

# **Pentland floating offshore wind farm**

## **Habitats Regulations Appraisal: Onshore Report to Inform Appropriate Assessment**



## PENTLAND FLOATING OFFSHORE WIND FARM – ONSHORE EIAR

### HABITATS REGULATIONS APPRAISAL:

### REPORT TO INFORM APPROPRIATE ASSESSMENT

Document Title:	Pentland Floating Offshore Wind Farm Onshore RIAA
Document no.	GBPNTD-ENV-XOD-RP-00029
Project:	Pentland Floating Offshore Wind Farm
Originator Company	Xodus Group Limited
Revision	01
Originator	Xodus Group Ltd
Date	10.10.2022

#### Revision History:

Revision	Date	Status	Originator	Reviewed	Approved
01	10.10.2022	Final	AF	RM	PM



# **CONTENTS**

<b>GLOSSARY OF PROJECT TERMS</b>	<b>4</b>
<b>ACRONYMS AND ABBREVIATIONS</b>	<b>5</b>
<b>1 INTRODUCTION</b>	<b>6</b>
1.1 Report Overview	6
1.2 Background to the Project	6
1.3 Assessment Process and Supporting Information	9
1.4 Structure of the HRA	10
<b>2 LEGISLATION, POLICY, AND GUIDANCE</b>	<b>12</b>
2.1 Legislative Context	12
2.2 The HRA Process	13
2.3 Guidance Documents	14
2.4 Case Law	14
<b>3 OVERVIEW OF THE HRA SCREENING PROCESS</b>	<b>15</b>
3.1 Screening Process Undertaken for the Project	15
3.2 Special Areas of Conservation and Interests Screened In	19
3.3 Special Protected Areas / Ramsar Sites and Interests Screened In	19
3.4 Potential Impacts Considered at Screening	20
<b>4 HRA CONSULTATION</b>	<b>22</b>
4.1 Consultation and HRA Screening	22
<b>5 PROJECT DESCRIPTION</b>	<b>24</b>
5.1 Introduction	24
5.2 Design Envelope Approach	24
5.3 Embedded Mitigation and Management Plans	24
5.4 Onshore Development Alternatives	25
5.5 Indicative Construction Programme	29
5.6 Operation and Maintenance	29
5.7 Decommissioning	30
<b>6 MITIGATION AND MANAGEMENT PLANS</b>	<b>31</b>
6.1 Embedded Mitigation and Management Plans	31

## **7 SPECIAL PROTECTED AREAS WITH TERRESTRIAL ORNITHOLOGY INTERESTS 36**

7.1	Introduction	36
7.2	Project Design Envelope Parameters Relevant to Non-Breeding Greylag goose	41
7.3	Approach to Assessment	43
7.4	Caithness Lochs SPA and Ramsar Site	44
7.5	North Caithness Cliffs SPA	47
7.6	Caithness and Sutherland Peatlands SPA	49
7.7	Summary	51

## **8 SPECIAL AREAS OF CONSERVATIONS WITH TERRESTRIAL ECOLOGY INTERESTS 53**

8.1	Introduction	53
8.2	Project Design Envelope Parameters Relevant to Otters	55
8.3	Approach to Assessment	57
8.4	Caithness and Sutherland Peatlands SAC	57

## **9 CONCLUSION OF THE RIAA 62**

## **10 REFERENCES 63**

### LIST OF FIGURES

Figure 1.1	Location of the Onshore Development	8
Figure 3.1	SPAs/ Ramsar sites within 25 km of the Onshore Development	17
Figure 3.2	SACs with Annex II Species that are located within 20 km of the Onshore Development	18
Figure 5.1	Site Layout Plan	28
Figure 5.2	Indicative Construction Programme	29
Figure 7.1	Projects to be Considered within the Ornithology HRA In-combination Assessment	39
Figure 7.2	Projects to be Considered within the Ornithology HRA In-combination Assessment	40

### LIST OF TABLES

Table 2.1	Legislation and policy relevant to ecologically designated sites	12
Table 3.1	Criteria used for Identification of European Sites and Ramsar sites	15
Table 3.2	Designated Sites Requiring Further Consideration	16
Table 3.3	SACs Screened in for assessment	19
Table 3.4	SPAs/ Ramsar Sites Screened in for assessment	19
Table 3.5	Potential Impacts screened in on Designated Sites and Qualifying Features	20
Table 4.1	Consultee responses to Screening Report	22
Table 5.1	Key Onshore Development Parameters	26
Table 6.1	Embedded Mitigation Measures and Management Plans for the Onshore Development	31
Table 7.1	Indicative Projects to be Considered within the Ornithology HRA In-combination Assessment	36
Table 7.2	Impact pathways screened out of RIAA	41

---

Table 7.3 Design parameters specific to the Greylag goose assessment .....	41
Table 7.4 Qualifying Interests and Condition for the Caithness Lochs SPA / Ramsar Site .....	44
Table 7.5 Caithness Lochs SPA Conservation Objectives.....	45
Table 7.6 Screened-in Qualifying Interests and their Condition for the North Caithness Cliffs SPA .....	47
Table 7.7 Caithness Lochs SPA Conservation Objectives.....	48
Table 7.8 Screened-in Qualifying Interests and their Condition for the Caithness and Sutherland Peatlands SPA / Ramsar Site .....	49
Table 7.9 Caithness and Sutherland Peatlands SPA Conservation Objectives.....	50
Table 7.10 Summary of results.....	51
Table 8.1 Summary of SAC designated sites with suitability for otter within 20 km of the Onshore Site .....	53
Table 8.2 Impact pathways screened out of RIAA .....	54
Table 8.3 Design parameters specific to the otter assessment.....	55
Table 8.4 Qualifying Interests and Condition for the Caithness and Sutherland Peatlands SAC .....	58
Table 8.5 Caithness and Sutherland Peatlands SAC Conservation Objectives relevant to otter .....	60
Table 8.6 Summary of results.....	61

## GLOSSARY OF PROJECT TERMS

Key Terms	Definition
Cable Joint Bay	Cable Joint Bays (CJBs) are typically required every 500 to 1,000 m to string together the onshore cable sections.
Dounreay Substation	The existing Scottish Southern Energy (SSE) Dounreay 132 kV Substation.
Dounreay Tri Floating Wind Demonstration Project (The Dounreay Tri Project)	The 2017 consented project previously owned by Dounreay Tri Limited (in administration) and subsequently acquired in 2020 by Highland Wind Limited (HWL). The Dounreay Tri Floating Wind Demonstration Project consent was for two demonstrator floating turbines with a marine licence covering the same area for which the Pentland Floating Offshore Wind Farm (PFOWF) Array, as defined, is applying for consent. The Dounreay Tri Project also gained consent for the onshore infrastructure required to support the offshore elements of the project. The offshore components of the Dounreay Tri consent are no longer being implemented. The onshore components will not be implemented if the application for which this EIA accompanies is approved.
Grid Connection Point	The point at which the electricity generated by the Project connects into the National Electricity Transmission System, located at the Dounreay Substation.
Grid Connection Cable Circuit	Electricity cable circuits connecting the Onshore Substation to the grid connection point. The circuit is made up of three cables in a trefoil or flat arrangement.
Offshore EIAR	The EIAR submitted for the Offshore Development. This was submitted to Marine Scotland in August 2022. This is available at <a href="https://pentlandfloatingwind.com/document-library/">https://pentlandfloatingwind.com/document-library/</a>
Highland Wind Limited (HWL)	The Developer of the PFOWF Project (defined below) and the Applicant for the associated planning permissions and consents.
Landfall	Point where the Offshore Export Cable(s) from the PFOWF Array, as defined, will reach the shore and connect to the Onshore Cable Circuit(s).
Offshore Export Cable(s)	The cable(s) which transmits electricity produced from the offshore wind turbines to landfall.
Offshore Site	Area encompassing the PFOWF Array Area and Offshore Export Cable Corridor, as defined.
Offshore Development	All offshore components of the PFOWF (Wind Turbine Generators (WTGs)), cables, floating substructures and all other associated infrastructure required) across all project phases from development to decommissioning.
Onshore Cable Circuit(s)	Electricity cable circuits running from the Transition Joint Bay to the Onshore Substation. Each circuit is made up of three cables in a trefoil or flat arrangement.
Onshore Site	The area where the Onshore Development, as defined, will be located and where the planning permission is being sought.
Onshore Substation	A substation (including transformers, switchgear, megavolt ampere reactor) located within the Onshore Site. Two indicative locations are assessed within this Onshore EIAR.
PFOWF Onshore Transmission Infrastructure (the Onshore Development)	All onshore components of the PFOWF including HDD, Onshore Cable Circuit(s) (i.e. those above Mean Low Water Springs), Transition Joint Bay, cable joint bays, Onshore Substation, construction compound and access (and all other associated infrastructure) across all project phases from development to decommissioning, for which HWL are seeking planning permission from The Highland Council. The focus of this document.
PFOWF Project (the Project)	The combined Offshore Development and Onshore Development for the Pentland Floating Offshore Wind Farm (PFOWF), as defined.
Transition Joint Bay	A concrete structure where offshore export cables and onshore cables are spliced together.

## ACRONYMS AND ABBREVIATIONS

AA	Appropriate Assessment
CEMP	Construction Environmental Management Plan
CMS	Construction Method Statement
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
HDD	Horizontal Directional Drilling
HRA	Habitats Regulations Appraisal
HVAC	High Voltage Alternating Current
HWL	Highland Wind Limited
LSE	Likely Significant Effects
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MW	Megawatts
NRTE	Naval Reactor Test Establishment
OECC	Offshore Export Cable Corridor
OEMP	Operational Environmental Management Plan
PDE	Project Design Envelope
PFOWF	Pentland Floating Offshore Wind Farm
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation
SHE	Scottish Hydro Electric
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPP	Scottish Planning Policy
SSE	Scottish and Southern Energy
SSEN	Scottish and Southern Electricity Networks
SSSI	Sites of Special Scientific Interest
UK	United Kingdom
WCS	Worst Case Scenario
WTG	Wind Turbine Generators

# 1 INTRODUCTION

## 1.1 Report Overview

Xodus Group (Xodus) has prepared this Habitats Regulation Appraisal (HRA) Report to Inform Appropriate Assessment (RIAA) on behalf of Highland Wind Limited (HWL), with support from industry experts. Atlantic Ecology Ltd has authored the terrestrial ornithology appraisal and Caledonian Conservation Ltd has authored the terrestrial ecology appraisal. This report has been prepared to support an application for planning permission in principle to The Highland Council (THC) under The Town and Country Planning (Scotland) Act 1997 (as amended) for the Pentland Floating Offshore Wind Farm (PFOWF) onshore transmission infrastructure, located approximately 14 km west of Thurso, herein referred to as the 'Onshore Development'. The location of the Onshore Development is shown in Figure 1.1.

The need for a Phase 2 HRA RIAA was identified through Phase 1 HRA Screening. A HRA Screening Report (HWL, 2022) was submitted to THC in August 2022, which outlined the details of the Onshore Development (as defined) and an assessment of whether, in view of best scientific knowledge, there is potential for the Onshore Development, individually or in combination with another plan or project, to have a Likely Significant Effect (LSE) on a European site (Special Areas of Conservation [SACs], Special Protection Areas [SPAs] [including candidate and proposed sites] and Ramsar Sites). For those sites where LSE could not be excluded, they have been carried forward for assessment in this RIAA.

