VOLUME 4: APPENDIX V1-7.7: FLOW COUNTRY WORLD HERITAGE SITE ASSESSMENT

VOLUME 4: APPENDIX V1-7.7: FLOW COUNTRY WORLD HERITAGE SITE ASSESSMENT

794-ENV-ECO-2045
Final
04 February 2025

rpsgroup.com

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
Final	Appendix	Jo Atkinson Lisette Coiffait	Stephen Lockwood	Stephen Lockwood	04.02.25

Approval for issue

Stephen Lockwood	[redacted]	4 February 2025

Prepared for:

ASH design+assessment Ltd

Louise Smith
Associate

[redacted]

T [redacted]
E

Contents

1 INTRODUCTION

1.1 Purpose of Document

This Appendix has been prepared to present the results of an impact assessment of the Proposed Development with the Proposed Alignment on the Flow Country World Heritage Site (WHS), which was inscribed as a WHS by UNESCO in July 2024. The approach taken to the assessment is in accordance with The Highland Council's Flow Country Candidate World Heritage Site Impact Assessment Toolkit[1] as published on The Highland Council's website[2].

The Proposed Development with the Proposed Alignment would comprise approximately 10.5 km of 132 kV double circuit overhead line (OHL) supported by steel lattice towers from Strathy North 'T' (near Dallangwell) to a new cable sealing end (CSE) compound, prior to connecting into Connagill 275/132 kV substation via two short sections of single circuit 132 kV underground cable (UGC). To allow for futureproofing, it is proposed that a section of the Proposed Alignment would be capable of operating at 275 kV in the future, if required.

Once the Proposed Alignment is constructed and commissioned, redundant parts of the existing Strathy North 132 kV trident 'H' wood pole OHL would be dismantled and removed.

A WHS assessment for the Alternative Alignment is provided in **Annex D** to this document, although the overall conclusion of the assessment remains the same as that for the Proposed Alignment.

The baseline conditions for the WHS and the assessment of potential construction and operational impacts are not described in detail in this document as detailed information is provided in the relevant chapters of the EIA Report, which this document forms an Appendix to. This document should therefore be read in conjunction with, and is supported by, the following technical reports and assessments, which are signposted as necessary throughout this Appendix:

- **Volume 1: Chapter 3: The Proposed Development** – which sets out a description of the construction and operational activities.
- **Volume 1: Chapter 7: Ecology** and relevant Appendices (in **Volume 4**):
    - Appendix V1-7.2: Ecological Impact Assessment Methodology
    - Appendix V1-7.3: Habitat Technical Report
    - Appendix V7.4: Protected Species Technical Report [Confidential]
    - Appendix V1-7.5: Bat Technical Report
    - Appendix V1-7.6: Shadow Habitats Regulations Assessment for the Caithness and Sutherland Peatlands SAC / Ramsar (Non-avian features)
    - Appendix V1-7.8 Connagill Cluster Outline Habitat Management Plan (HMP)
- **Volume 1: Chapter 8: Ornithology** and relevant Appendices (in **Volume 4**):
    - Appendix V1-8.1: Ornithology Technical Report
    - Appendix V1-8.2: Ornithology Confidential Annex [Confidential]

[1] It is noted that the Flow Country WHS has been formally inscribed as a WHS since the toolkit was published, and therefore is no longer a 'candidate' WHS. However, the toolkit has yet to be updated and therefore the 'candidate' WHS toolkit remains applicable until such time an updated version is published by The Highland Council.

[2] The Highland Council WHS Toolkit accessed online: https://www.highland.gov.uk/downloads/file/28012/flow_country_candidate_world_heritage_site_impact_assessment_toolkit

- Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential]

The Flow Country WHS nomination was submitted to the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in February 2023 and the site was formally inscribed as a WHS by UNESCO in July 2024. Subsequent to the WHS nomination, The Highland Council adopted a Planning Position Statement (PPS) for the WHS in April 2023 which states that:

"*Any planning application/application for consent under s36/s37 of the Electricity Act with the potential to effect* [sic] *the Site and its* [Outstanding Universal Value] *OUV being determined from the date of this planning position statement until the date of inscription or rejection will be considered in terms of its potential impact on the attributes of the Site and its integrity, and because the Site is now a candidate World Heritage Site, also in the context of Policy 7l in NPF4. Given the full support expressed from all tiers of government for the Site's World Heritage nomination, it is clear that the nomination should not be undermined by proposed development*."

This Appendix therefore aims to signpost the reader to the relevant sections of the EIA Report that have been used to inform an assessment of the potential impact of the Proposed Alignment on the Outstanding Universal Value (OUV) attributes of the WHS and its integrity, as well as to provide sufficient information to support the assessment using The Highland Council's Flow Country Candidate World Heritage Site Impact Assessment Toolkit.

1.2 Background

The Flow Country WHS straddles Caithness and Sutherland and supports one of the largest areas of blanket bog in the world; a globally rare habitat that is recognised for its international nature conservation importance through its overlapping designations as the Caithness and Sutherland Peatlands Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar. The extensive areas of peatland, bogs and lochs support a diverse ecosystem of invertebrates, mammals and breeding and wintering birds.

The following WHS criteria are considered by UNESCO to be met by the Flow Country WHS in recognition of their OUV, as set out in the Flow Country World Heritage Site Planning Position Statement[3]:

- Criterion (ix) – The Flow Country is the most extensive and diverse example of an actively accumulating blanket bog landscape found globally.
- Criterion (x) – The Flow Country contains an exceptional example of the biodiversity found within a blanket bog landscape. The geographical position of the Flow Country and the diversity of habitats result in biological associates unlike any other found globally. Furthermore, the scale and connectivity of the property afford resilience to the ecosystem and the species it contains.

Further details on the features and attributes of the Flow Country WHS and the criteria for their OUVs is provided in **Annex A** of this document.

[3] Available on The Highland Council Website: https://www.highland.gov.uk/downloads/file/27007/flow_country_candidate_world_heritage_site_planning_position_statement_-_may_2023

2 IMPACT ASSESSMENT

2.1 Method

The approach to impact assessment on the OUV attributes of the WHS is the same as that undertaken in the Ecological Impact Assessment (EcIA) presented in **Volume 1: Chapter 7 - Ecology** and **Volume 1: Chapter 8 - Ornithology** and was undertaken in accordance with standard CIEEM methodology (CIEEM, 2024).

Further details on the EcIA methodology are presented in **Volume 4: Appendix V1-7.2** (Ecological Impact Assessment Method) for terrestrial ecology features, and **Volume 1: Chapter 8; Section 8.7** (Methodology) for ornithology features.

This document presents a summary of the impact assessment undertaken with reference to the requirements for assessment of impacts on the WHS OUVs in The Highland Council's Flow Country Candidate World Heritage Site Impact Assessment Toolkit. The toolkit has been published by The Highland Council as a modified version of the guidance and toolkit for Impact Assessments in a World Heritage Context Resource Manual (UNESCO and Advisory Bodies to the World Heritage Committee, 2022). The UNESCO guidance has been designed to assist the decision-making process for development proposals that have the potential to damage the OUVs of a WHS and "…*aims to highlight that impact assessments can help to identify better projects that yield more benefits in the long term, satisfying both conservation and development needs*".

The following tables included in the Flow Country WHS Impact Assessment Toolkit have been completed and have assisted with the impact assessment presented in **Table 1**:

- Identifying Potential Risks – **Table B1** in **Annex B**; and
- Description and Evaluation Tool – **Table C1** in **Annex C**.

2.2 Embedded Mitigation

Embedded mitigation is described in detail in **Volume 1: Chapter 7; Section 7.9** (Embedded Mitigation / Mitigation by Design) for terrestrial ecology features and **Volume 1: Chapter 8; Section 8.9** (Mitigation by Design and Embedded Mitigation) for ornithology features.

The routeing process for the Proposed Alignment has taken into consideration the potential for significant effects on ecological features, and for such effects to be avoided or minimised where possible (see **Volume 1: Chapter 2 - The Routeing Process and Alternatives**). This has continued through the EIA process, with survey data informing the siting of infrastructure and access routes to further minimise effects on habitats and species where practicable, following the mitigation hierarchy as described in CIEEM guidance (CIEEM, 2018).

An Outline Construction Environmental Management Plan (CEMP) is provided as **Volume 4: Appendix V1-3.8** and sets out the structure for the final CEMP that will confirm best practice pollution control measures, storage of materials, waste management and other standard construction requirements for the construction phase. An Ecological Management Plan (EMP) will be included as part of the CEMP, which will include relevant information on habitats and protected species local to the Proposed Development, requirements for pre-construction surveys and toolbox talks (TBTs), reference to relevant species protection plans (SPPs) and information on licencing requirements and procedures (as necessary), and best practice pollution control measures with reference to Guidance for Pollution Prevention (GPPs).

