Scottish & Southern Electricity Networks

TRANSMISSION

Spittal to Loch Buidhe to Beauly 400 kV

OHL Connection

Environmental Impact Assessment

Volume 5 | Technical Appendix

Appendix 8.10 | Flow Country World Heritage Site (WHS) Impact Assessment Report

July 2025

VOLUME 5: APPENDIX 8.10 – FLOW COUNTRY WORLD HERITAGE SITE (WHS) IMPACT ASSESSMENT REPORT

Figures (Volume 3 of this EIA Report)

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8. THE FLOW COUNTRY WORLD HERITAGE SITE (WHS) IMPACT ASSESSMENT REPORT

8.1 Executive Summary

Purpose and Background

8.1.1 This Appendix presents the findings of an impact assessment of the Proposed Development on the Flow Country World Heritage Site (WHS), inscribed by the United Nations Educational, Scientific, and Cultural Organisation (UNESCO) in July 2024 (List entry: 1722). This assessment considers potential direct, indirect, and cumulative impacts on the WHS, including effects to its setting. This assessment has been prepared as part of the Environmental Impact Assessment (EIA) Report and should be read in conjunction with it.

8.1.2 Elements of the Proposed Development within The Flow Country WHS would comprise the installation and operation of:

- 7.6 km of new double circuit 400 kV Overhead Line (OHL) on steel lattice towers; and
- Ancillary development and associated works, required as part of the Proposed Development or to facilitate its construction and operation.

8.1.3 The Flow Country WHS was inscribed by UNESCO in July 2024 for its Outstanding Universal Value (OUV) (**Annex A**). The 187,026 ha site is located in Caithness and Sutherland and is inscribed under UNESCO WHS Criterion ix, representing an *outstanding example of an actively accumulating blanket bog landscape*. Attributes of the Flow Country WHS under UNESCO Criterion ix are presented in **Table 8-1.**

Methods

8.1.4 Guidance on assessing potential impacts of proposed developments on natural World Heritage Sites is supplied by UNESCO. The UNESCO guidance has been summarised and interpreted by The Highland Council's (THC), including an Impact Assessment Toolkit to guide applicants in assessing the potential impacts of proposed developments on the Flow Country WHS. NatureScot are now the lead authority on assessments of impact to the Flow Country WHS and, in the absence of any current formal guidance and following consultation with NatureScot, the approach taken herein is considered to be suitably precautionary. This impact assessment draws from the results and findings of the baseline surveys and assessments for relevant technical disciplines undertaken for the EIA, informing an assessment of potential impacts of the Proposed Development to the OUV of the Flow Country WHS.

Baseline Conditions

8.1.5 To establish an evidence base for the assessment, a combination of desktop study and field surveys were conducted as part of the EIA. Relevant topics and chapters include Introduction and Background (**Volume 2, Chapter 1**), Ecology and Nature Conservation (**Volume 2, Chapter 8**), Water Environment (**Chapter 10**), Geological Environment (**Volume 2, Chapter 11**), Peat Carbon Assessment (**Volume 5, Appendix 11.3**), Cultural Heritage (**Volume 2, Chapter 12**), and Tourism and Recreation (**Volume 2, Chapter 16**). Baseline conditions are detailed in **Section 22**. For Cultural Heritage, the WHS was not included in the assessment, as it was screened out early on in the process, and later scoped out entirely, based on the nature of the asset.

Assessment of Effects

8.1.6 The Proposed Development intersects the Flow Country WHS in four locations within Section A, passing through component parts 006: Munsary & Shielton and 005: East Halladale. A total of 25 steel lattice towers are

proposed to be constructed and sited permanently within the boundaries of the Flow Country WHS (Towers 24-28, 33-37, 126-138, 147 and 148).

8.1.7 Ancillary infrastructure proposed within the Flow Country WHS comprises:

- 7.5 km (7.5 ha) of temporary access tracks (5.2 km cut and fill, 2.4 km floating);
- 1.7 km (1.8 ha) of permanent access tracks (cut and fill only);
- 0.36 ha of temporary Equi-Potential Zones (EPZ) pulling positions, associated with angle towers;
- 12.9 ha of temporary tower platforms/compounds (working area); and
- 0.39 ha of permanent tower platforms/footing (operational area).

8.1.8 Screening was carried out in line with THC Impact Assessment Toolkit in order to determine which attributes were likely to be impacted by the Proposed Development, and which technical disciplines may be most relevant to each attribute. The responses to screening questions and technical disciplines screened in and out of each are detailed in **Table 8-13.** The Proposed Development has the potential to impact four of the six attributes for Criteria ix. The four attributes (described in **Table 8-1**) screened in include:

- a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally;
- c) archive it stores (4th dimension);
- e) carbon sequestration and storage; and
- f) water filtration and the impact on the water quality of associated riverine habitats.

8.1.9 The two attributes screened out include:

- b) climatic, topographic gradients and geological diversity: bog macroform diversity; and
- d) natural laboratory – ongoing scientific and educational use.

8.1.10 The assessment draws on inputs from four technical topics addressed in this EIA Report:

- ecology (attributes a, c, e);
- hydrology (attributes a, f);
- carbon (attribute e); and
- geology (attributes a, c, e).

8.1.11 All elements of the Proposed Development within the Flow Country WHS were evaluated to determine which elements would have the potential to cause an impact on the WHS. For each element, a preliminary assessment of impact was conducted for each attribute (**Table 8-21)**.

8.1.12 Permanent and temporary loss of blanket bog is anticipated due to construction activities. Localised permanent impacts are anticipated where construction activities will remove blanket bog habitat and peat, disrupting peat accumulation, the stored archive, and carbon sequestration and storage. Temporary impacts are anticipated where habitat will be reinstated, and where habitat will only be temporarily smothered. No pathway for impact is anticipated for attributes b) and d). Highly localised small-scale impacts, embedded mitigation, and access restrictions being temporary mean that these attributes are not anticipated to be impacted. Positive impact is anticipated where excavated peat is planned to be reused to reinstate peatland habitat. Reinstatement has the potential to reinstate actively accumulating bog, contributing to bog macroform diversity, future scientific and/or educational use, carbon sequestration and increased filtration.

8.1.13 Where a pathway for an element to affect an attribute was identified, a more detailed description and evaluation of potential impacts was conducted. The description and evaluation, and assessment of overall impacts of elements of the Proposed Development of the Flow Country WHS are presented in **Table 8-22**.

8.1.14 A total of **60.87 ha** of blanket bog habitat in the WHS is predicted to be impacted by the Proposed Development, amounting to **0.033%** of the total area of the WHS. Of this, **13.24 ha (21.8%)** is from permanent infrastructure impacts (amounting to **0.007%** of the total area of the WHS), including permanent tower footing and access tracks. The majority of impacts, **47.63 ha (78.25%)**, are from temporary infrastructure impacts (amounting to **0.025%** of the total area of the WHS), including temporary access tracks, pulling locations and tower compounds.

8.1.15 Any impacts of the Proposed Development on the Flow Country WHS will be limited to those components located within the boundaries of the Site, with impacts from temporary and permanent infrastructure highly localised.

Mitigation

8.1.16 The mitigation hierarchy was used to mitigate by design (**Volume 2, Chapter 4: The Routeing Process and Alternatives**), with the preferred alignment of the Proposed Development informed by a robust selection process to reduce impacts on sensitive receptors. All works for the OHL will be undertaken in line with SSEN's General Environmental Management Plans (GEMPs), which include specific guidelines for minimising impacts in peat. With the embedded mitigation measures in the GEMPs in place, including post-construction reinstatement, temporary impacts from the Proposed Development will not persist such that they impact the OUV of the WHS. General mitigation measures will be implemented for peat excavation, handling and storage, and reinstatement, detailed in the outline Peat Management Plan (oPMP), and in accordance with the best practice guidelines to be included in the Construction Environmental Management Plan (CEMP). The CEMP will outline best practice in relation to the implementation of drainage and pollution prevention.

8.1.17 As an inherent part of construction activities to mitigate impacts and to deliver positive restoration for blanket bog habitat, any peat, including volumes of peat excavated and turfs of active peat forming vegetation removed as part of the construction activities, would be reused on site where possible. This peat and turf could be used to restore areas of degraded peat identified during baseline surveys within the Flow Country WHS, as part of SSEN's embedded mitigation measures. The locations for peat re-use would be identified prior to construction in consultation with NatureScot. Peat re-use and restoration of degraded peat will be undertaken as part of construction reinstatement to enhance existing habitats. For a more detailed overview of SSEN's mitigation approach and how it aligns with World Heritage Site requirements, please refer to **Volume 5, Appendix 8.8: Biodiversity Net Gain (BNG) Assessment Report, Annex C**.

Residual Effects

8.1.18 Impacts of the Proposed Development on the Flow Country WHS have been reduced and managed through an appropriate mitigation hierarchy, including mitigation by design, embedded and additional mitigation measures. Additionally, the commitment to peat re-use, reinstatement and restoration, and soil replacement further reduces the residual effects of the Proposed Development. These measures are such that residual impacts to habitat, peat and peat stability, water environment and carbon have been reduced to a negligible level.

8.1.19 Given the extent of the Flow Country WHS, this project is not predicted to disrupt the primary ecological processes that sustain the attributes that convey OUV and maintain its integrity. The residual impacts of the Proposed Development are determined to have a negligible impact magnitude and as such impacts of the Proposed Development on the attributes that convey the OUV of the Flow Country WHS are anticipated to be not significant.

Enhancement Opportunities

8.1.20 In addition to embedded mitigation measures, SSEN is strongly committed to finding and enacting enhancement opportunities within the Flow Country WHS, as an inherent part of construction activities to mitigate impacts, and to deliver positive restoration for blanket bog habitat.

Cumulative Effects

8.1.21 The cumulative assessment for the Flow Country WHS focusses on only those projects which could affect the WHS. Peatland restoration for the Proposed Development is expected to result in a net positive outcome for peatland in the long-term. In-combination with the other Projects, the total habitat loss of the Proposed Development will have a minor impact relative to the total area of the WHS. Given the baseline condition of peatland habitat to be impacted, the mitigation measures to be carried out, and the spatial distribution between Projects, overall cumulative impacts remain **not significant**.

Summary

8.1.22 This assessment has concluded that there would be **no significant adverse effects** as a result of the Proposed Development on the attributes that convey OUV or integrity of the Flow Country WHS, either alone or in combination with other projects.

8.2 Introduction

Purpose and Scope of this Report

8.2.1 This Appendix presents the findings of an impact assessment of the Proposed Development on the Flow Country World Heritage Site (WHS), inscribed by the United Nations Educational, Scientific, and Cultural Organisation (UNESCO) in July 2024 (List entry: 1722). WHS status is a non-statutory designation granted by UNESCO under the World Heritage Convention[1], to which the UK is a signatory[2]. As WHS status is not inscribed directly in UK or Scottish legislation there is no formal process for assessment; however, signatories are obligated to ensure sufficient protection and effective management measures are in place. The assessment approach is aligned with UNESCO guidance[3] as interpreted by The Highland Council's (THC) Flow Country World Heritage Site development guidance[4], Planning Position Statement[5], and Impact Assessment Toolkit[6].

8.2.2 The proposed Spittal – Beauly 400kV overhead line is of a development type that would fall within National Development 3 - Strategic Renewable Electricity Generation and Transmission Infrastructure in Scotland's National Planning Framework (NPF4)[7] adopted in February 2023. This assessment considers those principles set out in Policy 5 of NPF4, further explored in **Section 8.4, Legislation**. A detailed description of the project

[1] United Nations Educational, Scientific, and Cultural Organisation (1972). *Convention Concerning the Protection of the World Cultural and Natural Heritage.*
[2] Ratified in 1984. List of States Parties. Available online [Accessed March 2025]: https://whc.unesco.org/en/statesparties/
[3] IUCN/ICOMOS/ICCROM/UN. 2022. *Guidance and Toolkit for Impact Assessments in a World Heritage Context.* Paris. UNESCO. Available online [Accessed March 2025]: https://whc.unesco.org/en/guidance-toolkit-impact-assessments/
[4] The Highland Council (2025) Development guidance - Flow Country World Heritage Site Planning Position Statement. The Highland Council, Inverness, Scotland. Available online [Accessed June 2025]: https://www.highland.gov.uk/directory_record/1979671/flow_country_world_heritage_site_planning_position_statement
[5] The Highland Council (2025) Flow Country Candidate World Heritage Site Planning Position Statement 2 - May 2025. The Highland Council, Inverness, Scotland. Available online [Accessed June 2025]: https://www.highland.gov.uk/downloads/file/30375/flow_country_world_heritage_site_planning_position_statement_2_-_may_2025
[6] The Highland Council (2023) Flow Country World Heritage Site Impact Assessment Toolkit version 2. The Highland Council, Inverness, Scotland. Available online [Accessed June 2025]: https://www.highland.gov.uk/downloads/file/28012/flow_country_world_heritage_site_impact_assessment_toolkit
[7] The Scottish Government, (2023). National Planning Framework 4. [Online] Available at: https://www.gov.scot/publications/national-planning-framework-4/ [Accessed: June 2024].

need and strategy for the Proposed Development can be found in **Volume 2, Chapter 2: Established Need for the Proposed Development**.

8.2.3 A detailed description of the Proposed Development proposed by the Scottish & Southern Electricity Networks - Transmission (SSEN) can be found in **Volume 2, Chapter 3: Project Description**. Elements of the Proposed Development within the Flow Country WHS would comprise the installation and operation of:

- 7.6 km of new double circuit 400 kV Overhead Line (OHL) on steel lattice towers; and
- Ancillary development and associated works, required as part of the Proposed Development or to facilitate its construction and operation.

8.2.4 This assessment considers potential direct, indirect, and cumulative impacts on the WHS, including effects to its wider setting[8]. This assessment has been prepared as part of the EIA Report and should be read in conjunction with it. As such, the baseline conditions for the Proposed Development and the assessment of potential construction and operational impacts are not described in detail here. Detailed information is provided in the relevant chapters and Technical Appendices of this EIA R, comprising the following technical reports and assessments, which are referenced throughout this document:

- **Volume 2, Chapter 8: Ecology and Nature Conservation**
  - **Volume 5, Appendix 8.1: Legislation, Policy and Guidance**
  - **Volume 5, Appendix 8.2: Ecology Assessment Methodology**
  - **Volume 5, Appendix 8.3: Habitats Technical Report**
  - **Volume 5, Appendix 8.7: Report to Inform Habitats Regulations Appraisal (HRA)**
  - **Volume 5, Appendix 8.8: Biodiversity Net Gain (BNG) Assessment Report**
- **Volume 2, Chapter 10: Water Environment**
  - **Volume 5, Appendix 10.3: Groundwater Dependent Terrestrial Ecosystems (GWDTE) Assessment**
- **Volume 2, Chapter 11: Geological Environment**
  - **Volume 5, Appendix 11.1: Peat Landslide and Hazard Risk Assessment**
  - **Volume 5, Appendix 11.2: Outline Peat Management Plan**
  - **Volume 5, Appendix 11.3: Peat Carbon Assessment**
- **Volume 2, Chapter 12: Cultural Heritage**
  - **Volume 5, Appendix 12.1: Scope and Method of Assessment**

8.2.5 Information described within this document is presented in the following figures, referenced throughout:

- Ecology and Nature Conservation
  - **Volume 3, Figure 8.1: Designated Sites (sheets 1a – 1d)**
  - **Volume 3, Figure 8.3: UK Habitat within Designated Sites (sheets 4-5 and 16-18)**
  - **Volume 3, Figure 8.5: GWDTE (sheets 4-5 and 16-18)[9]**
  - **Volume 3, Figure 8.7: Peatland Condition Mapping**

[8] The wider setting of a WHS is defined by UNESCO as … *the immediate and extended environment that is part of, or contributes to, its significance and distinctive character. It may relate to the property's topography* [and] *natural environment … It may include related ecological and hydrological connectivity...* [The wider setting] *might also play an essential role in protecting the… integrity of the property, and its management is related in its role in supporting the OUV*[3]

[9] Presents NVC communities identified

- Water Environment
  - **Volume 3, Figure 10.2: Surface Watercourses and Waterbodies**
  - **Volume 3, Figure 10.3: Surface Water Catchments**
  - **Volume 3, Figure 10.6: Private Water Supplies**
- Geological Environment
  - **Volume 3, Figure 11.1 Superficial Geology (sheets 1-2 and 4)**
  - **Volume 3, Figure 11.2 Bedrock Geology (sheets 1-2 and 4)**
  - **Volume 3, Figure 11.3 National Soils Map of Scotland (sheets 1-2 and 4)**
  - **Volume 3, Figure 11.4 Carbon and Peatland 2016 Map (sheets 1-2 and 4)**
  - **Volume 3, Figure 11.1.5 Slopes (sheets 1-2 and 4)**
  - **Volume 3, Figure 11.2.2 Recorded Peat Depths (sheets 1-2 and 4)**
  - **Volume 3, Figure 11.2.3 Interpolated Peat Depths (sheets 1-2 and 4)**

Background

8.2.6 The Flow Country WHS was inscribed by UNESCO in July 2024 for its Outstanding Universal Value (OUV)[10] (**Annex A**). The 187,026 ha site is located in Caithness and Sutherland and is inscribed under UNESCO WHS Criterion ix[11], representing an: *outstanding example of an actively accumulating blanket bog landscape*. The peatland ecosystem of the Flow Country; *has been accumulating for the past 9,000 years, provides a diversity of habitats home to a distinct combination of bird species and displays a remarkable diversity of features not found anywhere else on earth*[12]. The Flow Country also plays an important role in sequestering carbon at a landscape scale, and provides a significant research and educational resource.

8.2.7 The Nomination Text[13] for the Flow Country WHS defines blanket bog as per Lindsay *et al*. (1998)[14], as *an ombrotrophic (rain-fed) type of peatland, mainly located in areas with oceanic climatic conditions: high precipitation (>1,000 mm/year), high humidity, low average temperatures (<15ºC) and low seasonal temperature variability. The surface of a blanket bog usually follows the underlying topography and covers large extents of the landscape.* Blanket bogs in The Flow Country are formed mainly from *Sphagnum* mosses.

8.2.8 The attributes of a WHS are defined by UNESCO as …*the elements of a heritage place which convey its heritage/conservation values and enable an understanding of those values*[3]. … The term 'attributes' is particularly used for World Heritage Properties and a clear understanding of the attributes that convey their OUV is critical for their long-term protection[3]. Attributes of the Flow Country WHS under UNSECO Criterion ix are presented in **Table 8-1.**

[10] The Outstanding Universal Value (OUV) of a WHS is defined by UNESCO as the site having *Cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as whole*[3].

[11] Selection criterion ix is defined by UNESCO *to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals*. Available at: https://whc.unesco.org/en/criteria/. Accessed June 2025.

[12] UNSECO World Heritage Convention (2024) *The Flow Country*. Accessed at: https://whc.unesco.org/en/list/1722/

[13] The Flow Country World Heritage Project Steering Group (2023) The Flow Country: Nomination as a World Heritage Site, Nomination Document 2023. Available at: https://whc.unesco.org/en/list/1722/documents/. Accessed April 2025.

[14] Lindsay, R., Charman, D.J., Everingham, F., O'reilly, R.M., Palmer, M.A., Rowell, T.A. and Stroud, D.A., 1988. *The flow country: the peatlands of Caithness and Sutherland*. Joint Nature Conservation Committee.

Table 8-1: Attributes of the Flow Country WHS

Criterion ix	Attribute	Description
Outstanding example representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	Persistent rain fed wetness and low rates of evaporation across The Flow Country lead to widespread, year round waterlogged ground conditions which are ideal for the growth and preservation of peat forming plants. This ongoing process (paludification) began around 9,000 years ago and is key in the formation of blanket bog. Unlike other bog types, which are confined by topography, this allows blanket bog to mantle entire landscapes. The Flow Country is one of only a few locations globally where conditions exist that are conducive to blanket bog formation, and combines a quality, extent and connectivity of this habitat exceeding that of any other known blanket bog.
	b) climatic, topographic gradients and geological diversity: bog macroform diversity	The scale of the site, alongside the gradients in climate and topography, and the diversity of the underlying geology, provide the setting for subtle variations in processes which result in a huge diversity in the character of the blanket bog. These factors control the development of complex systems of hummocks, moss lawns, hollows and pools, and the associated plant species, which produce surface patterning that has been classified into 15 site-types. No other blanket bog in the world contains such a diverse collection of surface patterning within a single area
	c) archive it stores (4th dimension)	Delving deeper, the peat, which has been forming for over 9,000 years, reaches thicknesses of over 8 m, providing an exceptional archive and a 4th dimension to The Flow Country blanket bog. The processes responsible for the development of the blanket bog system and the ecosystems it supports can be scrutinised back through time across the vast area it covers using pollen records; plant sub-fossils (e.g. hazelnuts, pine cones, pine stumps); lake sediment records (midge and diatom (alga) remains); tephra (ash) layers blown south from Icelandic volcanoes; charcoal (indicating in situ burning).
	d) natural laboratory – ongoing scientific and educational use	The exceptional nature of The Flow Country makes it the 'type site' for blanket bog study and it continues to be used as a 'test bed' for peatland research globally. The diversity of features related to altitudinal and climatic gradients across the region and the depth of archive provides a huge scope for research. Furthermore, the breadth of existing studies provides a fantastic foundation for future research.
	e) carbon sequestration and storage	Globally peatlands are the largest natural terrestrial carbon store. Covering only 3% of the world's land area, they hold nearly 30% of all the carbon stored on land. In blanket bog, year-round waterlogged conditions slow the process of plant decomposition such that the dead plants accumulate to form peat, and thereby sequester carbon from the atmosphere. Over thousands of years this plant material builds up and becomes several metres thick producing a valuable carbon store. The Flow Country provides a superb example of ongoing sequestration, alongside carbon storage demonstrated by peat thicknesses which reach over 8 metres.
	f) water filtration and the impact on the water quality of associated riverine habitats	The catchments draining The Flow Country sustain exceptional water quality, resulting from the natural filtration of rainwater as it slowly seeps through these vast peatlands. The superb water quality is critically important in sustaining globally important populations of the freshwater pearl mussel in rivers which drain from The Flow Country. European eel (classed by the IUCN as Critically Endangered) are also recorded from these catchments. Furthermore, the rivers of The Flow Country are maintaining strong populations of Atlantic salmon which are in global decline.

8.2.9 The integrity[15] of a WHS is a measure of the wholeness and intactness of its natural (and/or cultural) heritage and attributes. The integrity of the Flow Country WHS is tied to the intactness of the features integral to the globally significant ecosystem, including those elements of OUV needed to demonstrate the ecological and biological processes and biodiversity. These features include the blanket bog itself, the wider peatland landscape complex and finer elements thereof, the climatic, altitudinal, geological and geomorphological gradients, and the hydrological elements that comprise the blanket bog. The majority of blanket bog within the property is in near-natural condition, with remaining areas undergoing restoration or expected to be restored in the near future. A full description of the integrity of the Flow Country WHS is laid out in **Annex A**.

8.2.10 The Flow Country was also submitted as a candidate WHS under UNESCO Criterion x, relating to habitats supporting the conservation of biological diversity and threatened species, but not inscribed for these attributes. However, a number of supporting documents have not yet been updated to reflect the inscription status of the site (e.g. the Flow Country WHS Management Plan[16]). This document therefore conducts an impact assessment against the attributes for Criterion ix only, as advised by NatureScot, utilising only those relevant components of supporting documentation as relate to Criterion ix.

8.3 Methods

Impact Assessment

8.3.1 Guidance on assessing potential impacts of proposed developments on natural World Heritage Sites is supplied by UNESCO[3]. The guidance recommends that unless it can be clearly shown that proposed actions[17] will not affect the WHS property and its OUV, an impact assessment must be carried out. The UNESCO guidance has been summarised and interpreted by THC, presented as Development Guidance[4], a Planning Position Statement[5], and Impact Assessment Toolkit[6] to guide applicants in assessing the potential impacts of proposed developments on the Flow Country WHS. NatureScot are now the lead authority on assessments of impact to the Flow Country WHS and, in the absence of any current formal guidance and following consultation with NatureScot, the approach taken herein is considered to be suitably precautionary. The guidance from UNESCO advises that where a national framework for impact assessments already exists, such as an EIA, the impacts on a WHS should be addressed specifically within that broader assessment.

8.3.2 This impact assessment has therefore been produced within the context of the broader EIA Report, drawing from the results and findings of the baseline surveys and assessments for relevant technical disciplines undertaken for the EIA. This information has been used to inform an assessment of potential direct and indirect impacts of the Proposed Development to the OUV of the Flow Country WHS, independently of other impact assessments within the EIA for protected sites and species. This assessment addresses potential impacts on

[15] The integrity of a WHS is defined by UNESCO as *a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes. Examining the conditions of integrity therefore requires assessing the extent to which the property: a. includes all elements necessary to express its Outstanding Universal Value, b. is of adequate size to ensure the complete representation of the features and processes which convey the property's significance, c. suffers from adverse effects of development and/or neglect*[3]

[16] Flow Country Steering Group (2022) *Management Plan for the Proposed Flow Country World Heritage Site*. Nomination draft, December 2022. Available online [Accessed March 2025]: https://whc.unesco.org/en/list/1722/documents/

[17] A proposed action is defined by UNESCO as *A policy, plan, programme or project*[3]. For the purposes of this assessment, the proposed action is the Proposed Development as defined in **Volume 2, Chapter 3: Project Description**.

the attributes of the WHS which convey OUV, and elements of the proposed action (hereafter referred to as 'elements') are assessed within the larger context of their setting and environment.

8.3.3 This impact assessment is underpinned by the principles laid out in the UNESCO guidance[3].

- The impact assessment follows an iterative and not a linear process. A range of reasonable alternatives should be considered, both negative and positive potential impacts assessed, to establish the most sustainable option that both protects the Outstanding Universal Value of the World Heritage property and achieves the objectives of the proposed action.
- Where the proposed action proceeds, monitoring during and after implementation is required to ensure that the World Heritage is continuously protected. Recommendations from the impact assessment can draw on existing management frameworks and processes, and should inform management decisions.
- The impact assessment has been carried out by a specialist multidisciplinary team with relevant expertise relating to one or more of the attributes for Criterion ix. All technical disciplines involved in this EIA Report considered to have potential relevance to the assessment of impacts on the OUV of the attributes were involved. These disciplines include ecology, geology, hydrology, carbon, cultural heritage and tourism and recreation.