This HRA RIAA provides the Competent Authority (THC) with the information required to assist them in undertaking an Appropriate Assessment (AA) for the Onshore Development as required under The Conservation (Natural Habitats & c.) Regulations 1994, as amended ('the Habitats Regulations'), to ensure compliance with the Habitats Directive (92/43/EEC).

This RIAA considers whether there is any potential for adverse effects from the Onshore Development on the conservation objectives and integrity of the relevant European sites where LSE could not be ruled out at Phase 1 Screening, as detailed in Section 2 of this report.

This report considers the LSE of the Onshore Development on qualifying interests through all phases of the development, including construction, operation and maintenance, and decommissioning.

## 1.2 Background to the Project

HWL is proposing to construct and operate a floating offshore wind farm approximately 7.5 km off the coast of Dounreay, Caithness with an installed capacity of around 100 megawatts (MW), known as the PFOWF Project or 'the Project'.

The PFOWF Project will comprise:

- > **The PFOWF Array and Offshore Export Cable(s) (the Offshore Development):** An offshore array of up to seven floating Wind Turbine Generators (WTGs) connected by subsea inter-array cables and supported by floating structures, mooring lines and anchors. Up to two offshore export cables will carry the power generated by the PFOWF array to a landfall located at the Dounreay coast. The Offshore Development is subject to a separate consent application which has been submitted to Marine Scotland (document number: GBPNTD-ENV-XOD-AA-00001) (HWL, 2022), which includes a separate HRA RIAA for the Offshore Development components; and
- > **The PFOWF Onshore Transmission Infrastructure (the Onshore Development):** All transmission infrastructure associated with the PFOWF Project landward of Mean Low Water Springs (MLWS). Buried onshore cables will transmit power from the PFOWF array inland to a new substation, where the Project will connect to the transmission network. HWL have received agreement from Scottish and Southern Electricity Networks (SSEN) Transmission for connection into the Scottish and Southern Energy (SSE) Dounreay Substation. The Onshore Development is the focus of this HRA RIAA.

Whilst there is a legislative requirement to consider the Project as a whole and the impacts that all project aspects may have on both onshore and offshore designated sites, as the Project is submitting separate



applications for onshore and offshore to different regulatory bodies, the impacts from the onshore activities will be considered in the Onshore RIAA and associated Onshore EIAR, and the offshore activities will be assessed in the offshore reports. Any offshore designated sites where there is potential connectivity to the Onshore Development have been considered in this Onshore HRA RIAA, and where a terrestrial designated site has potential connectivity with any aspect of the Offshore Development (e.g. the WTGs) of the Project, this has been considered in the Offshore EIAR and the associated Offshore RIAA.

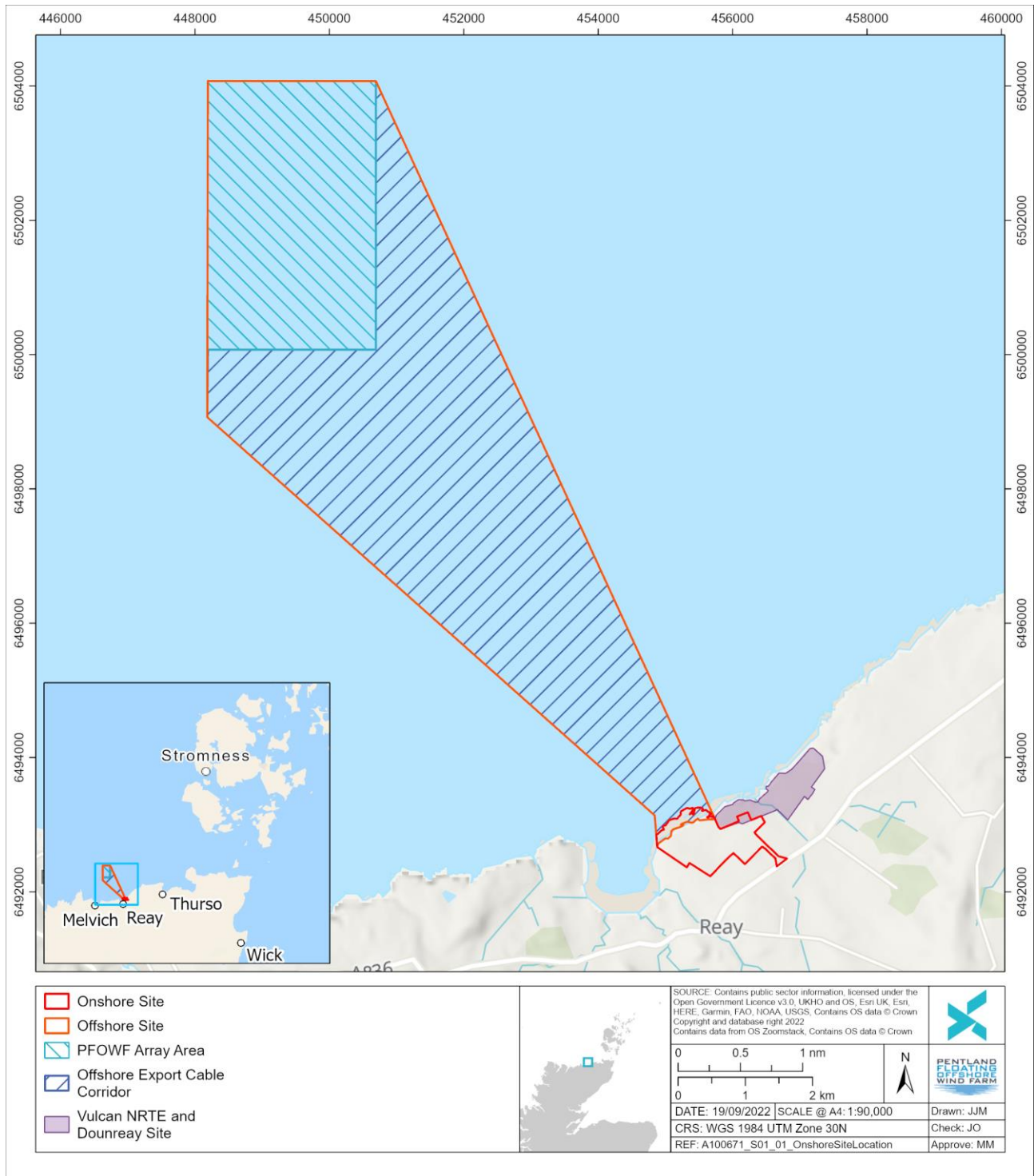


Figure 1.1 Location of the Onshore Development

The key components of the Onshore Development are outlined below, further details are provided in Chapter 5: Project Description (Volume 2) of the Onshore EIA Report:

- > A cable landfall (the Landfall), located between the boundary of Vulcan NRTE (east) and the border with the archaeological track 'White Geos' (west), where up to two offshore export cables from the PFOWF Array will be brought ashore via horizontal directional drilling (HDD) and into the Transition Joint Bay (TJB);
- > A TJB where up to two offshore and up to two onshore cable circuits (each circuit is made up of three cables in a trefoil or flat arrangement) will be spliced together;
- > Up to two onshore circuits, buried to a depth of approximately 1 to 2 m and laid in a maximum of two trenches each approximately 3 m wide, subject to ground conditions, landowner requirements and cable characteristics;
- > If the onshore cables are installed in sections, cable jointing pits will be required to join the sections together;
- > An Onshore Substation<sup>i</sup> of 65 m wide, 65 m length and 14m in height, which is required to transfer the electricity from the PFOWF Array prior to connection into the existing Dounreay Substation;
- > Onshore Cable Circuit(s) from the Onshore Substation to the grid connection point at the Dounreay Substation, laid in trenches and/or ducts; and
- > Construction compound to accommodate a temporary work site, including parking, welfare facilities, offices and changing rooms.

### 1.3 Assessment Process and Supporting Information

HRA is an iterative process, and this RIAA has not been prepared in isolation, but instead forms part of a suite of documents being submitted as part of the application.

The RIAA has been developed alongside the PFOWF Onshore EIAR produced as part of the Environmental Impact Assessment (EIA) process, under The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 ('the EIA Regulations'). Where information was not previously available, the Screening exercise adopted a highly precautionary stance. In some cases, the availability of assessments supporting the EIA process, has provided the evidence to refine the conclusions regarding impacts to European sites. Where design or supporting information is common to both assessments (EIAR and the HRA) this information has been referenced throughout the RIAA where appropriate.

It should be noted that although the same supporting surveys have been used to assess the effects on European Site integrity, the conclusions of the EIA have not been used to ascertain the assessment outcomes of the RIAA, as these two distinct assessments must be separate and stand-alone.

A summary list of key project chapters and documents with information relevant to the HRA and this RIAA include:

- > Onshore EIAR (Volume 2): Main Report:
  - o Chapter 1: Introduction, provides a detailed account of the background to the Onshore Development, location of the Onshore Development and an overview of the main components of the Onshore Development for this HWL are seeking consent;

---

<sup>i</sup> Two indicative Onshore Substation locations (indicative substation location Option 1 and Option 2) have been identified within the Onshore EIAR and application. It is important to note that these indicative positions for the Onshore Substation and associated construction compound are not finalised within the Onshore Site. The final position will be subject to detailed design once planning permission in principle (PPP) is granted and will be subject to approval by THC through the application for Approval of Matters Specified in Conditions.

- Chapter 2: Legislation and Policy, outlines the consents framework, key legislation and policies that have been considered for the development of the Onshore Development throughout the EIA process;
  - Chapter 3: Site Selection and Alternatives, provides details of the process followed to determine the location for the Onshore Development and any alternative sites considered;
  - Chapter 5: Project Description, the Project Description provides a detailed description of the Onshore Development, including design parameters described in accordance with the Design Envelope Approach;
  - Chapter 9: Terrestrial Ecology, provides an assessment at the EIA level of potential effects from the Onshore Development's impacts to terrestrial ecological receptors. The Chapter provides a detailed baseline environment with respect to Terrestrial Ecology receptors relevant to the Onshore Development;
  - Chapter 10: Terrestrial Ornithology provides an assessment at the EIA level of potential effects from the Onshore Development's impacts to terrestrial ornithological receptors. The Chapter provides a detailed baseline environment with respect to Terrestrial Ornithology receptors relevant to the Onshore Development; and
  - Chapter 16: Summary of Residual Effects and Mitigation, summarises the residual effects on the receptors assessed within the EIAR and the committed mitigation measures within the chapters of the EIAR.
- > Onshore EIAR (Volume 3): Technical Appendices:
- Appendix 9.1: Terrestrial Ecology Baseline Survey Summary (Annex A-D), informs the terrestrial ecology baseline characterisation for the Onshore Development and the EIA/HRA assessments; and
  - Appendix 10.1: Baseline Ornithology Bird Survey 2021, informs the terrestrial ornithology baseline characterisation for the Onshore Development and the EIA/HRA assessments.

