing emissions from modified peatland conditions. These projections form the baseline against which project-related impacts are assessed.

5. ASSESSMENT OF EFFECTS

5.1 The Proposed Development

5.1.1 The potential impacts on peat carbon storage from the Proposed Development have been assessed using the Peat Carbon Calculator. The assessment considers direct impacts to the peat from the proposed infrastructure, indirect impacts to the peat from adjacent infrastructure, and the mitigating effects of peat restoration. The results are presented in **Table 1: Summary of Impacts on Peat Carbon Storage** and reflect the calculator outputs to the nearest tCO_2e, with percentage changes calculated from precise values.

Direct Impacts

5.1.2 The calculator indicates that construction activities, particularly excavation for tower foundations and working areas, will result in a direct reduction in peat carbon storage. The pre-construction baseline carbon stock across the LOD is 37,107 tCO_2e, and during construction, this is projected to decrease to 32,095 tCO_2e, and to 31,838 tCO_2e post-construction, with the peatland area decreasing to 181,388 m^2. This results in a net loss of 5,269 tCO_2e over 50 years, primarily due to permanent peat removal, area reduction and disturbance. This is an average of 105.4 tCO2e/yr.

5.1.3 The UK Carbon Budgets[7] restrict the total amount of greenhouse gases the UK can emit over a 5-year period in order to reach climate change targets and which are secured through legislation, are currently 1,950 $MtCO_2e$ for the 2023 – 2027 period, reducing to 1,725 $MtCO_2e$ for 2028-2032 and to 965 $MtCO_2e$ for 2033-2037.

5.1.4 A 5,269 tCO_2e decrease in peat carbon storage, assuming this is released as CO_2 through peatland disturbance and removal, represents a negligible percentage of the current carbon budget, indicating that the impact of the Proposed Development on climate change through impacts to peatland carbon sequestration and storage would be negligible.

5.1.5 In addition, the Proposed Development supports carbon reduction targets at the national level by facilitating the transmission of electricity from the north of the UK, particularly from renewable sources.

Table 1: Summary of Impacts on Peat Carbon Storage

Scenario	Carbon Values reported	Pre-Construction		Future Baseline (5 years)	Future Baseline (50 years)	Overall Change (50 years)
No Impact Scenario	Carbon Storage (tCO2e)	37,107		37,078	36,823	-284
	Carbon Flux rate (tCO2e per 5 years)	-28.38		-28.38	-28.38	0
Scenario	**Carbon Values reported**	**Pre-Construction**	**During Construction**	**Future Baseline (5 years)**	**Future Baseline (50 years)**	**Overall Change (50 years)**
Project Impact Scenario	Carbon Storage (tCO2e)	37,107	32,095	32,070	31,838	-5,269
	Carbon Flux rate (tCO2e per 5 years)	-28.38	-27.30	-25.72	-25.72	2.7

Restoration and Mitigation

5.1.6 In the **Volume 5, Appendix 13.4: Outline Peat Management Plan**, it is proposed to focus peat restoration efforts on the Strans Burn Upper Peatland Restoration Area, adjacent to Towers N77 and N78 (subject to agreement with the

[7] UK Government (2021). Carbon Budgets [Online] Available at: https://www.gov.uk/guidance/carbon-budgets#setting-of-the-fourth-carbon-budget-2023-2027 (Accessed: July 2025)

landowner). Approximately 592 m³ of permanently excavated peat will be reused to improve degraded afforested peatland. While this restoration does not fully offset the carbon loss, it contributes to long-term peatland recovery and reduces the carbon flux rate from −27 tCO_2e per 5 years during construction to −26 tCO_2e per 5 years post-construction. In addition, the natural flux rate is already reducing carbon stored in peat. This is highly likely to be exacerbated by climate change (change habitats/ drying). Therefore, the Proposed Development might cause small loss but facilitation of renewable energy in the long term will mitigate climate change and the impacts on the peatland.

5.1.7 These efforts align with best practice guidance and demonstrate a commitment to minimising long-term carbon impacts.

Indirect Impacts

5.1.8 Indirect impacts refer to potential changes in peatland function due to alterations in hydrology or environmental conditions adjacent to infrastructure. For the Proposed Development, indirect impacts were not explicitly quantified in the Peat Carbon Calculator. The calculator includes an ‘Indirectly Impacted’ category for estimating carbon storage but does not model carbon loss due to hydrological changes or buffer zones.