8.3.4 The assessment of effects (**Section 8.5**) in this impact assessment was guided by the THC Impact Assessment Toolkit[6] and UNESCO guidance[3] and comprised the following stages:

- Review of reporting requirements for proposed development within Flow Country WHS.
- Mitigation by design, where the Proposed Development was selected through an iterative design process, avoiding impacts to sensitive receptors where possible.
- Desktop study of elements of the Proposed Development intersecting with the Flow Country WHS, whether permanent or temporary, including tower locations.
- Screening:
  - Working through the screening questions in THC Impact Assessment Toolkit, each question relating to an attribute, matching to and responding for each relevant technical discipline;
  - Attributes screened in or out; and
  - Technical disciplines screened in or out.
- Assessment of baseline conditions per technical discipline (including survey data collected for this EIA Report), as they relate to interaction with the Flow Country WHS.
- Identification of potential risks:
  - Identify and list all elements of the Proposed Development; and
  - Make a preliminary assessment of the potential pathway for impact from each element on each attribute, including a high-level analysis of the pathway to impact.
- Evaluate impacts:
  - Present each element of the Proposed Development in terms of potential impacts, per attribute; and
  - Describe the predicted impact for each element per attribute, including details of the element, area (ha) of habitat (blanket bog) impacted, the result of the element, (e.g. localised disruption to hydrology and peat accumulation), the scale of the impact (e.g. area of habitat loss as a percentage of the WHS area).
- Assess the overall impact of elements per attribute, including:
  - The frequency, duration and reversibility of each element;
  - The reversibility, longevity, degree and quality of change to each attribute impacted;
  - Summarise the predicted impact of individual elements; and

- Evaluate overall impact to the WHS.

8.3.5 This EIA Report and this impact assessment consider those principles set out in Policy 5 of NPF4[7]. The intent of Policy 5 (Soils) of the NPF4 is *to protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development*. The aspects of Policy 5 that particularly apply to the assessment of impacts upon the Flow Country WHS and signposting to where these aspects are explored are as follows:

- *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;

  - A detailed description of the project need and strategy for the Proposed Development can be found in **Volume 2, Chapter 2: Established Need for the Proposed Development**, **Volume 2, Chapter 4: The Routeing Process and Alternatives**, and **Section 8.6** (Mitigation by Design).

  ii. The generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets;

  - The Proposed Development is a class 3 (b) National Development, supported by national planning policy. It would contribute significantly towards the delivery of the UK and Scottish Government's Net Zero Targets (**Volume 2, Chapter 2: Established Need for the Proposed Development**).

  iii. Small-scale development directly linked to a rural business, farm or croft;

  - Not applicable

  iv. Supporting a fragile community in a rural or island area; or

  - Not applicable

  v. Restoration of peatland habitats.

  - Mitigation by design was utilised, with the Proposed Development selected through an iterative design process, avoiding impacts to sensitive receptors where possible. The full process of route determination and consideration of alternatives for this EIA Report is provided in **Volume 2, Chapter 4: The Routeing Process and Alternatives**.
  - Embedded mitigation strategy and SSEN's commitment to enhancement (**Section 8.8: Enhancement Opportunities**), and in **Volume 5, Appendix 11.2: Outline Peat Management Plan**.

- *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;

  - Presented in **Volume 2, Chapter 8: Ecology and Nature Conservation** (habitat condition), and **Volume 2, Chapter 11: Geological Environment** (depth, quality and stability of carbon rich soils) and **Section 8.4** (Baseline Conditions).

  ii. the likely effects of the development on peatland, including on soil disturbance; and

  - Assessed in **Section 8.5** (Assessment of Effects).

  iii. the likely net effects of the development on climate emissions and loss of carbon.

  - Assessed in **Volume 5, Appendix 11.3: Peat Carbon Assessment**

Establishing a Baseline

8.3.6 To establish an evidence base for the assessment, a combination of desktop study and field surveys were conducted as part of the EIA. Relevant topics and chapters are listed as follows and described:

- **Volume 2 Chapter 1: Introduction and Background;**
- **Volume 2, Chapter 8: Ecology and Nature Conservation;**

- **Volume 2, Chapter 10: Water Environment;**
- **Volume 2, Chapter 11: Geological Environment;**
- **Volume 5, Appendix 11.3 Peat Carbon Assessment;**
- **Volume 2, Chapter 12: Cultural Heritage; and**
- **Volume 2, Chapter 16: Tourism and Recreation.**

8.3.7 A summary of information collected to establish an evidence base for assessment is presented in the following sections, signposting relevant chapters of the EIA and Technical Assessments.

Ecology and Nature Conservation

8.3.8 A combination of desk-based study and field surveys were used to characterise the ecological baseline for this EIA Report. The desk-based study used publicly available data sources such as NatureScot and scientific literature to identify designated sites, habitats, and species of interest within the Survey Area. Field surveys included habitat classification using UKHab within 350 m of the alignment; comprising a 100 m LoD (Limit of Deviation) and 250 m buffer for targeted surveys for Ground Water Dependant Terrestrial Ecosystems (GWDTEs) using National Vegetation Community (NVC) methods, displayed in **Volume 3, Figure 8.3 (sheets 4-5 and 16-18)**. Surveys were undertaken by suitably experienced surveyors and during optimal survey periods for the geographic location and habitats present.

8.3.9 Blanket bog was classified using UKHab, which corresponds with the NVC blanket mire communities used by NatureScot in their peatland guidance[18]. These habitat definitions correspond and recognise that blanket bog occurs at a landscape scale, frequently as a mosaic of peatland habitats and communities which may have varying states of peat accumulation, based on the vegetation and hydrological status.

8.3.10 For the purposes of this assessment, only data recorded within the Operational Corridor (90 m in width; 45 m either side of the centre line) is considered. Further details are presented in **Volume 2, Chapter 8: Ecology and Nature Conservation**, supported by **Volume 5, Appendix 8.3: Habitats Technical Report**.

8.3.11 A full BNG Assessment was undertaken for the Proposed Development, though habitats within designated sites, such as the Flow Country WHS, were excluded from the calculations. Exclusion follows SSEN Biodiversity Net Gain Toolkit guidance, which advises that rather than being included in the BNG calculations, impacts to designated sites should be avoided, mitigated and, as a last resort, compensated for following national legislation, policy and guidelines. Further details on the approach to and results of the BNG Assessment are presented in **Volume 5, Appendix 8.8: Biodiversity Net Gain (BNG) Assessment Report**. Positive effects for biodiversity demonstrating compliance with NPF4 will be delivered through off-site habitat enhancement and creation. A suitable offsite area or areas will be identified by the Applicant to deliver a 10% NG. Annex D of **Volume 5, Appendix 8.8: Biodiversity Net Gain (BNG) Assessment Report** outlines the Applicant's off-site strategy for the Proposed Development.

Peatland Condition Assessment

8.3.1 Data collected during field surveys for this EIA Report to inform habitat classification (including UK Hab and NVC) and peat depth measurements were used to inform the assessment of peatland condition with the WHS.

[18] NatureScot (2023) Advising on peatland, carbon-rich soils and priority peatland habitats in development management. Available online at: https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management

To establish a preliminary baseline of peatland condition within the WHS, a desktop review was conducted, using data collected for this EIA Report and publicly available:

- UK Hab habitat survey data;
- NVC habitat survey data;
- Peat depth survey data (point data and interpolated);
- Carbon Peatland Map 2016 [19]
- Ordinance Survey (OS) data;
- Aerial imagery; and
- Photographs from site surveys.

8.3.2 For this assessment, 'peatland' is defined as 'those habitats occurring on peat or peat soils.' NatureScot's *Peatland Condition Assessment Guide*[20] was used to assign one of four condition categories, presented in **Table 8-2**. Peatland habitats and those occurring only on peat less than 0.5 m deep were assigned the category 'other' and excluded from further assessment, due to unsuitability for restoration to a higher condition.

Table 8-2: Peatland Condition categories and descriptions

Category	Key Features	Description
1) Near-Natural Condition	• *Sphagnum* dominated • No known fires (either prescribed or wild) within living memory • Evidence of grazing and trampling impacts is rare or absent • Little or no bare peat surface Heather (*Calluna vulgaris*) is **not** dominant	1. Key for near-natural condition is the dominance of peat-forming moss and sedge species 2. Natural pool systems may be present but not in all parts of the UK, mainly in the wetter north and west 3. *Sphagnum* moss is abundant. When squeezed *Sphagnum* moss will release lots of water, unlike other mosses 4. The surface will be undulating with *Sphagnum* hummocks and hollows
2) Modified	• Bare peat in small patches • Fires or fire history • Frequent impacts of grazing and trampling • Sphagnum mosses rare or absent • Extensive cover of heather (Calluna vulgaris) or purple moor grass (Molinia caerulea) • An undesirable level of scrub which is drying out the bog	5. Small discrete patches of bare peat (micro-erosion) may be common indicating significant impacts from livestock and wild herbivores 6. Peatland is more likely to be dominated by heather or purple moor grass 7. Grazing history and information on current management will help determine if the site has been modified due to grazing 8. Cover of peat-forming species (in most instances *Sphagnum* mosses) will be much lower than on a site in near-natural condition
3) Drained	• Within 30m of either an artificial drain (grip) or a re-vegetated hagg/gully system	9. Typical drains can show exposed peat

[19] NatureScot (2016). Carbon and Peatland Map 2016. NatureScot, Battleby, Perth (Scotland). Available online [Accessed May 2025]: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map

[20] NatureScot (2023) *Peatland Action: Peatland Condition Assessment*. NatureScot, Battleby, Perth (Scotland)/ Available at: Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf Accessed April 2025.

Category	Key Features	Description
		10. Drains can be blocked with plastic piling dams or other types of peat dams which can also be very effective 11. Despite being in the process of re-vegetation, gullies can still act as drains 12. Vegetation regrowth can occur in pools behind peat dams, such as Sphagnum mosses and sedges
4) Actively Eroding	• Actively eroding hagg/gully system (most of their length having no vegetation in gully bottoms with steep bare peat "cliffs" • Extensive continuous bare peat surfaces (peat "pans") • Extensive bare peat surfaces at former peat cutting sites • Restoration may require a period de-stocking and exclusion of wild herbivores	13. Actively eroding peat haggs can have limited vegetation in the gully bottoms and exposed peat and/or underlying soil 14. Re-profiling the gully sides (using an excavator) and replacing the vegetation can stop erosion. Geotextiles and/or mulches can also be used 15. Overgrazing can lead to extensive areas of bare peat 16. Deer fencing and removal of sheep allows re-wetting and re-vegetation over time

Source: Peatland Action (2023) Peatland Condition Assessment Guide

Water Environment

8.3.3 A combination of desk-based study and field surveys were used to characterise the Water Environment baseline presented in **Volume 2, Chapter 10: Water Environment**. The desk-based study used publicly available data sources including OS Mapping, Scottish Environment Protection Agency (SEPA) environmental datasets, and additional hydrological analysis undertaken by ERM hydrologists, to define the water environment, stream networks and hydrological catchments of interest within the WHS. Field surveys within the Flow Country WHS were undertaken by suitably experienced surveyors to ground truth the data and note any other hydrological features.

8.3.4 Attributes a) and f) of the Flow Country WHS (see **Table 8-1**) are based on the blanket bog being a rainwater fed habitat with *"persistent rain fed wetness" and "natural filtration of rainwater that seeps slowly through these base peatlands"*. Therefore, groundwater / hydrogeology is not assessed in this WHS Assessment because it is not relevant as the WHS is a surface water dependent habitat.

8.3.5 The NVC surveys carried out by the ecology team identified potentially groundwater dependent terrestrial ecosystems (GWDTE) within the WHS. Groundwater dependency has been assessed in **Volume 5, Appendix 10.3: Groundwater Dependent Terrestrial Ecosystems Assessment**. The GWDTE assessment concluded

that GWDTEs in the WHS are not groundwater dependent but surface water fed. Therefore, in line with the above, impacts to groundwater dependent GWDTEs are not considered as part of the WHS assessment.

8.3.6 This WHS hydrological assessment has focussed on surface water impacts within the WHS as presented in **Section 8.4** and **Table 8-10**.

8.3.7 Further details of the baseline water environment are presented in **Volume 2, Chapter 10: Water Environment**.

Geological Environment

8.3.8 A combination of desk-based and field surveys were used to characterise the Geological Environment baseline for this EIA Report. The desk-based study used publicly available data sources such as the British Geological Survey Onshore GeoIndex, Natural England MAGIC Map, Scotland's Environment Web-based Map, NatureScot Carbon and Peatland 2016 map, The National Soils Map of Scotland to identify geological boundaries, soil profiles and peatland classification within the Survey Area. Field surveys included a peat probing survey within the LoD. Peat depths were recorded on a 100 x 100 m crosshair survey grid at 10 m intervals for proposed tower locations, and at 50 m intervals with 10 – 25 m offsets along proposed tracks. **Volume 3, Figure 11.2.2 (sheets 1-2 and 4)** display the Peat Probing survey results within the Flow Country WHS. Peat probing surveys were undertaken by suitably experienced surveyors and during optimal survey periods for the geographic location and habitats present.

8.3.9 Further details are presented in **Volume 2, Chapter 11: Geological Environment**, supported by **Volume 5, Appendix 11.1: Peat Landslide and Hazard Risk Assessment** and **Volume 5, Appendix 11.2: Outline Peat Management Plan**.

Carbon

8.3.10 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 in order to support the assessment of carbon emissions from peatland disturbance. The calculator draws on input from the Scottish Government's Carbon Calculator Tool for Wind Farm Developments on Peatlands[21], and the Peatland Code Emissions Calculator[22]. Data on the area of peatland impacted (directly and indirectly), not impacted, and restored (in the short- and long-term), peat depth, carbon content of the peat, and the peat's bulk density is used to assess the impact of a development on peat carbon storage (the total quantity of carbon stored within the peatland). Further detail on the Peat Carbon Calculator can be found in **Volume 5, Appendix 11.3: Peat Carbon Assessment**.

8.3.11 The data used for the Peat Carbon Calculator was sourced from the NatureScot Carbon and Peatland 2016 Map, the footprint of the Proposed Development, and the results from other technical assessments (see the Ecology and Nature Conservation, and Geological Environment sections above). These technical assessments were used to determine the areas of peatland directly and indirectly impacted by the Proposed Development

[21] 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

[22] IUCN UK Peatland Programme (2023) Peatland Code Emissions Calculator (Version 2). [Online] Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.iucn-uk-peatlandprogramme.org%2Fsites%2Fdefault%2Ffiles%2Fheader-images%2FPC_Bog%2520Emissions%2520Calculator_v2%2520-%2520locked.xlsx&wdOrigin=BROWSELINK. Accessed April 2025.

(from peat balance calculations and GIS mapping), and the peat depth in these areas (from peat probing surveys), which fed into the Peat Carbon Calculator.

8.3.12 The Peat Carbon Assessment has been used to assess the potential impact of the Proposed Development on peat carbon storage for areas within the Proposed Development's LoD where soils were classed as Class 1, 2 and 3 peat on the NatureScot Carbon and Peatland 2016 Map within the WHS.

Cultural Heritage

8.3.13 A combination of desk-based assessment (including historic map review and remote sensing) and field survey were utilised to develop a robust baseline, using the following study areas: 10 km Designated Assets, 5 km Category B and C listed buildings, 1 km for non-designated assets. Data sources included, national (Historic Environment Scotland (HES) and Canmore), regional (Highland Historic Environment Record (HER) and local (survey and community) datasets.

8.3.14 The WHS was not included in the assessment, as it was screened out early on in the process, later scoped out entirely, based on the nature of the asset.

8.3.15 Further details are presented **in Volume 2, Chapter 12: Cultural Heritage and Volume 5, Appendix 12.1: Scope and Method of Assessment**.

Tourism and Recreation

8.3.16 In line with standard industry practice, the assessment of likely significant effects of the construction and operation of the Proposed Development on tourism and recreation was desk-based, using published and publicly available data, and did not involve any surveys. The study area for direct effects was the land within the Proposed Development LoD, 5 km from the LoD for indirect effects, and the Highland Council area for the effects on tourist accommodation.

8.3.17 The methodology does not seek to assess the significance of effects for individual tourism or recreational assets, but instead assesses the likely significant effects on tourism and recreation activity and behaviour in areas within the study area where relevant assets are located. Effects on the tourism economy are not within the scope of this assessment and are assessed in a separate Socio-Economic Report that will accompany the Application.

8.3.18 Further details are presented in **Section 16.4** of **Volume 2, Chapter 16: Tourism and Recreation**.

Consultation Responses

8.3.19 The EIA and scope of the assessment relating to the Flow Country WHS has been informed by consultation and engagement with relevant stakeholders. Responses relating to the Flow Country WHS are presented in **Table 8-3**. Details of all scoping responses, relevant consultation pertinent to Ecology and Nature Conservation, and SSEN responses are provided in **Volume 2, Chapter 8: Ecology and Nature Conservation, Table 8.2**.

Table 8-3: Consultation Responses Relating to the Flow Country WHS

Consultee	Issue Raised	SSEN Transmission Response / Action Taken
The Highland Council (THC)	The EIAR must detail a robust ecological impact assessment with detailed surveys, mitigation measures, and biodiversity enhancement plans to comply with NPF4 Policy 3 and Highland Council's Biodiversity Enhancement Planning Guidance. To comply with NPF4 Policy 3b, the Proposed Development must demonstrate a 10% biodiversity enhancement using the DEFRA metric. THC requires the following actions to be undertaken: • Conduct extensive baseline ecology surveys to establish presence and distribution of species and habitats, including rare or threatened habitats; • Complete cumulative impact assessments, considering wider ecological effects from other developments; • Assess impacts on designated sites and propose effective mitigation; and • Submit a Habitat Management Plan (HMP), outlining mitigation measures and enhancements.	The BNG assessment for the Proposed Development has been undertaken to comply with NPF4 policy 3 and Highland Council 'Biodiversity Enhancement Planning Guidance' May 2024 and the completed BNG report (and associated toolkit) is appended in **Volume 5, Appendix 8.8: BNG Assessment Report**. Through the impact assessment, identification of significant impacts **(Section 8.7**), the associated mitigation measures (**Section 8.8**) and the BNG report, ambitious enhancement measures have been identified. Habitat survey was undertaken and is presented in **Volume 5 Appendix 8.3: Habitat Technical Report**. Within **Volume 2, Chapter 8: Ecology and Nature Conservation**, protected species and habitats identified within the survey area are presented, with their protection or conservation status e.g. SBL or HNBAP noted. A cumulative assessment is present within **Section 8.10 of Volume 2, Chapter 8: Ecology and Nature Conservation** which includes all EIA projects, within the planning system and within an appropriate ZoI, that may affect the same ecological receptors. Mitigation through design was conducted during the alignment selection phase of the project, with the Proposed Development selected through an iterative design process, avoiding impacts to sensitive receptors where possible. The full process of route determination and consideration of alternatives for this EIA Report is provided in **Volume 2, Chapter 4: The Routeing Process and Alternatives**. Within **Volume 2, Chapter 8: Ecology and Nature Conservation**, designated sites are identified within defined ZoI's. These designated sites are subject to impact assessment in **Section 8.7** of that chapter and where significant impacts are identified additional mitigation is proposed (**Section 8.8**).
NatureScot (NS) (EIA Scoping Response)	The Applicant has been unable to identify a route that avoids crossing the Caithness and Sutherland Peatlands SAC and Ramsar site, and the Flow Country WHS. Direct and indirect effects on priority peatland habitats and its associated flora and fauna are therefore likely and could be significant. The protected areas listed, including the Flow Country WHS, are those that NS currently consider are at greatest risk of significant effects, and where standard mitigation alone may be insufficient to avoid adverse effects. There are sections of the Proposed Development within the Flow Country WHS. The site was inscribed as a WHS due to it being the most outstanding example of a blanket bog ecosystem globally. The Outstanding Universal Value (OUV) of the site	As the route has been refined through the alignment selection phase of the project, and the Study Area has narrowed, impacts on designated sites have been minimised to reflect the likely zone of influence (ZoI) of any potential impact pathway. Impacts to the WHS have been minimised as much as possible but have been unable to be eliminated completely due to constraints such as engineering challenges, other designated and protected sites, and technical and cost restraints. Further detail as to the design selection process is provided in **Sections 8.5.2 - 8.5.7** and in **Volume 2, Chapter 4: The Routeing Process and Alternatives**. The WHS has been subject to impact assessment across a range of technical disciplines including but not limited to **Volume 2, Chapter 8: Ecology and Nature Conservation**, Volume **2, Chapter 11: Geology Environment** and **Volume 2, Chapter 10: Water Environment**. The

Consultee	Issue Raised	SSEN Transmission Response / Action Taken
	encompasses several attributes including the blanket bog habitats and ecosystem processes. Where a proposal affects one or more of these attributes, this could result in impacts on the site's OUV. The Highland Council has produced a toolkit for developers to use in assessments to consider impacts to the WHS. Assessment of impacts to the WHS only needs to consider criterion (ix) for peatland ecosystem quality, as this reflects UNESCO's decision.	assessment is accompanied by THCs WHS Impact Assessment Toolkit (**Volume 5, Appendix 8.10: WHS Assessment, Annex 1**) which has been completed and consolidates the relevant chapter assessments.
Verbal advice from NatureScot, sent from SSEN (27 March 2025)	Verbal feedback was provided from NatureScot on what it is expected to be included in WHS assessments. There is an expectation that Policy 5 in NPF4 is considered [below]. *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.* *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.*	Policy 5 of NPF4 is addressed in this appendix, under **Section 8.4**. Project design has been informed by relevant guidance and has utilised the mitigation hierarchy to avoid adverse impacts in the first instance (see **Volume 2, Chapter 4: The Routeing Process and Alternatives**). Adverse impacts are further avoided and minimised through best practise, such as SSEN GEMPs (**Volume 5, Appendix 3.3: General Environmental Management Plans**) and CEMP. The outline CEMP is included as part of this EIA submission in **Volume 5, Appendix 3.6: Outline CEMP**. An Outline Peat Management Plan (OPMP) is included in the **Volume 5, Appendix 11.2: Outline Peat Management Plan**. This assessment sets out the relevant aspects of the oPMP as it relates to the mitigation of negative impacts and delivery of positive impacts from peat management.

Consultee	Issue Raised	SSEN Transmission Response / Action Taken
Verbal advice from NatureScot (NS), provided during a scheduled consultation meeting (22 May 2025)	(Note: this feedback has been paraphrased from notes taken during the meeting, and was not given as written advice). • NS noted that the relevant guidance appeared to have been followed and that the approach to defining assumptions (taking a precautionary approach informed by guidance and research) was aligned with their expectations. They would expect direct and indirect impacts to be considered as presented in the assessment. • In relation to the scope of the assessment NS advised that the potential for fragmentation should be considered, especially from access tracks. For example, where a new access track could bisect an area of blanket bog, and potentially impede water flow and dewater habitat. NS Advised ERM to consider peat depth in relation to the assessment. • NS pointed out that due to the newness of the WHS, NS are still maturing their approach to assessing the impacts of developments on WHS with natural habitat features, though have had discussions with the English counterpart colleagues (e.g. in relation to The Jurassic Coast WHS). • NS re-iterated that the WHS is designated for blanket bog and that the assessment should focus on that feature, and the project should aim to avoid impacts on blanket bog as far as possible. In their assessment of the effects of the Project on the WHS, NS will focuses on the impacts on the Outstanding Universal Values (OUV) of the WHS. • NS advise that condition (of blanket bog / habitat) cannot be used to rationalise impacts to the WHS, which aligns with the approach taken in the assessment presented. • NS noted that unlike HRA, there is no legal context for the WHS assessment but that sufficient impact on a WHS can lead to its de-listing with UNESCO. • NS noted that they are currently awaiting the outcome of the enquiry for the Kirkton Wind Farm which also affects the WHS and that the decision of the Scottish Ministers in that case would be taken into account when looking at the impact of the Project on the WHS. They stated that they had objected to the Kirkton Wind Farm due to its impacts on blanket bog habitat within the WHS, and noted that SLBB would result in a larger loss of blanket bog than the wind farm.	The potential for fragmentation has been addressed in **Section 8.5.32** of this technical appendix. Impacts to blanket bog have been mitigated through mitigation by design (**Sections 8.5.2 - 8.5.7**) and embedded mitigation (**Sections 8.5.47 - 8.5.51**). Construction will avoid drainage patterns and erosion features where feasible, as set out in the final CEMP.

Consultee	Issue Raised	SSEN Transmission Response / Action Taken
	• There was a discussion about mitigation and NS noting that temporary tracks on blanket bog can be almost as damaging as permanent due to the impacts on habitat from removing temporary track infrastructure. • Construction should avoid drainage patterns and erosion features where feasible. • NS raised issues they have experienced on previous projects in similar habitats, and the concern relating to whether the proposed mitigation can be delivered? • NS noted that due to the way WHS assessments are conducted and the UNESCO guidance, enhancement cannot be weighted against impacts by NS in their consideration of submissions. NS did note however that they can recognise the benefits of enhancement, but also have to recognise any impacts separately rather than considering that enhancements could compensate for impacts. • NS can however support and advise on enhancement separately from the consideration of impacts to WHS OUV. • NS stated that ordinarily, submissions are considered at the Area Manager level. However, for impacts to the WHS, when NS wish to object, the response to submission goes to the Director level. NS wished to emphasise that consideration of impacts to the WHS and objections to submissions are taken quite seriously and considered at a very high level. • NS are keen to be involved through the whole process, and were pleased to be consulted at this stage.	

Assumptions

8.3.20 The Proposed Development is defined within **Volume 2, Chapter 3: Description of the Proposed Development**. For the purpose of this WHS assessment, the Proposed Development refers to the following project elements:

- Permanent tower platform footprint;
- Temporary tower platform footprint;
- Temporary pulling location footprint; and
- Access tracks (including permanent and temporary cut and fill and floating tracks): with an assumed 10 m corridor (5 m either side of the track centre line).

8.3.21 Assumptions as to the definition of permanent and temporary impacts are described within **Volume 2, Chapter 3: Description of the Proposed Development**. Permanent and temporary impacts have been defined as follows:

- Permanent impact is an impact that cannot be reversed; and
- Temporary impact is an impact that is reversible.