## 1.4 Structure of the HRA

The structure of this document is summarised below:

- > **Section 1:** Introduction. Provides the background of the Onshore Development, including the assessment process and supporting information.
- > **Section 2:** Legislation, Policy, and Guidance. Identifies the legislation, policy, and guidance driving the need for the RIAA and defining the structure and content of the report.
- > **Section 3:** Overview of the HRA Screening Process. Summarises the screening process and identifies relevant European Sites to be considered within this HRA assessment.
- > **Section 4:** HRA Consultation. Summarises the consultation that has taken place to date, with whom the consultation was undertaken and the date the consultation was conducted.
- > **Section 5:** Project Description. Outlines the Onshore Development parameters including the construction, operation and maintenance, and decommissioning phases.
- > **Section 6:** Embedded Mitigation. Outlines the embedded mitigation measures that have been incorporated into the Project Design Envelope (PDE) to prevent / reduce any potentially adverse effects on qualifying interests.
- > **Section 7:** Special Protected Areas with Terrestrial Ornithology Interests. Provides an assessment of potential effects on terrestrial ornithology qualifying interests.

- > **Section 8:** Special Areas of Conservation with Terrestrial Ecology Interests. Provides an assessment of potential effects on Annex II other qualifying interests.
- > **Section 9:** Conclusions of the Assessment. Summarises the conclusions of the potential adverse effects of the Onshore Development on qualifying interests, either alone or in-combination.
- > **Section 10:** References.

## 2 LEGISLATION, POLICY, AND GUIDANCE

### 2.1 Legislative Context

Under Article 6(3) of the Habitats Directive (92/43/EEC), a HRA is required where a plan or project is likely to have a significant effect on a protected European site (a Natura 2000 site) either directly or in combination with any other plan or project. These sites are a network of core breeding, overwintering and migration stopover sites for qualifying species, and some good examples of natural habitat types which are protected in their own right. These include SACs, SPAs, and Ramsar sites.

Within Scotland, the legislative drivers governing the need for HRA are:

- > The Conservation (Natural Habitats & c.) Regulations 1994, as amended (the 'Habitats Regulations');
- > The Conservation on Wetlands of International Importance especially as Waterfowl Habitat (the 'Ramsar Convention') (implemented through the Habitats Regulations); and
- > The Wildlife and Countryside Act 1981.

It is through the Habitats Regulations that the Habitats Directive (Council Directive 92/43/EEC) and the Birds Directive (Directive 2009/147/EC) have been transposed into Scottish Law.

The Habitats Regulations outline how development control decisions are considered which could directly, indirectly or in-combination with, affect a European Site. Article 6(3) of the Habitats Directive [92/43/EEC] states that:

*“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.”*

It is necessary in the first instance to determine whether it is possible to conclude that a proposed development will not give rise to LSE on a European Site. If it is not possible to conclude that the proposed development will not have a significant effect on the European Site (based on objective information and adopting a precautionary approach) an Appropriate Assessment will be required to be undertaken.

The Habitats Regulations require that an AA must be undertaken by a Competent Authority before any decision for consent should be granted for any project that could have adverse effects on the integrity of a European Site. The AA should be carried out in view of the conservation objectives of these sites.

#### 2.1.1 Habitats Regulations

Key legislation that should be considered in relation to the potential effects of the Onshore Development on ecologically designated sites has been summarised in Table 2.1 below.

Table 2.1 Legislation and policy relevant to ecologically designated sites

Designated site	Legalisation
SPA / SAC (United Kingdom [UK] National Site Network)	<ul style="list-style-type: none"> <li>&gt; The European Union (EU) Habitats Directive implemented through the Conservation (Natural Habitats &amp; c.) Regulations 1994 (as amended in Scotland) (the Habitats Regulations)</li> <li>&gt; Conservation of Habitats and Species Regulations 2017</li> </ul>
Ramsar Sites	<ul style="list-style-type: none"> <li>&gt; The Convention on Wetlands of International Importance especially as Waterfowl Habitat (the 'Ramsar Convention') (implemented through the Habitats Regulations)</li> </ul>

## 2.1.2 European Sites (post Brexit)

Following the UK's exit from the EU, SACs and SPAs designated under the UK and the Convention of Habitats and Species regulations 2017 no longer form part of the EU's Natura 2000 Network. These sites and new SPAs and SACs now form the UK National Site Network (as defined in the Habitats Regulations).

Despite the UK's exit from the EU, the HRA process remains unchanged (Scottish Government, 2020). UK planning policy also extended the definition of European Sites to include proposed and designated Ramsar wetland sites of international importance designated under the Ramsar Convention 1971. The Scottish Government policy on protecting Ramsar sites notes that where Ramsar Site interests coincide with Natura qualifying interests protected under an SPA or an SAC, as the case may be, the interests are given the same level of (legal) protection as Natura sites. The policy also notes that where Ramsar interests are not the same as Natura qualifying interests but instead match Sites of Special Scientific Interest (SSSI) features, these receive protection under the SSSI regime (Scottish Government, 2019).

## 2.2 The HRA Process

The Habitats Regulations are in place to protect European Sites and contain the procedural requirements for the HRA process to assess the potential effects of a development on the qualifying interests of these European sites (Scottish Government, 2020). As mentioned above, in the UK, the Habitats Regulations are extended to consider the potential impacts of a development on Ramsar sites where interests coincide with Natura qualifying interests protected under an SPA or an SAC.

The objectives of the Habitats Regulations in relation to the UK Site Network include:

- > To maintain and restore qualifying habitats and species listed under the Habitats Directive to a favourable conservation status; and
- > To ensure the survival and reproduction of qualifying species of wild bird within their area of distribution and to maintain populations at levels that correspond to ecological, scientific and cultural requirements, whilst taking account of economic and recreational requirements of the site.

NatureScot (formerly Scottish Natural Heritage [SNH]) guidance 'Natura sites and the Habitats Regulations. How to consider proposals affecting SACs and SPAs in Scotland. The essential quick guide' (SNH, 2014), discusses a staged process for the assessment of a project on European Sites. These key stages can be summarised as follows:

- > Stage One: Screening – to determine whether a proposal is likely to have a significant effect on a European Site, this stage does not take into account any embedded mitigation measures (other than the intrinsic project design) as detailed in Section 2.4;
- > Stage Two: Report to Inform Appropriate Assessment – to provide information to allow the Competent Authority to ascertain whether the proposal will or will not adversely affect the integrity of a European Site, this stage considers the embedded mitigation measures implemented for the Onshore Development (as detailed in Section 6);
- > Stage Three: Assessment of Alternative Solutions – if it cannot be ascertained that a European Site's integrity will not be adversely affected, alternative solutions will need to be considered; and
- > Stage Four: Assessment of 'Imperative Reasons of Overriding Public Interest' – if there are no alternative solutions which can be implemented to ensure no adverse effects on a European Site's integrity then an assessment of whether there are imperative reasons of over-riding public interest for the proposal will be undertaken.

Cumulatively, these stages are referred to as an HRA. This document has been prepared in support of Stage Two, Report to Inform Appropriate Assessment (RIAA). This HRA RIAA provides the Competent Authority with the information required to assist them in undertaking an AA and determine whether there is any 'adverse effect on site integrity' from the Onshore Development.



The latter stages become relevant if the RIAA cannot exclude the risk of an adverse effect on site integrity. These stages will be addressed in the event there is a negative outcome to the second stage (AA). The current report therefore presents the conclusions of Stage One and the findings of Stage Two. The findings do not identify any requirement to progress beyond Stage Two for the Onshore Development.

## 2.3 Guidance Documents

Within Scotland, the HRA process draws on guidance and advice provided by NatureScot, primarily through the HRA guidance document 'Habitats Regulations Appraisal of Plans. Guidance for Plan-making Bodies in Scotland' (Tyldesley and Associates, 2015). This guidance document outlines a 13-stage process of statutory procedures which are used to assess the LSE of a development on European Sites, these stages fall within the key stages of HRA as described above. This guidance is referred to under 'Planning Circular 6, 2013. Development Planning' (Scottish Government, 2013).

Other guidance documents that should be used to inform the HRA process include:

- > European Commission (2000). Article 6 - Managing and protecting Natura 2000 sites;
- > SNH (2000). Natura Casework Guidance: Consideration of Proposals affecting SPA and SAC. Guidance Note Series; and
- > Oxford Brookes (2001). Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC. November 2001.

## 2.4 Case Law

Where the RIAA indicates that there is the potential for significant effects on European Site qualifying interests, the project proposal will be reviewed in accordance with regulatory guidance and against current case law, following which THC would seek expert advice to identify and categorise the actual impacts of the development on European sites and qualifying interests, and identify what mitigation measures may be required.

### 2.4.1 The People Over Wind Court of Justice of the European Union Judgement

In April 2018 the European Court of Justice issued a judgement that clarifies the stage in the HRA process when mitigation measures can be taken into account in the assessment of LSE on a European site.

The judgement is in relation to how screening for potential LSE is carried out. The ruling specifically states that mitigation cannot be considered at screening (but remains applicable for the determination of adverse effect). This ruling was taken into consideration during the preparation of the HRA Screening Report (HWL, 2022), submitted to THC in August 2022. At that stage, no mitigation measures (both embedded and additional) were used to assess whether the Onshore Development could have potential LSE on any European Sites.



### 3 OVERVIEW OF THE HRA SCREENING PROCESS

#### 3.1 Screening Process Undertaken for the Project

As required under Stage 1 of the HRA process, HWL undertook an HRA Screening exercise to inform the scope of this RIAA. This Phase 1 HRA Screening was provided within an HRA Screening Report (HWL, 2022) which was submitted to THC in August 2022. NatureScot was also consulted on the HRA Screening Report. The consultation responses received are discussed in Section 4.

The HRA Screening Report (HWL, 2022) considered sites to be assessed for LSE under the Habitats Regulations. All other designated sites such as SSSIs have been fully assessed within the Onshore EIAR where relevant.

As per 'The People Over Wind' Case Law (see Section 2.4.1), no mitigation measures, other than those intrinsic to the project design, were used to assess the potential for LSE on a European Site's integrity at screening stage.

During the screening exercise, the criteria outlined in Table 3.1 were used to identify connectivity between the Onshore Development and European Sites or Ramsar Sites.

Table 3.1 Criteria used for Identification of European Sites and Ramsar sites

Criteria
<ul style="list-style-type: none"> <li>&gt; There is direct spatial overlap between the Onshore Development and a European Sites or Ramsar Sites</li> <li>&gt; There is spatial overlap between the secondary effect footprint<sup>ii</sup> of the Onshore Development and European Sites or Ramsar Sites</li> <li>&gt; The European Sites or Ramsar Sites host a mobile population of qualifying interests (e.g. Annex II Species and/or Ornithology interests) or support a habitat for the qualifying feature that may directly interact with the Onshore Development</li> <li>&gt; The European Sites or Ramsar Sites host a mobile population of qualifying interests (e.g. Annex II Species and/or Ornithology interests) or support a habitat for the qualifying feature that may directly interact with the secondary effect footprint of the Onshore Development</li> </ul>

##### 3.1.1 Designated Site Identification

The identification of designated sites to be considered for potential LSE was undertaken with reference to the qualifying species / interests of the European Sites or Ramsar designated sites in line with the following process:

- > Identifying the range of potential impacts that the Onshore Development could have on European Sites or Ramsar sites qualifying interests (impact pathways); and
- > Determining connectivity between the Onshore Development and the European Sites or Ramsar sites.

Table 3.2 summarises the criteria used to identify the designated sites that would require further assessment within the RIAA based on the above criteria.

<sup>ii</sup> This is considered to occur where indirect effects from the Onshore Development (e.g. water quality effects) overlaps with a European Site or Ramsar site qualifying species or habitat.