An Outline Habitat Management Plan (HMP) for the Proposed Development is provided as **Volume 4: Appendix V1-7.8: Connagill Cluster Outline HMP**, which sets out habitat enhancements in the wider local area to mitigate construction and operational habitat losses within the Caithness and Sutherland Peatlands SAC / SPA / Ramsar and West Halladale Site of Special Scientific Interest (SSSI), as well as the wider peatland habitats. The Proposed Development forms part of a wider connection strategy for renewable generation in the area referred to as the Connagill Cluster Grid Connections. The developments that make

up the Connagill Cluster Grid Connections include the consented Strathy South Wind Farm, the consented Strathy Wood Wind Farm, the proposed Melvich Wind Energy Hub[4] and the proposed Kirkton Energy Park. To facilitate the Connagill Cluster Grid Connections, a new switching station, known as Strathy Switching Station, would also be required. To address the potential for adverse effects on the Caithness and Sutherland Peatlands SAC / Ramsar and its component SSSIs as a result of cumulative habitat loss / damage, an overarching Outline HMP for the Connagill Cluster Grid Connections is being prepared in consultation with NatureScot (see **Volume 4: Appendix V1-7.8**).

2.3 Summary of Impact Assessment

Each of the attributes for Criteria (ix) and (x) have been assessed and signposting to the relevant EIA Report Chapters (within **Volume 1**) and Appendices (within **Volume 4**), where baseline ecological data and impact assessment to support the conclusions, is provided where necessary in **Table 1**. The boundaries of the Caithness and Sutherland Peatlands SAC / SPA / Ramsar and West Halladale SSSI are not entirely contiguous with the Flow Country WHS boundary because the WHS boundary as a whole is larger. However, the assessment of impacts and effects presented in the EIA Report and shadow Habitat Regulations Appraisals (SHRAs) (see **Volume 4: Appendix V1-7.6** and **Appendix V1-8.3**) is considered similarly appliable to the WHS assessment because it covers the same habitats and species in the same area relevant to the Proposed Alignment.

The EcIA presented in **Volume 1: Chapter 7: Ecology** and **Volume 1: Chapter 8: Ornithology** of the EIA Report has concluded that the Proposed Alignment would result in no significant residual effects on habitats or protected species, including qualifying species and habitats of the Caithness and Sutherland SAC / SPA / Ramsar and West Halladale SSSI, which are also attributes of the Flow Country WHS. This assessment is applicable to WHS Criterion (ix) attributes (a) and (f) and Criterion (x) attributes (a) (i) and (a) (ii).

SHRAs undertaken for the terrestrial (see **Volume 4: Appendix V1-7.6**) and ornithological (see **Volume 4: Appendix V1-8.3**) qualifying features of the Caithness and Sutherland SAC / SPA / Ramsar has concluded that there will be no adverse effects on the integrity of the designated sites, which is within and overlapping with the Flow Country WHS boundary. This assessment is applicable to WHS Criterion (ix) attributes (a) and (f) and Criterion (x) attributes (a) (i) and (a) (ii).

Where specific assessment of attributes within the Flow Country WHS has not been undertaken as part of the EcIA (for WHS Criterion (ix) attributes (b), (c), (d) and (e) and Criterion (x) attribute (a) (iii)), the additional assessment undertaken and presented in **Table 1** has concluded there would be no effects on them as a result of the construction or operation of the Proposed Alignment.

[4] For the purposes of this assessment it is assumed that the Melvich Wind Energy Hub (and its grid connection) would not be constructed with the Proposed Alignment, and that the two projects are therefore mutually exclusive.

Table 1: Summary of WHS Assessment and Signposting to the EIA Report

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
Criterion (ix) outstanding example representing significant ongoing 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.	The Proposed Alignment would result in very minor losses of these habitats relative to that within the whole Flow Country WHS, which covers c. 200,000 ha. Total direct and indirect losses of blanket bog habitat are calculated at 25.8 ha, which represents 0.013% of the total area of land within the WHS. The EcIA concluded that the Proposed Alignment would result in a minor adverse effect (not significant) on the important peatland habitats, including those within the Caithness and Sutherland Peatlands SAC / Ramsar and West Halladale SSSI (which are also within the WHS boundary). The SHRA for the Proposed Alignment concluded that there would be no adverse effects on the integrity of the Caithness and Sutherland Peatlands SAC / Ramsar, as a result of direct and indirect impacts on blanket bog (an Annex I habitat of international importance and primary reason for the selection of the site as an SAC). This assessment is similarly applicable to the assessment of impacts on the blanket bog ecosystem OUV.	Assessment of Likely Significant Effects (see **Volume 1: Chapter 7: Ecology, Section 7.10**) SHRA for Caithness and Sutherland Peatlands SAC / Ramsar (see **Volume 4: Appendix V1-7.6)**	Minor adverse effect (not significant)
b) climatic, topographic gradients and geological diversity: bog	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	There are no pathways by which the Proposed Alignment could affect the climatic, topographic gradients or geological diversity that support bog macroform diversity.	N/A	No effect

[5] As set out in the Flow Country WHS Assessment toolkit on the Highland Council website: https://www.highland.gov.uk/downloads/file/28012/flow_country_candidate_world_heritage_site_impact_assessment_toolkit

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
macroform diversity	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 providing a 4th dimension to The Flow Country blanket bog. The processes 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 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).	There are no pathways by which the Proposed Alignment could affect the historic archive stored in the peat; any excavations for the foundations of the towers, and the new (permanent and temporary) access tracks, Cable Sealing End (CSE) compound or underground cable (UGC) would be of minimal depth and affect only a very small proportion of the habitats present.	N/A	No effect

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
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.	There are no pathways by which the Proposed Alignment could affect the ongoing scientific and educational use of the WHS.	N/A	No effect
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 meters.	Given the minimal permanent impact of the Proposed Alignment on blanket bog (25.80 ha), it is reasonable to assume that there would be no impacts on the ability of the Flow Country to continue to sequestrate and store carbon.	N/A	No effect

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
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.	All tower locations have been designed to accommodate a 20 m offset from the nearest watercourse, and although construction works may be undertaken in closer proximity, a minimum buffer of 10 m to watercourses would be implemented during the construction phase. Therefore, there would be no construction works within 10 m of the River Strathy or Halladale River or their tributaries, and there is no potential for impacts on any riparian or aquatic habitats; all aquatic freshwater habitats and species (including European eel, Atlantic salmon and freshwater pearl mussel) were consequently scoped out of the impact assessment. There is embedded mitigation as part of the CEMP to ensure there is no potential for accidental pollution to the River Strathy (or any other watercourse) during the construction phase.	See **Volume 1: Chapter 3: The Proposed Development** See **Volume 1: Chapter 7: Ecology**; Section 7.3: Scope of Assessment) See **Volume 4: Appendix V1-3.8:** Outline CEMP	No effect
Criterion (x) contains the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation				
a) species associations	The diverse range of habitats that The Flow Country contains supports an exceptional and specialised blanket bog biodiversity, and holds biological associations unlike any other blanket bog found globally. This is a consequence of the overlapping distributions of species typical of both arctic and temperate climatic zones, and is further influenced by altitudinal and climatic gradients and geological diversity found across the nominated property. Furthermore, the scale and connectivity of the nominated property	The international importance of the habitats for birds is recognised in its designation as an SPA and Ramsar, and the results of the EcIA (see **Volume 1: Chapter 8: Ornithology**) and SHRA (see **Volume 4: Appendix V1-8.3**) are summarised against the identified ornithology features in (a) (i). The international importance of the habitats is recognised in its designation as an SAC and Ramsar, and the results of the EcIA (see **Volume 1: Chapter 7: Ecology**) and SHRA (see **Volume 4: Appendix V1-7.6**) are summarised against the identified habitat features in (a) (ii).		

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
	provides resilience to species it contains.			
a) i. birds	The diversity of environments within the blanket bog of The Flow Country, and the patchwork of connected landscape elements within the wider setting (farmland, coastal, etc.), supports a distinctively special assemblage of breeding birds. The precise combination of species, with arctic-alpine and temperate and continental elements is not found anywhere else in the world and includes; red-throated diver, black-throated diver, common scoter, wigeon, golden plover, greenshank, dunlin, wood sandpiper, golden eagle, merlin, hen harrier and short-eared owl.	The international importance of the habitats for birds is recognised in its designation as an SPA and Ramsar, and all of the bird species listed in the OUV are designated features of the SPA / Ramsar site. Potential effects on each of the individual species listed in the OUV are summarised below.		
		<u>Common scoter</u> There were no observations of common scoter during field surveys and no records of breeding birds within potential disturbance distance of the Proposed Alignment were identified during the desk study. However, there were several desk study records of non-breeding birds and it is possible that common scoter could breed in the vicinity of the Proposed Alignment in future, although the extent of suitable habitat within potential disturbance distance is limited. Following implementation of the Bird Protection Plan (BPP), which includes measures to protect breeding species listed on Schedule 1 to the Wildlife and Countryside Act 1981 (as amended) (W&CA) and/or Annex I of the Birds Directive, potential effects on breeding common scoter, from disturbance due to construction and operation of the Proposed Alignment were assessed as being of negligible to low magnitude. No common scoter flights were recorded during field surveys or identified during the desk study. As there is no direct evidence that breeding common scoter make foraging trips to the coast and the potential for birds to migrate across the Proposed Alignment at potential collision height was considered to be low, effects on the breeding common scoter population due to collisions during operation of the Proposed Alignment were assessed as being of negligible to low magnitude.	Desk and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** and **Appendix V1-8.2: Sections 2.1** and **2.2.** Assessment of construction and operational effects: see **Volume 1: Chapter 8**; **Section 8.10** and **Appendix V1-8.2: Section 3.1.** Habitats Regulations Appraisal: see **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential]**	Negligible to low magnitude effects (not significant)