8.3.22 Assumptions for the Ecology assessment, including habitat surveys, are detailed in **Volume 2, Chapter 8: Ecology and Nature Conservation** and **Volume 5, Appendix 8.2: Ecology Assessment Methodology**. Assumptions which apply to this assessment include:

- A worst-case for all access tracks is assumed, with the track width and construction corridor merged to give a direct impact width of 10 m; and
- Indirect impacts on wetland habitats only, comprising:
  - up to 30 m from access tracks, due to the presence of drainage features and associated water table drawdown, based on NatureScot guidance[18,20]; and
  - up to 10 m from the footprint of all other infrastructure, due to the absence of drainage features but residual potential for localised impacts to species diversity, habitat, peat structure, and hydrology; based on guidance[23], literature review[24,25], and professional judgement.

8.3.23 Assumptions for the Peat Carbon assessment are detailed in **Volume 5, Appendix 11.3: Peat Carbon Assessment**. Assumptions which apply to this assessment include:

- The peat within the WHS has a bulk density of 175 kg / m^3 and a carbon content of dry peat of 42% (the default values used within the Peat Carbon Calculator);
- Class 1, 2, and 3 peat from the NatureScot Carbon and Peatland 2016 Map are assumed to be the most vulnerable carbon-rich soils to disturbance causing impacts on carbon sequestration;
- A worst-case for all access tracks is assumed, with the track width and construction corridor merged to assume a total upper limit impact width of 10 m;
- Indirect impacts on wetland habitats only, up to 30 m from permanent access tracks and up to 10 m from permanent tower bases;

[23] IUCN (2025) *Networks of Change: Tracks and Roads on Peatland*. IUCN National Committee, United Kingdom.
[24] Labadz J., *et al* (2010). *Peatland hydrology: Draft Scientific Review*. IUCN UK Peatland Programme
[25] Williams-Mounsey, J., Crowle, A., Grayson, R., Lindsay, R., & Holden, J.(2023). *Surface structure on abandoned upland blanket peatland tracks*. Journal of Environmental Management. 2023;325:116561. Available online [Accessed May 2025]: https://doi.org/10.1016/j.jenvman.2022.116561

- Temporary infrastructure (temporary access tracks and tower pads) will cause direct impacts to peat carbon permanently in order to assess the worst-case scenario, despite the fact that impacts from temporary infrastructure may be short-term and reversible following construction;
- Temporary infrastructure would not result in indirect impacts as their effect is short-term;
- Indirect impacts, for example from changes to the hydrological environment, are assumed to result in a total loss of one quarter (25%) of the carbon stored within the peat, in order to demonstrate the potential for indirect impacts while indicating that they are unlikely to result in total carbon loss within the peat and would most likely be mitigated through best practice measures;
- Peat restoration associated with the Proposed Development solely relates to peat reuse and redressing around infrastructure, with no additional peatland restoration or compensation included in the assessment; and
- Peat restoration will be successful and restore the peatland to its original, pre-construction quality and depth.

8.3.24 Assumptions for the Water environment are set out in **Volume 2, Chapter 10: Water Environment**. Assumptions which apply to this assessment include:

- Baseline conditions have been established from a variety of sources; due to the dynamic nature of the water environment, conditions will change during the construction and operation of the scheme;
- It is assumed that information received by third parties is complete and up to date;
- Construction methods will be in accordance with the SSEN GEMPs and measures that will be detailed in the CEMP. For this assessment, construction methods and measures have been assumed based on similar projects that SSEN have undertaken;
- The WHS hydrological assessment has focussed on water quantity and quality impacts. The associated impacts of changes to the blanket bog habitats are within the remit of the ecology team and is discussed in the relevant sections of this assessment;
- The GWDTEs discussed in the ecology sections of this assessment have been assessed by the ERM hydrologists, and within the WHS are not considered groundwater dependent but surface water fed. Further details on this assessment are found in **Volume 5, Appendix 10.3: Groundwater Dependent Terrestrial Ecosystem Assessment**;
- No assessment of groundwater / hydrogeology impacts have been assessed within this WHS Assessment because as per attributes a) and f) the WHS is a rainwater (surface water) dependent habitat; and
- The assessment of effects assumes that the embedded mitigation measures including CEMP and GEMPs are implemented.

8.3.25 Assumptions specific to this assessment include:

- Area and length calculations were rounded to two decimal places, or one significant figure for values >1.

Limitations

8.3.26 A detailed summary of limitations to the survey and assessment of the technical disciplines are presented in:

- Ecology and Nature Conservation
  - **Volume 5, Appendix 8.3: Habitats Technical Report, Section 3.5**.
- Water Environment
  - **Volume 2, Chapter 10: Water Environment Section 10.3.17.**
  - **Volume 5, Appendix 10.3: Groundwater Dependent Terrestrial Ecosystems Assessment.**
- Geological Environment

  - **Volume 2, Chapter 11: Geological Environment Sections 11.3.41 to 11.3.44**
- Carbon
  - **Volume 5, Appendix 11.3 Peat Carbon Assessment, Section 3.5.**

8.3.27 No significant limitations relevant to the assessment of the Flow Country WHS under Criterion ix or its attributes were identified.

8.4 Baseline Conditions

8.4.1 The following sections summarise the findings of baseline surveys and desk study relevant to the assessment of impacts to the Flow Country WHS. Further detailed information can be found in the referenced sections of the Proposed Development EIA Report and Appendices.

Geological Environment

Topography and Slope

8.4.2 OS mapping indicates that ground elevations within Study Area vary between 20 m and 360 m AOD. The lowest elevations are associated with the banks of watercourses and the highest elevations associated with the hill tops.

8.4.3 In areas with significant slopes, there is an increased risk of peat slides depending on the superficial geology and the composition and extent of the overlying soils which may affect the stability of the slopes. The majority of the Study Area is situated across flat expanses and gentle slopes, predominantly associated with undulating hills and watercourses.

Bedrock Geology

8.4.4 The BGS GeoIndex indicates that there are several bedrock formations underlying the Survey Area, detailed in **Table 8-4** below.

Table 8-4: Bedrock Geology in the Survey Area

Bedrock Formation	Lithology Type	Description
Spital Flagstone Formation	Sedimentary	Siltstone, mudstone and sandstone
Berriedale Sandstone Formation	Sedimentary	Sandstone, limestone, mudstone, siltstone and trace breccia
Lybster Flagstone Formation	Sedimentary	Siltstone, mudstone and sandstone
Helmsdale Granite Phase 1	Igneous	Granite (porphyritic)
Helmsdale Granite Phase 2	Igneous	Granite (porphyritic) and microgranite (aplitic)

Superficial Geology

8.4.5 The BGS GeoIndex Superficial Geology Mapping indicates that the most common superficial deposits mapped throughout the Study Area are peat and alluvium. **Table 8-5** details the superficial deposits that are present across the Survey Area.

Table 8-5: Superficial Geology within Survey Area

Superficial Deposit	Description
Peat	Peat is a partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps.

Superficial Deposit	Description
Alluvium	Comprised of clay, silt, sand and gravel. It is the unconsolidated detrital material deposited by a river, stream or other body of running water as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain or delta, or as a cone or fan at the base of a mountain slope.

Soils

8.4.6 The 1:250,000 National Soil Map of Scotland[19] indicates that there are two (2) soil types recorded across the Survey Area, including Peat and Peaty Podzols.

8.4.7 A summary of the information on soil units within Scotland's Soils, Scotland's Environment Website can be found in **Volume 2, Chapter 11: Geological Environment, Section 11.4.11 Soils**. In addition, **Volume 3, Figure 11.3** includes an extract from the 'National Soils Map of Scotland'.

Peat Depth Surveys

8.4.8 Peat depth surveys were carried out to determine the extent and depth of the peat present across the Study Area. The results from these surveys are summarised in **Section 11.3** of **Volume 2, Chapter 11**: **Geological Environment** and detailed in full in **Volume 5, Appendix 11.1: PLHRA** and **Volume 5, Appendix 11.2: Outline PMP.** These appendices provide Site-specific peat depth information which informed the design of the layout of the Proposed Development and the subsequent assessment of effects.

8.4.9 The 2016 Carbon and Peatland Map exhibits the distribution of peatland classes across Scotland, with the details of the specific classifications used shown in **Table 11.9** of **Volume 2, Chapter 11: Geological Environment**. The Carbon and Peatland Map indicates areas of Class 1, 2 and 5 peatlands within the Study Area. This section of the Study Area consists of large sections of high priority Class 1 and 2 peatland with isolated areas of Class 5 peatlands.

8.4.10 Within the Survey Area, peat depths ranged from 0.01 to 5.9 m. **Table 8-6** displays the minimum, maximum and average peat depths recorded within a 55 m radius of each proposed tower location and the access track within the WHS.

Table 8-6: WHS Peat Depths

Tower Number	Average Peat Depth (m)	Minimum Peat Depth (m)	Maximum Peat Depth (m)	Number of probes in 55 m Radius
N24	2.25	1.9	2.6	14
N25	4.62	3.5	5.9	18
N26	2.68	1.2	3.5	18
N27	1.37	1	2.6	19
N28	3.82	3	4.5	17
N33	3.13	2.1	4.4	22
N34	2.78	2.3	2.9	6
N35	2.8	2.8	2.8	1
N36	0.29	0.1	0.8	19
N37	0.23	0.1	0.4	23
N126	0.42	0.1	0.5	22

Tower Number	Average Peat Depth (m)	Minimum Peat Depth (m)	Maximum Peat Depth (m)	Number of probes in 55 m Radius
N127	0.42	0.1	0.5	22
N128	0.28	0.01	0.6	22
N129	0.37	0.01	0.8	21
N130	0.79	0.5	1.1	22
N131	2.21	1	3.4	18
N132	0.95	0.2	2.1	21
N133	1.07	0.5	2	21
N134	1.23	0.60	1.8	22
N135	1.15	0.9	1.6	17
N136	2.30	2.1	2.9	5
N137	2.60	2.4	3	6
N138	1.76	1.4	2.8	8
N148	0.21	0.05	1.25	21
Permanent Access Track	1.28	0.1	4.2	NA
Temporary Access Track	1.53	0.1	5.9	NA

Note: No probing data was obtained around Tower N147 as it was excluded from survey due to access issues

Peat Landslide and Hazard Risk Assessment

8.4.11 **Volume 5, Appendix 11.1: PLHRA** provides factual information based on the peat survey results across the Proposed Development, relating to proposed infrastructure locations. The desk-based information and site surveys have been utilised to assess any potential risks of peat landslide. The methodology adopted and details on the assessment are outlined in **Section 11.4** of **Volume 5, Appendix 11.1**. The assessment has been undertaken in accordance with Scottish Government Guidance in assessing the likelihood and consequence of such an event.

8.4.12 The Hazard Ranking Plan, **Section 11.8.1 to 11.8.9** and **Table 37** of **Volume 5, Appendix 11.1: PLHRA** show the sections of WHS to be of Low to Moderate risk of peat slide before mitigation. A moderate risk or higher is usually assigned to areas of deep peat, steep slopes or a combination of the two.

8.4.13 The moderate risk points are located throughout the WHS, with occurrences close to the Proposed Development infrastructure. The Proposed Development infrastructure sits within the WHS and is situated close to the moderate risk points including proposed Towers N25, N34, N35, N133, N135, in addition to areas of access tracks to the east of Tower N133. These moderate risk points are located near the proposed infrastructure but are considered isolated occurrences and therefore, with the appropriate mitigation measures and monitoring found in **Section 11.8** of **Volume 5, Appendix 11.1: PLHRA**, the risks associated with the points can be mitigated to negligible and low.

Peat Excavation and Re-use Volumes

8.4.14 Excavated peat volumes have been estimated through review of average peat depth data recorded during peat probing surveys. Using probed peat depth survey data and GPS co-ordinates of each peat probe, peat depth and interpolated peat depth maps were created through ArcGIS Spatial Analyst tools. Data tables were exported from GIS and analysed in Excel to calculate average, maximum and minimum depths within a 55 m radius of site infrastructure. Data was then compared to a proposed areas anticipated for the site infrastructure.

8.4.15 For the purpose of the peat excavation and re-use calculations some assumptions have been adopted as detailed below in **Table 8-7**.

Table 8-7: Design, Excavation and Reuse assumptions

Infrastructure	Design Assumption	Excavation Assumption	Reuse Assumption	Additional Information
Tower Foundations	Current maximum pad size of 6.5 x 6.5 x 0.9m per tower leg	For Excavation area: Maximum pad size of 6.5 x 6.5 = 42.25 per tower leg. For 4 tower legs x 4 = 169m2	An additional 0.4 m has been added to the perimeter of each tower foundation to be dressed off.	Average peat depths suggest there should be sufficient acrotelmic peat available for redressing infrastructure.
			Catotelmic peat will be placed in the bottom of the tower foundations to a maximum thickness of 2.2 m where very deep peat is encountered.	Peat cut volume has been calculating using area of total tower legs x average peat depth.
			Towers and associated earthworks will be dressed off with up to 0.5 m of peat and peaty soils.	
			a + 10% Bulk Factor Contingency has been included in peat cut volumes	Average peat depths have been calculated using peat survey data within a 55 m radius of individual tower centres
Permanent Tracks	Track widths during construction are typically expected to have a running width of 6m with overall construction corridor of approximately 10 m to allow for suitable drainage and pollution prevention measures	Track areas calculated length x 10 m	Where new permanent tracks are proposed, peat will be reinstated along verges and associated earthworks with peat up to 0.5 m thick with verged not	Where operation access is required, this would likely range from use of all-terrain vehicle (ATV) routes with no formal track to a stone road suitable for 4x4x vehicle access, approximately 2.5m width with appropriate turning heads where required.

Infrastructure	Design Assumption	Excavation Assumption	Reuse Assumption	Additional Information
		Track lengths calculated by individual track.	expected to exceed 3 m on either side.	Permanent and temporary tracks are required to facilitate construction and operation of the proposed development. Tracks to be retained would be partially reinstated on commissioning of the OHL to reduce their width to approximately 2.5m for use by SSEN Transmission for maintenance access. Other tracks noted as temporary would be removed and the land reinstated.
				Average peat depths have been calculated using peat survey data within a 50 m radius of individual tracks.
				Average peat depths suggest there should be sufficient acrotelmic peat available for redressing infrastructure.
Tower compounds	85 m x 85 m - Tension Tower 60 m x 60 m - Suspension Tower	Excavation assumption has calculated individual tower compound area minus any infrastructure that sits within the compound, such as permanent tower footings and access tracks that pass though (permanent and temporary) to ensure volumes are accurate.	It is assumed peat excavated for temporary compounds will be temporarily stored and replaced in the vicinity of its original location once permanent infrastructure is in place.	The same average peat depths for tower footings have been used to calculate temporary compound volumes.
Temporary access tracks (Cut and Fill)	Track widths during construction are typically expected to have a running width of 6m with overall construction corridor of approximately 10 m to allow for suitable drainage and pollution prevention measures	Excavation volumes have been calculated by individual track.	It is assumed peat excavated for temporary tracks will be temporarily stored and replaced in the vicinity of its original location.	Average peat depths have been calculated using peat survey data within a 50 m radius of individual tracks.

8.4.16 The estimated peat excavation volumes for the Proposed Infrastructure within the WHS are included in **Table 8-8** using the anticipated construction activities that will generate excavated soils.

Table 8-8: Peat Excavation Volumes Based on Construction Activity in the WHS

Development Component	Estimated Volume of Excavated Peat (m3)	Excavated Volume of Acrotelmic Peat (m3)	Estimated Volume of Catotelmic Peat (m3)
Towers and associated earthworks	5171	1489	3682
New permanent access tracks	13609	9321	4288
Temporary Cut and Fill Access Tracks	79009	25820	53189
Sub-Total	**97788**	**36630**	**61159**
+ 10% Bulk Factor Contingency	9779	3663	6116
Total	**107567**	**40545**	**79251**

8.4.17 **Section 3.4.46** in **Volume 5, Appendix 11.2: Outline PMP** outlines the principles of reinstating peat and peat soils that will be adhered to. **Section 3.4.47** in **Volume 5, Appendix 11.2: Outline PMP** outlines the objectives in proposing restoration of peatlands on the Site.

8.4.18 **Table 8-9** shows the opportunities for the re-use of peat within the WHS including the demand for acrotelm and catotelm peat, while **Table 8-10** summarises the total peat balance estimated during construction of the Proposed Development.

Table 8-9: Peat Re-Use Volumes Based on Construction Activity in the WHS

Development Area	Total Demand Estimate (m^3)	Acrotelm Demand (m^3)	Catotelm Demand (m^3)	Reinstatement Thickness (max) (m)
Towers and associated earthworks	4444	1639	2805	2.2
New permanent access tracks	12397	8855	3542	0.7
Temporary Cut and Fill Access Tracks	79009	25820	53189	All excavated peat reinstated
Total	**95849**	**36314**	**59536**	

8.4.19 The following assumptions have been made in assessing peat re-use:

- Excavated peat will be temporarily placed adjacent to where it is excavated. These are areas of previous disturbance area where peat was less than 0.5 m, areas out with 50 m buffer of watercourses and where topography permits.
- Temporary peat storage areas may be required throughout the construction phase, the location of which will be defined by the chosen Principal Contractors based on the site conditions, environmental constraints and logistical considerations. Any proposed storage location will provide space for approximately half of the total volume of peat excavated throughout the development. Since the development will be phased it is proposed that this approach will be sufficient.

Table 8-10: Peat Balance Calculations in the WHS

Peat Description	Total Peat Demand Estimate for Reinstatement (m³)	Total Peat Supply from Excavation (m³)	Surplus (+) or Deficit (-) (m³)
Acrotelm	36,314	40,545	+ 4,231
Catotelm	59,536	79,251	+ 19,715
Total	95,849	107,567	+ 11718

8.4.20 **Table 8-10** demonstrates that there is a surplus of acrotelm and catotelm peat following the development and re-use of excavated peat. Surplus peat will be re-used either to dress off nearby infrastructure along the wider extent of the OHL or in deep peatland where erosion has been observed. Further details are available within the oHMP.

8.4.21 **Section 3.5.1** in **Volume 5, Appendix 11.2: Outline PMP** discusses the handling and storage of peat where required.

Peat Carbon Assessment

8.4.22 Within the WHS there is Class 1 and Class 2 peat, as described in Section 23 . When considering the full LoD of the Proposed Development which falls within the WHS and these classes of peat (an area of 77.95 ha), and assuming the average recorded peat depth (1.58 m) across these areas of peat, then it is calculated that the peat within the LoD of the Proposed Development within the WHS stores approximately 331,000 tonnes CO_2 equivalent (tCO_2e) or 0.33 Mt CO_2e.

Ecology and Nature Conservation

Habitat Surveys

8.4.23 Within the Survey Area, where it overlaps with the Flow Country WHS, 13 UKHab habitat types were recorded. Those habitats surveyed and recorded within the Operational Corridor where it passes through the WHS are displayed in **Volume 3, Figure 8.3 (sheets 4-5 and 16-18)** and presented in **Table 8-11**.

Table 8-11: Habitats recorded within the Flow Country WHS

Habitat Classification	Area (ha) within Operational Corridor
f1a - Blanket bog	35.59
f1a5 - Blanket bog (H7130)	65.82
f1a6 - Degraded blanket bog	5.42
f2b - Purple moor-grass and rush pastures	2.58
f2c - Upland flushes, fens and swamps	0.12
g1b - Upland acid grassland	1.78
g1b6 - Other upland acid grassland	2.08
g1c - Bracken	0.58
g3c8 - Holcus-Juncus neutral grassland	2.54
h1b - Upland heathland	0.04

Habitat Classification	Area (ha) within Operational Corridor
h1b5 - Dry heaths; upland (H4030)	8.95
h1b6 - Wet heathland with cross-leaved heath; upland (H4010)	3.46
w2c - Other coniferous woodland	0.82
Total	**129.8**

Peatland Condition Assessment

8.4.24 Condition was established for areas of peatland within the Study Area, being placed into one of four categories (detailed in **Table 8-2)**. The areas (ha) of peatland within the WHS classed as being in near-natural condition, or as modified, drained or actively eroding, are presented in **Table 8-12** and displayed in **Volume 3, Figure 8.7: Peatland Condition Mapping**.

Table 8-12: Peatland Condition within Study Area in WHS

Condition Category	Area (ha)
1) Near-Natural Condition	32.01
2) Modified	21.03
3) Drained	7.99
4) Actively Eroding	0
Other	12.35
Total peatland	**61.04**
Grand total	**73.38**

8.4.25 In the north, where the WHS boundary overlaps with the Caithness and Sutherland SAC, habitat recorded as NVC M17 (Scirpus cespitosus-Eriophorum vaginatum blanket mire) was categorised as being in 'near-natural' condition. All other habitat in this area not recorded as M17 at best fell into the 'modified' category.

8.4.26 In the south where the OHL overlaps with the WHS, much of the habitat was NVC M19 (Calluna vulgaris-Eriophorum vaginatum blanket mire) or M20 (Eriophorum vaginatum blanket and raised mire), and so was classified as 'modified'. Annex 1 blanket bog (recorded a UKHab f1a5 - Blanket bog (H7130)) was also identified in the southern area, and was precautionarily classed as 'near-natural' where clearly not drained. Blanket bog in the south (M19, M20; classified as modified or drained) was interspersed with other peatland habitats including wet heath on deeper peat (classified 'modified'), and dry heath on shallower peat (usually classified as 'other').

8.4.27 Cutover peat and artificial drainage were recorded across the areas where the OHL intersects the WHS, but was much more prevalent in the southern areas.

Water Environment

Surface Water

8.4.28 There are several named surface watercourses as shown on OS 1:50,000 scale mapping and their associated tributaries that flow through the Flow Country WHS, as well as other flowpaths identified through surface water modelling.

8.4.29 Between T64 and T148 of Section A of the Proposed Development, all watercourses drain in a southeasterly direction. The watercourses originate within the WHS and discharge into coastal waters downstream of the

WHS. Between T24 and T63 watercourses drain north and then east towards the coast. These watercourses originate outside of the WHS boundary but subsequently flow through it.

8.4.30 Where the Proposed Development crosses watercourses within or upstream of the WHS, this has the potential to effect downstream surface water quality and quantity in the following named watercourses and their associated tributaries:

- Caen Burn;
- Ousdale Burn;
- Wick River;
- Loop Burn/ Little River;
- Burn of Tacher;
- Burn of Acharole; and
- Allt Caol.

8.4.31 The Ousdale Burn is classified under the Water Framework Directive (WFD) as having an overall classification of 'Good'. The Caen Burn has an overall classification of 'High', and the Wick River has an overall classification of 'Moderate'.

GWDTE

8.4.32 Potentially groundwater dependent habitats were identified at the following locations within the WHS (all within Section A of the Proposed Development) between:

- T24-28
- T33-36
- T130-131; and
- T143-148.

8.4.33 The GWDTE assessment concluded these habitats were surface water fed and not groundwater dependent. Full details of the assessment can be found in **Volume 5, Appendix 10.3: Groundwater Dependent Terrestrial Ecosystem Assessment**. These habitats are therefore sensitive to changes in the hydrological regime within the WHS.

Tourism and Recreation

8.4.34 The Proposed Development crosses the Flow Country WHS at four locations in Section A: at Achavanich (Towers N24-N28, and Towers N33-N37), and at Helmsdale (Towers N126-N138, and Towers N147 and N148). The areas affected provide very limited tourism infrastructure, and as the Flow Country WHS covers an area of approximately 190,000 ha, the areas affected comprise a very small proportion of the total area of the WHS.

8.4.35 The sensitivity of the Flow Country WHS is assessed as high due to its international importance as a WHS. While there is the potential for a direct impact on the WHS and for indirect effects on amenity for visitors to the WHS, the areas affected are small and provide very limited tourism infrastructure. Given the scale of the impact and the small proportion of the WHS that would be affected, the magnitude of the impact is assessed as negligible.

8.4.36 Further details are presented in **Volume 2, Chapter 16: Tourism and Recreation**.

8.5 Assessment of Effects

8.5.1 The following section identifies potential effects from the Proposed Development on the Flow Country WHS and presents an assessment of predicted impacts on its attributes.

Mitigation by Design

8.5.2 The Proposed Development was selected through an iterative design process, avoiding impacts to sensitive receptors where possible. The preferred alignment of the Proposed Development has been informed by a robust selection process, taking into account identification of subsequently more detailed corridor, route and alignment options. The approach to alignment selection has been informed by SSEN's guidance 'Procedures for Routeing OHLs and Underground Cables of 132 kV and above'[26]. This guidance considers within it the Holford Rules[27], which sets out a hierarchical approach to routeing which advocates avoiding areas of high amenity value, minimizes changes in direction, and takes advantage of topography to minimise visual interaction with other transmission infrastructure.

8.5.3 SSEN assessed the strategic electricity transmission infrastructure requirements to identify the most appropriate, viable, and long term, enduring technical design solution. SSEN followed a series of stages in the iterative design process, including route selection and consultation, alignment selection and consultation, consideration of design solutions and other considerations to avoid or reduce likely adverse significant effects, and design strategy for ancillary infrastructure. The final alignment proposed is the one believed to have the least significant impact overall. Further detail as to the routeing process and consideration of alternatives is laid out in **Volume 2, Chapter 4: The Routeing Process and Alternatives**.

8.5.4 The Proposed Development terminates in the north at the proposed Banniskirk 400kv Substation and HVDC Converter Station by Spittal in Caithness and Sutherland. The preferred alignment follows the infrastructure corridor of the A9 and existing Spittal-Mybster 132 kV OHL north from Latheron. Two options, A1.1 and A1.2 (**Volume 3, Figure 4.3, Sheets 1-2**), were then considered to reach Banniskirk, one to the west and one to the east of the existing Halsary Windfarm. In consideration of alignment options in the northern two crossing points, both Option A1.1 and A1.2 flagged minimising potential impacts on the Flow Country WHS as a key environmental constraint in Section A. The eastern Option A1.1 was preferred as A1.2 had greater engineering challenges (including multiple crossings of existing roads and OHLs), impacts on Causeymire-Knockfin Flows Wild Land area and the Royal Society for Protection of Birds (RSPB) Forisnaird Flows Reserve, and a potentially greater length through the Caithness and Sutherland Peatlands SAC and the Flow Country WHS (component part 006: Munsary & Shielton).