Table 3.2 Designated Sites Requiring Further Consideration

Designated Site	Criteria
SPAs and Ramsar sites protected for ornithological features	<p>These sites have been short-listed on the basis of potential for connectivity between the Onshore Development. NatureScot (formally SNH) guidance (SNH, 2016) has been followed to identify sites with potential connectivity, for example with respect to the foraging distances of breeding raptors and diver species and wintering geese and swans. All SPAs/ Ramsar sites within 25 km of the Onshore Development were screened for potential connectivity, a map of these sites is provided in Figure 3.1 below.</p> <p>With the exception of North Caithness Cliffs SPA which is adjacent to the Onshore Site (&lt;100 m), other more distant (i.e. beyond 25 km) seabird breeding colony SPAs were not examined for connectivity because no seabird qualifying species are likely to be impacted by the Onshore Development activities; the HRA screening for the Offshore Development considers potential impacts on other breeding seabird colony SPAs.</p>
SACs (including proposed and candidate sites) with Annex II Species as a qualifying interest (excluding SACs designated for Annex II migratory fish species <sup>iii</sup> )	<p>SACs (including proposed and candidate sites) with Annex II Species that are located within 20 km of the Onshore Development, and which have theoretical connectivity with the Onshore Development. This range has been established based on the home ranges of male coastal otters, as the Onshore Development is at the seashore, and as such otters present would likely be coastal in habit. These otters generally have smaller home ranges than those inland, with males holding larger territories than females, being up to 20 km in length (Chanin, 2013). A map of these sites is provided as Figure 3.2 below. For SACs identified under this criterion, only Annex II Otter and Marsh Saxifrage features are designated.</p>
SACs (including proposed and candidate sites) with Annex I Habitats e.g. vegetated sea cliffs, plants etc. as a qualifying feature	<p>SACs (including proposed and candidate sites) with Annex I Habitats which are within approximately 20 km or have hydrological connectivity with the Onshore Development, and therefore which have theoretical connectivity with the Onshore Development. A map of these sites is provided as Figure 3.2 below.</p>

<sup>iii</sup> River SACs for which Annex II migratory fish species are a feature are not included within the Onshore HRA Screening Report. These will be considered separately within the Offshore RIAA as there is no potential for connectivity and resultant LSE from the PFOWF Onshore Development infrastructure and terrestrial activities (to MLWS) for these features as all river catchments for these SACs are outwith the Onshore Development.

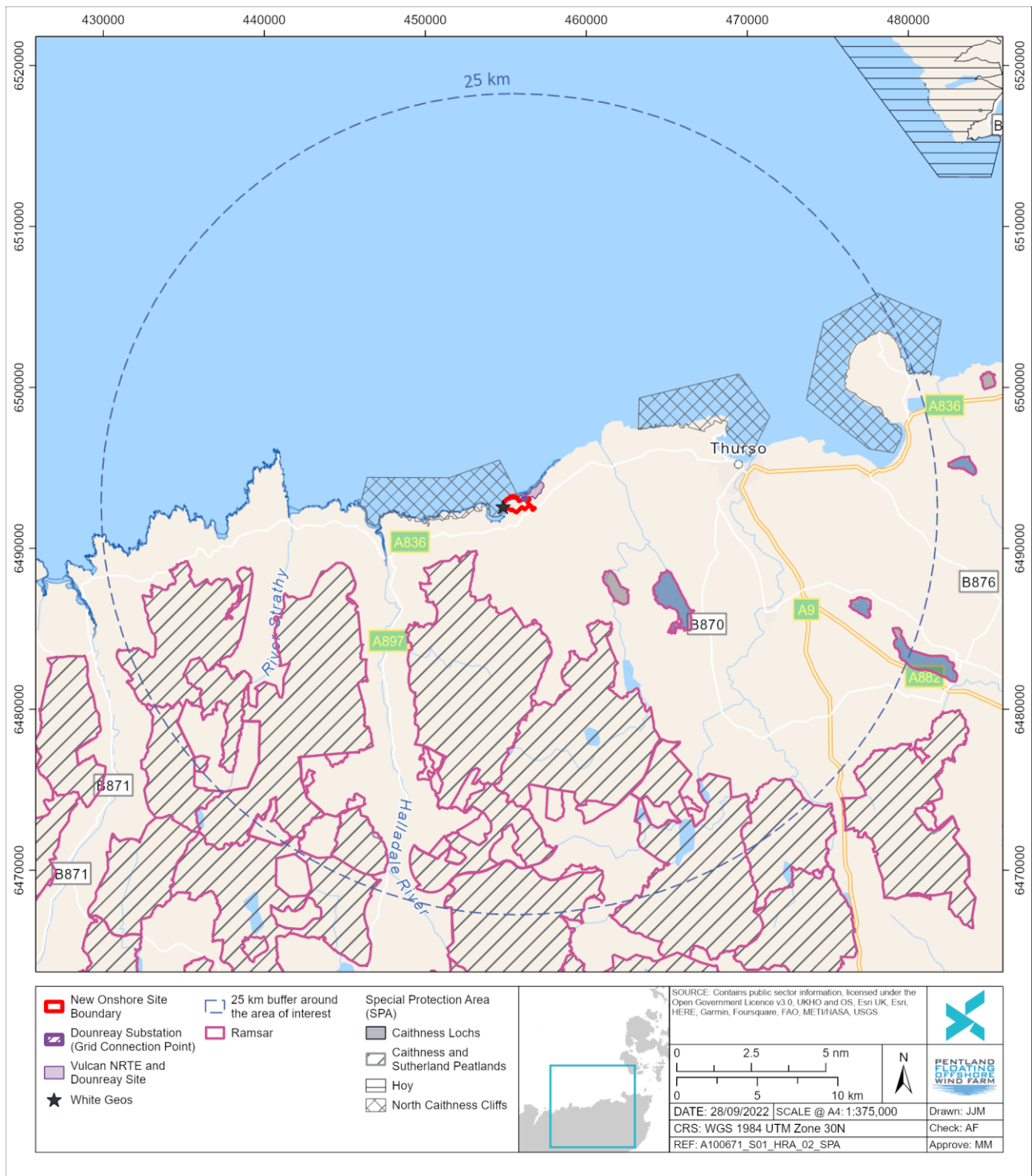


Figure 3.1 SPAs/ Ramsar sites within 25 km of the Onshore Development



Figure 3.2 SACs with Annex II Species that are located within 20 km of the Onshore Development

## 3.2 Special Areas of Conservation and Interests Screened In

Table 3.3 present the SACs screened into the RIAA as a result of the initial Screening exercise undertaken and the justification for the screening decision. Only one SAC has been screened in based on the initial screening exercise – the Caithness and Sutherland Peatland SAC. This SAC is also shown on Figure 3.2.

Table 3.3 SACs Screened in for assessment

Site name	Qualifying interest(s) screened in	Distance to the Onshore Site	Requirement for further assessment
Caithness and Sutherland Peatlands SAC	Annex II Species: Otter	3.4 km	An otter spraint was found within the terrestrial ecology search area during the ecology surveys undertaken for the Onshore Site in 2021. The Onshore Development site offers poor foraging habitat for this species, and there are no opportunities for holts. As such it is considered that otters only occasionally travel over the site. Therefore, LSE cannot be ruled out.

## 3.3 Special Protected Areas / Ramsar Sites and Interests Screened In

Table 3.4 lists the SPAs/ Ramsar sites and relevant qualifying interests screened into the Onshore RIAA on the basis of the initial screening exercise undertaken (HWL, 2022), the criteria in Table 3.1 and as a of consultation received from NatureScot.in response to the HRA Screening Report. The location of these SPA / Ramsar site is shown in Figure 3.2.

It should be noted, as detailed in Section 1.2, that potential impacts considered in the Onshore RIAA are limited to consideration of those arising from the Onshore Development. The potential impacts of offshore activities on designated sites are assessed in the Offshore RIAA, including all potential effects on seabird species. Where a terrestrial designated site has potential connectivity with any aspect of the Offshore Development (e.g. the WTGs), this is considered in the Offshore EIAR and the associated Offshore RIAA.

Table 3.4 SPAs/ Ramsar Sites Screened in for assessment

Site name	Qualifying interest(s) screened in	Distance to the Onshore Site <sup>iv</sup>	Requirement for further assessment
Caithness Lochs SPA / Ramsar Site	Greylag goose ( <i>Anser anser</i> ), non-breeding	6.3 to 35.7 km	Occasionally recorded during 2021 and 2015 baseline surveys in Onshore Site and adjacent fields in small to moderate numbers. SNH Guidance (2016) states that core range from night-time roost sites is 15-20 km. Therefore, LSE cannot be ruled out.
North Caithness Cliffs SPA	Peregrine ( <i>Falco peregrinus</i> ) breeding	<100 m to 45.7 km	NatureScot advised that this qualifying interest should be screened-in for assessment.  Peregrine was not recorded during 2015 or 2021 baseline surveys; however it is likely that this species occasionally hunts over the Onshore Site and its vicinity. Peregrine is known to have nested locally, though not in recent years. Therefore, LSE cannot be ruled out.  Note, the potential for impacts on the breeding seabird qualifying interests of this SPA from the

<sup>iv</sup> For ornithology features this distance presents the closest point and farthest point of the SPA concerned as to give a more accurate representation of potential connectivity.

Site name	Qualifying interest(s) screened in	Distance to the Onshore Site <sup>iv</sup>	Requirement for further assessment
			Offshore Development are examined in the Offshore RIAA.
Caithness and Sutherland Peatlands SPA	Red-throated diver ( <i>Gavia stellata</i> ), breeding Common scoter ( <i>Melanitta nigra</i> ), breeding	3.3 to 77.6 km	<p>NatureScot advised that these qualifying interests should be screened-in for assessment.</p> <p>Red-throated divers occasionally forage locally to the Onshore Site in Sandside Bay in the summer months. Sandside Bay lies within the foraging range distance (assumed 10 km) of red-throated divers breeding at closest SPA breeding lochs, and therefore there is potential for connectivity to the SPA.</p> <p>Similarly, there is a possibility (Hancock <i>et al.</i>, 2019) that breeding common scoters from this SPA also use the inshore waters of Sandside Bay for foraging during the breeding season. There is therefore a theoretical potential for connectivity. However this species was not recorded during baseline surveys.</p> <p>The potential for construction activities to disturb red-throated diver and common scoter using Sandside Bay provides a potential impact pathway for the Onshore Development to impact on these two species and therefore LSE cannot be ruled out.</p> <p>Note, the potential for the Offshore Development to impact the red-throated diver qualifying interests of this SPA are examined in the Offshore RIAA.</p>

### 3.4 Potential Impacts Considered at Screening

Table 3.5 details the potential impacts which have been screened into the RIAA based on the screening exercise undertaken for each stage of the Onshore Development (construction, operation [including maintenance and repair] and decommissioning<sup>v</sup>).

Table 3.5 Potential Impacts screened in on Designated Sites and Qualifying Features

Receptor	Potential Impact	Project phase (Y/N)		
		Construction	Operation	Decommissioning
Caithness Lochs SPA/Ramsar site (Greylag goose, non-breeding)	Disturbance and/or displacement from foraging areas	Yes	Yes	Yes
	Foraging habitat loss/change	Yes	Yes	Yes
Caithness and Sutherlands Peatlands SPA/ Ramsar site	Disturbance and/or displacement from foraging areas	Yes	No	Yes

<sup>v</sup> Assumed that decommissioning impacts are the same or less than those of construction.