5.1.9 Nonetheless, the project acknowledges that indirect effects such as localised drying or changes in water flow could occur in areas adjacent to construction zones. These effects are expected to be minimal due to the limited extent of peatland affected, the use of floating access tracks where feasible, and the implementation of best practice construction and restoration methods. Micrositing and careful design have further reduced the likelihood of significant hydrological disruption. As such, while indirect impacts are not quantified, they are expected to be minor and well-managed through mitigation.

Overall Impact

5.1.10 Taking into account the direct impacts from tower foundations and working areas, and the proposed peat restoration at Strans Burn Upper Peatland Restoration Area, the overall impact of the Proposed Development on peat carbon storage is projected to be inconsequential, given the scale of the project which is large. According to the Peat Carbon Calculator, the pre-construction baseline carbon stock is 37,107 tCO_2e, which declines to 31,838 tCO_2e post-construction of 50 years, resulting in a net loss to that atmosphere of 5,269 tCO_2e over 50 years.

5.1.11 Given the ‘do nothing’ scenario would have seen a net loss of 284 tCO_2e over the 50 year time period, the overall change between the project scenario on the ‘do nothing’ is 4,985 tCO_2e.

5.1.12 This loss is primarily due to permanent peat removal at Towers N77 and N78. While indirect impacts were not quantified, they are expected to be minimal and well-managed through micrositing, floating access tracks, and best practice construction methods.

5.1.13 The restoration of approximately 127 m³ of peat, as modelled in the Peat Carbon Calculator’s long-term post-construction scenario, contributes to long-term carbon recovery and reduces the carbon flux rate post-construction. This volume includes peat reused from both permanent and temporary works. It is important to distinguish this from the 592 m³ of permanently excavated peat from tower foundations N77 and N78, which is proposed for reuse at the Strans Burn Upper Peatland Restoration Area (exact area still to be agreed with the landowner). Although the restoration efforts do not fully offset the carbon loss, they demonstrate a commitment to avoidance, minimisation and restoration.

Scottish & Southern Electricity Networks
TRANSMISSION

6. SUMMARY AND CONCLUSIONS

6.1.1 The Proposed Development has the potential to adversely impact peat carbon storage through direct excavation for tower foundations and working areas, and through potential indirect effects on peatland function, such as hydrological changes. However, the Proposed Development also includes outline plans for peat restoration and reuse measures within areas covered by the Durris (Forest) Land Management Plan (LMP) 2024-2034 (exact locations still to be determined with the landowner), which contribute positively to peat carbon storage. These dynamics are relevant to climate change, as peatlands are significant carbon sinks, and their disturbance can lead to increased atmospheric CO_2.

6.1.2 In line with National Planning Framework 4, which prioritises the protection of peat and carbon-rich soils under Policy 5, SSEN Transmission has applied a bespoke assessment methodology using a Peat Carbon Calculator. This tool quantifies carbon storage and flux changes based on peat depth, area, and condition across directly and indirectly impacted zones, as well as restored areas.

6.1.3 For the Proposed Development, the pre-construction baseline carbon stock is estimated at 37,107, tCO_2e. Under the Project Impact scenario, this declines to 31,838 tCO_2e over 50 years, resulting in a net loss of 5,269 tCO_2e. Taking the project future baseline of a ‘do nothing’ scenario away, the impact of the Proposed Development over the ‘do nothing’ scenario is 4,985 tCO_2e. This loss is primarily due to permanent peat excavation at Towers N77 and N78. Indirect impacts were not quantified but are expected to be minimal due to the limited peatland extent and the application of best practice mitigation measures. The Peat Carbon Calculator also models a restoration volume of 127 m^3, which includes both permanent and temporary peat reuse, and this aids in reducing the carbon flux rate from −27 tCO_2e per 5 years during construction to −26 tCO_2e per 5 years post-construction.

6.1.4 While the restoration measures outlined in **Volume 5, Appendix 13.4: Outline Peat Management Plan (PMP)** do not fully offset the carbon loss, they demonstrate a commitment to avoidance, minimisation and restoration. The project’s approach aligns with national policy and reflects a responsible strategy for managing peatland carbon impacts.