8.5.5 Route Option A1.1 was further refined at the alignment selection stage. The Preferred Alignment was located to the east of the A9 to avoid additional crossings of the A9 and existing Spittal-Mybster 132 kV OHL, and to avoid passing through the Caithness and Sutherland Peatlands SAC west of Crofts of Benachielt and Loch Rangag. For Option A1.1 to maintain sufficient stand-off distance from the Halsary Wind Farm, the alignment has to cross the SAC and Flow Country WHS at Halsary. The original alignment of Option A1.1 comprised a longer 'dog leg' section passing to the east of Acharole before swinging north to head towards Banniskirk. This alternative alignment ran through the SAC and Flow Country WHS for approximately 6.4 km included 18 tower locations. The preferred alignment was selected, which passes through the SAC and Flow Country WHS for approximately 3.6 km including 10 tower locations. Access to the construction corridor for the Proposed Development has been refined with temporary access used wherever possible.

[26] SSEN Transmission (September 2020). Procedures for Routeing Overhead Lines and Underground Cables of 132 kV and above. Revision 2.
[27] Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines with NGC 1992 and SHETL 2003 Notes.

8.5.6 In consideration of alignment options in the southern two crossing points, both Options A1.5 and A1.6 factored in crossings into the WHS. At the time of consideration, routes A1.5 and A1.6 were determined to require further work to minimise impact to landscape character and wild land. From a habitat and protected species perspective, option A1 was considered to be less impactful than Option A2, with the latter traversing an area of Wild Land and crossing into a large extent of the Caithness Flows peatlands which [was] a Candidate World Heritage Site. Option A1.5 was considered environmentally preferred due to reduced potential to impact ancient woodland and its proximity to the A9, thereby reducing potential landscape and habitat impact on the less developed interior. However, whilst Option A1.5 was environmentally preferred, the technical and cost preference was for Option A1.6. This is the option that was taken forward for development and is assessed here.

8.5.7 The full process of route determination and consideration of alternatives for this EIA Report is provided in **Volume 2, Chapter 4: The Routeing Process and Alternatives**.

Interaction of the Proposed Development with the Flow Country WHS

8.5.8 The Proposed Development intersects the Flow Country WHS in four locations within Section A (Spittal to Brora), passing through WHS component parts 006: Munsary & Shielton, and 005: East Halladale[28]. A total of 25 steel lattice towers are proposed to be constructed and sited permanently within the boundaries of the Flow Country WHS. These comprise ten towers within WHS component 006: Munsary & Shielton (Towers N24-N28 and N33-N37), and 15 within WHS component 005: East Halladale (Towers N126-N138, N147 and N148). The Proposed Development and location of towers within the Flow Country WHS are presented in **Volume 3, Figure 8.1: Designated Sites (sheets 1a – 1d)**.

8.5.9 Ancillary infrastructure proposed within the Flow Country WHS comprises:

- 7.5 km (7.5 ha) of temporary access tracks (5.2 km cut and fill, 2.4 km floating);
- 1.7 km (1.8 ha) of permanent access tracks (cut and fill only);
- 0.36 ha of temporary Equi-Potential Zones (EPZ) pulling positions, associated with angle towers;
- 12.9 ha of temporary tower platforms/compounds; and
- 0.39 ha of permanent tower platforms.

Screening

8.5.10 Screening was carried out in line with THC Impact Assessment Toolkit in order to determine which attributes were likely to be impacted by the Proposed Development, and which technical disciplines may be most relevant to each attribute. The responses to screening questions and technical disciplines screened in and out of each are detailed in **Table 8-13.**

[28] As described in: Flow Country Steering Group (2022) *The Flow Country proposed World Heritage Site: Management Plan Nomination draft Dec 2022.* Available at: https://whc.unesco.org/en/list/1722/documents/

Table 8-13: Technical disciplines associated with attributes of Criterion ix

Relevant WHS attribute	THC Impact Assessment Toolkit Screening question	Y/N	Explanation of Reasons	Ecology	Geology	Hydrology	Carbon	Cultural Heritage	Tourism and Recreation
a)	*Might the project/ development negatively impact the extent or continuity of natural, actively accumulating, blanket bog ecosystem?*	Yes	The project will impact the extent of blanket bog habitat, through temporary and permanent localised removal. Any impact would be highly localised, a very small proportion of the overall site (tower, access track and pulling locations), and would not affect the surrounds into the long term. Where the Proposed Development crosses watercourses within or upstream of WHS, the downstream water quality and quantity which supports the blanket bog habitats will be impacted. However, the impact would be temporary and localised to the Proposed Development and immediate downstream receptors.	✓	✓	✓	N/A	N/A	N/A
b)	*Might the project/ development reduce the range of climatic, topographic gradients and geological diversity that result in the recorded bog macroform diversity?*	No	The project will not impact on climatic or geological diversity. Topography will be impacted on a very local scale by the project footprint. Any impact would be highly localised to the tower and access track locations, and would not affect the surrounds into the long term.	✗	✗	✗	N/A	N/A	N/A
c)	*Might the project/ development degrade the temporal and spatial record of peatland development and related factors?*	Yes	The project will have a permanent localised impact to the temporal archive under the project footprint. There is no likely pathway for impact to the overall spatial and temporal archive of the WHS. Any impact would be highly localised to the tower and access track locations, and would not affect the surrounds into the long term.	✓	✓	N/A	N/A	✗	N/A
d)	*Might the project/ development impact on ongoing scientific work or the educational*	No	Although temporary access restrictions are anticipated during the construction phase, the project will not affect the ongoing scientific work or educational	✗	N/A	N/A	N/A	N/A	✗

Relevant WHS attribute	THC Impact Assessment Toolkit Screening question	Y/N	Explanation of Reasons	Ecology	Geology	Hydrology	Carbon	Cultural Heritage	Tourism and Recreation
	value of the peatlands and associated biodiversity?		value of the peatlands and associated biodiversity. Any impact would be highly localised to the tower and access track locations, and would not affect the surrounds into the long term.						
e)	*Might the project/ development reduce the carbon sequestration and/or storage potential of the peatlands?*	Yes	The project will result in a temporary or permanent reduction in the carbon sequestration and storage potential of the peatlands through the temporary/permanent localised removal of blanket bog habitat. Any impact would be highly localised to the tower and access track locations, and would not affect the surrounds into the long term.	✓	✓	N/A	✓	N/A	N/A
f)	*Might the project/ development impact the water filtration and resultant water quality of associated riverine habitats?*	Yes	Where the Proposed Development crosses a watercourse within or upstream of WHS, the water quality and quantity in downstream riverine habitats will be impacted. In addition, the project will impact water filtration in the WHS. Any impact would be temporary and localised to the Proposed Development and immediate downstream receptors.	✗	N/A	✓	N/A	N/A	N/A

Note: tick (✓) = screened in, Cross (✗) = screened out, N/A = not applicable.

8.5.11 From the screening questions, it is determined that the Proposed Development has the potential to impact 4 of the 6 attributes for Criteria ix. The four attributes (described in **Table 8-1**) screened in include a), c), e), and f) (actively accumulating blanket bog, stored archive, carbon sequestration and storage, and water filtration and quality), and two attributes screened out were b), and d) (bog macroform diversity, and educational and scientific use).

8.5.12 Four technical disciplines were screened in for these attributes, including Ecology (attributes a, c, e), Hydrology (attributes a, f), Carbon (attribute e) and Geology (attributes a, c, e). The impacts of the Proposed Development to the Flow Country WHS are further explored in this section, also supported by each corresponding technical Chapter: **Volume 2, Chapter 8: Ecology and Nature Conservation, Volume 2, Chapter 10: Water Environment, and Volume 2, Chapter 11: Geological Environment**.

8.5.13 Cultural heritage was screened out for attribute c) (stored archive) as it was determined that there were no inherent heritage considerations, with the Proposed Development not considered likely to have an impact on

the overall temporal and spatial archive of the Flow Country WHS. Any impacts would be highly localised, disrupting the record where removed or compacted, but would not impact/disrupt the broader stored archive within the Flow Country WHS. Cultural Heritage impacts are further addressed in **Volume 2, Chapter 12: Cultural Heritage**.

8.5.14 Tourism and Recreation was screened out for attribute d) (educational and scientific use) as it was determined that despite temporary access restrictions, and as the direct removal of habitat due to tower locations and access tracks would be highly localised, the Proposed Development would have negligible impact on the ongoing scientific work or educational value of the peatlands and associated biodiversity. Tourism and recreation impacts are further explored in **Volume 2, Chapter 16: Tourism and Recreation**.

8.5.15 Further to attribute screening, THC Impact Assessment Toolkit provides high level screening for potential impact to the integrity[29] of the Flow Country WHS as a whole, as detailed in **Table 8-14**.

Table 8-14: THC Impact Assessment Toolkit Flow Country WHS Integrity

THC Impact Assessment Toolkit Screening question	Y/N	Explanation of Reasons
The site boundary encapsulates all of the elements of OUV needed to demonstrate the ecological and biological processes and associated biodiversity of a blanket bog landscape as well as ensuring ecosystem integrity and coherence. Would the project/development impact on the integrity of the site as a whole?	No	The Proposed Development is partially located within the site, and also within the site 'setting', and has potential to impact 4 of 6 criteria ix attributes. Due to the small scale of impacts, and limited interaction with the WHS (intersecting for short distances at four locations), impacts to the OUV of attributes are anticipated to be negligible, and not anticipated to negatively impact the integrity of the site as a whole.

Assessment of Technical Discipline Baseline Data

8.5.16 The following section summarises the assessment of impacts to the Flow Country WHS attributes, per technical discipline, drawing from the baseline information laid out in **Section 8.4**. Further detailed information can be found in the referenced sections of the Proposed Development EIA Report and Appendices.

Geological Environment

8.5.17 The attributes of OUV screened in for the Geology technical discipline are:

- a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally;
- c) archive it stores (4th dimension); and
- e) carbon sequestration and storage.

8.5.18 The Flow Country WHS has the potential to be impacted by the Proposed Development due to the disturbance and excavation of peat during construction. Beyond the main construction activities, there are other considerations to include when assessing impacts including peat stability and the loss and compaction of peat.

8.5.19 When assessing receptor sensitivity for the assessment of impacts, the presence of Class 1 peatland across more than 20% of the Proposed Development in the Flow Country WHS classifies the peat in the Flow Country

[29] The integrity of a WHS is defined by UNESCO as *a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes. Examining the conditions of integrity therefore requires assessing the extent to which the property: a. includes all elements necessary to express its Outstanding Universal Value, b. is of adequate size to ensure the complete representation of the features and processes which convey the property's significance, c. suffers from adverse effects of development and/or neglect*[3]

WHS as a high sensitivity receptor. This is based on the framework outlined in **Section 11.3.32** of **Volume 2, Chapter 11: Geological Environment.**

Peat Stability

8.5.20 Construction activities have the potential to increase the likelihood of peat slides if the ground conditions where the peat is present are altered e.g. if proposed tracks are constructed on sloping ground where peat is present. Construction activities may involve the removal of surface vegetation and excavation of peat and other near surface soils from the bedding surface of the underlying rock which would naturally increase the potential for slide.

8.5.21 A detailed account of potential peat slide risk and appropriate mitigation is presented in **Volume 5, Appendix 11.1: PLHRA.**

Carbon

8.5.22 The attribute of OUV screened in for the Carbon technical discipline is e) carbon sequestration and storage.

8.5.23 The Flow Country WHS has the potential to be impacted by the Proposed Development due to the disturbance and excavation of peat during construction which reduces the carbon storage potential of the peat. For ease of communication and understanding the calculated results in this section of this Appendix are rounded to the nearest thousand. More detailed results can be found in **Volume 5, Appendix 11.3: Peat Carbon Calculator**.

8.5.24 A worst-case scenario has been assessed, where both the permanent and temporary infrastructure located on Class 1, 2 and 3 peat have been assumed to cause direct impacts to peat carbon storage. Restoration has also been excluded from the initial calculations, to demonstrate the overall potential impact to peat carbon storage in the WHS if restoration does not occur or is unsuccessful in establishing or continuing carbon sequestration. The Peat Carbon Calculator suggests that the peat carbon store will be reduced by 32,000 tCO_2e through direct impacts from permanent and temporary infrastructure, and by 18,000 tCO_2e through indirect impacts from permanent infrastructure, resulting in a 50,000 tCO_2e overall reduction in total when considering both direct and indirect impacts together. When comparing this to the baseline peat carbon storage referenced above (331,000 tCO_2e), this reduction represents 15.1% of the baseline peat carbon storage (approximately 9.5% from direct effects and approximately 5.4% from indirect effects).

8.5.25 However, it is unlikely that temporary infrastructure (temporary access tracks and tower compound areas) will cause a total loss of peat carbon storage as complete excavation is unlikely and the effects are reversible. Therefore, taking account of only the permanent infrastructure (both direct and indirect effects), the results from the Peat Carbon Calculator are decreased to a reduction of 10,000 tCO_2e in peat carbon storage from direct impacts, and the same 18,000 tCO_2e reduction from indirect impacts (totalling 28,000 tCO_2e). This represents 8.5% of the baseline (approximately 2.9% from direct impacts and 5.4% from indirect impacts). This demonstrates that the direct impacts have the potential to have a negligible impact on the overall peat carbon storage within the LoD within the WHS, while indirect impacts have the potential to have a larger effect (due to the larger area affected), but these have the potential to be reversible and are likely to be of a smaller magnitude the further from the infrastructure the peat is located. It is also assumed in the calculator that 25% of stored carbon is lost with indirect impacts, whereas in reality this is unlikely to occur through the implementation of best practice measures and management as detailed within the Outline PMP (**Volume 5, Appendix 11.2: Outline PMP**) and the Construction Environmental Management Plan (an Outline CEMP is included in **Volume 5, Appendix 3.6: Outline CEMP**). The measures with particular relevance to peat carbon storage include the development of methodologies to prevent degradation and erosion of exposed peat deposits, the avoidance of removal and off-site disposal of soils where possible, the implementation of best practice measures for soil and

peat handling, storage, transportation, excavation, and reuse, and the use of existing and floating tracks in order to avoid unnecessary disturbance and impacts on sensitive areas.

8.5.26 The area of the WHS assessed within the Peat Carbon Calculator (the area within the LoD of the Proposed Development) also represents only 0.04% of the total area of the WHS, so even if this calculated impact occurred, it would still have a negligible impact on the overall peat carbon storage of the full WHS.

8.5.27 If peatland restoration / re-use is included in the calculations, the impact of the Proposed Development on peat carbon storage is reduced. For this assessment, it is assumed that the 34,673 m^3 of peat demand for reinstatement (as detailed in **Table 8-10**) is provided, but the surplus 85,123 m^3 is not reinstated at this stage as it is unknown what will happen to this peat at the time of this assessment. It should therefore be noted that over the longer term, the Proposed Development may have further beneficial effects on peat carbon storage through the restoration of this surplus peat. The proposed reinstatement of 34,673 m^3 of peat would reduce the overall impact on peat carbon storage from direct and indirect impacts to a 19,000 tCO_2e reduction (an approximately 5.6% reduction in the baseline). This value still assumes a 25% carbon loss from indirect impacts, which as detailed above is unlikely in reality. If direct impacts alone are considered, the inclusion of peatland restoration reduces the impact on peat carbon storage to a decrease of 800 tCO_2e (a 0.25% decrease in the baseline peat carbon storage). This demonstrates that with peat restoration and redressing, the direct impacts of the Proposed Development are almost entirely mitigated. Should the surplus peat also be used for restoration, direct and indirect impacts on peat carbon storage within the WHS from the Proposed Development could be wholly mitigated.

Ecology and Nature Conservation

8.5.28 The attributes of OUV screened in for the Ecology technical discipline are:

- a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally;
- c) archive it stores (4th dimension); and
- e) carbon sequestration and storage.

8.5.29 As the attributes for Criterion ix, under which the Flow Country WHS is inscribed, relate only to peat forming blanket bog (described in **Table 8-1**), only data relating to blanket bog is explored further in this assessment. Blanket bog habitats recorded in the baseline habitat surveys included f1a – Blanket bog, f1a5 – Blanket bog (H7130), and f1a6 – Degraded blanket bog. The only exception to this is the peat carbon assessment, which considers the impact of the Proposed Development on peatland with Class 1, 2 and 3 peat within the LoD within the WHS as a worst-case scenario as carbon sequestration and storage (attribute e) can occur across all peatland habitats, not just blanket bog.

8.5.30 Direct impacts to blanket bog habitat are anticipated within the WHS, including the removal (loss) of areas of habitat and smothering of areas of vegetation. Impacts will be either temporary or permanent, per ancillary infrastructure type.

8.5.31 Indirect impacts to blanket bog habitat are anticipated within the WHS, related to de-watering of peat in the area surrounding ancillary infrastructure. Indirect habitat impacts for access tracks have been calculated based on water table drawdown associated with drainage features within peatland habitats, assumed to be a maximum of 30 m from access tracks, before returning to nominal levels. Indirect habitat impacts for all other infrastructure is assumed to be up to a maximum of 10 m surrounding the infrastructure, due to the absence of drainage features but residual potential for localised impacts to species diversity and habitat. Embedded mitigation will allow the continuity of hydrological flows across access tracks (surface water and groundwater). Within the water table drawdown area, peatland habitats may potentially be subject to localised drying.

8.5.32 Additionally, habitats within the Flow Country WHS may be directly or indirectly affected by the impacts of the Proposed Development where infrastructure may cause the fragmentation of habitat. It is considered that due to the nature of their footprint, the presence of infrastructure such as the pylons for tower bases would not lead to fragmentation effects. Larger linear features, however, such as access tracks, could lead to effects on blanket bog habitat by potentially impeding water flow and therefore dewatering habitat. The potential for fragmentation is accounted for in consideration of indirect impacts related to de-watering of peat in the area surrounding ancillary infrastructure. In the northern section of overlap with the WHS (east of Tacher), the proposed access tracks are all temporary and are largely overlaid on deep peat (≥ 1m). In the southern section of overlap with the WHS (west of Ousdale), the proposed permanent access track runs largely perpendicular to the contours over a large expanse of consistently deep peat (≥ 1m). The extensive area of peat and location of the permanent infrastructure mean surface water flows will be maintained from adjacent areas. In addition, embedded mitigation on permanent and temporary access tracks will be designed to maintain surface and groundwater flows. In light of these factors, it is considered unlikely that there will be fragmentation effects within the Flow Country WHS as a result of the Proposed Development.

8.5.33 The areas (ha) to be directly and indirectly impacted by the ancillary infrastructure of the Proposed Development for those habitats defined as f1a – Blanket bog, f1a5 – Blanket bog (H7130), and f1a6 – Degraded blanket bog are presented in **Table 8-15** and **Table 8-16**. The total direct and indirect impacts, and overall impact areas (ha) are presented in **Table 8-17**. Assumptions for impacts to habitat are detailed in **Sections 8.3.20 - 8.3.258.3.20**.

Table 8-15: Permanent Direct and Indirect Impacts to Habitats Within the Proposed Development

Habitat	Permanent Direct Impact (ha)			Permanent Indirect Impact (ha)			Permanent: Total
	Access Tracks	Tower Footings	Subtotal	Access Track	Tower Footing	Subtotal	
f1a - Blanket bog	1.61	0.07	1.68	9.70	0.40	10.09	11.77
f1a5 - Blanket bog (H7130)	0.02	0.18	0.19	0.27	0.92	1.19	1.38
f1a6 - Degraded blanket bog	0.00	0.01	0.01	0.00	0.08	0.08	0.09
Total Area	**1.62**	**0.26**	**1.88**	**9.96**	**1.39**	**11.36**	**13.24**
Percent of WHS Area (%)	**0.00087%**	**0.00014%**	**0.00101%**	**0.00533%**	**0.00075%**	**0.00607%**	**0.00708%**

(1) The areas of access tracks are presented as a total, irrespective of the proposed construction technique.

(2) The total area of the Flow Country WHS as inscribed by UNESCO is 187,023.57 ha.

Table 8-16: Temporary Direct and Indirect Impacts to Habitat Within the Proposed Development

Habitat	Temporary Direct Impact (ha)				Temporary Indirect Impact (ha)				Temporary Total
	Access Tracks	Pulling Positions (EPZ)	Tower Compounds	Subtotal	Access Tracks	Pulling Positions (EPZ)	Tower Compounds	Subtotal	
f1a - Blanket bog	1.80	0.17	2.88	4.85	9.64	0.07	1.63	11.34	16.19
f1a5 - Blanket bog (H7130)	3.46	0.17	5.43	9.06	18.03	0.08	3.13	21.24	30.30
f1a6 - Degraded blanket bog	0.08	0.00	0.36	0.44	0.46	0.00	0.24	0.71	1.14
Total Area	**5.34**	**0.34**	**8.67**	**14.35**	**28.13**	**0.14**	**5.00**	**33.28**	**47.63**
Percent of WHS Area (%)	**0.00286%**	**0.00018%**	**0.00463%**	**0.00767%**	**0.01504%**	**0.00008%**	**0.00267%**	**0.01779%**	**0.02547%**

(1) The areas of access tracks are presented as a total, irrespective of the proposed construction technique.

(2) The total area of the Flow Country WHS as inscribed by UNESCO is 187,023.57 ha.

Table 8-17: Total direct and indirect habitat impacts

Habitat	Total Direct Impacts	Total Indirect Impacts	Overall Impacts
f1a - Blanket bog	6.53	21.43	**27.96**
f1a5 - Blanket bog (H7130)	9.26	22.43	**31.68**
f1a6 - Degraded blanket bog	0.45	0.78	**1.23**
Total Area	**16.23**	**44.64**	**60.87**
Percent of WHS Area (%)	**0.00868%**	**0.02387%**	**0.03255%**

(1) The total area of the Flow Country WHS as inscribed by UNESCO is 187,023.57 ha.

Peatland Condition Assessment

8.5.34 Direct and indirect impacts are anticipated to peatland within the Flow Country WHS. The areas (ha) of peatland to be directly and indirectly impacted by the ancillary infrastructure of the Proposed Development for those peatland areas defined as being in near-natural, modified or drained condition are presented in **Table 8-18** and **Table 8-19**. The total direct and indirect impacts, and overall impact areas (ha) are presented in **Table 8-20** and displayed in **Volume 3, Figure 8.7: Peatland Condition Mapping**. Assumptions for impacts to habitat are detailed in **Section 8.3.20**.

Table 8-18: Permanent Direct and Indirect Impacts to Peatland Within the Proposed Development

Peatland Condition	Permanent Direct Impact (ha)			Permanent Indirect Impact (ha)			Total Permanent Impact (ha)
	Access tracks[1]	Tower Footings	Subtotal	Access tracks[1]	Tower Footings	Subtotal	
Near-natural	0.00	0.18	**0.18**	0.16	0.92	**1.08**	**1.26**
Modified	1.55	0.13	**1.68**	9.42	0.77	**10.18**	**11.86**
Drained	0.22	0.00	**0.22**	1.25	0.00	**1.25**	**1.48**
Total Area (ha)	**1.77**	**0.31**	**2.08**	**10.83**	**1.69**	**12.52**	**14.60**
Total Area as a Proportion of WHS (%)[2]	**0.00095%**	**0.00016%**	**0.00111%**	**0.00579%**	**0.00090%**	**0.00669%**	**0.00780%**

(1) The areas of access tracks are presented as a total, irrespective of the proposed construction technique.

(2) The total area of the Flow Country WHS as inscribed by UNESCO is 187,023.57 ha.

Table 8-19: Temporary Direct and Indirect Impacts to Peatland Within the Proposed Development

Peatland Condition	Temporary Direct Impact (ha)				Temporary Indirect Impact (ha)				Total Temporary Impact (ha)
	Access tracks[1]	Pulling positions (EPZ)	Tower compounds	Subtotal	Access tracks[1]	Pulling positions (EPZ)	Tower compounds	Subtotal	
Near-natural	3.30	0.17	5.39	8.86	16.99	0.08	3.08	20.14	**29.00**
Modified	2.25	0.17	4.53	6.95	12.02	0.07	2.49	14.58	**21.53**
Drained	0.40	0.00	0.16	0.56	2.58	0.00	0.26	2.85	**3.41**
Total Area (ha)	**5.95**	**0.34**	**10.08**	**16.37**	**31.59**	**0.14**	**5.83**	**37.57**	**53.94**
Total Area as a Proportion of WHS (%)[2]	**0.00318%**	**0.00018%**	**0.00539%**	**0.00875%**	**0.01689%**	**0.00008%**	**0.00312%**	**0.02009%**	**0.02884%**

(1) The areas of access tracks are presented as a total, irrespective of the proposed construction technique.

(2) The total area of the Flow Country WHS as inscribed by UNESCO is 187,023.57 ha.

Table 8-20: Total direct and indirect peatland impact areas (ha)

Peatland Condition	Total Direct Impact (ha)	Total Indirect Impact (ha)	Overall Impact (ha)
Near-natural	9.03	21.23	**30.26**
Modified	8.63	24.76	**33.39**
Drained	0.78	4.10	**4.88**
Total Area (ha)	**18.45**	**50.09**	**68.53**
Total Area as a Proportion of WHS (%)[1]	**0.00986%**	**0.02678%**	**0.03664%**

(1) The total area of the Flow Country WHS as inscribed by UNESCO is 187,023.57 ha.

Water Environment

8.5.35 The attributes of OUV screened in for the Hydrology technical discipline are:

- a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally; and
- f) water filtration and the impact on the water quality of associated riverine habitats.

8.5.36 The Flow Country WHS has the potential to be impacted by the Proposed Development through changes to surface water quantity and alterations to surface water flowpaths to, and through, the blanket bog habitats.

8.5.37 During construction, impacts will include impediments to and modifications of surface water drainage patterns as a result of excavations, vehicle use, storage of materials in temporary construction compounds, the introduction of impermeable surfaces, and any temporary blocking of watercourses to construct for example watercourse crossings. These impacts will prevent surface water from reaching the blanket bog habitats and / or rainwater from infiltrating into those areas. In addition, effects on surface water quality have the potential to degrade the quality of the blanket bog habitats. During construction this would be through for example chemical spills.

8.5.38 During the operation of the Proposed Development the areas of permanent hardstanding and access tracks will result in long term changes to surface water flowpaths but water is likely to re-route into the blanket bog habitats. There is considered to be a lower risk of water quality impacts during operation.