Receptor	Potential Impact	Project phase (Y/N)		
		Construction	Operation	Decommissioning
(Red-throated diver and common scoter, breeding)				
North Caithness Cliffs SPA (peregrine, breeding)	Disturbance and/or displacement at breeding sites	Yes	No	Yes
Annex II Species (Otter)	Foraging habitat loss/change (Otters)	Yes	Yes	Yes



## 4 HRA CONSULTATION

### 4.1 Consultation and HRA Screening

As part of stage one of the HRA process, consultation with key stakeholders was undertaken by HWL. A Screening Report (HWL, 2022) was submitted to THC (who consulted with NatureScot) in August 2022 which outlined the details of the Onshore Development and an assessment of whether, in view of the best scientific knowledge, there is potential for the Onshore Development, individually or in combination with another plan or project, to have an LSE on a European site. Where LSE could not be excluded, these have been carried forward for assessment in this RIAA. A Screening Opinion was received from THC on the 9<sup>th</sup> October 2022 and responses are presented in this RIAA. These comments, together with HWL responses have been summarised in Table 4.1.

HWL will maintain communication with key statutory and non-statutory stakeholders throughout the HRA process to capture and address comments regarding the Onshore Development.

Table 4.1 Consultee responses to Screening Report

Consultee	Topic	Consultee Comment	Response
NatureScot	Selection of relevant SPA	North Caithness Cliffs SPA should be screened in	The breeding peregrine qualifying feature of has been screened-in for assessment of potential effects from the Onshore Development only.  All potential impacts on this SPA's seabird qualifying interests would arise from the Offshore Development only. Therefore, the seabird interests are screened-in for assessment in the Offshore RIAA. In addition, the Offshore RIAA also examines if the offshore export cable passing through the marine extension of the SPA could give rise to effects that impact on the qualifying species, including disturbance, displacement, seabed habitat loss and changes to prey distribution.
		Fulmars should be screened in for assessment.	NatureScot advised that fulmars (a qualifying breeding seabird interest of the North Caithness Cliffs SPA) nest to the east side of Sandside Bay, close to the Onshore Site and adjacent to the marine extension, and could therefore potentially be affected by the Onshore Development construction works. However, this information is outdated. Although fulmars formerly bred on the east side of Sandside Bay (presumably on the low cliffs) they have not nested at this location in recent years. The Seabird 2000 census recorded 59 pairs in the relevant count section in June 2000 (SMP Database, Site ID 80338), however no breeding fulmars were recorded there in the baseline surveys undertaken in 2015 (Dounreay Tri, 2016) and in 2021 (Onshore EIAR, Volume 3 Appendix 10.1), nor in seabird colony counts undertaken in 2016 (SMP database). Therefore, this species remains screened out of assessment in this Onshore RIAA.
		The Caithness and Sutherland Peatlands SPA breeding red-	The breeding red-throated diver and breeding common scoter qualifying interests are



		throated diver and breeding common scoter qualifying interests should be screened-in for assessment because these species potentially use marine foraging areas in the breeding season close to the Onshore Development.	<p>screened-in for assessment of potential effects from the Onshore Development only.</p> <p>The Offshore RIAA examines the potential for the Offshore Development to lead to disturbance and displacement of red-throated divers.</p>
--	--	--	--

## 5 PROJECT DESCRIPTION

### 5.1 Introduction

As set out in Section 1.3, a full description of the Onshore Development is provided in Onshore EIAR (Volume 2): Chapter 5: Project Description. The following information within this section provides a summary of the key maximum Design Envelope parameters for the Onshore Development infrastructure that are relevant to the assessment provided in this RIAA.

### 5.2 Design Envelope Approach

The Onshore Development has adopted a Design Envelope approach to the assessment and application. This is because at this early stage in the development process for the Onshore Development it is not possible to finalise the specifics of the project design, due to:

- > Procurement and supply chain considerations associated with emerging technologies;
- > The timing of investment decisions; and
- > Further site investigations which will inform the final project design.

Throughout the RIAA (and EIAR) the parameters comprising the Onshore Development follow this Design Envelope approach which assesses the potential impacts of the Onshore Development based on the worst case parameters. The worst case parameters identified and assessed are the most realistic scenario that would give rise to the greatest potential impact for the topic assessed, therefore they are considered to provide a cautious worst case assessment. This approach ensures that the scenario that would have the greatest impact (e.g. largest footprint) is assessed for each relevant receptor; it can then be assumed that any other (lesser) scenarios will have an impact that is no greater than that assessed.

The final Design Envelope of the Onshore Development, as presented within Onshore EIAR (Volume 2): Chapter 5: Project Description, has been refined during the EIA process from that presented in the Scoping Report (HWL, 2020) and Scoping Report Addendum (HWL, 2022). Stakeholder comments received in the Scoping Opinion, the Scoping Opinion Addendum, during consultation meetings and at public events have also been considered. The Design Envelope presented represents the different design parameters still under consideration and will be further refined as the development of the Onshore Development progresses. Further details of the Design Envelope refinement are provided within Section 5.4 below.

For brevity, as the full Onshore Development Design Envelope (set out in Onshore EIAR (Volume 2): Chapter 5: Project Description) does not apply to each receptor group, it has not been repeated here in its entirety. A summary of the key maximum Design Envelope parameters relevant to this RIAA for the Onshore Development infrastructure is provided below in 5.5.

The specific parameters within the Design Envelope that are relevant to the receptor assessments in this RIAA are presented within the relevant assessment sections of this report.

### 5.3 Embedded Mitigation and Management Plans

As part of the Onshore Development design process, a number of designed-in measures and management plans have been proposed to reduce the potential for impacts on receptors. As there is a commitment to implementing these measures which will likely be secured through planning permission conditions, they are considered inherently part of the design of the Onshore Development and have therefore been considered in the assessment presented below (i.e. the determination of significance of effect assumes implementation of these embedded mitigation measures). These measures are considered standard industry practice for this type of development. These embedded measures for the receptors assessed are further discussed in Section 6 below.

As detailed in Section 2.4.1, in line with case law, mitigation measures (both embedded and additional) were not used during the screening stage of the HRA. That is, they were not used to assess the potential for LSE on a European Site's integrity.

## 5.4 Onshore Development Alternatives

As set out in Section 1.3, the process to develop alternatives for the Onshore Development Design Envelope is detailed within Onshore EIAR (Volume 2): Chapter 3: Site Selection and Alternatives. This chapter of the EIAR explains how the Design Envelope has been refined since Screening and the design parameters that have been taken forward for the assessments as summarised below in Section 5.5.

In selecting an offshore export cable corridor for the Project, the following factors were considered and weighted:

- > Suitability of landfall options;
- > Minimisation of potential environmental impact(s);
- > Cable stability and protection;
- > Minimisation of the number of cable and pipeline crossings;
- > A route that is as direct as possible, when considering the above; and
- > The potential onshore route to the grid connection point.

Three OECC and landfall options were considered, at Melvich Bay, Crosskirk Bay, and Dounreay. Sandside Bay was considered as a fourth, alternative landfall option.

Dounreay was chosen as it avoids crossing environmentally designated sites or features, and significantly reduces the length of the onshore and offshore export cable corridors, thereby reducing potential environmental impacts as well as costs, transmission losses, and delivery risk. Whilst this location requires crossing the Dounreay Food and Environment Protection Act Closure zone and intersects an SPA designated for ornithology features, these risks can be managed through careful planning and the implementation of suitable controls and mitigations, such as tailored construction techniques and methods.

A full description of the Onshore Development Design Envelope refinements is provided in the Onshore EIAR (Volume 2): Chapter 3: Site Selection and Alternatives.

The key parameters for the Onshore Development of relevance to the assessments within this RIAA are summarised in Section 1.2 above and below in Table 5.1.

Within the assessments undertaken in this report, a worst case scenario (WCS) has been defined for each of the receptors, based on the parameters that would give rise to the greatest level of impact. These receptor WCS are defined within each of the specific receptor assessments within this document.

As described above the full details of the Onshore Development are provided in in Onshore EIAR (Volume 2): Chapter 5: Project Description.

**Table 5.1 Key Onshore Development Parameters**

<b>Project aspect</b>	<b>Description</b>	<b>Worst case parameters</b>
Landfall + Horizontal Directional Drilling (HDD)	The landfall location will be situated in an area between the boundary of the Vulcan NRTE at the east of the Onshore Site and the White Geos (adjacent to Sandside Bay) at the west of the Onshore Site (as shown in Figure 5.1). HDD at a point along this location will be required to bring the export cables ashore.	No. Drilled Holes: <b>2</b> (up to 5 attempts) HDD Bore Diameter: <b>750 mm</b> HDD Compound Area: <b>5,600 m<sup>2</sup></b>
Transition Joint Bay (TJB)	At the cable landfall point, a concrete TJB may be required to house the joint between the offshore export cables and onshore cables. The TJB would be located above Mean High Water Springs (MHWS).	No. TJBs: <b>1</b> Length: <b>15 m</b> Width: <b>5 m</b> Depth: <b>2.5 m</b> Excavated Materials: <b>187.5 m<sup>3</sup></b>
Onshore Cable Circuit(s)	There will be a maximum of two High Voltage Alternating Current (HVAC) onshore cable circuits that will be installed in a maximum of two excavated trenches along the cable route. Each circuit will contain 3 x single core aluminium or copper conductor XLPE or other solidly insulated material. The overall distance of the onshore cable circuits will depend on the location of the landfall and Onshore Substation, but will be no greater than 2 km.	No. Onshore Cable Circuits: <b>Up to 2 (110 kV)</b> Length: <b>Up to 2 km</b> Installation: <b>OCT<sup>vi</sup></b> No. Trenches: <b>Up to 2</b> Trench Width: <b>Approximately 3 m per trench</b> Trench Depth: <b>Up to 2 m</b> Working Corridor: <b>Approximately 20 m per circuit</b> Excavated Materials: <b>Up to 12,000 m<sup>3</sup></b>
Cable Joint Bays (CJB)	Cable Joint Bays (CJBs) are typically required every 500 - 1,000 m to string together the onshore cable sections depending on the manufacturing specification of the cable supplier.	No. CJBs: <b>4</b> CJB Length: <b>5 m</b> CJB Width: <b>1.5 m</b> CJB Depth: <b>1.5 m</b> Excavated Materials: <b>45 m<sup>3</sup></b>
Onshore Substation <sup>vii</sup>	The Onshore Substation will include the electrical equipment required to connect the Onshore Development	Substation Width: <b>Up to 65 m</b> Substation Length: <b>Up to 65 m</b>

<sup>vi</sup> Although Open Cut Trenching (OCT) is the primary installation method, HDD may be required if there are any sensitive features such as water courses which need to be avoided. A much smaller drilling rig and working area (20 m x 20 m) would be required with OCT installation when compared to the landfall HDD operations.

<sup>vii</sup> As noted in Section 1.2 above, whilst two indicative Onshore Substation locations have been identified within the Onshore EIAR, it is important to note that these indicative positions for the Onshore Substation and associated construction compound are not finalised within the Onshore Site. The final position will be subject to detailed design once planning permission in principle (PPP) is granted and will be subject to approval by THC through the application for Approval of Matters Specified in Conditions.