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
		The potential for barrier effects on the breeding common scoter population, for the reasons described above, were therefore assessed as being of negligible magnitude.		
		<u>Golden plover</u> A small number of breeding territories were recorded in the survey area, one of which was within Limits of Deviation (LoD). Given the limited extent of habitat loss, relatively large core foraging range of this species (3 km; NatureScot, 2016) and the presence of extensive suitable undisturbed habitat in the wider local area, effects on this species were assessed as being of low magnitude. The risk of mortality resulting from collisions with the OHL when the Proposed Alignment is operational was assessed as low for this species, because levels of flight activity were very low and no regular commuting routes across the Proposed Alignment were identified.	Desk and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1** and **3.2.** Assessment of construction and operational effects: see **Volume 1: Chapter 8**; **Section 8.10** Habitats Regulations Appraisal: see **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential]**	Low magnitude effects (not significant)
		<u>Red-throated diver and black-throated diver</u> No breeding territories were identified within the OHL LoD, and there is no suitable nesting or foraging habitat for these species within the OHL LoD. Therefore, there is not considered to be any potential for effects on diver species due to habitat loss. Additionally, as embedded mitigation includes measures to prevent pollution of waterbodies, there is not considered to be any potential for indirect effects on diver breeding or foraging habitat. However, there are breeding territories of both species within potential disturbance distance of the Proposed Alignment. Implementation of the BPP, which includes measures to protect breeding species listed on Schedule 1 to the Wildlife	Desk and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** and **Appendix V1-8.2: Sections 2.1 and 2.2.** Assessment of construction and operational effects: see **Volume 1: Chapter 8; Section 8.10** and **Appendix V1-8.2: Section 3.1.** Habitats Regulations Appraisal: see **Volume 4: Appendix V1-8.3: Shadow**	Negligible to low magnitude effects following implementation of targeted mitigation (not significant)

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
		and Countryside Act 1981 (as amended) (W&CA) and/or Annex I of the Birds Directive, will reduce potential effects on breeding divers due to noise and visual disturbance during construction of the Proposed Alignment as well as any major operational works. Targeted mitigation, namely installation of artificial nest rafts, will provide alternative nest sites for any birds that are temporarily displaced. Following implementation of the BPP and targeted mitigation, effects on breeding red-throated and black-throated diver populations due to disturbance/displacement during construction and operation of the Proposed Alignment were assessed as being of low magnitude. Regularly used flight routes used by red-throated diver to commute between breeding lochs and foraging areas at sea were identified crossing the Proposed Alignment. In contrast, levels of black-throated diver flight activity were low and no regular commuting routes were identified. Following implementation of targeted mitigation, namely installation of line markers on the OHL to allow divers to detect it more easily and adjust their flight altitude to avoid it, the risk of mortality resulting from collisions with the OHL when the Proposed Alignment is operational was assessed as being low for both species. The potential for barrier effects to red-throated and black-throated divers were assessed as being of negligible magnitude.	**Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential].**	
		<u>Golden eagle</u> Although two golden eagle breeding territories were identified during the desk study, these were over 6 km from the Proposed Alignment. Therefore, there was not considered to	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** and **Appendix V1-8.2: Sections 2.1 and 2.2.X**	Negligible to low magnitude effects (not significant)

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
		be any potential for disturbance of breeding birds due to construction or operation of the Proposed Alignment. The risk of mortality resulting from collisions with the OHL when the Proposed Alignment is operational was assessed as low for this species, because levels of flight activity were low and no regular commuting routes across the Proposed Alignment or areas of concentrated flight activity were identified. The potential for significant effects on golden eagle due to electrocution was scoped out as the risk is considered to be negligible due to the design of the Proposed Alignment.	Assessment of construction and operational effects: see **Volume 1: Chapter 8; Section 8.10**. Habitats Regulations Appraisal: see **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential]**	
		<u>Hen harrier</u> Two breeding territories were identified within 2 km of the Proposed Alignment, both of which were outwith the LoD of the Proposed Alignment but within potential disturbance distance. It is possible that birds could be temporarily displaced from one or both of these territories during construction, although one of the territories was considered to have been abandoned following a wildfire in the area in 2019 and the habitat is unlikely to be suitable for several years until the heather has recovered. The other territory is within potential disturbance distance of the ancillary infrastructure associated with the Proposed Alignment, but not the OHL, which us approximately 1 km away. and The potential for operational disturbance is considered to be low as works will typically be infrequent, temporary and of limited extent both spatially and temporally, and hen harriers are known to breed in relatively close proximity to artificial structures such as wind turbines and OHLs. The potential for disturbance / displacement of breeding hen harrier during construction (and any major operational works) would be minimised through	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** and **Appendix V1-8.2: Sections 2.1 and 2.2.** Assessment of construction and operational effects: see **Volume 1: Chapter 8; Section 8.10** and **Appendix V1-8.2: Section 3.1.** Habitats Regulations Appraisal: see **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential]**	Low magnitude effects (not significant)

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
		implementation of the BPP and it is considered that any birds temporarily displaced during construction of the Proposed Alignment could breed in suitable habitat in the wider area rather than being lost from the population. Potential effects on this species due to disturbance/displacement during construction and operation of the Proposed Alignment were therefore assessed as being of low magnitude and not significant. Although regular flight activity by hen harriers was recorded within and around the Proposed Alignment, hen harriers typically hunt at very low elevations, which would be below potential collision risk height. Although birds could be more susceptible to collision when displaying during the breeding season, the majority of breeding activity was several hundred metres from the Proposed Development and collision risk was assessed as being of low magnitude.		
		<u>Merlin</u> Three merlin breeding territories were identified within 2 km of the Proposed Alignment. Neither was within the OHL LoD, but as two were within potential disturbance distance from the Proposed Alignment, it is possible that, as a worst-case scenario, 1-2 pairs could be displaced during construction or operation of the Proposed Alignment. The potential for disturbance / displacement of breeding merlin during construction (and any major operational works) would be minimised through implementation of the BPP and it is considered that any displaced birds could breed in suitable habitat in the wider area rather than being lost from the population and effects on this species due to disturbance/displacement were assessed as being of low magnitude.	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** and **Appendix V1-8.2: Sections 2.1 and 2.2.** Assessment of construction and operational effects: see **Volume 1: Chapter 8; Section 8.10** and **Appendix V1-8.2: Section 3.1** Habitats Regulations Appraisal: see **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal for European**	Negligible to low magnitude effects (not significant)

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
		Low levels of merlin flight activity were recorded and the effects of collision risk on this species were assessed as being of low magnitude.	**Sites of Ornithological Importance [Confidential]**	
		Wigeon, dunlin, wood sandpiper, greenshank and short-eared owl There were no records of wood sandpiper or short-eared owl during the field surveys, and none were identified during the desk study. For the other species (wigeon, dunlin and greenshank), no breeding birds within the maximum species-specific disturbance buffer in NatureScot (2022) guidance were recorded during field surveys or identified during the desk study. Additionally, where flights were recorded, these were infrequent, with no commuting routes across the Proposed Alignment identified for any species. Based on the habitats present and patterns of historical activity, it is considered unlikely that levels of breeding or flight activity around the Proposed Alignment would change to such an extent in the future that there could be significant effects on breeding populations of any of these species.	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** Habitats Regulations Appraisal: see **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential]**	Scoped out of assessment (no/ negligible effects)
a) ii. plants	The floristic composition of The Flow Country blanket bog, and associated wet heath, is not found anywhere else globally, and represents a highly Atlantic influence on plant distribution and development. Key plants of importance are; dwarf birch, alpine bearberry, bogbean, bog hair-grass, water lobelia and bog orchid, marsh saxifrage and 29 species of Sphagnum (over 10% of global Sphagnum flora).	The Proposed Alignment would not adversely affect the floristic composition of the blanket bog and associated wet heath given the very minor impacts on these habitats arising from construction and operation (28.05 ha). None of the key plants listed in the OUV were recorded in the study area.	Assessment of Likely Significant Effects (see **Volume 1: Chapter 7**; **Section 7.10**) See **Volume 4: Appendix V1-7.6: Shadow HRA for Caithness and Sutherland Peatlands SAC/ Ramsar**	Minor adverse effect (not significant)

Attribute[5]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
a) iii. genetic diversity	The Flow Country occupies a position at the western extreme of the Eurasian landmass. As such it is a haven of locally adapted genetic diversity. Many species here are isolated from their continental relatives, which means that local lineages have developed. Whilst small, isolated populations frequently suffer from inbreeding depression, the large size of The Flow Country means that this not a significant issue here. Furthermore, many species operate as metapopulations: groups of smaller populations between which individuals can move. Not only does this mean that genes can flow between populations, it also means that individuals can recolonise sites in the event of short-term localised extinction, as has been demonstrated with newts. Given models that suggest droughts will increase in both frequency and intensity in the north of Scotland, the large number of waterbodies in The Flow Country will greatly reduce the likelihood of population loss. This makes it a valuable refuge for wildlife of many species at both a population and a genetic level.	Given the very minor and localised impacts of the Proposed Alignment in context with the thousands of hectares of the WHS, there is no potential for any effects on the genetic diversity of species. The construction and operation of the Proposed Alignment would not impact the WHS habitats to such an extent that there would be no populations remaining for recolonisation in the event of short-term localised extinctions of species. The Proposed Alignment would not impact any of the waterbodies that provide valuable refuges.	N/A	No effect

2.4 Potential Cumulative Effects

A cumulative impact assessment on habitats and species impacted by the Proposed Alignment with other consented and planned projects in the wider local area has been undertaken and is presented in **Volume 1: Chapter 7; Section 7.12** for terrestrial ecology features and in **Volume 1: Chapter 8; Section 8.13** for ornithology features within Volume 1 of the EIA Report.