Identifying Potential Risks

8.5.39 Those elements of the Proposed Development likely to impact upon the Flow Country WHS include:

- Construction of temporary access tracks;
- Construction of temporary tower working areas / compounds;
- Construction of temporary working area for Equi-Potential Zones (EPZ) pulling positions;
- Construction of permanent access tracks;
- Construction of permanent tower footing;
- On-site reuse of excavated peat following construction; and
- Hydrological impacts to 'setting' (elements outside WHS).

8.5.40 These elements are described in **Volume 2, Chapter 3: Description of the Proposed Development**, and displayed **in Volume 3, Figure 8.1: Designated Sites (sheets 1a – 1d)**.

8.5.41 All elements of the Proposed Development are here evaluated to determine which elements would have the potential to cause an impact on the Flow Country WHS. For each element, a preliminary assessment of impact

is conducted for each attribute. The high-level analysis of each attribute, and the potential pathway for impacts to the components of each attribute, are laid out in **Table 8-21.**

Table 8-21: Identification of potential risks to attributes of Criterion ix

Attribute	Element of a proposed action that has the potential to cause an impact						
	Construction of temporary access tracks	**Construction of temporary tower working areas / compounds**	**Construction of temporary working area for Equi-Potential Zones (EPZ) pulling positions**	**Construction of permanent access tracks**	**Construction of permanent tower footing**	**On-site reuse of excavated peat following construction**	**Hydrological impacts to 'setting' (all elements outside WHS)**
a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Temporary loss of blanket bog habitat.** **Temporary impacts to water quality and quantity supporting blanket bog habitat.** Impacts will be temporary and localised to the project footprint and downstream hydrological receptors.	**Temporary loss of blanket bog habitat.** **Temporary impacts to water quality and quantity supporting blanket bog habitat.** Impacts will be temporary and localised to the project footprint and downstream hydrological receptors.	**Temporary impact to blanket bog habitat.** **Temporary impacts to water quality and quantity supporting blanket bog habitat.** Impacts will be temporary and localised to the project footprint and downstream hydrological receptors.	**Permanent loss of blanket bog habitat.** **Permanent alteration to flowpaths supporting blanket bog habitat.** Impacts will be permanent and localised to the project footprint and downstream hydrological receptors.	**Permanent loss of blanket bog habitat.** **Permanent alteration to flowpaths supporting blanket bog habitat.** Impacts will be permanent and localised to the project footprint and downstream hydrological receptors.	**Pathway for positive impact.** Reinstatement and restoration of peatland habitat and re-use of peat have the potential to increase the area of actively accumulating bog.	**Impacts to surface waters which flow through and feed the blanket bog.** Impacts to water quality and quantity will be temporary and localised to the project footprint and downstream hydrological receptors.
b) climatic, topographic gradients and geological diversity: bog macroform diversity	**No pathway for impact.** No anticipated impact to climatic, topographic gradients and geological diversity and therefore bog macroform diversity.	**No pathway for impact.** No anticipated impact to climatic, topographic gradients and geological diversity and therefore bog macroform diversity.	**No pathway for impact.** No anticipated impact to climatic, topographic gradients and geological diversity and therefore bog macroform diversity.	**No pathway for impact.** No anticipated impact to climatic, topographic gradients and geological diversity and therefore bog macroform diversity.	**No pathway for impact.** No anticipated impact to climatic, topographic gradients and geological diversity and therefore bog macroform diversity.	**Pathway for positive impact.** Reinstatement and restoration of peatland habitat and re-use of peat will contribute to maintaining bog macroform diversity over time.	**No pathway for impact.** Not applicable to hydrological considerations.

Attribute	Element of a proposed action that has the potential to cause an impact						
	Construction of temporary access tracks	**Construction of temporary tower working areas / compounds**	**Construction of temporary working area for Equi-Potential Zones (EPZ) pulling positions**	**Construction of permanent access tracks**	**Construction of permanent tower footing**	**On-site reuse of excavated peat following construction**	**Hydrological impacts to 'setting' (all elements outside WHS)**
c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** Excavations will be of limited depth and scope. Impacts will be localised to the project footprint.	**Localised permanent impact to the stored archive (under project footprint).** Excavations will be of limited depth and scope. Impacts will be localised to the project footprint.	**No pathway for impact.** Archive will not be impacted as peat will not be excavated.	**Localised permanent impact to the stored archive (under project footprint).** Excavations will be of limited depth and scope. Impacts will be localised to the project footprint.	**Localised permanent impact to the stored archive (under project footprint).** Excavations will be of limited depth and scope. Impacts will be localised to the project footprint.	**No pathway for positive impact.** Any peat reinstated will not retain context of original stored archive.	**No pathway for impact.** Not applicable to hydrological considerations.
d) natural laboratory – ongoing scientific and educational use	**No pathway for impact.** Access restrictions during construction phase will be temporary.	**No pathway for impact.** Access restrictions during construction phase will be temporary.	**No pathway for impact.** Access restrictions during construction phase will be temporary.	**No pathway for impact.** Access restrictions during construction phase will be temporary.	**No pathway for impact.** Access restrictions during construction phase will be temporary.	**Pathway for positive impact.** Reinstatement and restoration of peatland habitat and re-use of peat may contribute to future scientific and/or educational use.	**No pathway for impact.** Not applicable to hydrological considerations.

Attribute	Element of a proposed action that has the potential to cause an impact						
	Construction of temporary access tracks	**Construction of temporary tower working areas / compounds**	**Construction of temporary working area for Equi-Potential Zones (EPZ) pulling positions**	**Construction of permanent access tracks**	**Construction of permanent tower footing**	**On-site reuse of excavated peat following construction**	**Hydrological impacts to 'setting' (all elements outside WHS)**
e) carbon sequestration and storage	**Temporary loss of blanket bog habitat and peatland.** Excavated peat to be reinstated in-situ. Impacts will be localised to the project footprint.	**Temporary loss of blanket bog habitat and peatland.** Excavated peat to be reinstated in-situ. Impacts will be localised to the project footprint.	**Temporary impact to blanket bog habitat and peatland.** Impacts will be temporary and localised to the project footprint.	**Permanent loss of blanket bog habitat and peatland.** Impacts will be permanent and localised to the project footprint.	**Permanent loss of blanket bog habitat and peatland.** Impacts will be permanent and localised to the project footprint.	**Pathway for positive impact.** Reinstatement and restoration of peatland habitat and re-use of peat have the potential to enhance active blanket bog carbon sequestration.	**No pathway for impact.** Not applicable to hydrological considerations.
f) water filtration and the impact on the water quality of associated riverine habitats	**Temporary reduction in filtration and surface water quality.** Impacts will be localised to the project footprint and immediate downstream receptors.	**Temporary reduction in filtration and surface water quality.** Impacts will be localised to the project footprint and immediate downstream receptors.	**Temporary reduction in filtration and surface water quality.** Impacts will be localised to the project footprint and immediate downstream receptors.	**Permanent reduction in filtration and changes to flow paths.** Impacts will be localised to the project footprint and immediate downstream receptors.	**Permanent reduction in filtration and changes to flow paths.** Impacts will be localised to the project footprint and immediate downstream receptors.	**No pathway for impact.** Not applicable to hydrological considerations.	**Impacts to surface water quality.** Impacts to water quality will be temporary and localised to the project footprint and riverine habitats in immediate hydrological connectivity to the Proposed Development.

8.5.42 Loss of blanket bog is anticipated for four of six elements, including permanent loss associated with the construction of permanent tower footings and access tracks. Temporary loss is anticipated where blanket bog recovery will occur following temporary elements (construction of temporary access tracks and tower compounds), where temporary tracks would be removed and land reinstated in-situ. A localised temporary impact to blanket bog is anticipated where temporary work areas for Equi-Potential Zones (EPZ) pulling positions are to be installed over exiting ground and habitat.

8.5.43 Localised permanent impacts are anticipated where elements will remove blanket bog habitat and peat, disrupting peat accumulation, the stored archive, and carbon sequestration and storage. Temporary disruption to carbon sequestration and storage is anticipated where construction activities such as construction of temporary access tracks and tower compounds remove and store habitat material (the acrotelmic layer), to then be reinstated once infrastructure is dismantled and habitat restored. Impacts from EPZ pulling positions are expected to be minimal and highly localised as panels will be laid over vegetation for a short period of time. Despite being smothered for the duration of installation, the vegetation beneath the panels is expected to recover after removal. The Proposed Development will impact water filtration and quality for all elements for attribute f) without the implementation of mitigation.

8.5.44 No pathway for impact is anticipated for all elements for attribute b) (bog macroform diversity) as impacts will be localised to the project footprint on a small scale, and will not impact the WHS as a whole. For attribute d) (educational and scientific use), whilst temporary access restrictions to the construction areas are anticipated during the construction phase, the ongoing scientific and educational use of the WHS will not be impacted.

8.5.45 Positive impact is anticipated where peatland habitat is to be reinstated, with potential to:

- reinstate actively accumulating bog (attribute a);
- contribute to bog macroform diversity over time (attribute b);
- contribute to future scientific and/or educational use (attribute d);
- reinstate the former storage capacity of peatland habitat, with the resultant active blanket bog contributing to carbon sequestration (attribute e); and
- create active blanket bog, which would increase filtration in the area, where excavated peat is used to fill in drainage ditches (attribute f).

There would, however, be a localised permanent impact to the stored archive (attribute c) beneath the project footprint where peat is excavated, as it would not be possible to retain the original context once removed.

8.5.46 Without mitigation there will be impacts to water quality and quantity which support the WHS blanket bog habitats as outlined in **Sections 8.5.15 - 8.5.17** of this assessment.

Embedded Mitigation

8.5.47 All works for the OHL will be undertaken in line with SSEN's General Environmental Management Plans (GEMPs), which include specific guidelines for minimizing impacts in peat, and are provided in **Volume 5, Appendix 3.3: General Environmental Management Plans (GEMPs)**. The GEMPs will be applied through the CEMP, to apply best practice. Installation will also apply careful micro-siting of permanent and temporary structures, to avoid or minimise interaction with sensitive ecological receptors, identified in **Table 8.3** of **Volume 2, Chapter 8: Ecology and Nature Conservation**, including The Flow Country WHS.

8.5.48 With the measures in the GEMP in place, including post-construction reinstatement, temporary impacts from the Proposed Development will not persist such that they impact the OUV of the WHS.

8.5.49 General mitigation measures will be implemented in accordance with the peat excavation, handling and storage, and reinstatement methods are detailed in **Section 4** of **Volume 5, Appendix 11.2: Outline PMP** and in accordance with the best practice guidelines to be included in the CEMP. The CEMP will outline best practice in relation to the implementation of drainage and pollutions prevention.

8.5.50 The key mitigation measures for the excavation, reuse, restoration, storage, handling and transport are detailed in **Section 4 of Chapter 11, Appendix 11.2: Outline PMP.** Key mitigation measures are summarised below:

- Excavation
  - Separate layers of peat are excavated with care (acrotelm from catotelmic peat) to maintain structural integrity.
  - Avoid excavation during heavy rainfall.
- Peat Reuse
  - Excavated peat is reinstated on-site, near its original location, to support ecological benefits.
  - Wet catotelmic peat is placed at the bottom during restoration, followed by semi-fibrous and acrotelmic peat.
- Restoration
  - Excavated peat is used in peatland restoration to enhance ecological value and sequester carbon, overseen by an Ecological Clerk of Works (ECoW).
- Storage
  - Temporary peat storage areas are carefully chosen and monitored to minimise environmental impacts. Layers are stored separately, and storage height is limited to 2m.
- Handling & Transport
  - Minimise movement and handling of peat to preserve its structure. Avoid transportation during high rainfall and prevent cross-contamination.
- Additional Mitigation
  - Measures such as drainage inspections and floating access tracks are recommended to protect deep peat areas.

8.5.51 Embedded mitigation is detailed further in:

- **Volume 2, Chapter 19: Schedule of Mitigation**;
- **Volume 5, Appendix 3.3: General Environmental Management Plans (GEMPs)**;
- **Volume 5, Appendix 3.6 Outline Construction Environmental Management Plan**;
- **Volume 2, Chapter 10: Water Environment;**
- **Volume 5, Groundwater Dependent Terrestrial Ecosystems Assessment;**
- **Volume 2, Chapter 11: Geological Environment, Section 11.3.45**;
- **Volume 5, Appendix 11.1: PLHRA, Section 1.8.5**; and
- **Volume 5, Appendix 11.2: Outline PMP, Section 4.6**.

Description and Evaluation of Risks

8.5.52 Where a pathway for an element to affect an attribute was identified, a more detailed description and evaluation of potential impacts was conducted. Descriptions include the area (ha) of blanket bog impacted, the impacts to surface water quality and quantity, potential disturbance of deep peat, degradation, removal or loss of soils, and peat stability, impacts on peatland carbon storage and carbon flux, and details of the element, impact of the element, and scale of impact as a percentage of the total WHS area. Assessment of the overall impact of the elements, per attribute, include: the frequency, duration and reversibility of the element; reversibility, longevity,

degree and quality of change to the attribute; and evaluation of impact. The description and evaluation, and assessment of overall impacts of elements of the Proposed Development of the Flow Country WHS are presented in **Table 8-22**.

Table 8-22: Description and evaluation of potential impacts of elements of the proposed action on the attributes of Criteria ix

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
Construction of temporary access tracks	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Temporary loss of blanket bog habitat (33.47 ha)** to facilitate construction of temporary tracks, resulting in a highly localised reduction in accumulation of blanket bog in small areas **(0.018% of WHS area)**. **Localised temporary disruption of surface water flows and water quality** which support the blanket bog habitats. With embedded mitigation in place water quantity and quality will be maintained such that habitats are not impacted. **Excavation of Peat Soils** (79,000 m^3) to facilitate for the construction of temporary access tracks, **Increased potential for peat slides** where potential slide material could result in a wider loss of blanket bog habitat depending on the pathway of the slide. Slides are planned to be mitigated for to reduce the likelihood of a peat	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		slide occurring (**Volume 5, Appendix 11.1: PLHRA**).								
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** **Peat will be excavated** to facilitate construction of temporary tracks and replaced once road removed. Excavations will be of limited depth and scope. Impacts to blanket bog habitat will be temporary and highly localised on a small scale **(33.47ha of blanket bog or 0.018% of WHS area)**, and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.	Once	Short-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	e) carbon sequestration and storage	**Temporary loss of blanket bog habitat (33.47 ha) and peatland (37.54 ha)** where applicable, to facilitate construction of temporary tracks. Impacts will be temporary and highly localised on a small scale **(0.018% (blanket bog) and 0.02% (peatland) of**	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		WHS area) unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Potential temporary reduction in peat carbon storage and peat carbon flux** during the construction phase of the temporary access tracks due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its ability to sequester carbon.								

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised temporary disruption of filtration** into the areas covered by the tracks, alterations to wider flowpaths into riverine habitats, and water quality impacts through sedimentation and chemical pollution. With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
Construction of temporary tower working areas / compounds	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Temporary loss of blanket bog habitat (13.67 ha)** to facilitate construction of temporary tower working areas. Impacts will result in a highly localised reduction in accumulation of blanket bog in small areas **(0.0073% of WHS area)**. Once concrete cast and set, excavation would be backfilled using original material where possible. **Localised temporary disruption of surface water flows and water quality** which support the blanket bog habitats. With embedded mitigation in place water quantity and quality will be maintained such that habitats are not impacted.	Once (per tower location, 23 suspension and 2 tension towers)	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		Potential disturbance of deep peat, degradation, removal or loss of soils during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation.								
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** **Topsoil and peat (where present) will be excavated**, to facilitate construction of temporary tower working areas, and replaced once temporary working areas removed. Excavations will be of limited depth and scope. Impacts to blanket bog habitat will be temporary and highly localised on a small scale **(13.67 ha of blanket bog or 0.0073% of WHS area)**, and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.	Once (per tower location, 25 towers)	Short-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
	e) carbon sequestration and storage	**Temporary loss of blanket bog habitat (13.67 ha) and peatland (15.91 ha)** to facilitate construction of temporary tower working areas. Impacts will be temporary and highly localised on a small scale **(0.0073% (blanket bog) and 0.009% (peatland) of WHS area)**, unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Topsoil and peat (where present) will be excavated**, to facilitate temporary tower working areas, and replaced once temporary working areas removed. Excavations will be of limited depth and scope. It is anticipated that peat will be reinstated following completion of works, and thus carbon sequestration and storage will continue post-construction. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of	Once (per tower location, 25 towers)	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Potential temporary reduction in peat carbon storage and peat carbon flux** during the construction phase of the temporary tower working areas / compounds due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its ability to sequester carbon.								
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised temporary disruption of filtration** into the areas covered by the tracks, alterations to wider flowpaths into riverine habitats, and water quality impacts through sedimentation and chemical pollution. With embedded mitigation in place water quality and	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		filtration to surrounding habitats will not be impacted.								
Construction of temporary working area for Equi-Potential Zones (EPZ) pulling positions	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Temporary impact to blanket bog habitat (0.48 ha)** to facilitate two EPZ pulling positions per tower, resulting in a highly localised reduction in accumulation of blanket bog in small areas **(0.00026% of WHS area)**. **Localised temporary disruption of surface water flows and water quality** which support the blanket bog habitats. With embedded mitigation in place water quantity and quality will be maintained such that habitats are not impacted. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon.	Once (two towers, N24, N133)	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
	e) carbon sequestration and storage	**Temporary impact to blanket bog habitat (0.48 ha) and peatland (0.48 ha)** to facilitate two EPZ pulling positions per tower. Impacts will be temporary and highly localised on a small scale **(0.00026% (blanket bog) and 0.00026% (peatland) of WHS area)**, unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Potential temporary reduction in peat carbon storage and peat carbon flux** during the construction phase of the	Once (two towers, N24, N133)	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		temporary working areas for EPZ pulling positions due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its ability to sequester carbon.								
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised temporary disruption of filtration** into the areas covered by the tracks, alterations to wider flowpaths into riverine habitats, and water quality impacts through sedimentation and chemical pollution. With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
Construction of permanent access tracks	a) most extensive near continuous example of natural, actively accumulating, blanket bog	**Permanent loss of blanket bog habitat (11.58 ha)** to facilitate construction of permanent tracks, resulting in a highly localised reduction in accumulation of blanket bog in small areas **(0.018% of WHS area)**.	Once	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
	ecosystem found globally	**Localised alteration of surface water flowpaths which support the blanket bog habitats.** With embedded mitigation in place including SuDS, the water quantity and quality to habitats will be maintained such that they are not impacted. **Excavation of Peat Soils** (23,940 m^3) to facilitate for the construction of permanent access tracks. **Increased potential for peat slides** where potential slide material could result in a wider loss of blanket bog habitat depending on the pathway of the slide. Slides are planned to be mitigated for to reduce the likelihood of a peat slide occurring (**Volume 5, Appendix 11.1: PLHRA**).								
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** Peat will be excavated, to facilitate construction of permanent tracks.	Once	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		Excavations will be of limited depth and scope. Impacts to blanket bog habitat will be limited to the construction phase, will be highly localised on a small scale **(11.58 ha blanket bog or 0.018% of WHS area)**, and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.								
	e) carbon sequestration and storage	**Permanent localised loss of blanket bog habitat (11.58 ha) and peatland (12.6 ha)** and thus carbon sequestration and storage, to facilitate construction of permanent tracks. Impacts will be temporary and highly localised on a small **scale (0.018% (blanket bog) and 0.007% (peatland) of WHS area)**, unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Potential disturbance of deep peat, degradation, removal or loss of soils**	Once	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Permanent reduction in peat carbon storage and peat carbon flux** during the construction phase of the permanent access tracks due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its ability to sequester carbon.								
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised alteration of filtration and flow to habitats.** With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
Construction of permanent tower footing	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Permanent loss of blanket bog habitat (1.65 ha)** to facilitate construction of permanent tower footing. Impacts will result in a highly localised reduction in accumulation of blanket bog in small areas **(0.00088% of WHS area).** **Localised alteration of surface water flowpaths which support the blanket bog habitats.** With embedded mitigation in place including SuDS, the water quantity and quality to habitats will be maintained such that they are not impacted. **Excavation of Peat Soils** (5,966 m^3) to facilitate for the construction of permanent tower footings. **Increased potential for peat slides** where potential slide material could result in a wider loss of blanket bog habitat depending on the pathway of the slide. Slides are planned to be mitigated for to reduce the likelihood of a peat slide occurring (**Volume 5, Appendix 11.1: PLHRA**).	Once (4 footings per tower, 25 towers located in WHS; 100 footings total)	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** **Peat will be excavated**, to facilitate construction of permanent tower footing, and replaced once temporary working areas removed, or relocated locally as needed. Excavations will be of limited depth and scope. Impacts to blanket bog habitat will be limited to the construction phase, will be highly localised on a small scale **(1.65 ha of blanket bog or 0.00088% of WHS area)**, and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.	Once (4 footings per tower, 25 towers located in WHS; 100 footings total)	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	e) carbon sequestration and storage	**Permanent loss of blanket bog habitat (1.65 ha) and peatland (2 ha)** and thus carbon sequestration and storage, to facilitate construction of permanent tower footing. Excavated peat to be reinstated elsewhere. Impacts will be temporary and highly localised on	Once (4 footings per tower, 25 towers located in WHS; 100	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		a small **scale (0.00088% (blanket bog) and 0.001% (peatland) of WHS area)**, unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Permanent reduction in peat carbon storage and peat carbon flux** during the construction phase of the permanent tower footings due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its ability to sequester carbon.	footings total)							

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised alteration of filtration and flow to habitats.** With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor negative
On-site reuse of excavated peat following construction	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Pathway for positive impact.** Excavated and temporarily stored peat will first be utilised on-site for construction and reinstatement purposes in the first instance, including: • Restoring hardstanding areas, borrow pits, road verges, or degraded peatland; or • For off-site peatland restoration efforts, only where it is suitable for the identified and required use. Any peat, including volumes of peat excavated and turfs of active peat forming vegetation removed as part of the construction activities, will be reused on site where possible. This peat and turf will be used to restore areas of	Once	Long-term	Irreversible	Irreversible	Permanent	Some	Positive	Minor impact - positive

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		degraded peat identified during baseline surveys within the Flow Country WHS, as part of SSEN's embedded mitigation measures. Peat reuse and restoration of degraded peat will be undertaken as part of construction reinstatement to enhance existing habitats. Reinstated peatland habitat would restore actively accumulating blanket bog ecosystems. Reuse of 34,673 m^3 of peat for dressing off permanent infrastructure. Additional 85,123 m^3 of surplus peat available to support restoration activities.								
	e) carbon sequestration and storage	**Pathway for positive impact.** Excavated and temporarily stored peat will first be utilised on-site for construction and reinstatement purposes in the first instance, including: • Restoring hardstanding areas, borrow pits, road verges, or degraded peatland; or	Once	Long-term	Irreversible	Irreversible	Permanent	Some	Positive	Minor impact - positive

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		• For off-site peatland restoration efforts, only where it is suitable for the identified and required use. Any peat, including volumes of peat excavated and turfs of active peat forming vegetation removed as part of the construction activities, will be reused on site where possible. This peat and turf will be used to restore areas of degraded peat identified during baseline surveys within the Flow Country WHS, as part of SSEN's embedded mitigation measures. Peat reuse and restoration of degraded peat will be undertaken as part of construction reinstatement to enhance existing habitats. Restored peatland habitat would restore actively accumulating blanket bog and thus contribute to carbon sequestration and storage. The reinstatement of the excavated peat would potentially mitigate the impacts to peat carbon storage and peat carbon flux caused by								

Element of a proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent/ continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
		the infrastructure of the Proposed Development.								
Hydrological impacts to 'setting' (all elements outside WHS)	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Localised temporary disruption of surface water quality** which supports the blanket bog habitats. With embedded mitigation in place water quality will be maintained such that habitats are not impacted.	Once	Short-term	Reversible	Reversible	Temporary	None	Neutral	Neutral impact
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised temporary alteration of water quality to riverine habitats.** With embedded mitigation in place water quality to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	None	Neutral	Neutral impact

8.5.53 The areas (ha) of blanket bog (f1a, f1a5, f1a6) to be impacted by elements of the Proposed Development are presented in **Table 8-15**. A total of **60.87 ha** of blanket bog habitat in the WHS is predicted to be impacted by the Proposed Development, amounting to **0.033%** of the total area of the WHS. Of this, **13.24 ha (21.8%)** is from permanent infrastructure impacts (amounting to **0.007%** of the total area of the WHS), including permanent tower footing and access tracks. The majority of impacts, **47.63 ha (78.25%)**, are from temporary infrastructure impacts (amounting to **0.025%** of the total area of the WHS), including temporary access tracks, pulling locations and tower compounds.

8.5.54 With the embedded mitigation in place impacts to water quantity and quality which supports the formation of blanket bog habitat will not be impacted.

8.5.55 The construction of temporary cut and fill access tracks, permanent tracks and permanent tower footings all pose impacts on the blanket bog, such as the disturbance of deep peat, soil degradation, and erosion due to removal, transport, and stockpiling, which could impact peat soils and their ability to sequester and store carbon. There is an increased possibility of peat slides with construction activities, that might lead to further loss of blanket bog habitat. Embedded and additional mitigation measures, described above, are in place to reduce the risk of peat instability and the disturbance, compaction and loss of peat soils across the Flow Country WHS. A total of 119,796m^3 of peat soils are estimated to be excavated in the Flow Country WHS to support the construction of the Proposed Development. Peat reuse calculations estimate 34,673 m^3 of peat will be reused for dressing off permanent infrastructure, while 85,123 m^3 of surplus peat will support restoration activities.

8.5.56 The excavation and disturbance of peat in Class 1, 2 and 3 peatlands during the construction phase of the Proposed Development would result in adverse impacts to peat carbon storage within the WHS. However, given the scale of the WHS and the small footprint of the Proposed Development within this area (as detailed above), the impact is expected to be negligible. When accounting for both permanent and temporary infrastructure, and direct and indirect effects, the peat carbon storage of the LoD is calculated to reduce by 50,000 tCO_2e in total, equating to 15.1% of the baseline peat carbon storage. Direct impacts are typically of a lower magnitude than indirect impacts, although it is acknowledged that the indirect impacts assume a 25% carbon loss occurs with indirect impacts, when in reality indirect impacts are likely to be mitigated through best practice measures and management. Given that the LoD covers a tiny part of the full WHS area, this peat carbon storage loss would be negligible for the full WHS. It should also be noted that the re-use and reinstatement of excavated peat has the potential to benefit carbon storage, with the potential to almost fully mitigate direct impacts.