Project aspect	Description	Worst case parameters
	<p>to the grid. The Onshore Substation may include switchgear, transformers, harmonic filter, reactive compensation devices, protection equipment, batteries and other auxiliary equipment. The substation will be located within or at close proximity to a construction compound which will also house other ancillary plant items such as offices, parking, fuel storage etc.</p> <p>External lighting will be used to illuminate the building, but this will be intermittent and only used when people are on site. Passive infrared (PIR) sensor lighting may be provided around the external perimeter of the buildings.</p>	<p>Substation Height <b>Up to 14 m</b></p> <p>Substation Footprint <b>Up to 4,225 m<sup>2</sup></b></p> <p>Construction Compound Footprint <b>Up to 6,975 m<sup>2</sup></b></p> <p>Combined Footprint: <b>Up to 11,200 m<sup>2</sup></b></p>

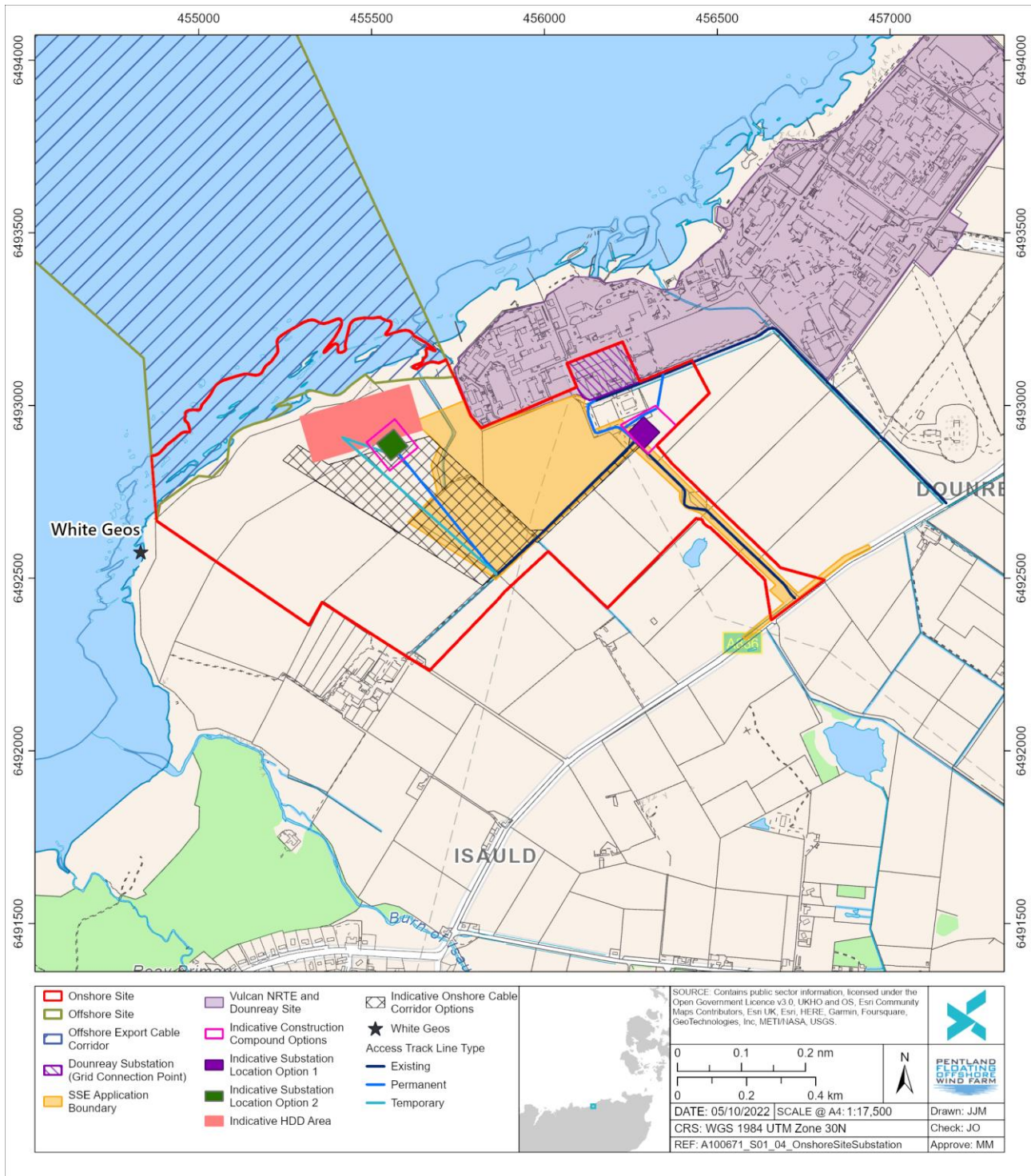


Figure 5.1 Site Layout Plan



## 5.5 Indicative Construction Programme

A detailed construction programme will be developed as design and procurement activities progress. The offsite fabrication activities for the Onshore Development are planned to commence upon financial close, anticipated in Q4 2023, and will continue for a period of approximately 18 months.

Activities may not be continuous, and the sequence of activities may change. Engineering and procurement activities may overlap with certain development construction activities. The main construction activities and their anticipated high-level durations are outlined in Figure 5.2 Indicative Construction Programme. It should be noted that these dates are indicative at this stage and will be confirmed following consent (if granted) when the construction programme is finalised.

Figure 5.2 Indicative Construction Programme

Task	2024												2025					
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
Enabling Works																		
Access Roads																		
Substation Civil Works																		
Plant Delivery																		
Services & Plant Installation																		
Intertidal Works																		
Onshore Cabling																		
Electrical Plant Installation																		
Drainage																		
Landscaping																		
Commissioning																		

## 5.6 Operation and Maintenance

Following commissioning, it is assumed that the Onshore Substation will operate continuously (24 hours a day, seven days a week) except during planned shutdowns for maintenance.

There will be a limited amount of traffic to and from the Onshore Substation for general operation and maintenance purposes. This is estimated to be around four vehicles per month carrying up to three persons per vehicle. Beside this, the Onshore Substation will be unmanned during operation and there will be no day-to-day personnel on site in normal operation.

Unexpected faults may lead to increasing traffic volumes depending on the type of fault. Fault signals can be monitored remotely, however, if the fault cannot be dealt with remotely a site visit would be required. Backup diesel generator low fuel alarm would require site visit to re-fuel. A monthly site visit will be required for visual inspection of site security systems and general state of play. Closed-circuit television (CCTV) may be installed for the operational stage of the Onshore Substation.

Routine activities on the underground cable system during the operational phase will be regular and ad-hoc visits to the manholes as required for inspection/maintenance purposes. Non-routine activities could include repair of damage to cables or replacement of failed cable joints.

An Operational Environmental Management Plan (OEMP) will be written, remain a live document and adhered to throughout the lifespan of the Project. The OEMP will also set out the procedures for managing and delivering the specific environmental commitments as per each technical chapter for each receptor over the operational period.

## 5.7 Decommissioning

It is anticipated that the Onshore Development will be decommissioned following the end of the Onshore Substation's operational life which is not fixed but would be for the lifespan of the Project. Decommissioning works are likely to be of a similar nature and duration as construction activities, and the potential effects resulting from decommissioning are likely to be similar to those resulting from construction.

The specific details of decommissioning are currently unknown, in terms of activities and duration, and it is not certain what guidance will be applicable at the time of decommissioning. A Decommissioning Plan will be prepared prior to decommissioning. Decommissioning activities will be undertaken in accordance with applicable guidance at the relevant time.



## 6 MITIGATION AND MANAGEMENT PLANS

As described in Section 5.3 a number of embedded mitigation measures and management plans have been incorporated into the Project Design Envelope to prevent/reduce any potential adverse effects on receptors where possible. These embedded mitigation measures and management plans have been accounted for in this RIAA when assessing the potential magnitude of effect from the identified impacts.

As detailed in Section 2.4.1, in line with case law, these embedded mitigation measures were not used during the screening stage of the HRA, that is, they were not used to assess the potential for LSE on a European Site's integrity.

In addition to embedded mitigation and management plans, in some cases additional mitigation may be required, where measures are required to prevent or reduce any remaining potential adverse effects. These are considered and detailed in any integrity test where they may be required.

### 6.1 Embedded Mitigation and Management Plans

Embedded mitigation measures and management plans considered relevant to the receptors assessed within this RIAA are provided below in Table 6.1. These mitigations form part of the application and will be described in detail during condition discharge stage, should permission be granted.

Table 6.1 Embedded Mitigation Measures and Management Plans for the Onshore Development

Embedded Mitigation Measures and Management Plans	Justification	Receptor Applicable to in this RIAA
Management Plans		
Construction Environmental Management Plan (CEMP)	The CEMP will set out procedures to ensure all activities with potential to affect the environment are appropriately managed and will include: Pollution Prevention Plan, Waste Management Plan, Wet-Weather Protocol, Oil Spill Contingency Plan, , Noise Management Plan, Dust Management Plan, and Site Compound and Welfare Plan.	Ornithology and Ecology
Habitat Reinstatement	The CEMP will detail Habitat Reinstatement protocols recommended for areas of temporary construction works (e.g. HDD compound, cable route and temporary access track).  Where habitat is to be reinstated, turfs will be removed to a suitable storage point where they will be maintained during works. Topsoil and subsoil, where applicable, will also be stored separately, and excavations backfilled with these materials to maintain the original stratification as well as is practical. Turfs will then be replaced as close to their original location as possible. Due to the temporary and short-term nature of most construction activities, this method will allow the reinstatement of habitat immediately after works are completed in a given area.	Ornithology and Ecology
A Breeding Bird Protection Plan (BBPP)	The BBPP will be implemented if construction (or decommissioning) occurs during the breeding season (April to July). This would include a breeding bird survey to be undertaken ahead of works commencing, and updated as work progress as appropriate, to identify specific ornithological sensitivities, including nest sites. The BBPP would ensure compliance with the WCA legislation through identifying specific breeding bird sensitivities and putting in place appropriate measures to prevent disturbance and safeguarding nest sites.	Ornithology

Embedded Mitigation Measures and Management Plans	Justification	Receptor Applicable to in this RIAA
	Full details of the measures will be included in the CEMP to be produced and approved by THC prior to construction commencing.	
Pollution Prevention Plan	<p>The CEMP will include a Pollution Prevention Plan (PPP) in accordance with SEPA's Pollution Prevention Guidelines. Measures set out within the PPP would seek to:</p> <ul style="list-style-type: none"> <li>&gt; Ensure there would be no increase to flood risk or impact on drainage;</li> <li>&gt; Reduce sediment being disturbed and moved down gradient;</li> <li>&gt; Reduce (and preferably avoid) the impact on biodiversity;</li> <li>&gt; Ensure careful storage and disposal of waste;</li> <li>&gt; Prevent pollution of watercourses, for example from construction debris or contaminated Land;</li> <li>&gt; Prevent pollution from static plant, mobile machinery, refueling and material storage;</li> <li>&gt; Prevent or reduce impacts on habitats and wildlife; and</li> </ul> <p>Prevent the spread of invasive non-native species or plant or animal diseases.</p>	Ecology
Environmental Clerk of Works (ECoW)	An independent ECoW will be appointed to audit site activities and will advise on implementation of mitigation.	Ornithology and Ecology
Onshore Construction Method Statement (CMS)	A Construction Method Statement (CMS) will be developed in accordance with the CEMP detailing how project activities will be carried out, highlighting any possible dangers/risks associated with particular Onshore Development activities.	Ornithology and Ecology
Drainage Strategy (DS)	Prior to construction, a DS for the Onshore Development will be prepared. The DS will detail the site drainage design e.g. Sustainable Drainage Systems (SuDS) if required, including any necessary ponds, swales, cross drains and bunds, to ensure that runoff from hard surfaces within the substation / switchgear will be controlled and managed. The DS will also include reference to Flood Risk Assessment (as detailed below) and will further detail how groundwater flows will be maintained around sub-surface structures such as substation foundations and cable ducts. The DS would be submitted to THC consultees for the agreement prior to construction.	Ornithology and Ecology
Operational Environmental Management Plan (OEMP)	An OEMP will be prepared to guide on-going operations and maintenance activities during the lifetime of the Project. The OEMP will also set out the procedures for managing and delivering the specific environmental commitments as per outlined in the Onshore EIAR for each receptor over the operational period.	Ornithology and Ecology
Decommissioning Plan	A Decommissioning Plan will be prepared prior to decommissioning. Decommissioning activities will be undertaken in accordance with applicable guidance at the relevant time. The plan will include any measures required to protect ecological and ornithological features during	Ornithology and Ecology