The EcIA has concluded that the Proposed Alignment would result in no significant cumulative effects on habitats or protected species, including qualifying species and habitats of the Caithness and Sutherland SAC / SPA / Ramsar and West Halladale SSSI, which are also attributes of the Flow Country WHS. This assessment is applicable to WHS Criterion (ix) attributes (a) and (f) and Criterion (x) attributes (a) (i) and (a) (ii).

A SHRA undertaken for the terrestrial and ornithological qualifying features of the Caithness and Sutherland SAC / Ramsar and SPA has concluded that there would be no adverse effects on the integrity of the designated site in combination with any other projects, which is within and overlapping with the Flow Country WHS boundary. This assessment is applicable to WHS Criterion (ix) attributes (a) and (f) and Criterion (x) attributes (a) (i) and (a) (ii).

The projects scoped into the cumulative assessment (and in-combination SHRA for the Caithness and Sutherland Peatlands SAC / Ramsar and SPA) are all wind farms and associated electrical infrastructure (e.g. substations and grid connections), of the Connagill Cluster Grid Connections (Strathy South, Strathy Wood and Kirkton Energy Hub). The cumulative assessment for ornithology was extended to include proposed and consented (but not yet constructed) wind farms at Bettyhill (Phase 2) and Limekiln due to the mobile nature of bird species. In common with the assessment for the Proposed Alignment alone, there is no potential for adverse cumulative effects with the Proposed Alignment on the following attributes that were not considered in the EcIA:

- Criterion (ix) attribute (b) – climatic and topographic gradients, and geological diversity: bog macroform diversity – the consented and proposed wind farms and associated grid infrastructure would not impact on the climatic and topographic gradients of the blanket bog habitat. There is therefore no potential for cumulative effects on this attribute with the Proposed Alignment.
- Criterion (ix) attribute (c) – archive it stores (4th dimension) – the consented and proposed wind farms and associated electrical infrastructure would not impact on the historic archive of the blanket bog system. There is therefore no potential for cumulative effects on this attribute with the Proposed Alignment.
- Criterion (ix) attribute (d) – natural laboratory, ongoing scientific and educational use – the consented and proposed wind farms and associated electrical infrastructure would not impact the ongoing scientific and educational use of the attribute. There is therefore no potential for cumulative effects on this attribute with the Proposed Alignment.
- Criterion (ix) attribute (e) – carbon sequestration and storage - the consented and proposed wind farms and associated electrical infrastructure would not impact the ability of the peat bog for long-term carbon sequestration and storage, although there may be some releases of carbon in the short-term during construction as peat bog habitat is disturbed, albeit on a very small scale given the magnitude of impact. Cumulative effects on this attribute with the Proposed Alignment are therefore assessed as negligible (not significant).
- Criterion (x) attribute (a) (iii) – species associations; genetic diversity – the consented and proposed wind farms and associated electrical infrastructure would not impact the genetic diversity of the attribute species. There is therefore no potential for cumulative effects on this attribute with the Proposed Alignment.

3 CONCLUSION

The Flow Country WHS straddles Caithness and Sutherland and supports one of the largest areas of blanket bog in the world; a globally rare habitat that is recognised for its international nature conservation importance through its overlapping designations as the Caithness and Sutherland Peatlands SAC, SPA and Ramsar. Much of the ecological impact assessment presented in **Volume 1: Chapter 7 - Ecology** and **Chapter 8 - Ornithology** is therefore applicable to the assessment of potential impacts on the OUV attributes of the Flow Country WHS.

The assessment, which has been undertaken in accordance with guidance in The Highland Council's Flow Country Candidate World Heritage Site Impact Assessment Toolkit, has concluded that there would be no significant adverse effects as a result of the Proposed Alignment on the OUV attributes of the WHS, either alone or in-combination with any other wind farm project or their associated electrical infrastructure in the wider Strathy area..

REFERENCES

CIEEM (2024). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Chartered Institute of Ecology and Environmental Management, Winchester.

NatureScot. (2016). Assessing connectivity with Special Protection Areas (SPAs), version 3.

NatureScot. (2022). Disturbance Distances in selected Scottish Bird Species – NatureScot Guidance.

UNESCO and Advisory Bodies to the World Heritage Committee (2022) *World Heritage Resource Manual: Guidance and Toolkit for Impact Assessments in a World Heritage Context*.

ANNEXES

Annex A

Flow Country Statement of Outstanding Universal Value (SOUV)

The following text has been taken from the World Heritage Statement Draft Statement of Outstanding Universal Value (SOUV) Toolkit.

A.1 Brief Synthesis

"*The Flow Country property is the most outstanding example of a blanket bog ecosystem in the world. With its intricate network of pools, hummocks and ridges, the bog stretches across some c. 190,000 hectares of northern mainland Scotland, with the property boundary comprising seven discrete, but adjacent areas. The underlying peat has been accumulating for the past 9,000 years and the bog displays a remarkable range of features resulting from the climatic, altitudinal, geological and geomorphological gradients found across the region. Alongside the extensive record of peat accumulation that The Flow Country contains, and the store of carbon this represents, the ecological processes that result in peat formation continue to sequester carbon on a very large scale.*

The Flow Country blanket bog also provides a globally significant natural habitat for an internationally important assemblage of specialist biodiversity. The area supports a unique and distinctive assemblage of birds, with a combination of arctic-alpine, temperate and continental species not found anywhere else in the world. This is a result of the site's location and the diversity of blanket bog habitats it contains, combined with the patchwork of connected farming and coastal landscape elements within the wider setting.

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

A.2 Justification of Criteria

A.2.1 Criterion (ix) – The Flow Country is the most extensive and diverse example of an actively accumulating blanket bog landscape found globally.

"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, c. 400,000 hectares, that blankets the landscape, including hills, slopes and hollows, together forming a globally rare and significant peatland ecosystem. Of this, nearly 190,000 hectares is identified as suitable to be included within the property, on the basis of current quality and continuity of habitat.

The Flow Country therefore 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 uninterrupted for 9,000 years, and the diversity of blanket bog features is not found anywhere else on Earth. Moreover, the processes of blanket bog formation provide an outstanding example of carbon sequestration and long-term storage on a massive scale.

The blanket bog also provides an incredible record of its formation, preserved as pollen and plant fossils, and telling a story of its past flora, fauna, climate, palaeoecology and human influence. This is also important for helping us understand the future functioning of this and other blanket bogs globally."

A.2.2 Criterion (x) – The Flow Country contains an exceptional example of the biodiversity found within a blanket bog landscape. The geographical position of The Flow Country and the diversity of habitats result in biological associations unlike any other found globally. Furthermore, the scale and connectivity of the property afford resilience to the ecosystem and the species it contains.

"*The blanket bog of The Flow Country is a globally significant natural habitat for the conservation of biodiversity, not least because of its unique and specialised assemblage of flora and fauna, but also because of the rarity of the ecosystem and the declining condition and extent of comparable ecosystems globally.*

The diverse range of blanket bog features that The Flow Country contains, such as pools and hummocks, support an exceptional and specialised blanket bog biodiversity and holds biological associations unlike any other blanket bog found globally. This diversity is a consequence of the overlapping distributions of species typical of both arctic and temperate climatic zones and is further influenced by altitudinal and climatic gradients, and geological diversity found across the site.

The property includes some species that are rare, scarce or threatened, but it is the distinct assemblage of specialised flora and fauna within a high-quality blanket bog that make The Flow Country so significant, along with its pivotal position at the crossroads of bird flyways and migration routes. Furthermore, the scale and connectivity of the property afford resilience to the ecosystem and the species it contains."