8.5.57 The evaluation and assessment of overall impacts of elements of the Proposed Development on the WHS are presented in **Table 8-22**. The frequency at which each element will occur is **once**, with duration **short-term for temporary** and **long-term for permanent** elements. For all temporary elements, impacts to attributes are considered **reversible**, with the exception of attribute c), as the stored archives beneath the footprint will be permanently and irreversibly impacted. For those elements that are permanent, impacts to the attributes will be **irreversible**, as infrastructure will be permanent. Similarly, the longevity of change to attributes for temporary elements are considered **temporary**, with the exception of attribute c), as the stored archives beneath the footprint will be permanently and irreversibly impacted. The longevity of changes to attributes for permanent elements is considered to be **permanent**, as this infrastructure is planned to remain in situ in perpetuity.

8.5.58 The degree of change to the attributes assessed, for all elements both permanent and temporary save two, is considered to be **negligible** as all impacts will be highly localised and on a small scale. The reuse of excavated peat for peatland reinstatement is anticipated to have '**some**' degree of change to attributes a) and e), with a commitment to net gain (10%) (see **Section 8.8: Enhancement opportunities** for further detail). Additionally, the degree of change to attributes e) and f) is anticipated to be **none** for the hydrological impacts to the 'setting', with embedded mitigation anticipated to prevent impact to water quality to surrounding habitats.

8.5.59 Similarly, the quality of change is considered to be **negative** for all elements both permanent and temporary save two, as most elements will result in a negative impact to attributes. The re-use of excavated peat however, anticipated to result in a **positive** quality of change, serving to reinstate peatland, and the hydrological impacts to the 'setting' a **neutral** quality of change where embedded mitigation is anticipated to prevent impact to water quality to surrounding habitats.

8.5.60 Of the seven elements, both permanent and temporary, five are evaluated to be **minor – negative**. One element, the *On-site reuse of excavated peat following construction*, was evaluated to be **minor – positive** and another element, *Hydrological impacts to 'setting' (all actions outside WHS)*, was evaluated to have a **neutral impact**.

Impacts to the wider setting of the Flow Country WHS

8.5.61 The Proposed Development is a continuous OHL, intersecting the Flow Country WHS in four places. In the wider setting[8] of the WHS, the alignment of the Proposed Development passes through and between the boundaries of the WHS, and so infrastructure is located both within the WHS and within its broader setting. The potential impact to hydrology within the 'setting', including surface waters which flow through and feed the blanket bog, is assessed in **Table 8-21** and **Table 8-22.** It has been determined that impacts to quality and quantity of surface waters which flow through and feed the blanket bog will be temporary and localised to the project footprint and downstream hydrological receptors, and riverine habitats in immediate hydrological connectivity to the Proposed Development.

8.5.62 As all impacts from temporary and permanent infrastructure will be highly localised, and with embedded mitigation measures in place, any impacts of the Proposed Development to the WHS will be limited to those components located within the boundaries of the WHS, with infrastructure in the wider setting not predicted to impact the attributes that convey the OUV of the WHS.

8.6 Mitigation

8.6.1 In the context of a World Heritage Site, the UNSECO guidance[3] states that not all of the typical mitigation measure options within a mitigation hierarchy are appropriate. The only types of mitigation that should be considered are the avoidance of negative impacts entirely, or minimising them to acceptable levels. UNESCO's stance on mitigation and offsetting is that; *Any loss of, or damage to OUV is unacceptable, which means that rectification, reduction (to less severe but still significant) or offsetting of impacts is inappropriate in a World Heritage context*, and that the; *OUV is irreplaceable and cannot be 'offset'.* Mitigation usually applies to negative impacts, but can also apply to positive impacts. SSEN has employed the mitigation hierarchy, through first avoiding impacts (mitigation by design) and secondly establishing embedded mitigation. A full list of mitigation measures for this EIA Report is provided in **Volume 2**, **Chapter 19: Schedule of Mitigation**.

8.6.2 An outline Peat Management Plan (oPMP) has been prepared by ERM to assess the estimated peat excavation and re-use potential as well as the proposed peat and soil management methodologies to be employed during the construction of the Proposed Development. The oPMP will ensure that the construction of the Proposed Development will comply with good practice in accordance with Scottish Renewables (SR) and Scottish Environmental Protection Agency (SEPA) guidance and is presented in **Volume 5, Appendix 11.2: Outline PMP.**

8.6.3 Any peat, including volumes of peat excavated and turfs of active peat forming vegetation removed as part of the construction activities, would be reused on site where possible. This peat and turf could be used to restore areas of degraded peat identified during baseline surveys within the Flow Country WHS, as part of SSEN's embedded mitigation measures. The locations for peat re-use would be identified prior to construction in

consultation with NatureScot. Peat re-use and restoration of degraded peat will be undertaken as part of construction reinstatement to enhance existing habitats.

8.6.4 The principles of reinstating peat and peat soils will be adhered to for all elements of the Proposed Development, comprising of the following:

- Peat and peaty soils will be reinstated on access track and infrastructure verges with turves placed on the upper horizons, encouraging revegetation;
- All peat, soil and turves excavated from beneath infrastructure (excluding floated access tracks) will be reinstated in the vicinity of its original location;
- Any wet catotelmic peat will be placed at the bottom of any restoration profile, followed by semi-fibrous catotelmic peat and acrotelmic peat will be placed at the top;
- It is proposed that a large proportion of excavated peat will be utilised in peatland restoration activities in line with the outline techniques discussed in the oHMP; and;
- Peatland restoration activities will be overseen by the Ecological Clerk of Works (ECoW) to ensure methods are properly adhered to.

8.6.5 The outline objectives in proposing restoration of peatlands on Site are to:

- Ensure residual volumes of excavated peat from the Development are reused in areas where ecological benefits and maintained or increased carbon sequestration can be delivered;
- Promote the reuse of excavated peat materials and avoid their disposal to landfill;
- Promote use of best practices and guidance to ensure that benefit is made from reusing peat and peaty soils for ecological enhancement; and
- Complement planned mitigation identified in the oHMP.

8.6.6 It is assumed, that where possible, towers and associated earthworks will be dressed off with up to 0.5 m of acrotelmic peat and peaty soils, and where tracks are not floated peat will be reinstated along verges and associated earthworks with peat up to 0.5 m thick with verged not expected to exceed 3 m on either side.

8.6.7 Any surplus catotelmic peat will be re-used in deep peatland where erosion has been observed. Further details are available within the oPMP in **Volume 5, Appendix 11.2: Outline PMP**.

8.6.8 Over the lifetime of the Proposed Development, embedded peatland mitigation and re-instatement measures, and operational management of the wayleave are considered to mitigate for the loss of blanket bog under the tower bases. This would be confirmed through habitat loss and gain calculations being undertaken as part of the EIA and Shadow Appropriate Assessment (**Volume 5, Appendix 8.7: Report to Inform Habitats Regulations Appraisal (HRA)**) and SSEN's Biodiversity Net Gain Toolkit calculations (**Volume 5, Appendix 8.8: Biodiversity Net Gain Assessment Report**).

8.6.9 In combination, these measures are expected to result in a net positive outcome for peatland in the long-term.

8.7 Residual Effects

8.7.1 Impacts to the attributes that convey the OUV of the Flow Country WHS span across the assessments made by the listed technical disciplines. A summary of residual effects per technical discipline is provided below, followed by a summary of residual effects to each of the attributes that convey the OUV of the Flow Country WHS, drawing from the technical discipline assessments. Impacts to the intactness of the features integral to the Flow Country WHS are also summarised, with a succeeding statement made as to the anticipated residual effects on the OUV of the Flow Country WHS.

Summary of Residual Effects per Technical Discipline

Ecology and Nature Conservation

Habitat

8.7.2 The Proposed Development would impact a total of **60.87 ha of** blanket bog habitat within the Flow Country WHS, representing **0.033%** of the total WHS area; **13.24 ha permanent** and **47.63 ha temporary**. A total of **68.53 ha** of peatland within the Flow Country WHS would be impacted, representing **0.037%** of the total WHS area; **14.6 ha permanent** and **53.94 ha temporary**.

8.7.3 Taking into account the embedded mitigation measures, operational management, and peat-reuse, the residual effects on blanket bog and peatland are anticipated to be **Not significant**. Impacts on habitats and peatland in the WHS will be reduced such that **it is considered that there will be no adverse effect** on the attributes which convey the OUV of the Flow Country WHS.

Geology

Disturbance and Excavation of Peat

8.7.4 The proposed development would result in a total of 119,796 m^3 of peat to be excavated within the Flow Country WHS**.** Taking into account the embedded mitigation measures, including the reinstatement of soils in the vicinity of the original location where possible, the residual effects associated with the disturbance and excavation of peat will be **Minor**. Therefore, the disturbance and excavation of peat soils is **not considered to have an adverse effect** on the attributes which convey the OUV of the Flow Country WHS.

Peat Stability

8.7.5 Peat depths across the Flow Country WHS of the Proposed Development are significant with 63.16% of probes recording peat depths more than 1.0 m. The PLHRA has identified that there is negligible to moderate risk of peat instability across the Flow Country WHS.

8.7.6 The residual effect on peat stability is classed as **Negligible** for Towers N24 -N28, N33 - N37, N127- N129 and N148, and **Low** for Towers N130 - N137, following the incorporation of embedded mitigation measures and additional mitigation measures. A High sensitivity was assigned due to the presence of Class 1 priority peatland and carbon rich, peaty soils covering >20% of the WHS Flow Country within the Proposed Development. Through further assessment the residual risk relating to peat stability has been concluded within **Volume 5, Appendix 11.1: PLHRA** on a localised, case by case basis. For the purpose of this EIA Report, a conservative approach, based on both the high sensitivity of receptors and the highest risk outcome of the PLHRA per section, has been adopted when assessing peat stability overall. Following the implementation of additional mitigation measures, the residual effect for peat stability is **not considered to have an adverse effect** on the attributes which convey the OUV of the Flow Country WHS.

Water Environment

8.7.7 The sensitivity of the Flow Country WHS is assessed as High within the Water Environment chapter. However, with embedded mitigation in place the water quality and quantity which supports the blanket bog habitats within the WHS would be maintained. The mitigation during construction will include the CEMP which will detail site specific construction drainage measures, pollution prevention plans, and a detailed drainage strategy to maintain water quality and quantity. During operation, mitigation will include Sustainable Drainage Systems being in place to also maintain water quality and quantity to surrounding habitats. Therefore, the impacts on hydrology within the WHS are considered **negligible** and is **not considered to have an adverse effect** on the attributes which convey the OUV of the Flow Country WHS.

Carbon

8.7.8 The Proposed Development is assessed as having an adverse effect on peat carbon storage within the WHS, although given the scale of the WHS compared to the infrastructure footprint within it**, this effect is considered to be negligible**. The commitment to peat re-use, reinstatement and restoration would ensure that impacts to peat carbon storage are mitigated effectively and would reduce the residual effects of the Proposed Development on peat carbon storage, with the potential to wholly mitigate the adverse impacts if the surplus peat is used within the WHS.

Impacts to Attributes of OUV and Integrity of the Flow Country WHS

8.7.9 The final evaluation of each identified impact (**Table 8-22**) reflects the description of the impact, as well as the characteristics of the action and the changes to the attribute. The categories of impact can either be negative or positive, with each category reflecting the level of change to the attribute, and are assigned based research into the potential impact. The categories include neutral (no change), minor (negligible change), moderate (some change), or major (large change).

8.7.10 The final evaluation for five of the seven elements (relating to infrastructure for the Proposed Development) was **Minor impact - negative**, for all attributes assessed. For one element, the *On-site reuse of excavated peat following construction*, the final evaluation was **Minor impact – positive** for the two attributes assessed. For the element *Hydrological impacts to 'setting' (all actions outside WHS)*, the final evaluation was **Neutral impact** for the two attributes assessed.

8.7.11 Following the assessment of impacts to the Flow Country WHS, the residual effects and category of impact per attribute have been determined, as presented in **Table 8-23**.

Table 8-23: Residual effects of the Proposed Development on the attributes of the Flow Country WHS

Attribute	Impact Assessment Findings	Residual impact
a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	Anticipated impacts to attribute a include: • Impact to 60.87 ha (0.033% of the total WHS area) of blanket bog habitat within the Flow Country WHS (13.24 ha permanent loss, 47.63 ha temporary impact). • Localised disruption or alteration of surface water flows and water quality; mitigated such that habitats will not be impacted. • Excavation of peat soils (119,796 m^3) to facilitate infrastructure; to be reinstated in the vicinity of the original location where possible. Additional information regarding best practice for the excavation, handling, storage and reuse of peat is detailed in the Outline PMP available at **Volume 5 Appendix 11.2: Outline PMP.** • Potential disturbance of deep peat, degradation, removal or loss of soils due to construction phase activities. Mitigation measures, detailed in the Outline PMP available at **Volume 5 Appendix 11.2: Outline PMP.** will be implemented to protect peat integrity and limit soil disruption during construction.	**Negligible change – no adverse effect**

Attribute	Impact Assessment Findings	Residual impact
	• Increased potential for peat slides; mitigated to reduce likelihood of occurring. Migitation to reduce the likelihood of peat slides occurring is further detailed in the Outline PMP available at **Volume 5 Appendix 11.2: Outline PMP.** and Peat Landslide Hazard Risk Assessment (PLHRA) available at **Volume 5, Appendix 11.1: PLHRA**. • Peat and turfs of active peat forming vegetation to be reinstated or reused onsite, where possible, to restore actively accumulating blanket bog ecosystems. Further details regarding the reuse of peat is detailed in the Outline PMP available at **Volume 5 Appendix 11.2: Outline PMP..**	
b) climatic, topographic gradients and geological diversity: bog macroform diversity	Screened out at screening stage	**No impact**
c) archive it stores (4th dimension)	Anticipated impacts to attribute c include: • Localised permanent impact to the stored archive (under project footprint). • Excavation of topsoil and peat soils (119,796 m^3) to facilitate infrastructure; to be reinstated in the vicinity of the original location where possible. Additional information regarding best practice for the excavation, handling, storage and reuse of peat is detailed in the Outline PMP available at **Volume 5 Appendix 11.2: Outline PMP.** • Impact to 60.87 ha (0.033% of the total WHS area) of blanket bog habitat (13.24 ha permanent loss, 47.63 ha temporary impact); impacts will be highly localised on a small scale and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.	**Negligible change – no adverse effect**
d) natural laboratory – ongoing scientific and educational use	Screened out at screening stage	**No impact**
e) carbon sequestration and storage	Anticipated impacts to attribute e include: • Impact to 60.87 ha of blanket bog habitat and 68.53 ha of peatland (0.033% (blanket bog) and 0.037% (peatland) of the total WHS area) is unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. • Excavation of topsoil and peat soils (119,796 m^3) to facilitate infrastructure; to be reinstated in the vicinity of the original location where possible. Additional information regarding best practice for the excavation, handling, storage and reuse of peat is detailed in the Outline PMP	**Negligible change – no adverse effect**

Attribute	Impact Assessment Findings	Residual impact
	available at **Volume 5 Appendix 11.2: Outline PMP.** • Potential disturbance of deep peat, degradation, removal or loss of soils due to construction phase activities may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. Mitigation measures, detailed in the Outline PMP available at **Volume 5 Appendix 11.2: Outline PMP.** will be implemented to protect peat integrity and limit soil disruption during construction. • Potential reduction in peat carbon storage during construction phase due to excavation and disturbance of peat; mitigated through peat re-use, reinstatement and restoration to reduce impact, or wholly mitigated if the surplus peat is used within the WHS. • Peat and turfs of active peat forming vegetation to be reinstated or reused onsite, where possible, to restore actively accumulating blanket bog ecosystems and thus contribute to carbon sequestration and storage. Further details regarding the reuse of peat is detailed in the Outline PMP available at **Volume 5 Appendix 11.2: Outline PMP.**	
f) water filtration and the impact on the water quality of associated riverine habitats	Anticipated impacts to attribute f include: • Localised disruption or alteration of filtration into areas where infrastructure is present, alterations to wider flowpaths into riverine habitats, and water quality impacts through sedimentation and chemical pollution; these impacts will be mitigated such that water quality and filtration to surrounding habitats will not be impacted.	**Negligible change – no adverse effect**

8.7.12 As laid out in **Section 8.2.9**, the integrity of the Flow Country WHS is tied to the intactness of the features integral to the globally significant ecosystem, including those elements of OUV needed to demonstrate the ecological and biological processes and biodiversity. Impacts of the Proposed Development to the elements of OUV tied to the integrity of the Flow Country WHS include:

- **Blanket bog:** an area of 60.87 ha (0.033% of the total WHS area) of blanket bog habitat within the Flow Country WHS is anticipated to be impacted. Of this, 13.24 ha will be a permanent loss, with 47.63 ha temporarily impacted. As this is such a small percentage (0.033%) of the total area of the Flow Country WHS, the impact is deemed to be negligible and therefore the integrity of this feature will not be compromised.
- **Wider peatland landscape complex:** an area of 68.53 ha (0.037% of the total WHS area) of peatland habitat within the Flow Country WHS is anticipated to be impacted. Of this, 18.44 ha will be a permanent loss, with 50.09 ha temporarily impacted. As this is such a small percentage (0.037 %) of the total area of the Flow Country WHS, the impact is deemed to be negligible and therefore the integrity of this feature will not be compromised.

- **Climatic, altitudinal, geological and geomorphological gradients:** no pathway for impact, therefore the integrity of this feature will not be compromised.
- **Hydrological elements that comprise the blanket bog:** possible impacts to hydrological elements include localised disruption or alteration of filtration into areas where infrastructure present, alterations to wider flowpaths into riverine habitats, and water quality impacts through sedimentation and chemical pollution. With embedded mitigation in place however, the water quality and quantity which supports the blanket bog habitats within the WHS will be maintained, reducing impacts to low to negligible and therefore the integrity of this feature will not be compromised.

8.7.13 It has been demonstrated through the assessment that any change to the attributes which convey OUV, or to the intactness of the features tied to integrity, would be **negligible** at most, and consequently it is anticipated that there will be **no adverse effect** to the OUV of the Flow Country WHS.

Residual Effects

8.7.14 Impacts of the Proposed Development on the Flow Country WHS have been reduced and managed through an appropriate mitigation hierarchy, including mitigation by design, embedded and additional mitigation measures. Additionally, the commitment to peat re-use, reinstatement and restoration, and soil replacement further reduces the residual effects of the Proposed Development. These measures are such that residual impacts to habitat, peat and peat stability, water environment and carbon have been reduced to a negligible level.

Given the extent of the Flow Country WHS, this project is not predicted to disrupt the primary ecological processes that sustain the attributes that convey OUV and maintain its integrity. The residual impacts of the Proposed Development are determined to have a negligible impact magnitude and as such impacts of the Proposed Development on the attributes that convey the OUV of the Flow Country WHS are anticipated to be **not significant**.

8.8 Enhancement Opportunities

8.8.1 The offsetting of impacts is deemed by UNESCO to be inappropriate in a World Heritage context[3]. This assessment has therefore considered the appropriate mitigation measures of avoiding impacts (mitigation by design) and through embedded and additional mitigation. The exploration of enhancement opportunities provides an opportunity for positive impact to the Flow Country WHS following the implementation of mitigation.

8.8.2 There are a number of opportunities to enhance the OUVs of the Flow Country WHS. SSEN have outlined their approach to identifying and delivering enhancement opportunities in **Volume 5, Appendix 8.8: Biodiversity Net Gain Assessment Report, Annex C**.

8.8.3 The Highland Council's *Highland Nature Biodiversity Action Plan 2021-2026*[30] sets out actions and commitments for priority habitats. For peatland and wetland habitats, commitments made by THC include:

- Support World Heritage Site status for the Flow Country;
- Restoration of peatlands, wetlands, bogs, mires, wet grasslands; and
- Prevent the loss of peatlands, wetlands, bogs, mires, wet grasslands.

8.8.4 The World Heritage Site nomination was accepted, with the Flow Country inscribed in July 2024. THC also states that they *will continue to encourage, promote and secure peatland restoration from development where*

[30] The Highland Council (2021) Highland Nature Biodiversity Action Plan 2021-2026. Available at: https://www.highland.gov.uk/downloads/file/27148/highland_nature_biodiversity_action_plan_2021_%E2%80%93_2026. Accessed April 2025.

appropriate[30]. Additionally, it is noted that NatureScot and SEPA undertake catchment management planning, and provide planning advice to direct development impacts away from wetlands where appropriate. SSEN's commitment to mitigate the loss of and restore peatland aligns with THC's commitments to restore and prevent the loss of peatland habitats.

8.8.5 NatureScot have published a guidance note on the approach required to manage losses to peatland habitats from development: *Advising on peatland, carbon-rich soils and priority peatland habitats in development management*[18]. The priority peatland habitat to be impacted by the Proposed Development within the WHS is blanket bog.

8.8.6 SSEN has a commitment to achieve positive effects for biodiversity, demonstrating enhancement consistent with NPF4, specifically Policy 3. SSEN have also committed to deliver Biodiversity Net Gain (BNG) (of 10%) on all projects gaining consent. Under SSEN's BNG assessment protocol[31], areas of blanket bog assessed as being in moderate, fairly good or good condition are considered to be irreplaceable habitat in Scotland. Where impacts to irreplaceable habitats are unavoidable, SSEN will ensure that more habitat is restored than is lost.

8.8.7 Commitments to achieving positive effects for biodiversity (such as priority peatland habitat restoration) and to delivering enhancement opportunities within the WHS, are collectively anticipated to enhance the OUV of the Flow Country WHS.

8.8.8 **Volume 5, Appendix 8.8: Biodiversity Net Gain Assessment Report: Annex C: SSEN Transmission's biodiversity net gain and irreplaceable habitat off-site strategy for Spittal to Beauly 400kV OHL** sets out SSEN Transmission's methodology for off-site BNG and irreplaceable habitats following application of the mitigation hierarchy throughout the development's routeing and design process. It also provides an overview of the approach taken to mitigate the impact within designated sites and the Flow Country WHS.

8.9 Cumulative Effects

8.9.1 An assessment of the in-combination cumulative effects for the Proposed Development (by geographical Section A-E) was completed for this EIA Report. This comprises intra-project cumulative effects (i.e. additional effects due to the combination of the Proposed Development and related substations into which it will connects) and inter-project cumulative effects (i.e. incremental effects arising from the combination of the Proposed Development + other ASTI associated developments and other SSEN Transmission and third-party projects). A summary of findings in terms of in-combination cumulative effects, and the assessment of interactive cumulative effects (i.e. effects from different impact types of the Proposed Development on key sensitive receptors), can be found in **Volume 2, Chapter 17: Cumulative Effects**.

8.9.2 Further details on projects included within the cumulative assessment can be found in **Volume 2, Chapter 5: EIA Process and Methodology** and **Volume 3, Figure 5.1: Cumulative Developments**.

8.9.3 The cumulative assessment for the Flow Country WHS focusses on only those projects whose boundary overlaps that of the WHS. Six inter-project developments considered in this EIA Report have a red line boundary overlapping with the Flow Country WHS: Strathy Wood Wind Farm Grid Connection, Strathy South Wind Farm Connection, Kirkton Energy Park, Watten Wind Farm, Tormsdale Wind Farm, and Golticlay Wind Farm. Cumulative effects for each of these projects are discussed below.

[31] SSEN (2022) TG-NET-ENG-526: Biodiversity Net Gain Toolkit User Guide. Revision 2.00.

Inter-project Developments

Strathy Wood Wind Farm Grid Connection

8.9.4 The EIA Report/WHS assessment found that the Project would impact attribute a) of criterion ix (actively accumulating blanket bog), resulting in a total habitat loss of 8.19 ha. This loss represents 0.0044% of the total area within the WHS.

8.9.5 The Project has no potential pathways to impact attributes b-e) of criterion ix, which encompass the climatic, hydrological, and ecological drivers that shape peatland development and biodiversity. The overall spatial continuity of the peatland ecosystem would remain largely unaffected. Embedded mitigation measures within the construction phase will avoid any potential impacts on riparian and aquatic habitats with respect to attribute f) of criterion ix.

8.9.6 Given the extent of the Flow Country WHS, this Project is not predicted to disrupt the primary ecological processes that sustain the OUV.

8.9.7 The Strathy Wood Wind Farm Connection EcIA concludes that the Project alone would result in a minor adverse effect, on the inscribed attributes of the peatland habitats within Flow Country WHS which is not considered to be significant.

8.9.8 SSEN's Connagill Cluster Grid Connection Projects HMP combines the HMP of five renewable energy projects within the local landscape, including Strathy Wood Wind Farm Grid Connection. This HMP will restore 550 hectares (ha) of peatland partially within the WHS footprint, and partially outside of it, which will contribute a moderate permanent beneficial effect for the OUV feature.

8.9.9 In combination with the Proposed Development, impacts are predicted to be minor magnitude, which is not significant.

Strathy South Wind Farm Connection

8.9.10 The EIA Report/WHS assessment found that the Project would impact attribute a) of criterion ix (actively accumulating blanket bog), resulting in a total habitat loss of 25.8 ha. This loss represents 0.013% of the total area within the WHS.

8.9.11 The Project has no potential pathways to impact attributes b-e) of criterion ix, which encompass the climatic, hydrological, and ecological drivers that shape peatland development and biodiversity. The overall spatial continuity of the peatland ecosystem would remain largely unaffected. Embedded mitigation measures within the construction phase will avoid any potential impacts on riparian and aquatic habitats with respect to attribute f) of criterion ix.

8.9.12 The Strathy South Wind Farm Connection EcIA concludes that the Project alone would result in a minor adverse effect, on the inscribed attributes of the peatland habitats within Flow Country WHS, which is not considered to be significant. Given the extent of the Flow Country WHS, this Project is not predicted to disrupt the primary ecological processes that sustain the OUV.