Embedded Mitigation Measures and Management Plans	Justification	Receptor Applicable to in this RIAA
	decommissioning which are likely to be similar to those proposed within the CEMP.	
<b>Embedded mitigations</b>		
Best Practice in relation to Breeding Birds	<p>Where possible, works will be scheduled to avoid the breeding season (April to July). Where this is not possible and works are required to commence or continue during the breeding season, the required measures will be taken to avoid disturbance to ground nesting birds, nests, eggs and chicks which will be detailed within the BBPP.</p> <p>Full details of the measures will be included in the CEMP to be produced and approved by THC prior to construction commencing. This reduces likelihood of disturbance to ground-nesting birds (e.g., curlew, lapwing and skylark) and the accidental destruction of legally protected nests, eggs and chicks.</p>	Ornithology
Protection measures for high-tide wader roost sites	<p>The vicinity of the roost site on rocks at on the north coast of the Onshore Site (OS grid reference ND 97200/66800) will be avoided as far as practically possible to minimise disturbance.</p> <p>As detailed in Chapter 10: Terrestrial Ornithology (Volume 2) of the Onshore EIAR, the Sandside Bay wader roost site will remain free of disturbance and therefore available as an alternative roost site should HDD activities result in disturbance to birds using the roost site on the north coast. There are also other alternative high-tide roost sites locally available, for example the foreshore rocks on the west side of Sandside Bay and, further to the east along the coast adjacent to Vulcan NRTE and Dounreay sites.</p>	Ornithology
Restoration of grassland habitats damaged during construction	In recognition of its importance to ground-nesting birds (e.g., curlew, lapwing and skylark) any semi-improved coastal grassland habitat that is damaged by construction activity (or decommissioning) will be restored to a condition that is of equal or greater value to ground-nesting birds.	Ornithology
Avoidance of the Sandside Bay SSSI.	The boundary of the Onshore Site has been developed to ensure there is no direct interaction with these features from the Onshore Development to reduce any potential environmental effects on the protected features of the SSSI.	Ecology
No devegetation or groundbreaking works shall occur within 50 m of the cliff edge	No works are to occur within 50 m of the cliff edge this. This will ensure that sensitive coastal habitats and species are not adversely affected by the construction, operation or decommissioning works for the Onshore Development.	Ecology
Measures to protect GWDTEs.	Where possible, the following buffers between GWDTEs and excavations will be implemented: 250 m for the Onshore Cable Circuit(s) route and any other excavations greater than 1 m in depth; and 100 m for excavations less than 1 m in depth. If the Onshore Cable Circuit(s) corridor route is located within 250 m of any GWDTEs, clay stoppers will be included in the cable trench to prevent them from acting as preferential pathways for drainage.	Ecology

Embedded Mitigation Measures and Management Plans	Justification	Receptor Applicable to in this RIAA
	This process will be detailed and secured through the CEMP.	
Best Practice Measure in relation to locally occurring terrestrial mammals / ecology	<p>The CEMP will ensure all trenches and excavations will be fenced or covered over at night to prevent any animals from falling in and becoming trapped. If this is not possible, an adequate means of escape must be provided (i.e. a gently graded side wall or provision of gently sloped wooden plank or equivalent).</p> <p>Piping will be capped to avoid its potential use as refugia by animals.</p>	Ecology
Measures to prevent harm to protected mammals and reptiles.	<p>Pre-construction surveys for protected mammal and reptile species will be undertaken to identify any species making use of the Onshore Site ahead of works.</p> <p>Should any protected species be identified, specific mitigation would need to be developed in consultation with NatureScot.</p> <p>Pre-construction surveys will identify features with the potential to be used by reptiles as hibernation sites. Wherever possible works will avoid impacts on these features by micro-siting. Where this is not possible, potential hibernation features will be dismantled under the supervision of a suitably qualified and experienced ECoW, outwith the hibernation season (September to March inclusive) (Cathrine, 2018).</p> <p>Specific mitigation to be detailed in the CEMP.</p>	Measures to prevent harm to protected mammals and reptiles.
Measures to prevent the disturbance, modification or destruction of bat roosts.	<p>Survey limitations outlined in Section 9.5.5 'Data Gaps and Uncertainties' are considered to have resulted in a data gap for determining bat roost potential in buildings. Therefore, a precautionary approach has been taken to mitigation by assuming bat roost potential for all farm buildings present and applying a general buffer area – no works are to take place within 30 m of any buildings. If works cannot be avoided within the recommended buffer area, and significant direct or indirect impact is still anticipated, detailed preliminary roost assessments and bat activity surveys are to be undertaken prior to commencement of works. In the event that a bat roost is identified within the 30 m buffer, it may be necessary to secure a bat derogation licence prior to works commencing.</p> <p>Specific mitigation to be detailed in the CEMP.</p>	Measures to prevent the disturbance, modification or destruction of bat roosts.
Ecology Watching Brief	<p>The CEMP will include details of a watching brief which will ensure that the correct procedure can be followed if a protected mammal or reptile is found during revegetation or groundbreaking works. When the ECoW is not present onsite, works must stop within 30 m as soon as it is safe to do so. Advice must then be sought from the ECoW and an approach agreed upon with NatureScot (if appropriate) prior to works recommencing.</p>	Ecology
Wet Weather Protocol	<p>This will detail the procedures to be adopted by all staff during periods of heavy rainfall e.g. inspection and maintenance regimes of sediment and runoff control measures will be</p>	Ecology

Embedded Mitigation Measures and Management Plans	Justification	Receptor Applicable to in this RIAA
	adopted during these periods. This protocol will be detailed within the CEMP.	
Continued engagement with Scottish Hydro Electric Transmission / Neighbouring Developments	<p>Continued engagement with neighboring developments and landowners will occur throughout the lifetime of the development.</p> <p>In particular the SHET Dounreay West Substation construction which has been granted consent may overlap with the Onshore Development's construction activities. However, at this stage no confirmation from SHET has been provided. On-going discussions with the development will continue to ensure that once final construction dates are known that protocols will be in place to limit any environmental effects on ecology and ornithology receptors if required.</p>	Ecology and Ornithology

## 7 SPECIAL PROTECTED AREAS WITH TERRESTRIAL ORNITHOLOGY INTERESTS

### 7.1 Introduction

This section provides an assessment of the potential adverse effects from the Onshore Development on the qualifying interests of SPAs and Ramsar Sites which have been screened into the assessment.

#### 7.1.1 Summary of Screening

Screening was conducted in order to identify potential exposure pathways for terrestrial ornithology species (see Section 3).

##### 7.1.1.1 SPAs screened in for assessment

Three SPA / Ramsar Site are screened in for assessment. These are:

- Caithness Lochs SPA / Ramsar Site
- North Caithness Cliffs SPA
- Caithness and Sutherland Peatlands SPA / Ramsar Site

Summary details of these sites and qualifying interests considered relevant to the Onshore RIAA are given in Section 3.3 and Table 3.4.

##### 7.1.1.2 In-combination assessment

As per the HRA Screening Report (HWL, 2022), projects within 25 km of the Onshore Site are considered to have the potential to result in in-combination effects for terrestrial ornithology species.

This includes built and operational wind farms as well as those which are consented or submitted for application. Proposals at scoping stage and earlier are considered on a qualitative basis, but no quantitative assessment will be possible due to the lack of data. Other terrestrial developments which are operational e.g. the adjacent Dounreay (former nuclear facility) and Vulcan Naval Reactor Test Establishment (NRTE) nuclear sites are considered part of the existing baseline and are therefore not included for in-combination assessment. The assessment of cumulative effects will be proportionate in line with the determined magnitude of impact with regard to the Onshore Development.

Figures 7.1 and 7.2 show the projects to be considered within the ornithology HRA in-combination assessment.

The potential for adverse in-combination effects will be considered within Section 7.4.4, and the need for any specific mitigation requirements to reduce any adverse effects upon the integrity of the designated sites will be identified if required.

Table 7.1 Indicative Projects to be Considered within the Ornithology HRA In-combination Assessment

Development Description	Status	Approximate <sup>viii</sup> Distance to Onshore Site (km)	Start Date	Duration of Project
SSE Dounreay West Substation	Consented	0	Unknown	Unknown
SHE Transmission	Consented	0	Unknown	Unknown

<sup>viii</sup> Distances are measured from the red line boundary (RLB) that was submitted to The Highland Council to accompany 21/04098/PAN. The RLB has since been updated, with a small increase in area to the south and east. It is considered that the change in distance is de minimis and will not have impacts on the assessments.

Development Description	Status	Approximate <sup>viii</sup> Distance to Onshore Site (km)	Start Date	Duration of Project
Orkney-Caithness Project				
West of Orkney Wind Farm – Potential landfall at Dounreay	Scoping	0	Estimated construction in 2027	4 years of construction
Limekiln Wind Farm	Consented	3.2	2021	Unknown (designed with an operational life of 40 years)
Limekiln Wind Farm Extension	Consented	3.2	Unknown	Unknown (30 years operational life)
Baillie Hill Wind Farm	Operational	3.4	2013	2038 (25 years operational life)
Forss III Wind Farm	Application	4.3	Unknown	Unknown (30 years operational life)
Forss Wind Farm	Operational	4.7	2007	2033 (subject to a S42 variation)
Hill of Lybster Wind Turbine	Consented	5.3	Unknown	Unknown
Cairnmore Hill Wind Farm - Resubmission	Scoping	6.8	Unknown	Unknown
Broubster	Scoping (Likely Inactive)	8.2	Unknown	Unknown
Thusater Farm	Operational	8.5	2012	Unknown
Weydale	Operational	15.4	2014	Unknown
Strathy North	Operational	16	2015	Unknown
Strathy Wood	Consented	16.9	2024	Unknown
Armada Wind Farm	Application	18.5	Unknown	Unknown
Strathy South	Consented	20	2024	2074 (50 years operational life)
Tormsdale Wind Farm	Application Submitted	20.8	Unknown	Unknown (30 years operational life)
Causeymire Wind Farm	Operational	20.8	2003	2038 (subject to S42 variation)
Achlachan Wind Farm	Operational	21.2	2019	2044

Development Description	Status	Approximate <sup>viii</sup> Distance to Onshore Site (km)	Start Date	Duration of Project
Achlachan 2 Wind Farm	Consented	22.1	Unknown	Unknown
Halsary Wind Farm	Operational	23.7	2019	Unknown
Loch Toftinghall Wind Farm	Scoping	23.6	Unknown	Unknown
Bettyhill Wind Farm	Operational	23.9	2013	Unknown
Bettyhill Wind Farm Extension	Scoping	23.9	2024	2059 (35 years operational life)
Bad a Cheo Wind Farm	Operational	24.3	2019	2043