A.3 Statement of Integrity

"*The Flow Country property comprises seven discrete but adjacent areas totalling around 190,000 hectares, which encompass 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 short to medium term.*

The property is of sufficient size to contain all the elements of Outstanding Universal Value (OUV) needed to demonstrate the ecological and biological processes, and the biodiversity that comprise this globally significant ecosystem. These include the blanket bog itself, the wider peatland landscape complex in which it lies and the finer elements, including intricate 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 nominated property are largely defined on the basis of the hydrological elements that comprise the blanket bog, and therefore ensure ecosystem integrity and coherence.

Large areas of the wider Flow Country peatland have suffered from poor historical management decisions in relation to matters 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 more degraded bog in the wider Flow Country into the property."

A.4 Requirements for protection and management

"Around 73% of the area within the proposed property boundary has the highest level of statutory protections, with national regulation and policy reflecting their national and international significance, including those originally introduced via the EU Habitats and Birds Directives leading to Special Protection Area (SPA) and Special Area of Conservation (SAC) classification which are now protected through

domestic legislation. The majority of the area is also protected through the Ramsar Convention. These instruments provide specific protection for the elements of OUV as set out in the Site's attributes, notably including the processes for the maintenance and formation of blanket bog, and the associated flora and fauna.

Further to the statutory protection, peatlands – particularly those containing peat greater than 50cm in depth – are protected through planning policies, both at Scottish national and local levels. There are specific planning policies at national level in relation to both World Heritage Sites and areas of peatland that afford them effective protection from development proposals that might impact adversely on OUV. Moreover, where the boundary is not coincident with existing environmental designations, protection will again be ensured by national and local planning policy; the Local Authority will have regard to the Management Plan as a material consideration.

The property has no buffer zone. Areas important for the protection of OUV outside of the boundary are protected through a combination of national and local planning policy, and the wider protection afforded by the existing high-level designations. Buffer zones also have no basis in Scottish law, so would not add more protection than is already in place.

Management of the Site's OUV will be guided by a single clear Management Plan, developed by a stakeholder partnership comprising key landowners and managers, government agencies, local communities and scientific experts, and also through public consultation. The key management opportunity is bog restoration, and potential threats include commercial forestry and unwanted tree regeneration, inappropriate deer management, water management and drainage, intensive agriculture, inappropriately sited and/or designed wind farms, 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."

Annex B
Flow Country WHS Impact Assessment Toolkit: Identifying Potential Risks

Table B1: Identifying Potential Risks to WHS Criteria and Attributes

Criteria	Attribute	Element of a proposed action that has the potential to cause an impact						
		Construction of towers, UGC and CSE compound	**Construction of temporary access tracks**	**Construction of new permanent access tracks**	**Operation of new permanent access tracks**	**Operational maintenance and presence of personnel and vehicles/ machinery**	**Operational presence of towers, UGC and CSE compound**	**Dismantling redundant sections of the existing Strath Halladale to Dallangwell 132 kV OHL**
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	Loss of/ damage to habitat	Loss of/ damage to habitat	Loss of/ damage to habitat	No pathway for impacts (habitats already affected at construction phase)	No pathway for impacts	No pathway for impacts	Loss of/ damage to habitat
	b) climatic, topographic gradients and geological diversity: bog macroform diversity	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts
	c) archive it stores (4th dimension)	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts

Criteria	Attribute	Element of a proposed action that has the potential to cause an impact						
		Construction of towers, UGC and CSE compound	**Construction of temporary access tracks**	**Construction of new permanent access tracks**	**Operation of new permanent access tracks**	**Operational maintenance and presence of personnel and vehicles/ machinery**	**Operational presence of towers, UGC and CSE compound**	**Dismantling redundant sections of the existing Strath Halladale to Dallangwell 132 kV OHL**
	d) natural laboratory – ongoing scientific and educational use	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts
	e) carbon sequestration and storage	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts
	f) water filtration and the impact on the water quality of associated riverine habitats	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts

Criteria	Attribute	Element of a proposed action that has the potential to cause an impact						
		Construction of towers, UGC and CSE compound	**Construction of temporary access tracks**	**Construction of new permanent access tracks**	**Operation of new permanent access tracks**	**Operational maintenance and presence of personnel and vehicles/ machinery**	**Operational presence of towers, UGC and CSE compound**	**Dismantling redundant sections of the existing Strath Halladale to Dallangwell 132 kV OHL**
x: contains the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation	(a) Species associations (i) birds	Loss of/ damage to habitat supporting nesting and foraging birds. Noise and visual disturbance/ displacement.	Loss of/ damage to habitat supporting nesting and foraging birds. Noise and visual disturbance/ displacement.	Loss of/ damage to habitat supporting nesting and foraging birds. Noise and visual disturbance/ displacement.	No pathway for impacts	Noise and visual disturbance/ displacement	Visual disturbance/ displacement Collision risk	Loss of/ damage to habitat supporting nesting and foraging birds. Noise and visual disturbance/ displacement.
	(a) Species associations (ii) plants	Loss of/ damage to habitat	Loss of/ damage to habitat	Loss of/ damage to habitat	No pathway for impacts (habitats already affected at construction phase)	No pathway for impacts	No pathway for impacts	Loss of/ damage to habitat

Criteria	Attribute	Element of a proposed action that has the potential to cause an impact						
		Construction of towers, UGC and CSE compound	**Construction of temporary access tracks**	**Construction of new permanent access tracks**	**Operation of new permanent access tracks**	**Operational maintenance and presence of personnel and vehicles/ machinery**	**Operational presence of towers, UGC and CSE compound**	**Dismantling redundant sections of the existing Strath Halladale to Dallangwell 132 kV OHL**
	(a) Species associations (iii) genetic diversity	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts	No pathway for impacts

Annex C
Flow Country WHS Impact Assessment Toolkit: Description and Evaluation Tool

Table C1: Description and Evaluation Tool

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	Evaluation of impact
		Once/ intermittent/ continuous	Short-term/ long-term	Reversible/ irreversible	Reversible/ irreversible	Temporary / permanent change	None/ negligible/ some/ large change	Neutral/ minor/ moderate/ major impact (negative or positive)
(ix) (a) most extensive near continuous example of natural, actively accumulating, blanket bog ecosystem found globally	Loss of/ damage to habitat during construction of towers, UGCs and CSE compound	Once	Long-term	Irreversible	Irreversible	Permanent	Negligible	Minor impact (negative)
	Loss of/ damage to habitat during construction of temporary access tracks	Once	Short-term	Reversible	Reversible	Temporary	Some	Minor impact (negative)
	Loss of/ damage to habitat during construction of new permanent access tracks	Once	Long-term	Irreversible	Irreversible	Permanent	Some	Minor impact (negative)

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	Evaluation of impact
		Once/ intermittent/ continuous	Short-term/ long-term	Reversible/ irreversible	Reversible/ irreversible	Temporary / permanent change	None/ negligible/ some/ large change	Neutral/ minor/ moderate/ major impact (negative or positive)
	Loss of/ damage to habitat during the dismantling of the redundant parts of the existing Strath Halladale to Dallangwell 132kV grid connection	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Minor impact (negative)
(x) (a) Species associations **(i) birds**	Loss of/ damage to habitat supporting nesting and foraging birds during construction of towers, UGC's and CSE compound.	Once	Long-term	Irreversible	Irreversible	Permanent	Negligible	Minor impact (negative)

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	Evaluation of impact
		Once/ intermittent/ continuous	Short-term/ long-term	Reversible/ irreversible	Reversible/ irreversible	Temporary / permanent change	None/ negligible/ some/ large change	Neutral/ minor/ moderate/ major impact (negative or positive)
	Noise and visual disturbance/ displacement during construction of towers, UGC's and CSE compound.	Intermittent	Short-term	Reversible	Reversible	Temporary	Some	Minor impact (negative)
	Loss of/ damage to habitat supporting nesting and foraging birds during construction of temporary access tracks	Once	Short-term	Reversible	Reversible	Temporary	Negligible	Minor impact (negative)
	Noise and visual disturbance/ displacement during construction of temporary access tracks	Intermittent	Short-term	Reversible	Reversible	Temporary	Some	Minor impact (negative)

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	Evaluation of impact
		Once/ intermittent/ continuous	Short-term/ long-term	Reversible/ irreversible	Reversible/ irreversible	Temporary / permanent change	None/ negligible/ some/ large change	Neutral/ minor/ moderate/ major impact (negative or positive)
	Loss of/ damage to habitat supporting nesting and foraging birds during construction of new permanent access tracks	Once	Short-term	Irreversible	Irreversible	Permanent	Negligible	Minor impact (negative)
	Noise and visual disturbance/ displacement during construction of new permanent access tracks	Intermittent	Short-term	Reversible	Reversible	Temporary	Negligible	Minor impact (negative)
	Noise and visual disturbance/ displacement during operational maintenance	Intermittent	Short-term	Reversible	Reversible	Temporary	Negligible	Minor impact (negative)