8.9.13 SSEN's Connagill Cluster Grid Connection Projects HMP combines the HMP of five renewable energy projects within the local landscape, including Strathy South Wind Farm Connection. This HMP will restore 550 hectares (ha) of peatland partially within the WHS footprint, and partially outside of it, which will contribute a moderate permanent beneficial effect for the OUV feature.

8.9.14 In combination with the Proposed Development, impacts are predicted to be minor magnitude, which is not significant.

Kirkton Energy Park

8.9.15 The EIA Report/WHS assessment found that the Project would impact attribute a) of criterion ix (actively accumulating blanket bog), resulting in a total habitat loss of 5.95 ha. This loss represents 0.003% of the total area within the WHS.

8.9.16 The Project has no potential pathways to impact attributes b-e) of criterion ix, which encompass the climatic, hydrological, and ecological drivers that shape peatland development and biodiversity. The overall spatial continuity of the peatland ecosystem would remain largely unaffected. Embedded mitigation measures within the construction phase will avoid any potential impacts on riparian and aquatic habitats with respect to attribute (f) of criterion (ix).

8.9.17 Kirkton Energy Park EcIA concludes that the Project alone would result in a minor adverse effect, on the inscribed attributes of the peatland habitats within Flow Country WHS which is not considered to be significant. Given the extent of the Flow Country WHS, this Project is not predicted to disrupt the primary ecological processes that sustain the OUV.

8.9.18 The HMP for Kirkton Energy Park proposes to enhance habitats on the proposed development site, including blanket bog habitats and particularly in the improvement of peatland quality and quantity, through a programme of habitat management and enhancement. This includes aims to establish a beneficial operational effect by aiming to restore blanket bog habitats affected by historic drainage and planting of coniferous woodland. Full implementation of the HMP and establishment of blanket bog habitats (81.25 ha increase in extent) are anticipated to have a minor positive residual effect on the qualifying features of the WHS.

8.9.19 In combination with the Proposed Development, impacts are predicted to be minor magnitude, which is not significant.

Watten Wind Farm

8.9.20 The EIA Report/WHS assessment found that the Project has no potential pathways to impact attributes b-e) of criterion ix, which encompass the climatic, hydrological, and ecological drivers that shape peatland development and biodiversity. There is no hydrological connection between the habitats due to the separation provided by the Burn of Acharole. The overall spatial continuity of the peatland ecosystem would remain largely unaffected. Embedded mitigation measures within the construction phase will avoid any potential impacts on riparian and aquatic habitats with respect to attribute f) of criterion ix. The Project would not impact attribute a) of criterion ix (actively accumulating blanket bog), as although the Project boundary is within the WHS, it only partially overlaps, and the total habitat loss of 7.43 ha, would occur outside of the WHS boundary.

8.9.21 Watten Wind Farm EcIA concludes that the Project alone would result in a negligible effect, on the inscribed attributes of the peatland habitats within Flow Country WHS which is not considered to be significant. Given that habitats within the WHS will not be impacted directly by this Project, this Project is not predicted to disrupt the primary ecological processes that sustain the OUV.

8.9.22 As part of the Biodiversity Enhancement Management Plan (BEMP), a managed area of 80.44 ha of peatland will be restored and enhanced outside of the WHS footprint.

8.9.23 In combination with the Proposed Development, impacts are predicted to be negligible magnitude, which is not significant.

Tormsdale Wind Farm

8.9.24 The EIA Report/WHS assessment found that the Project would not impact attribute a) of criterion ix (actively accumulating blanket bog), as although there will be total habitat loss of 7.3 ha or 0.0004% of total WHS, the OUV feature of blanket bog was not recorded within the Project footprint, therefore would not be impacted.

8.9.25 The Project has no potential pathways to impact attributes b-e) of criterion ix, which encompass the climatic, hydrological, and ecological drivers that shape peatland development and biodiversity. No OUV blanket bog was recorded within the Project footprint. As such the habitats within the Project lack hydrological connectivity to surrounding blanket bog habitat, The overall spatial continuity of the peatland ecosystem would remain largely unaffected. Embedded mitigation measures within the construction phase will avoid any potential impacts on riparian and aquatic habitats with respect to attribute f) of criterion ix.

8.9.26 Given the extent of the Flow Country WHS, this Project is not predicated to disrupt the primary ecological processes that sustain the OUV. Tormsdale Wind Farm EcIA concludes that the Project alone would result in a negligible adverse effect, on the inscribed attributes of the peatland habitats within Flow Country WHS, which is not considered to be significant.

8.9.27 As part of the Outline Habitat Management Plan (oHMP), an area of 258.43 ha will be restored which is outside of the WHS footprint.

8.9.28 In combination with the Proposed Development, impacts are predicted to be negligible magnitude, which is not significant.

Golticlay Wind Farm

8.9.29 The EIA Report/WHS assessment found that the Project would not impact attribute a) of criterion ix (actively accumulating blanket bog), as the total habitat loss of 12.34 ha lies outside the WHS boundary. Therefore, the OUV feature of blanket bog would not be impacted.

8.9.30 The Project has no potential pathways to impact attributes b-e) of criterion ix, which encompass the climatic, hydrological, and ecological drivers that shape peatland development and biodiversity. Habitats within the Project footprint are degraded through extensive forestry practices likely have limited hydrological connectivity to the WHS. The overall spatial continuity of the peatland ecosystem would remain largely unaffected. Embedded mitigation measures within the construction phase will avoid any potential impacts on riparian and aquatic habitats with respect to attribute f) of criterion ix.

8.9.31 Golticlay Wind Farm EcIA concludes that the Project alone would result in a negligible adverse effect, on the inscribed attributes of the peatland habitats within Flow Country WHS which is not considered to be significant. Given the extent of the Flow Country WHS, this Project is not predicted to disrupt the primary ecological processes that sustain the OUV.

8.9.32 As part of the Habitat Management Plan (HMP), 32.5 hectares (ha) of peatland will be restored within the WHS footprint, which will contribute a moderate permanent beneficial effect for the OUV feature.

8.9.33 In combination with the Proposed Development, impacts are predicted to be minor magnitude, which is not significant.

Ackron Wind Farm

8.9.34 Part of the site for the proposed Ackron Wind Farm (23/06023/SCOP) overlaps with the Flow Country WHS. The decision status for this project is: Scoping Application Decision Issued. The Flow Country WHS (then

candidate/ proposed) was scoped in as an ecological feature in the EIA Scoping Report (Table 8.2.3: Ecological features 'Scoped In'), stating that: *The potential impacts upon peatland habitats associated with the proposed WHS will be assessed in the EIAR*.

8.9.35 The potential for in-combination effects for the proposed Ackron WF was identified in the HRA (**Volume 5, Appendix 8.7: Report to Inform Habitats Regulation Appraisal (HRA)**), concluding that there is insufficient information available for analysis of in-combination effects at this time. The Ackron WF has therefore not been further assessed in this report for in-combination effects due to insufficient information.

Baledigle Wind Farm

8.9.36 The decision status for the proposed Baledigle Wind Farm project is: Scoping Application Decision Issued. Part of the site for the proposed Baledigle Wind Farm (24/03036/SCOP) overlaps with the Flow Country WHS, as per the current boundary for the inscribed WHS. The EIA Scoping Report, however, states that the proposed development (Baledigle Wind Farm) is *not located within the boundary limits of the FCWHS property*, [instead lying] *adjacent to the candidate site – is bound on all aspects, and is therefore subject to setting assessment for the functional OUV of the FCWHS*. The EIA Scoping Report also stated that: *An additional FCWHS setting assessment would focus on connectivity in terms of 'intactness' and 'integrity' of the surrounds as a whole*. The impacts of the proposed Baledigle Wind Farm on the Flow Country WHS were not further assessed in the EIA Scoping Report. It is inferred therefore that the assessment of impacts of the proposed Baledigle Wind Farm on the Flow Country WHS will be addressed in the EIA Report.

8.9.37 The potential for in-combination effects for the proposed Baledigle WF was identified in the HRA (**Volume 5, Appendix 8.7: Report to Inform Habitats Regulation Appraisal (HRA)**), concluding that there is insufficient information available for analysis of in-combination effects at this time. The Baledigle WF has therefore not been further assessed in this report for in-combination effects due to insufficient information.

Overall Cumulative Effects

8.9.38 The Proposed Development would impact a total of **60.87 ha of** blanket bog habitat within the Flow Country WHS. This represents **0.033%** of the total WHS area and has been assessed as having a minor adverse effect, which is not significant on its own. Habitat loss for inter-projects considered in cumulative assessment is summarised in **Table 8-24**.

Table 8-24: Habitat loss for inter-projects considered in cumulative assessment.

Project	Predicted Area (ha) of habitat loss in WHS	% of the total area within the WHS
Strathy Wood Wind Farm Grid Connection	8.19	0.0044%
Strathy South Wind Farm Connection	25.8	0.013%
Kirkton Energy Park	5.95	0.003%
Watten Wind Farm	0	0%
Tormsdale Wind Farm	0	0%
Golticlay Wind Farm	0	0%
Total	**39.94**	**0.02%**

8.9.39 Cumulatively, the Proposed Development, Strathy Wood, Strathy South, and Kirkton Energy have been assessed as having a **minor impact** on the peatland habitat OUV attribute of the Flow Country WHS. The combined magnitude of habitat loss and disturbance is assessed to be minor. As Watten, Tormsdale, and

Golticlay are assessed as having negligible effects, their cumulative contribution is expected to have **negligible impact.**

8.9.40 The Proposed Development incorporates peatland restoration as a key mitigation measure, consistent with similar commitments in the EcIAs of the six other projects. These measures are expected to result in a **net positive outcome** for peatland in the long-term. See **Volume 5, Appendix 8.8: Biodiversity Net Gain Assessment Report: Annex C: SSEN Transmission's biodiversity net gain and irreplaceable habitat off-site strategy for Spittal to Beauly 400kV OHL** for further detail.

8.9.41 In-combination with the other Projects, the total habitat loss of the Proposed Development will have **a minor impact** relative to the total area of the WHS. Given the baseline condition of peatland habitat to be impacted, the mitigation measures to be carried out, and the spatial distribution between Projects, overall cumulative impacts remain **not significant**.

8.10 Summary

8.10.1 The Flow Country WHS represents an outstanding example of an actively accumulating blanket bog landscape, whose integrity is tied to the intactness of the features integral to the globally significant ecosystem.

8.10.2 Within the boundary of the Flow Country WHS, the Proposed Development will comprise the installation and operation of 7.6 km of new double circuit 400 kV Overhead Line (OHL) on steel lattice towers and ancillary development and associated works required to facilitate its construction and operation. The Proposed Development falls within National Development 3 - Strategic Renewable Electricity Generation and Transmission Infrastructure in Scotland's National Planning Framework.

8.10.3 This assessment has considered the potential direct, indirect, and cumulative impacts of the Proposed Development on the Flow Country WHS, including effects to its wider setting, and has been prepared as part of the EIA Report for the project. The baseline information used in the assessment of effects within this report has also drawn from this EIA Report.

8.10.4 The offsetting of impacts is deemed by UNESCO to be inappropriate in a World Heritage context[3]. SSEN has therefore employed the mitigation hierarchy to avoid, minimise and restore, through first avoiding impacts (mitigation by design), and secondly establishing embedded mitigation, which includes the restoration of habitats. With the application of these mitigation measures, and given the extent of the Flow Country WHS, this project is not predicted to disrupt the primary ecological processes that sustain the attributes that convey OUV, with impacts reduced such that no adverse effect on the OUV of the Flow Country WHS is anticipated.

8.10.5 As a result, there will be **no significant adverse effects** as a result of the Proposed Development on the attributes that convey OUV or integrity of the Flow Country WHS, either alone or in combination with other projects.

8.10.6 Where mitigation rather than offsetting has appropriately been considered as part of this assessment, enhancement opportunities provide an opportunity for positive impact to the Flow Country WHS for the long-term. SSEN has a commitment to achieve positive effects for biodiversity, demonstrating enhancement consistent with NPF4. Commitments to achieving positive effects for biodiversity (such as priority peatland habitat restoration) and to delivering enhancement opportunities within the WHS, are collectively anticipated to enhance the OUV of the Flow Country WHS.

ANNEX A FLOW COUNTRY STATEMENT OF OUTSTANDING UNIVERSAL VALUE (SOUV)

Outstanding Universal Value[32]

Brief Synthesis

The Flow Country is considered the most outstanding example of a blanket bog ecosystem in the world. This blanket peat and its intricate network of pools, hummocks and ridges stretches across nearly 190,000 ha of the northern mainland Scotland, with the boundary comprising seven separate but proximal areas. The peat has been accumulating for the past 9,000 years and displays a remarkable range of features resulting from the climatic, altitudinal, geological and geomorphological gradients found across the region. Peatlands play an important role in storing carbon, and The Flow Country has an extensive record of peatland accumulation, with peat thicknesses which reach over eight metres. Ongoing peat-forming ecological processes continue to sequester carbon on a very large scale.

The Flow Country blanket bog also provides a diversity of habitats, combined with the patchwork of connected farming and coastal landscape elements within the wider setting. The area supports a distinctive assemblage of birds, with a combination of arctic-alpine and temperate and continental species.

Protection for The Flow Country is provided through international and national designations, and national, and local planning law and policy, and there is scope for future expansion of the property through restoration of adjacent degraded blanket bog. The area is also considered to be the type-locality for description of blanket bog and so represents a significant research and educational resource.

Criterion (ix): Since the glaciers receded from Scotland, climatic conditions in combination with the underlying geology, the resultant topography, and the biogeography have led to the formation of a vast and diverse blanket bog landscape that stretches across the north of Scotland. The persistent precipitation-fed waterlogging of the soil has led to an expanse of peat bog that blankets the landscape, including hills, slopes and hollows, and forming a globally rare and significant peatland ecosystem and associated species assemblage. The property represents the most extensive, near-continuous, high quality and near-natural blanket bog landscape found globally. The active processes of blanket bog formation have continued for 9,000 years, and the diversity of blanket bog features is not found anywhere else on Earth.

The blanket bog also provides a highly significant record of its formation, preserved as pollen and plant fossils, and telling a story of its past flora, fauna, palaeoecology and human influence. This is important for the understanding of the future evolution of this and other blanket bogs globally. Moreover, the processes of blanket bog formation provide a significant example of carbon sequestration on a large scale.

The property holds between 29 and 34 peat forming species of Sphagnum moss, which are themselves home to complex assemblages of unique microorganisms adapted to survive in the low oxygen, cold temperature, acidity, and oligotrophy conditions of bog systems, adding to the biodiversity value of peatland habitats, and which also provide refuge for many breeding bird species. The property hosts a particular biodiversity assembly with specific communities composed of Atlantic, boreal and arctic taxa.

Integrity

The Flow Country property comprises seven discrete but adjacent areas totalling nearly 190,000 ha, which encompasses a large expanse of actively accumulating blanket bog ecosystem. The overwhelming majority of

[32] Statement of Outstanding Universal Value sourced from: UNSECO (2024) The Flow Country, Available at: https://whc.unesco.org/en/list/1722/

the blanket bog within the property boundary is in near-natural condition. The remainder includes areas of blanket bog that are undergoing restoration, and areas that are expected to be restored in the near future.

The property is of sufficient size to contain all of the elements of Outstanding Universal Value needed to demonstrate the ecological and biological processes, and the biodiversity that comprises this globally significant ecosystem. These include the blanket bog itself, the wider peatland landscape complex in which it lies and the finer elements, including pool systems, diverse surface patterning, fens, and the range of flora and fauna that all of these systems support. The climatic, altitudinal, geological and geomorphological gradients that occur across the Flow Country all contribute to ensuring that the variety of features that make up blanket bogs are represented. Furthermore, the boundaries of the property are largely defined on the basis of the hydrological elements that comprise the blanket bog, and therefore ensure ecosystem integrity and coherence.

Areas of the property have suffered from poor historical management decisions such as drainage and woodland creation, but the boundary has been chosen to include only those areas of deep peat which are in good condition or have the ability to return to a near-natural state within the next 10-25 years. It is expected that in time, it will be possible to integrate some of the bog of the wider Flow Country into the property. The construction of wind turbines represents a more recent threat to the property through supporting infrastructure and through negative impacts on the avian fauna, which constitutes an integral part of the blanket bog ecosystem.

Protection and Management Requirements

The property is legally protected in its entirety based on its Outstanding Universal Value. Around 73 percent of the area within the property boundary has the highest level of statutory protection that domestic law can provide: SSSIs, SACs (for habitats), SPAs (for birds) and a Ramsar Site (for wetlands). These laws provide specific protection for the elements of Outstanding Universal Value as set out in the property's attributes, notably including the processes for the maintenance and formation of blanket bog, and the associated flora and fauna.

Further to statutory environmental protection, peatlands, particularly those containing deep peat greater than 50 centimetres, are protected through the planning system for Scotland, both at national and local level. There are specific planning policies at national level in relation to both World Heritage properties and areas of peatland that afford effective protection from development proposals that might impact upon Outstanding Universal Value. Moreover, where the boundary is not coincident with existing environmental designations, protection will be ensured by national and local planning policy.

The property has no buffer zone. However, areas important for the protection of Outstanding Universal Value outside of the boundary are protected through a combination of national and local planning policy, and the wider protection of features afforded by the existing European-level environmental designations. In addition, the integrity of the property is ensured thanks to its large size and the inclusion of areas that provide a buffering function within the property boundaries.

Management of the property's Outstanding Universal Value is guided by a single clear Management Plan, developed by the Flow Country Partnership in collaboration with key stakeholders such as landowners and managers, government agencies, local communities and scientific experts. Management requirements include bog restoration, monitoring of and responding to any potential developments in the vicinity of the property, including the construction of wind turbines. Potential threats include woodland restocking and natural regeneration, water management and drainage, intensive agriculture, wind farms, inappropriate deer management, burning and climate change. A key requirement for the management of this property lies in continued strong and adequately resourced coordination and partnership arrangements focused on the World Heritage property and its Outstanding Universal Value.

ANNEX B FLOW COUNTRY WHS IMPACT ASSESSMENT TOOLKIT

Flow Country World Heritage Impact Assessment Screening

Brief description and location of the project / development	SSEN OHL (electricity transmission towers) Beauly - Loch Buidh - Spittal
Does the project / development lie wholy or partly within the boundary of the inscribed Site?	Partly - intersects in 4 places
Does the project / development lie outwith the Site but would include actions that might impact aspects	Potentially - long sections within 'setting'. However, impacts anticipated to be minimal.
Has the project / development been subject to an Environmental Impact Assessment or any other	Yes, EIAR to be submitted

A. Screening Criteria Question	B. Response to the Screening Criteria Question in Column A (yes / no / N/A)	C. Briefly explain reasons for response in Column B and, if applicable and/or known, include name of feature(s), connectivity and proximity to site(s)
Flow Country World Heritage Site OUV*		
Might the project/development negatively impact the extent or continuity of natural, actively accumulating, blanket bog ecosystem?	Yes	The project will impact the extent of blanket bog habitat, through temporary and permanent localised removal. Any impact would be highly localised, a very small proportion of the overall site (tower, access track and pulling locations), and would not affect the surrounds into the long term. Where the Proposed Development crosses watercourses within or upstream of WHS, the downstream water quality and quantity which supports the blanket bog habitats will be impacted. However, the impact would be temporary and localised to the Proposed Development and immediate downstream receptors. Geology: Direct removal of peat soils during the construction of tower bases and other associated infrastructure will impact the natural active bog ecosystem. However, impact will be highly localised and temporary and would not impact peat soils in the wider area or during the long term operation of the development. Hydrology: Where the Proposed Development crosses watercourses within or upstream of WHS, the downstream water quality and quantity which supports the blanket bog habitats will be impacted. Ecology: Direct removal of habitat through tower locations and access tracks. Any impact would be highly localised to the tower locations, and would not affect peat in surrounds into long term.
Might the project/development reduce the range of climatic, topographic gradients and geological diversity that result in the recorded bog macroform diversity?	No	The project will not impact on climatic or geological diversity. Topography will be impacted on a very local scale by the project footprint. Any impact would be highly localised to the tower and access track locations, and would not affect the surrounds into the long term. Geology: Impacts to the geology, soils and peat are anticipated, however, impact will be highly localised and limited to the construction phase of the development. Hydrology: As blanket bog is rain water fed and there are towers and access tracks proposed on top of the WHS then there is a potential for a localised reduction in hydrological connectivity. Any impact would be highly localised to the tower and access track locations, and would not affect the surrounds into the long term. Ecology: Direct removal of habitat through tower locations and access tracks. Any impact would be highly localised to the tower locations, and would not affect peat in surrounds into long term.
Might the project/development degrade the temporal and spatial record of peatland development and related factors?	Yes	The project will have a permanent localised impact to the temporal archive under the project footprint. There is no likely pathway for impact to the overall spatial and temporal archive of the WHS. Any impact would be highly localised to the tower and access track locations, and would not affect the surrounds into the long term. Geology: Impacts to the geology, soils and peat are anticipated, however, impact will be highly localised and limited to the construction phase of the development. Cultural Heritage: No inherent heritage considerations, Heritage impact further explored in the EIA (Volume 2 Chapter 12). Ecology: The temporal and spatial record of peatland development across the WHS as a whole would not be affected. Any impact would be highly localised to the project footrpint.
Might the project/development impact on ongoing scientific work or the educational value of the peatlands and associated biodiversity?	No	Although temporary access restrictions are anticipated during the construction phase, the project will not affect the ongoing scientific work or educational value of the peatlands and associated biodiversity. Any impact would be highly localised to the tower and access track locations, and would not affect the surrounds into the long term. Tourism and recreation: The direct removal of habitat due to tower locations and access tracks will be highly localised and will have negligible impact on the ongoing scientific work or educational value of the peatlands and associated biodiversity. Ecology: Direct removal of habitat through tower locations and access tracks. Any impact would be highly localised to the tower locations, and would not affect peat in surrounds into long term.
Might the project/development reduce the carbon sequestration and/or storage potential of the peatlands?	Yes	The project will result in a temporary or permanent reduction in the carbon sequestration and storage potential of the peatlands through the temporary/permanent localised removal of blanket bog habitat. Any impact would be highly localised to the tower and access track locations, and would not affect the surrounds into the long term. Carbon: Impacts to peatland is anticipated during the construction phase, with peat removal / disturbance potentially reducing carbon sequestration and storage potential of the peatlands. However, impacts to peat will be localised to the tower locations, and the surrounding peat will not be impacted in the long term. Given the small footprint of disturbance for the tower foundations / construction phase within the WHS, any carbon emissions would likely be negligible, especially compared to the average UK yearly emissions, and the extent of peatlands within the WHS that would not be impacted. Geology: The construction of towers and associated infrastructure where peat is present will involve the excavation of peat and soils. Impact on areas of peatland will affect its ability to store carbon. However, excavation of peat and soils will be on a highly localised scale and it will not impact peatlands in the surrounding area in the long term. Ecology: Direct removal of habitat through tower locations and access tracks. Any impact would be highly localised to the tower locations, and would not affect peat in surrounds into long term.
Might the project/development impact the water filtration and resultant water quality of associated riverine habitats?	Yes	Where the Proposed Development crosses a watercourse within or upstream of WHS, the water quality and quantity in downstream riverine habitats will be impacted. In addition, the project will impact water filtration in the WHS. Any impact would be temporary and localised to the Proposed Development and immediate downstream receptors. Hydrology: Where the Proposed Development crosses a watercourse within or upstream of WHS, the water quality and quantity in downstream riverine habitats will be impacted. Water filtration will also be impacted. Ecology: Direct removal of habitat through tower locations and access tracks. Any impact would be highly localised to the tower locations, and would not affect habitats in surrounds into long term.
Flow Country World Heritage Site Integrity		
The site boundary encapsulates all of the elements of OUV needed to demonstrate the ecological and biological processes and associated biodiversity of a blanket bog landscape as well as ensuring ecosystem	No	The Proposed Development is partially located within the site, and also within the site 'setting', and has potential to impact 4 of 6 criteria ix attributes. Due to the small scale of impacts, and limited interaction with the WHS (intersecting for short distances at four locations), impacts to the OUV of attributes are anticipated to be negligible, and not anticipated to negatively impact the integrity of the site as a whole.

* for more detailed background information on each of the questions please review the Site attributes.

SCOPING EXPECTATIONS
In a World Heritage context, the scope should include:
Any data that need to be collected to fill knowledge gaps
Potential significant impacts
The geographical area of each potential impact
The time period over which each potential impact may occur
Initial identification of alternatives to the proposed action

SUGGESTED SCOPING REPORT CONTENTS*
Assessment of the WH property and its attributes
Policy context
The proposed action: map, plans, need, alternatives
Baseline
Identification of potential impacts (Identifying Potential Risks Tool & Description & Evaluation Tool)
Methodology
Rights-holders and stakeholders
Time frame

* see table 6.1 in Guidance and Toolkit for Impact Assessments in a World Heritage Context (2022)

Statement of Outstanding Universal Value

Brief synthesis

The Flow Country is considered the most outstanding example of a blanket bog ecosystem in the world. This blanket peat and its intricate network of pools, hummocks and ridges stretches across nearly 190,000 ha of the northern mainland Scotland, with the boundary comprising seven separate but proximal areas. The peat has been accumulating for the past 9,000 years and displays a remarkable range of features resulting from the climatic, altitudinal, geological and geomorphological gradients found across the region. Peatlands play an important role in storing carbon, and The Flow Country has an extensive record of peatland accumulation, with peat thicknesses which reach over eight metres. Ongoing peat-forming ecological processes continue to sequester carbon on a very large scale.

The Flow Country blanket bog also provides a diversity of habitats, combined with the patchwork of connected farming and coastal landscape elements within the wider setting. The area supports a distinctive assemblage of birds, with a combination of arctic-alpine and temperate and continental species.

Protection for The Flow Country is provided through international and national designations, and national, and local planning law and policy, and there is scope for future expansion of the property through restoration of adjacent degraded blanket bog. The area is also considered to be the type-locality for

Criterion (ix): Since the glaciers receded from Scotland, climatic conditions in combination with the underlying geology, the resultant topography, and the biogeography have led to the formation of a vast and diverse blanket bog landscape that stretches across the north of Scotland. The persistent precipitation-fed waterlogging of the soil has led to an expanse of peat bog that blankets the landscape, including hills, slopes and hollows, and forming a globally rare and significant peatland ecosystem and associated species assemblage. The property represents the most extensive, near-continuous, high quality and near-natural blanket bog landscape found globally. The active processes of blanket bog formation have continued for 9,000 years, and the diversity of blanket bog features is not found anywhere else on Earth.