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	Evaluation of impact
		Once/ intermittent/ continuous	Short-term/ long-term	Reversible/ irreversible	Reversible/ irreversible	Temporary / permanent change	None/ negligible/ some/ large change	Neutral/ minor/ moderate/ major impact (negative or positive)
	Visual disturbance/ displacement due to presence of towers, UGC's and CSE compound.	Continuous	Long-term	Irreversible	Irreversible	Permanent	Negligible	Minor impact (negative)
	Collision risk due to presence of towers, UGCs and CSE compound	Continuous	Long-term	Irreversible	Irreversible	Permanent	Some	Minor impact (negative)
	Collision risk due to dismantling the redundant parts of the existing Strath Halladale to Dallangwell 132kV grid connection	Continuous	Long-term	Irreversible	Irreversible	Permanent	Some	Minor impact (positive)

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	Evaluation of impact
		Once/ intermittent/ continuous	Short-term/ long-term	Reversible/ irreversible	Reversible/ irreversible	Temporary / permanent change	None/ negligible/ some/ large change	Neutral/ minor/ moderate/ major impact (negative or positive)
(x) (a) Species associations **(ii) plants**	Loss of/ damage to habitat during construction of towers, UGC's and CSE compound	Once	Long-term	Irreversible	Irreversible	Permanent	Negligible	Minor impact (negative)
	Loss of/ damage to habitat during construction of temporary access tracks	Once	Short-term	Reversible	Reversible	Temporary	Some	Minor impact (negative)
	Loss of/ damage to habitat during construction of new permanent access tracks	Once	Long-term	Irreversible	Irreversible	Permanent	Some	Minor impact (negative)

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	Evaluation of impact
		Once/ intermittent/ continuous	**Short-term/ long-term**	**Reversible/ irreversible**	**Reversible/ irreversible**	**Temporary / permanent change**	**None/ negligible/ some/ large change**	**Neutral/ minor/ moderate/ major impact (negative or positive)**
	Loss of/ damage to plant species during the dismantling of the redundant parts of the existing Strath Halladale to Dallangwell 132kV grid connection	Once	Short-term	Reversible	Reversible	Temporary	Some	Minor impact (negative)

Annex D

Flow Country WHS Assessment: Proposed Development with Alternative Alignment

Flow Country WHS Assessment: Proposed Development with the Alternative Alignment

D.1 Purpose of Document

This Annex aims to signpost the reader to the relevant sections of the EIA Report that have been used to inform an assessment of the potential impact of the Proposed Development with the Alternative Alignment on the Outstanding Universal Value (OUV) attributes of the WHS and its integrity, as well as to provide sufficient information to support the assessment using The Highland Council's Flow Country Candidate World Heritage Site Impact Assessment Toolkit.

D.2 Description

As described in **Volume 5: Chapter 3: The Proposed Development – Alternative Alignment**, the Alternative Alignment takes a slightly more northerly route than that of the Proposed Alignment to avoid the proposed Melvich Wind Energy Hub. Towers 19 – 31 are on the same OHL alignment as the Proposed Alignment, and then from the point at which the Proposed Alignment route heads in a broad easterly direction, the Alternative Alignment route heads further north and east towards the A836 (Towers A1 – A15). The Alternative Alignment OHL route then heads southwards (Towers A16 – A27), returning to join the Proposed Alignment OHL route at Tower 47.

The Alternative Alignment comprises approximately 13.5 km of 132 kV overhead line (OHL) grid connection between Strathy North 'T' (near Dallangwell) to a CSE compound prior to entering the Connagill 275/132 kV substation via a short section of underground cable (UGC) supported by 58 No. steel lattice towers (of which 31 towers are the same as for the Proposed Alignment; 13 at the western end and 18 at the eastern end). As part of the Alternative Alignment, two short temporary diversionary sections to the existing trident 'H' wood pole OHL infrastructure would be required to maintain the operation of the current transmission infrastructure to enable construction of the of the Alternative Alignment construction phase. As for the Proposed Alignment, once the Alternative Alignment is operational the existing trident 'H' wood pole OHL infrastructure (including the temporary diversion sections) would be removed. Thereafter, the Alternative Alignment would act as 'shared infrastructure' for the Strathy Wood and Strathy North wind farms

Proposed construction access would make use of existing tracks as far as practicable, upgraded as required. Existing bellmouths would also be utilised where possible, subject to improvements. The construction of one new bellmouth would be required off the A897 to access the terminal tower and CSE compound. It is anticipated that access would mainly be achieved through upgrade of existing and installation of new tracks, both temporary and permanent.

As for the Proposed Alignment, as part of the Alternative Alignment design, a buffer of more than 20 m has been applied to watercourses and water features, including the River Strathy and Halladale River, where technically and practically possible. All the proposed towers have been designed to be outwith the 20 m watercourse buffer however the temporary working areas (in some locations) may be a minimum of 10 m from watercourses and water features. These areas would be demarked and necessary additional safeguards agreed with the site Environmental Clerk of Works (EnvCoW) prior to construction works commencing. A 10 m buffer is specified in SSEN Transmission's GEMP Working in or Near Water (Revision 1.02, March 2024, see **Volume 4: Appendix V1-3.4: SSEN Transmission General Environmental Management Plans (GEMPs)** and has been previously agreed with stakeholders. This buffer is typical for developments of this nature and provides a standoff to watercourses and water features that, in combination with industry good practice, minimises the risk to water bodies.

The baseline conditions for the WHS and the assessment of potential construction and operational impacts are not described in detail in this document as detailed information is provided in the relevant chapters of the EIA Report, which this document forms an Appendix to. This document should therefore be read in conjunction with, and is supported by, the following technical reports and assessments, which are signposted as necessary throughout this Appendix:

- **Volume 5: Chapter 3: The Proposed Development - Alternative Alignment** – which sets out a description of the construction and operational activities.
- **Volume 1: Chapter 7: Ecology** and relevant Appendices (in **Volume 4**):
    - Appendix V1-7.2: Ecological Impact Assessment Methodology (relevant to both the Proposed Alignment and Alternative Alignment)
    - Appendix V1-7.3: Habitat Technical Report (relevant to both the Proposed Alignment and Alternative Alignment)
    - Appendix V7.4: Protected Species Technical Report [Confidential] (relevant to both the Proposed Alignment and Alternative Alignment)
    - Appendix V1-7.5: Bat Technical Report (relevant to both the Proposed Alignment and Alternative Alignment)
    - Appendix V1-7.6: Shadow Habitats Regulations Appraisal for the Caithness and Sutherland Peatlands SAC / Ramsar (Non-avian features) (Annex B considers the Alternative Alignment)
    - Appendix V1-7.8 Connagill Cluster Outline Habitat Management Plan (HMP) ((relevant to both the Proposed Alignment and Alternative Alignment)
- **Volume 5: Chapter 5: Ecology – The Alternative Alignment**
- **Volume 1: Chapter 8: Ornithology** and relevant Appendices (in **Volume 4**):
    - Appendix V1-8.1: Ornithology Technical Report
    - Appendix V1-8.2: Ornithology Confidential Annex [Confidential]
    - Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential] (Annex A considers the Alternative Alignment)
- **Volume 5: Chapter 6: Ornithology – The Alternative Alignment**

D.3 Impact Assessment

D.3.1 Method

See Section 2.1 in the WHS assessment, which is equally applicable to the Alternative Alignment.

The identification of potential risks in **Table B1** in **Annex B** is equally applicable for the Alternative Alignment.

The description and evaluation tool completed in **Table C1** in **Annex C** is equally applicable for the Alternative Alignment.

D.3.2 Embedded Mitigation

See Section 2.2 in the WHS assessment, which is equally applicable to the Alternative Alignment.

D.3.3 Summary of Impact Assessment

Each of the attributes for Criteria (ix) and (x) have been assessed and signposting to the relevant EIA Report Chapters for the Alternative Alignment (within **Volume 5**) and Appendices (within **Volume 4**), where baseline ecological data and impact assessment to support the conclusions, is provided where necessary in **Table D1.** The Alternative Alignment would result in slightly larger habitat impact within the WHS when compared to the Proposed Alignment (32.22 ha compared to 28.05 ha). This is because the OHL route is longer and therefore requires more towers, although as it is closer to the road network the area of habitat impacted by the temporary and permanent access tracks is smaller than that for the Proposed Alignment. The difference between the two options is therefore very small.

The EcIA presented in **Volume 5: Chapter 5: Ecology - Alternative Alignment** and **Volume 5: Chapter 6: Ornithology - Alternative Alignment** of the EIA Report has concluded that the Alternative Alignment would result in no significant residual effects on habitats or protected species, including qualifying species and habitats of the Caithness and Sutherland Peatlands SAC / SPA / Ramsar and West Halladale SSSI, which are also attributes of the Flow Country WHS. This assessment is applicable to WHS Criterion (ix) attributes (a) and (f) and Criterion (x) attributes (a) (i) and (a) (ii).

SHRAs undertaken for the terrestrial ecology (see **Annex B** of **Volume 4: Appendix V1-7.6**) and ornithological (see **Annex A** of **Volume 4: Appendix V1-8.3**) qualifying features of the Caithness and Sutherland SAC / SPA / Ramsar has concluded that there would be no adverse effects on the integrity of the designated sites, which is within and overlapping with the Flow Country WHS boundary. This assessment is applicable to WHS Criterion (ix) attributes (a) and (f) and Criterion (x) attributes (a) (i) and (a) (ii).

Where specific assessment of attributes within the Flow Country WHS has not been undertaken as part of the EcIA (for WHS Criterion (ix) attributes (b), (c), (d) and (e) and Criterion (x) attribute (a) (iii)), the additional assessment undertaken and presented in **Table D1** has concluded there would be no effects on them as a result of the construction or operation of the Alternative Alignment.

Table D1: Summary of Alternative Alignment WHS Assessment and Signposting to the EIA Report

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
Criterion (ix) outstanding example representing significant ongoing 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.	The Alternative Alignment would result in very minor losses of these habitats relative to that within the whole Flow Country WHS, which covers c. 200,000 ha. Total direct and indirect losses of blanket bog habitat are calculated at 30.07 ha, which represents 0.015% of the total area of land within the WHS. The EcIA concluded that the Alternative Alignment would result in a minor adverse effect (not significant) on the important peatland habitats, including those within the Caithness and Sutherland Peatlands SAC / Ramsar and West Halladale SSSI (which are also within the WHS boundary). The SHRA for the Alternative Alignment concluded that there would be no adverse effects on the integrity of the Caithness and Sutherland Peatlands SAC / Ramsar, as a result of direct and indirect impacts on blanket bog (an Annex I habitat of international importance and primary reason for the selection of the site as an SAC). This assessment is similarly applicable to the assessment of impacts on the blanket bog ecosystem OUV.	Assessment of Likely Significant Effects (see **Volume 5: Chapter 5: Ecology – Alternative Alignment, Section 5.10**) SHRA for Caithness and Sutherland Peatlands SAC / Ramsar (see **Volume 4: Appendix V1-7.6 (Annex B)**)	Minor adverse effect (not significant)
b) climatic, topographic gradients and geological	The scale of the nominated property, alongside the gradients in climate and topography, and the diversity of the underlying geology, provide the setting	As for the Proposed Alignment, there are no pathways by which the Alternative Alignment could affect the climatic, topographic gradients or geological diversity that support bog macroform diversity.	N/A	No effect

[6] As set out in the Flow Country WHS Assessment toolkit on the Highland Council website: https://www.highland.gov.uk/downloads/file/28012/flow_country_candidate_world_heritage_site_impact_assessment_toolkit

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
diversity: bog macroform diversity	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 providing a 4th dimension to The Flow Country blanket bog. The processes 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 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).	As for the Proposed Alignment, there are no pathways by which the Alternative Alignment could affect the historic archive stored in the peat; any excavations for the foundations of the towers, and the new (permanent and temporary) access tracks, Cable Sealing End (CSE) compound or underground cable (UGC) would be of minimal depth and affect only a very small proportion of the habitats present.	N/A	No effect

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
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.	As for the Proposed Alignment, there are no pathways by which the Alternative Alignment could affect the ongoing scientific and educational use of the WHS.	N/A	No effect
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 meters.	Given the minimal permanent impact of the Alternative Alignment on blanket bog (30.07 ha), it is reasonable to assume that there would be no impacts on the ability of the Flow Country to continue to sequestrate and store carbon.	N/A	No effect

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
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.	As for the Proposed Alignment, all tower locations have been designed to accommodate a 20 m offset from the nearest watercourse, and although construction works may be undertaken in closer proximity, a minimum buffer of 10 m to watercourses would be implemented during the construction phase. Therefore, there would be no construction works within 10 m of the River Strathy or Halladale River or their tributaries, and there is no potential for impacts on any riparian or aquatic habitats; all aquatic freshwater habitats and species (including European eel, Atlantic salmon and freshwater pearl mussel) were consequently scoped out of the impact assessment. There would be embedded mitigation as part of the CEMP to ensure there is no potential for accidental pollution to the River Strathy (or any other watercourse) during the construction phase.	See **Volume 5: Chapter 3: The Proposed Development – Alternative Alignment** See **Volume 5: Chapter 5: Ecology**; Section 5.3: Scope of Assessment) See **Volume 4: Appendix V1-3.8:** Outline CEMP	No effect
Criterion (x) contains the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation				
a) species associations	The diverse range of habitats that The Flow Country contains supports an exceptional and specialised blanket bog biodiversity, and holds biological associations unlike any other blanket bog found globally. This is a consequence of the overlapping distributions of species typical of both arctic and temperate climatic zones, and is further influenced by altitudinal and climatic gradients and geological diversity found across the nominated property. Furthermore, the scale and connectivity of the nominated property	The international importance of the habitats for birds is recognised in its designation as an SPA and Ramsar, and the results of the EcIA (see **Volume 5: Chapter 5: Ornithology – Alternative Alignment**) and SHRA (see **Volume 4: Appendix V1-8.3 (Annex A)**) are summarised against the identified ornithology features in (a) (i). The international importance of the habitats is recognised in its designation as an SAC and Ramsar, and the results of the EcIA (see **Volume 5: Chapter 5: Ecology – Alternative Alignment**) and SHRA (see **Volume 4: Appendix V1-7.6 (Annex B)**) are summarised against the identified habitat features in (a) (ii).		

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
	provides resilience to species it contains.			
a) i. birds	The diversity of environments within the blanket bog of The Flow Country, and the patchwork of connected landscape elements within the wider setting (farmland, coastal, etc.), supports a distinctively special assemblage of breeding birds. The precise combination of species, with arctic-alpine and temperate and continental elements is not found anywhere else in the world and includes; red-throated diver, black-throated diver, common scoter, wigeon, golden plover, greenshank, dunlin, wood sandpiper, golden eagle, merlin, hen harrier and short-eared owl.	The international importance of the habitats for birds is recognised in its designation as an SPA and Ramsar, and all of the bird species listed in the OUV are designated features of the SPA / Ramsar site. Potential effects on each of the individual species listed in the OUV are summarised below.		
		<u>Common scoter</u> There were no observations of common scoter during field surveys and no records of breeding birds within potential disturbance distance of the Alternative Alignment were identified during the desk study. However, there were several desk study records of non-breeding birds and it is possible that common scoter could breed in the vicinity of the Alternative Alignment in future, although the extent of suitable habitat within potential disturbance distance is limited. Following implementation of the Bird Protection Plan (BPP), which includes measures to protect breeding species listed on Schedule 1 to the Wildlife and Countryside Act 1981 (as amended) (W&CA) and/or Annex I of the Birds Directive, potential effects on breeding common scoter, from disturbance due to construction and operation of the Alternative Alignment were assessed as being of negligible to low magnitude. No common scoter flights were recorded during field surveys or identified during the desk study. As there is no direct evidence that breeding common scoter make foraging trips to the coast and the potential for birds to migrate across the Alternative Alignment at potential collision height was considered to be low, effects on the breeding common scoter population due to collisions during operation of the Alternative Alignment were assessed as being of negligible to low magnitude.	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** and **Appendix V1-8.2: Section 2.1 and 2.2.** Assessment of construction and operational effects: see **Volume 5: Chapter 6**; Section 6.10 and **Volume 4: Appendix V1-8.2: Section 3.2** Habitats Regulations Appraisal: see **Annex A** of **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential]**	Negligible to low magnitude effects (not significant)

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
		The potential for barrier effects on the breeding common scoter population, for the reasons described above, were therefore assessed as being of negligible magnitude.		
		<u>Golden plover</u> A small number of breeding territories were recorded in the survey area, one of which was within Limits of Deviation (LoD). Given the limited extent of habitat loss, relatively large core foraging range of this species (3 km; NatureScot, 2016) and the presence of extensive suitable undisturbed habitat in the wider local area, effects on this species were assessed as being of low magnitude. The risk of mortality resulting from collisions with the OHL when the Alternative Alignment is operational was assessed as low for this species, because levels of flight activity were very low and no regular commuting routes across the Alternative Alignment were identified.	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** Assessment of construction and operational effects: see **Volume 5: Chapter 6,** Section 6.10 Habitats Regulations Appraisal: see **Annex A** of **Volume 4: Appendix V1-8.3 Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential]**	Low magnitude effects (not significant)
		<u>Red-throated diver and black-throated diver</u> No breeding territories were identified within the OHL LoD, and there is no suitable nesting or foraging habitat for these species within the OHL LoD. Therefore, there is not considered to be any potential for effects on diver species due to habitat loss. Additionally, as embedded mitigation includes measures to prevent pollution of waterbodies, there is not considered to be any potential for indirect effects on diver breeding or foraging habitat. However, there are breeding territories of both species within potential disturbance distance of the Alternative Alignment. Implementation of the BPP, which includes measures to	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** and **Appendix V1-8.2: Section 2.1 and 2.2.** Assessment of construction and operational effects: see **Volume 5: Chapter 6; Section 6.10** and **Appendix V1-8.2: Section 3.2** Habitats Regulations Appraisal: see **Annex A** of	Negligible to low magnitude effects following implementation of targeted mitigation (not significant)