The blanket bog also provides a highly significant record of its formation, preserved as pollen and plant fossils, and telling a story of its past flora, fauna, palaeoecology and human influence. This is important for the understanding of the future evolution of this and other blanket bogs globally. Moreover, the processes of blanket bog formation provide a significant example of carbon sequestration on a large scale.

The property holds between 29 and 34 peat forming species of Sphagnum moss, which are themselves home to complex assemblages of unique microorganisms adapted to survive in the low oxygen, cold temperature, acidity, and oligotrophy conditions of bog systems, adding to the biodiversity value of

Integrity

The Flow Country property comprises seven discrete but adjacent areas totalling nearly 190,000 ha, which encompasses a large expanse of actively accumulating blanket bog ecosystem. The overwhelming majority of the blanket bog within the property boundary is in near-natural condition. The remainder includes areas of blanket bog that are undergoing restoration, and areas that are expected to be restored in the near future.

The property is of sufficient size to contain all of the elements of Outstanding Universal Value needed to demonstrate the ecological and biological processes, and the biodiversity that comprises this globally significant ecosystem. These include the blanket bog itself, the wider peatland landscape complex in which it lies and the finer elements, including pool systems, diverse surface patterning, fens, and the range of flora and fauna that all of these systems support. The climatic, altitudinal, geological and geomorphological gradients that occur across the Flow Country all contribute to ensuring that the variety of features that make up blanket bogs are represented. Furthermore, the boundaries of the property are largely defined on the basis of the hydrological elements that comprise the blanket bog, and therefore ensure ecosystem integrity and coherence.

Areas of the property have suffered from poor historical management decisions such as drainage and woodland creation, but the boundary has been chosen to include only those areas of deep peat which are in good condition or have the ability to return to a near-natural state within the next 10-25 years. It is expected that in time, it will be possible to integrate some of the bog of the wider Flow Country into the property. The construction of wind turbines represents

Protection and management requirements

The property is legally protected in its entirety based on its Outstanding Universal Value. Around 73 percent of the area within the property boundary has the highest level of statutory protection that domestic law can provide: SSSIs, SACs (for habitats), SPAs (for birds) and a Ramsar Site (for wetlands). These laws provide specific protection for the elements of Outstanding Universal Value as set out in the property's attributes, notably including the processes for the maintenance and formation of blanket bog, and the associated flora and fauna.

Further to statutory environmental protection, peatlands, particularly those containing deep peat greater than 50 centimetres, are protected through the planning system for Scotland, both at national and local level. There are specific planning policies at national level in relation to both World Heritage properties and areas of peatland that afford effective protection from development proposals that might impact upon Outstanding Universal Value. Moreover, where the boundary is not coincident with existing environmental designations, protection will be ensured by national and local planning policy.

The property has no buffer zone. However, areas important for the protection of Outstanding Universal Value outside of the boundary are protected through a combination of national and local planning policy, and the wider protection of features afforded by the existing European-level environmental designations. In addition, the integrity of the property is ensured thanks to its large size and the inclusion of areas that provide a buffering function within the property boundaries.

Management of the property's Outstanding Universal Value is guided by a single clear Management Plan, developed by the Flow Country Partnership in collaboration with key stakeholders such as landowners and managers, government agencies, local communities and scientific experts. Management

Attributes of The Flow Country Property (the Site)		
Criteria ix.	Attributes	Description
outstanding example representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	Persistent rain fed wetness and low rates of evaporation across The Flow Country lead to widespread, year round waterlogged ground conditions which are ideal for the growth and prese This ongoing process (paludification) began around 9,000 years ago and is key in the formation of blanket bog. Unlike other bog types, which are confined by topography, this allows blank landscapes. The Flow Country is one of only a few locations globally where conditions exist that are conducive to blanket bog formation, and combines a quality, extent and connectivity o of any other known blanket bog.
	b) climatic, topographic gradients and geological diversity: bog macroform diversity	The scale of the nominated property, alongside the gradients in climate and topography, and the diversity of the underlying geology, provide the setting for subtle variations in processes v in the character of the blanket bog. These factors control the development of complex systems of hummocks, moss lawns, hollows and pools, and the associated plant species, which prod has been classified into 15 site-types. No other blanket bog in the world contains such a diverse collection of surface patterning within a single area.
	c) archive it stores (4th dimension)	Delving deeper, the peat, which has been forming for over 9,000 years, reaches thicknesses of over 8 m, providing an exceptional archive and providing a 4th dimension to The Flow Countr responsible for the development of the blanket bog system and the ecosystems it supported can be scrutinised back through time across the vast area it covers using pollen records; plant pine cones, pine stumps); lake sediment records (midge and diatom (alga) remains); tephra (ash) layers blown south from Icelandic volcanoes; charcoal (indicating in situ burning).
	d) natural laboratory – ongoing scientific and educational use	The exceptional nature of The Flow Country makes it the 'type site' for blanket bog study and it continues to be used as a 'test bed' for peatland research globally. The diversity of features climatic gradients across the region and the depth of archive provides a huge scope for research. Furthermore, the breadth of existing studies provides a fantastic foundation for future re
	e) carbon sequestration and storage	Globally peatlands are the largest natural terrestrial carbon store. Covering only 3% of the world's land area, they hold nearly 30% of all the carbon stored on land. In blanket bog, year-ro slow the process of plant decomposition such that the dead plants accumulate to form peat, and thereby sequester carbon from the atmosphere. Over thousands of years this plant mater several metres thick producing a valuable carbon store. The Flow Country provides a superb example of ongoing sequestration, alongside carbon storage demonstrated by peat thickness
	f) water filtration and the impact on the water quality of associated riverine habitats	The catchments draining The Flow Country sustain exceptional water quality, resulting from the natural filtration of rainwater as it slowly seeps through these vast peatlands. The superb v important in sustaining globally important populations of the freshwater pearl mussel in rivers which drain from The Flow Country. European eel (classed by the IUCN as Critically Endange these catchments. Furthermore, the rivers of The Flow Country are maintaining strong populations of Atlantic salmon which are in global decline.

Criteria	Attribute	Element of a proposed action that has the potential to cause an impact						
		Construction of temporary access tracks	Construction of temporary tower working areas / compounds	Construction of temporary working area for Equi-Potential Zones (EPZ) pulling positions	Construction of permanent access tracks	Construction of permanent tower footing	On-site reuse of excavated peat following construction	Hydrological impacts to 'setting' (all elements outside WHS)
ix: outstanding example representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Temporary loss of blanket bog habitat. Temporary impacts to water quality and quantity supporting blanket bog habitat.** Impacts will be temporary and localised to the project footprint and downstream hydrological receptors.	**Temporary loss of blanket bog habitat. Temporary impacts to water quality and quantity supporting blanket bog habitat.** Impacts will be temporary and localised to the project footprint and downstream hydrological receptors.	**Temporary impact to blanket bog habitat. Temporary impacts to water quality and quantity supporting blanket bog habitat.** Impacts will be temporary and localised to the project footprint and downstream hydrological receptors.	**Permanent loss of blanket bog habitat. Permanent alteration to flowpaths supporting blanket bog habitat.** Impacts will be permanent and localised to the project footprint and downstream hydrological receptors.	**Permanent loss of blanket bog habitat. Permanent alteration to flowpaths supporting blanket bog habitat.** Impacts will be permanent and localised to the project footprint and downstream hydrological receptors.	**Pathway for positive impact.** Reinstatement and restoration of peatland habitat and re-use of peat have the potential to increase the area of actively accumulating bog.	**Impacts to surface waters which flow through and feed the blanket bog.** Impacts to water quality and quantity will be temporary and localised to the project footprint and downstream hydrological receptors.
	b) climatic, topographic gradients and geological diversity: bog macroform diversity	**No pathway for impact.** No anticipated impact to climatic, topographic gradients and geological diversity and therefore bog macroform diversity.	**No pathway for impact.** No anticipated impact to climatic, topographic gradients and geological diversity and therefore bog macroform diversity.	**No pathway for impact.** No anticipated impact to climatic, topographic gradients and geological diversity and therefore bog macroform diversity.	**No pathway for impact.** No anticipated impact to climatic, topographic gradients and geological diversity and therefore bog macroform diversity.	**No pathway for impact.** No anticipated impact to climatic, topographic gradients and geological diversity and therefore bog macroform diversity.	**Pathway for positive impact.** Reinstatement and restoration of peatland habitat and re-use of peat will contribute to maintaining bog macroform diversity over time.	**No pathway for impact.** Not applicable to hydrological considerations.
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** Excavations will be of limited depth and scope. Impacts will be localised to the project footprint.	**Localised permanent impact to the stored archive (under project footprint).** Excavations will be of limited depth and scope. Impacts will be localised to the project footprint.	**No pathway for impact.** Archive will not be impacted as peat will not be excavated.	**Localised permanent impact to the stored archive (under project footprint).** Excavations will be of limited depth and scope. Impacts will be localised to the project footprint.	**Localised permanent impact to the stored archive (under project footprint).** Excavations will be of limited depth and scope. Impacts will be localised to the project footprint.	**No pathway for positive impact.** Any peat reinstated will not retain context of original stored archive.	**No pathway for impact.** Not applicable to hydrological considerations.
	d) natural laboratory – ongoing scientific and educational use	**No pathway for impact.** Access restrictions during construction phase will be temporary.	**No pathway for impact.** Access restrictions during construction phase will be temporary.	**No pathway for impact.** Access restrictions during construction phase will be temporary.	**No pathway for impact.** Access restrictions during construction phase will be temporary.	**No pathway for impact.** Access restrictions during construction phase will be temporary.	**Pathway for positive impact.** Reinstatement and restoration of peatland habitat and re-use of peat may contribute to future scientific and/or educational use.	**No pathway for impact.** Not applicable to hydrological considerations.
	e) carbon sequestration and storage	**Temporary loss of blanket bog habitat and peatland.** Excavated peat to be reinstated in-situ. Impacts will be localised to the project footprint.	**Temporary loss of blanket bog habitat and peatland.** Excavated peat to be reinstated in-situ. Impacts will be localised to the project footprint.	**Temporary impact to blanket bog habitat and peatland.** Impacts will be temporary and localised to the project footprint.	**Permanent loss of blanket bog habitat and peatland.** Impacts will be permanent and localised to the project footprint.	**Permanent loss of blanket bog habitat and peatland.** Impacts will be permanent and localised to the project footprint.	**Pathway for positive impact.** Reinstatement and restoration of peatland habitat and re-use of peat have the potential to enhance active blanket bog carbon sequestration.	**No pathway for impact.** Not applicable to hydrological considerations.
	f) water filtration and the impact on the water quality of associated riverine habitats	**Temporary reduction in filtration and surface water quality.** Impacts will be localised to the project footprint and immediate downstream receptors.	**Temporary reduction in filtration and surface water quality.** Impacts will be localised to the project footprint and immediate downstream receptors.	**Temporary reduction in filtration and surface water quality.** Impacts will be localised to the project footprint and immediate downstream receptors.	**Permanent reduction in filtration and changes to flow paths.** Impacts will be localised to the project footprint and immediate downstream receptors.	**Permanent reduction in filtration and changes to flow paths.** Impacts will be localised to the project footprint and immediate downstream receptors.	**No pathway for impact.** Not applicable to hydrological considerations.	**Impacts to surface water quality.** Impacts to water quality will be temporary and localised to the project footprint and riverine habitats in immediate hydrological connectivity to the Proposed Development.

e.g., formation of access track / installation of turbine foundations / installation of new drainage system

Element of proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent / continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
Construction of temporary access tracks	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Temporary loss of blanket bog habitat (33.47 ha)** to facilitate construction of temporary tracks, resulting in a highly localised reduction in accumulation of blanket bog in small areas **(0.018% of WHS area)**. **Localised temporary disruption of surface water flows and water quality** which support the blanket bog habitats. With embedded mitigation in place water quantity and quality will be maintained such that habitats are not impacted. **Excavation of Peat Soils** (79,000 m3) to facilitate for the construction of temporary access tracks. **Increased potential for peat slides** where potential slide material could result in a wider loss of blanket bog habitat depending on the pathway of the slide. Slides are planned to be mitigated for to reduce the likelihood of a peat slide occurring (**Volume 5, Appendix 11.1: PLHRA**).	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** **Peat will be excavated** to facilitate construction of temporary tracks and replaced once road removed. Excavations will be of limited depth and scope. Impacts to blanket bog habitat will be temporary and highly localised on a small scale **(33.47 ha of blanket bog or 0.018% of WHS area)**, and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.	Once	Short-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	e) carbon sequestration and storage	**Temporary loss of blanket bog habitat (33.47 ha) and peatland (37.54 ha)** where applicable, to facilitate construction of temporary tracks. Impacts will be temporary and highly localised on a small scale **(0.018% (blanket bog) and 0.02% (peatland) of WHS area)** unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Potential temporary reduction in peat carbon storage and peat carbon flux** during the construction phase of the temporary access tracks due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its ability to sequester carbon.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised temporary disruption of filtration** into the areas covered by the tracks, alterations to wider flowpaths into riverine habitats, and water quality impacts through sedimentation and chemical pollution. With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
Construction of temporary tower working areas / compounds	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Temporary loss of blanket bog habitat (13.67 ha)** to facilitate construction of temporary tower working areas. Impacts will result in a highly localised reduction in accumulation of blanket bog in small areas (0.0073% of WHS area). Once concrete cast and set, excavation would be backfilled using original material where possible. **Localised temporary disruption of surface water flows and water quality** which support the blanket bog habitats. With embedded mitigation in place water quantity and quality will be maintained such that habitats are not impacted. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation.	Once (per tower location, 23 suspension and 2 tension towers)	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** **Topsoil and peat (where present) will be excavated**, to facilitate construction of temporary tower working areas, and replaced once temporary working areas removed. Excavations will be of limited depth and scope. Impacts to blanket bog habitat will be temporary and highly localised on a small scale **(13.67 ha of blanket bog or 0.0073% of WHS area),** and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.	Once (per tower location, 25 towers)	Short-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	e) carbon sequestration and storage	**Temporary loss of blanket bog habitat (13.67 ha) and peatland (15.91 ha)** to facilitate construction of temporary tower working areas. Impacts will be temporary and highly localised on a small scale **(0.0073% (blanket bog) and 0.009% (peatland) of WHS area)**, unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Topsoil and peat (where present) will be excavated**, to facilitate temporary tower working areas, and replaced once temporary working areas removed. Excavations will be of limited depth and scope. It is anticipated that peat will be reinstated following completion of works, and thus carbon sequestration and storage will continue post-construction. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Potential temporary reduction in peat carbon storage and peat carbon flux** during the construction phase of the temporary tower working areas / compounds due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its ability to sequester carbon.	Once (per tower location, 25 towers)	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised temporary disruption of filtration** into the areas covered by the tracks, alterations to wider flowpaths into riverine habitats, and water quality impacts through sedimentation and chemical pollution. With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact -negative
Construction of temporary working area for Equi-Potential Zones (EPZ) pulling positions	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Temporary impact to blanket bog habitat (0.48 ha)** to facilitate two EPZ pulling positions per tower, resulting in a highly localised reduction in accumulation of blanket bog in small areas **(0.00026% of WHS area).** **Localised temporary disruption of surface water flows and water quality** which support the blanket bog habitats. With embedded mitigation in place water quantity and quality will be maintained such that habitats are not impacted. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon.	Once (two towers, N24, N133)	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
	e) carbon sequestration and storage	**Temporary impact to blanket bog habitat (0.48 ha) and peatland (0.48 ha)** to facilitate two EPZ pulling positions per tower. Impacts will be temporary and highly localised on a small scale **(0.00026% (blanket bog) and 0.00026% (peatland) of WHS area)**, unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Potential temporary reduction in peat carbon storage and peat carbon flux** during the construction phase of the temporary working areas for EPZ pulling positions due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its ability to sequester carbon.	Once (two towers, N24, N133)	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised temporary disruption of filtration** into the areas covered by the tracks, alterations to wider flowpaths into riverine habitats, and water quality impacts through sedimentation and chemical pollution. With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative

Element of proposed action	Attribute	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Reversibility of change to the attribute	Longevity of change to the attribute	Degree of change to the attribute	Quality of change to the attribute	Evaluation of Impact
			Once / intermittent / continuous	Short-term / long-term	Reversible / irreversible	Reversible / irreversible	Temporary / permanent change	None / negligible / some / large change	Positive / negative change	Neutral / minor / moderate / major impact (negative or positive)
Construction of permanent access tracks	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Permanent loss of blanket bog habitat (11.58 ha)** to facilitate construction of permanent tracks, resulting in a highly localised reduction in accumulation of blanket bog in small areas **(0.018% of WHS area).** **Localised alteration of surface water flowpaths which support the blanket bog habitats.** With embedded mitigation in place including SuDS, the water quantity and quality to habitats will be maintained such that they are not impacted. **Excavation of Peat Soils** (23,940 m3) to facilitate for the construction of permanent access tracks. **Increased potential for peat slides** where potential slide material could result in a wider loss of blanket bog habitat depending on the pathway of the slide. Slides are planned to be mitigated for to reduce the likelihood of a peat slide occurring **(Volume 5, Appendix 11.1: PLHRA**).	Once	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** **Peat will be excavated**, to facilitate construction of permanent tracks. Excavations will be of limited depth and scope. Impacts to blanket bog habitat will be limited to the construction phase, will be highly localised on a small scale **(11.58 ha blanket bog or 0.018% of WHS area)**, and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.	Once	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	e) carbon sequestration and storage	**Permanent localised loss of blanket bog habitat (11.58 ha) and peatland (12.6 ha)** and thus carbon sequestration and storage, to facilitate construction of permanent tracks. Impacts will be temporary and highly localised on a small scale **(0.018% (blanket bog) and 0.007% (peatland) of WHS area)**, unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Permanent reduction in peat carbon storage and peat carbon flux** during the construction phase of the permanent access tracks due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its ability to sequester carbon.	Once	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised alteration of filtration and flow to habitats.** With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
Construction of permanent tower footing	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Permanent loss of blanket bog habitat (1.65 ha)** to facilitate construction of permanent tower footing. Impacts will result in a highly localised reduction in accumulation of blanket bog in small areas **(0.00088% of WHS area)**. **Localised alteration of surface water flowpaths which support the blanket bog habitats.** With embedded mitigation in place including SuDS, the water quantity and quality to habitats will be maintained such that they are not impacted. **Excavation of Peat Soils** (5,966 m3) to facilitate for the construction of permanent tower footings. **Increased potential for peat slides** where potential slide material could result in a wider loss of blanket bog habitat depending on the pathway of the slide. Slides are planned to be mitigated for to reduce the likelihood of a peat slide occurring (**Volume 5, Appendix 11.1: PLHRA**).	Once (4 footings per tower, 25 towers located in WHS; 100 footings total)	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** **Peat will be excavated**, to facilitate construction of permanent tower footing, and replaced once temporary working areas removed, or relocated locally as needed. Excavations will be of limited depth and scope. Impacts to blanket bog habitat will be limited to the construction phase, will be highly localised on a small scale **(1.65 ha of blanket bog or 0.00088% of WHS area)**, and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.	Once (4 footings per tower, 25 towers located in WHS; 100 footings total)	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	e) carbon sequestration and storage	**Permanent loss of blanket bog habitat (1.65 ha) and peatland (2 ha)** and thus carbon sequestration and storage, to facilitate construction of permanent tower footing. Excavated peat to be reinstated elsewhere. Impacts will be temporary and highly localised on a small scale **(0.00088% (blanket bog) and 0.001% (peatland) of WHS area)**, unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Permanent reduction in peat carbon storage and peat carbon flux** during the construction phase of the permanent tower footings due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its ability to sequester carbon.	Once (4 footings per tower, 25 towers located in WHS; 100 footings total)	Long-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised alteration of filtration and flow to habitats.** With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
Re-use of excavated peat for peatland reinstatement	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Pathway for positive impact.** Excavated and temporarily stored peat will first be utilised on-site for construction and reinstatement purposes in the first instance, including: - Restoring hardstanding areas, borrow pits, road verges, or degraded peatland; or - For off-site peatland restoration efforts, only where it is suitable for the identified and required use. Any peat, including volumes of peat excavated and turfs of active peat forming vegetation removed as part of the construction activities, will be reused on site where possible. This peat and turf will be used to restore areas of degraded peat identified during baseline surveys within the Flow Country WHS, as part of SSEN's embedded mitigation measures. Peat reuse and restoration of degraded peat will be undertaken as part of construction reinstatement to enhance existing habitats. Reinstated peatland habitat would restore actively accumulating blanket bog ecosystems. Reuse of 34,673 m3 of peat for dressing off permanent infrastructure. Additional 85,123 m3 of surplus peat available to support restoration activities.	Once	Long-term	Irreversible	Irreversible	Permanent	Some	Positive	Minor impact - positive
	e) carbon sequestration and storage	**Pathway for positive impact.** Excavated and temporarily stored peat will first be utilised on-site for construction and reinstatement purposes in the first instance, including: - Restoring hardstanding areas, borrow pits, road verges, or degraded peatland; or - For off-site peatland restoration efforts, only where it is suitable for the identified and required use. Any peat, including volumes of peat excavated and turfs of active peat forming vegetation removed as part of the construction activities, will be reused on site where possible. This peat and turf will be used to restore areas of degraded peat identified during baseline surveys within the Flow Country WHS, as part of SSEN's embedded mitigation measures. Peat reuse and restoration of degraded peat will be undertaken as part of construction reinstatement to enhance existing habitats. Restored peatland habitat would restore actively accumulating blanket bog and thus contribute to carbon sequestration and storage. The reinstatement of the excavated peat would potentially mitigate the impacts to peat carbon storage and peat carbon flux caused by the infrastructure of the Proposed Development.	Once	Long-term	Irreversible	Irreversible	Permanent	Some	Positive	Minor impact - positive
Hydrological impacts to 'setting' (all actions outside WHS)	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Localised temporary disruption of surface water flows and water quality which supports the blanket bog habitats.** With embedded mitigation in place water quantity and quality will be maintained such that habitats are not impacted.	Once	Short-term	Reversible	Reversible	Temporary	None	Negative	Neutral impact
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised temporary alteration of water quality alteration of filtration and flow to riverine habitats.** With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	None	Negative	Neutral impact

ANNEX C NATURESCOT WHS TOOLKIT

Proposed action	Attribute	Description of potential impact	Action			Change to the attribute				Impact
			Frequency	Duration	Reversibility	Reversibility	Longevity	Degree of change	Quality of change	
			Once / Intermittent / Continuous	Short-term / Long-term	Reversible / Irreversible	Reversible / Irreversible	Temporary / Permanent	None / Negligible / Some / Large	Positive / Negative	Neutral / Minor / Moderate / Major
Construction of temporary access tracks	**a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally**	**Temporary loss of blanket bog habitat (33.47ha)** to facilitate construction of temporary tracks, resulting in a highly localised reduction in accumulation of blanket bog in small areas **(0.018% of WHS area)**. **Localised temporary disruption of surface water flows and water quality** which support the blanket bog habitats. With embedded mitigation in place water quantity and quality will be maintained such that habitats are not impacted. **Excavation of Peat Soils** (79,000 m3) to facilitate for the construction of temporary access tracks, **Increased potential for peat slides** where potential slide material could result in a wider loss of blanket bog habitat depending on the pathway of the slide. Slides are planned to be mitigated for to reduce the likelihood of a peat slide occurring (**Volume 5, Appendix 11.1: PLHRA**).	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** **Peat will be excavated** to facilitate construction of temporary tracks and replaced once road removed. Excavations will be of limited depth and scope. Impacts to blanket bog habitat will be temporary and highly localised on a small scale **(33.47 ha of blanket bog or 0.018% of WHS area)**, and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.	Once	Short-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative
	e) carbon sequestration and storage	**Temporary loss of blanket bog habitat (33.47ha) and peatland (37.54)** where applicable, to facilitate construction of temporary tracks. Impacts will be temporary and highly localised on a small scale **(0.018% (habitat) and 0.02% (peatland) of WHS area)** unlikely to reduce carbon sequestration and storage potential of the peatlands, and will not impact the surrounding peat in the long term. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation and its ability to sequester and store carbon. **Potential temporary reduction in peat carbon storage and peat carbon flux** during the construction phase of the temporary access tracks due to the excavation and disturbance of peat. All activities requiring excavation and disturbance of peat have the potential to reduce the peat carbon storage potential of the peatland and its	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
	f) water filtration and the impact on the water quality of associated riverine habitats	**Localised temporary disruption of filtration** into the areas covered by the tracks, alterations to wider flowpaths into riverine habitats, and water quality impacts through sedimentation and chemical pollution. With embedded mitigation in place water quality and filtration to surrounding habitats will not be impacted.	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
	a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	**Temporary loss of blanket bog habitat (13.67 ha)** to facilitate construction of temporary tower working areas. Impacts will result in a highly localised reduction in accumulation of blanket bog in small areas (0.0073% of WHS area). Once concrete cast and set, excavation would be backfilled using original material where possible. **Localised temporary disruption of surface water flows and water quality** which support the blanket bog habitats. With embedded mitigation in place water quantity and quality will be maintained such that habitats are not impacted. **Potential disturbance of deep peat, degradation, removal or loss of soils** during the construction phase of temporary access tracks. All activity requiring removal, transport and stockpiling of soils may cause erosion of soils and loss of structure, resulting in overall soil degradation.	Once (per tower location, 23 suspension and 2 tension towers)	Short-term	Reversible	Reversible	Temporary	Negligible	Negative	Minor impact - negative
	c) archive it stores (4th dimension)	**Localised permanent impact to the stored archive (under project footprint).** **Topsoil and peat (where present) will be excavated**, to facilitate construction of temporary tower working areas, and replaced once temporary working areas removed. Excavations will be of limited depth and scope. Impacts to blanket bog habitat will be temporary and highly localised on a small scale **(13.71 ha of blanket bog or 0.0073% of WHS area),** and would not impact the broader stored record of peatland development across the extent of the Flow Country WHS.	Once (per tower location, 25 towers)	Short-term	Irreversible	Irreversible	Permanent	Negligible	Negative	Minor impact - negative