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
		protect breeding species listed on Schedule 1 to the Wildlife and Countryside Act 1981 (as amended) (W&CA) and/or Annex I of the Birds Directive, will reduce potential effects on breeding divers due to noise and visual disturbance during construction of the Alternative Alignment as well as any major operational works. Targeted mitigation, namely installation of artificial nest rafts, will provide alternative nest sites for any birds that are temporarily displaced. Following implementation of the BPP and targeted mitigation, effects on breeding red-throated and black-throated diver populations due to disturbance/displacement during construction and operation of the Alternative Alignment were assessed as being of low magnitude. Regularly used flight routes used by red-throated diver to commute between breeding lochs and foraging areas at sea were identified crossing the Alternative Alignment. In contrast, levels of black-throated diver flight activity were low and no regular commuting routes were identified. Following implementation of targeted mitigation, namely installation of line markers on the OHL to allow divers to detect it more easily and adjust their flight altitude to avoid it, the risk of mortality resulting from collisions with the OHL when the Alternative Alignment is operational was assessed as being low for both species. The potential for barrier effects to red-throated and black-throated divers were assessed as being of negligible magnitude.	**Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential].**	
		<u>Golden eagle</u> Although two golden eagle breeding territories were identified during the desk study, these were over 6 km from the Alternative Alignment. Therefore, there was not considered to	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** and **Appendix**	Negligible to low magnitude effects (not significant)

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
		be any potential for disturbance of breeding birds due to construction or operation of the Alternative Alignment, The risk of mortality resulting from collisions with the OHL when the Alternative Alignment is operational was assessed as low for this species, because levels of flight activity were low and no regular commuting routes across the Alternative Alignment or areas of concentrated flight activity were identified. The potential for significant effects on golden eagle due to electrocution was scoped out as the risk is considered to be negligible due to the design of the Alternative Alignment.	**V1-8.2: Sections 2.1 and 2.2.** Assessment of construction and operational effects: see **Volume 5: Chapter 6; Section 6.10.** Habitats Regulations Appraisal: see **Annex A** of **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential]**	
		Hen harrier Two breeding territories were identified within 2 km of the Alternative Alignment, both of which were outwith the LoD of the Alternative Alignment but within potential disturbance distance. It is possible that birds could be temporarily displaced from one or both of these territories during construction, although one of the territories was considered to have been abandoned following an extensive wildfire in the area in May 2019, and the habitat is unlikely to be suitable for several years until the heather has recovered. The potential for operational disturbance is considered to be low as works will typically be infrequent, temporary and of limited extent both spatially and temporally, and hen harriers are known to breed in relatively close proximity to artificial structures such as wind turbines and OHLs. The potential for disturbance / displacement of breeding hen harrier during construction (and any major operational works) would be minimised through implementation of the BPP and it is considered that any birds	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Section 3.2** and **Appendix V1-8.2: Sections 2.1 and 2.2** Assessment of construction and operational effects: see **Volume 5: Chapter 6; Section 6.10** and **Appendix V1-8.2: Section 3.2.** Habitats Regulations Appraisal: see **Annex A** of **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites**	Low magnitude effects (not significant)

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
		displaced during construction of the Alternative Alignment could breed in suitable habitat in the wider area rather than being lost from the population. Potential effects on this species due to disturbance/displacement during construction and operation of the Alternative Alignment were therefore assessed as being of low magnitude and not significant. Although regular flight activity by hen harriers was recorded within and around the Alternative Alignment, hen harriers typically hunt at very low elevations, which would be below potential collision risk height. Although birds could be more susceptible to collision when displaying during the breeding season, the majority of breeding activity was several hundred metres from the Alternative Development and collision risk was assessed as being of low magnitude.	**of Ornithological Importance [Confidential]**	
		Merlin Three merlin breeding territories were identified within 2 km of the Alternative Alignment. None were within the OHL LoD, but as two were within potential disturbance distance from the Alternative Alignment, it is possible that, as a worst-case scenario, 1-2 pairs could be displaced during construction or operation of the Alternative Alignment. The potential for disturbance / displacement of breeding merlin during construction (and any major operational works) would be minimised through implementation of the BPP and it is considered that any displaced birds could breed in suitable habitat in the wider area rather than being lost from the SPA breeding population and effects on this species due to disturbance/displacement were assessed as being of low magnitude.	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** and **Appendix V1-8.2: Sections 2.1 and 2.2.** Assessment of construction and operational effects: see **Volume 5: Chapter 6; Section 6.10** and **Appendix V1-8.2: Section 3.2.** Habitats Regulations Appraisal: see **Annex A** of **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal for European Sites of**	Negligible to low magnitude effects (not significant)

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
		Low levels of merlin flight activity were recorded and the effects of collision risk on this species were assessed as being of low magnitude.	**Ornithological Importance [Confidential]**	
		Wigeon, dunlin, wood sandpiper, greenshank and short-eared owl There were no records of wood sandpiper or short-eared owl during the field surveys, and none were identified during the desk study. For the other species (wigeon, dunlin and greenshank), no breeding birds within the maximum species-specific disturbance buffer in NatureScot (2022) guidance were recorded during field surveys or identified during the desk study. Additionally, where flights were recorded, these were infrequent, with no commuting routes across the Alternative Alignment identified for any species. Based on the habitats present and patterns of historical activity, it is considered unlikely that levels of breeding or flight activity around the Alternative Alignment would change to such an extent in the future that there could be significant effects on breeding populations of any of these species.	Desk study and field survey results: see **Volume 4: Appendix V1-8.1: Sections 3.1 and 3.2** See **Annex A** of **Volume 4: Appendix V1-8.3: Shadow Habitats Regulations Appraisal Report for European Sites of Ornithological Importance [Confidential]**	Scoped out of assessment (no/ negligible effects)
a) ii. plants	The floristic composition of The Flow Country blanket bog, and associated wet heath, is not found anywhere else globally, and represents a highly Atlantic influence on plant distribution and development. Key plants of importance are; dwarf birch, alpine bearberry, bogbean, bog hair-grass, water lobelia and bog orchid, marsh saxifrage and 29 species of Sphagnum (over 10% of global Sphagnum flora).	The Alternative Alignment would not adversely affect the floristic composition of the blanket bog and associated wet heath given the very minor impacts on these habitats arising from construction and operation (30.07 ha). None of the key plants listed in the OUV were recorded in the study area.	Assessment of Likely Significant Effects (see **Volume 5: Chapter 5**; **Section 5.10**) See **Annex B** of **Volume 4: Appendix V1-7.6: Shadow HRA for Caithness and Sutherland Peatlands SAC/ Ramsar**	Minor adverse effect (not significant)

Attribute[6]	Description[5]	Comment	Signposting to Relevant Baseline Data & Impact Assessment in EIA Report	Assessment of Effects
a) iii. genetic diversity	The Flow Country occupies a position at the western extreme of the Eurasian landmass. As such it is a haven of locally adapted genetic diversity. Many species here are isolated from their continental relatives, which means that local lineages have developed. Whilst small, isolated populations frequently suffer from inbreeding depression, the large size of The Flow Country means that this not a significant issue here. Furthermore, many species operate as metapopulations: groups of smaller populations between which individuals can move. Not only does this mean that genes can flow between populations, it also means that individuals can recolonise sites in the event of short-term localised extinction, as has been demonstrated with newts. Given models that suggest droughts will increase in both frequency and intensity in the north of Scotland, the large number of waterbodies in The Flow Country will greatly reduce the likelihood of population loss. This makes it a valuable refuge for wildlife of many species at both a population and a genetic level.	As for the Proposed Alignment, given the very minor and localised impacts of the Alternative Alignment in context with the thousands of hectares of the WHS, there is no potential for any effects on the genetic diversity of species. The construction and operation of the Alternative Alignment would not impact the WHS habitats to such an extent that there would be no populations remaining for recolonisation in the event of short-term localised extinctions of species. The Alternative Alignment would not impact any of the waterbodies that provide valuable refuges.	N/A	No effect

D.3.4 Potential Cumulative Effects

See Section 2.4 in the WHS assessment, which is equally applicable to the Alternative Alignment. No adverse cumulative effects on the OUVs have been identified.

D.4 Conclusion

The Flow Country WHS straddles Caithness and Sutherland and supports one of the largest areas of blanket bog in the world; a globally rare habitat that is recognised for its international nature conservation importance through its overlapping designations as the Caithness and Sutherland Peatlands SAC, SPA and Ramsar. Much of the ecological impact assessment presented in **Volume 5: Chapter 5 – Ecology – Alternative Alignment** and **Volume 5: Chapter 6 - Ornithology – Alternative Alignment** is therefore applicable to the assessment of potential impacts on the OUV on the attributes of the Flow Country WHS.

The only difference between the Proposed Alignment and Alternative Alignment is a slight increase in the total area of habitat impacted by the Alternative Alignment (32.22 ha for the Alternative Alignment compared to 28.05 ha for the Proposed Alignment). This very small change does not result in any changes to the outcome of the Flow Country WHS assessment, which has concluded that there would be no significant adverse effects as a result of the Alternative Alignment Development on the OUV attributes of the WHS, either alone or in-combination with any other wind farm project or their associated electrical infrastructure in the wider Strathy area.