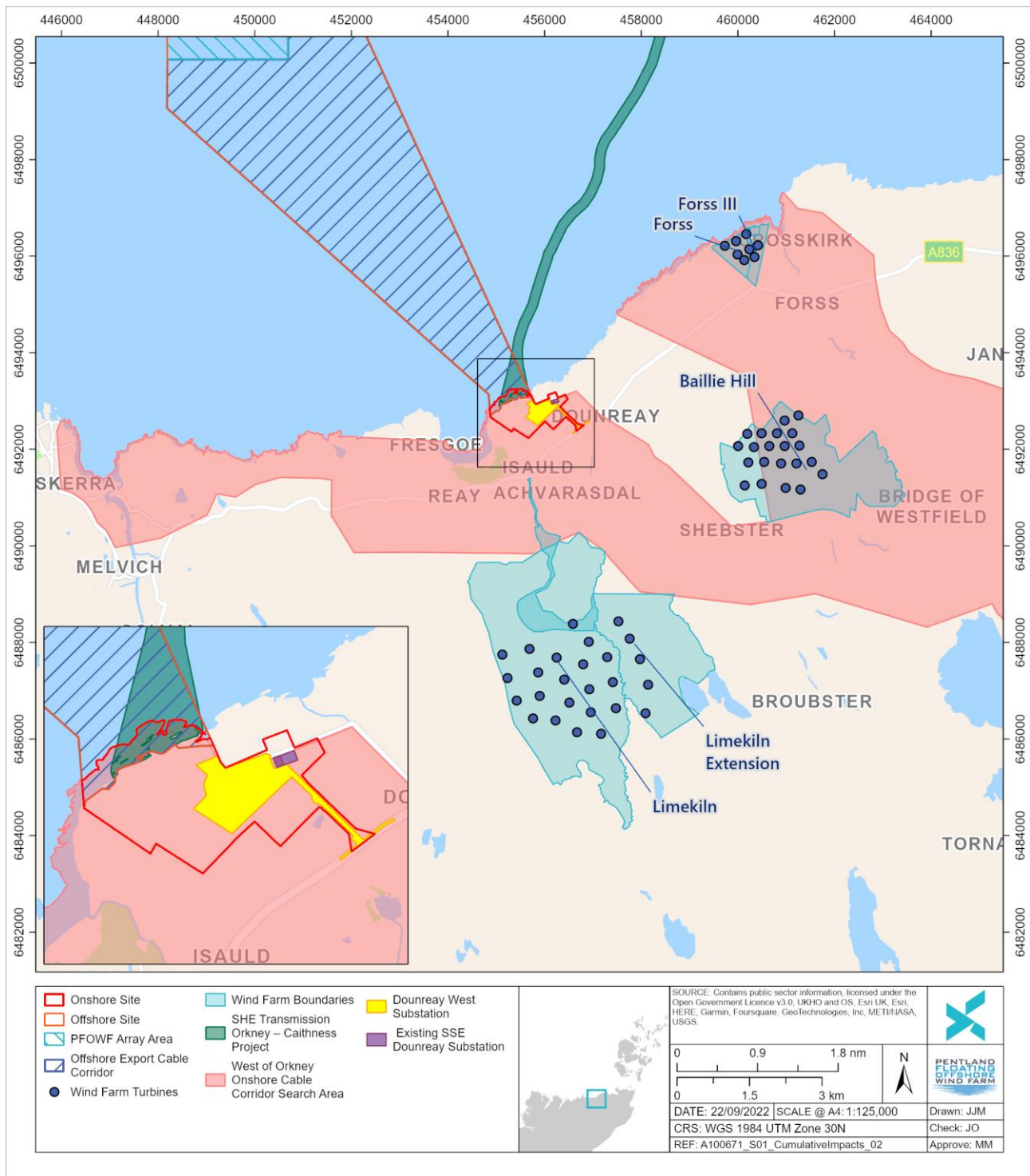


Figure 7.1 Projects to be Considered within the Ornithology HRA In-combination Assessment

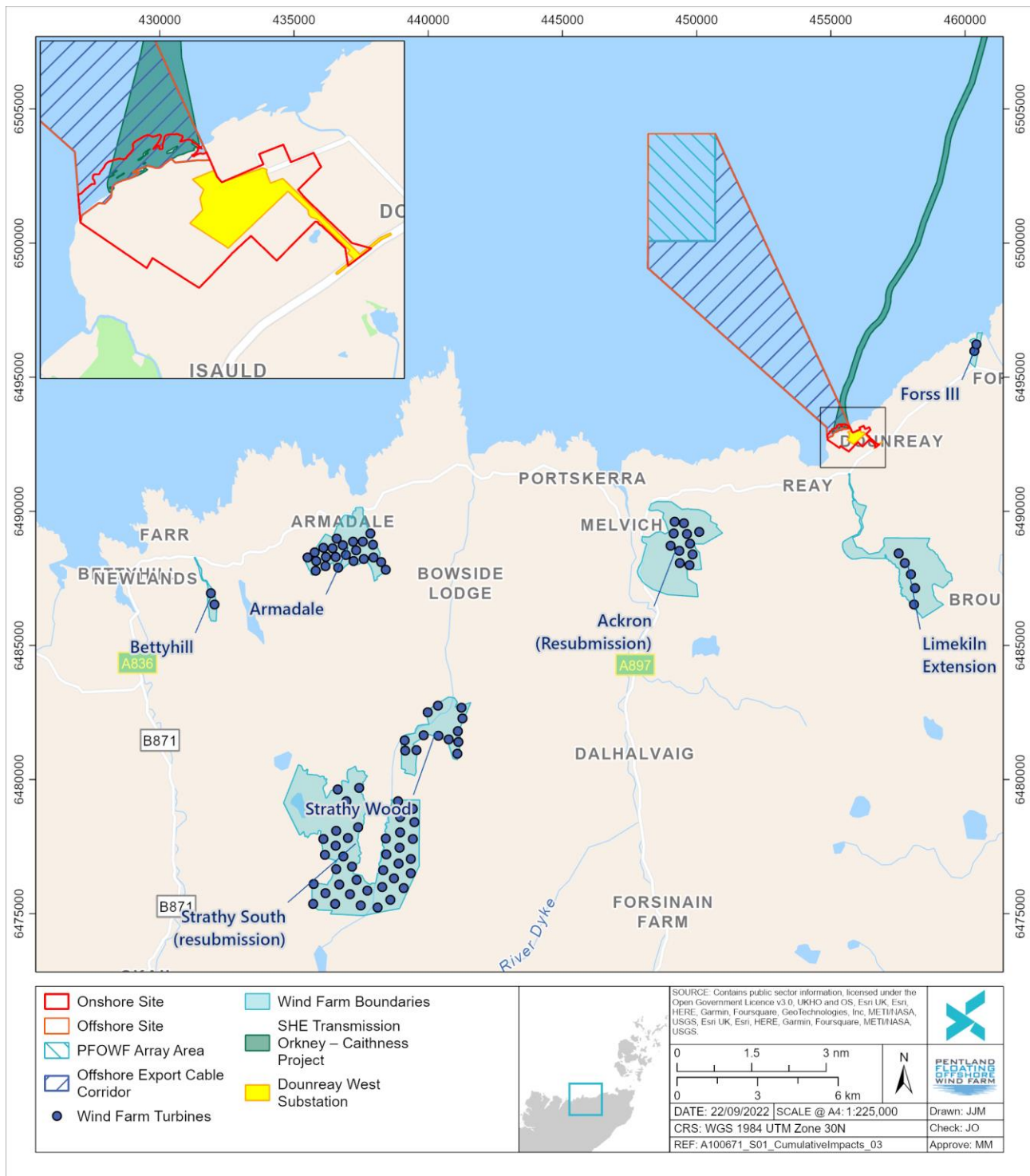


Figure 7.2 Projects to be Considered within the Ornithology HRA In-combination Assessment

## 7.1.2 Impacts Screened Out

Following the assessment during screening, the following potential impact pathways have been screened out for further assessment within this RIAA:

Table 7.2 Impact pathways screened out of RIAA

Receptor	Pathway Screened Out
All qualifying features	<ul style="list-style-type: none"> <li>Potential impacts on SPA / Ramsar interests using the marine environment in the vicinity of the HDD marine exit. These are assessed in the Offshore RIAA.</li> </ul>
	<ul style="list-style-type: none"> <li>Collision impacts arising from the Onshore Development. The Onshore Development does not include new overhead lines or other infrastructure likely to pose a material collision risk to flying birds.</li> </ul>

## 7.1.3 Summary of Potential Pathways

The remaining impact pathways for which potential LSE could not be ruled out for the European Sites and are therefore screened into the RIAA include:

- > Effects of habitat loss and habitat change; and
- > Disturbance effects, including both visual and noise disturbance.

## 7.2 Project Design Envelope Parameters Relevant to Non-Breeding Greylag goose

The realistic WCS for the assessment of adverse effects on the SPA integrity is based on the design option (or combination of options) that represents the greatest potential for change. Confidence can be held that development of any alternative options within the design parameters will give rise to no effects greater or worse than those assessed in this impact assessment.

Table 7.3 presents the realistic WCS for potential impacts on greylag geese during the construction, operation and maintenance, and decommissioning phases of the Onshore Development.

In terms of greylag geese, the realistic WCS has been derived by ensuring that the maximum parameters of components for the Onshore Development with the potential to interact with greylag geese are considered to enable the maximum habitat loss / change and the maximum disturbance to be assessed. The worst-case parameters of each of these stages are addressed individually in Table 7.3 below.

Table 7.3 Design parameters specific to the Greylag goose assessment

Potential Impact	Design Envelope Scenario Assessed
<b>Construction Phase</b>	
Habitat loss or modification as a result of the construction of the Onshore Development	<p><b>Landfall including HDD</b></p> <p>HDD at a point along the landfall location will be required to bring the export cables ashore. The worst-case scenario for these works are:</p> <ul style="list-style-type: none"> <li>&gt; Two drilled holes (up to five attempts);</li> <li>&gt; HDD Bore Diameter 750 mm; and</li> <li>&gt; HDD Compound area 5,600 m<sup>2</sup>.</li> </ul> <p><b>Transition Joint Bay</b></p> <p>At the cable landfall point, a concrete TJB may be required to house the joint between the offshore export cables and onshore cables. The TJB would be located above Mean High Water Springs (MHWS). The worst-case scenario for these works are:</p> <ul style="list-style-type: none"> <li>&gt; One TJB;</li> </ul>

Potential Impact	Design Envelope Scenario Assessed
	<ul style="list-style-type: none"> <li>&gt; TJB 15 m length, 5 m width and 2.5 m depth; and</li> <li>&gt; Excavated materials 187.5 m<sup>2</sup>.</li> </ul> <p><b>Onshore Cables</b></p> <ul style="list-style-type: none"> <li>&gt; Two onshore cable circuits (66kV);</li> <li>&gt; Length of onshore cable 2 km;</li> <li>&gt; Installation OCT;</li> <li>&gt; Two trenches; and</li> <li>&gt; Trench width 3 m, trench depth 2m and working corridor 20 m;</li> <li>&gt; Excavated materials 12,000 m<sup>2</sup>.</li> </ul> <p><b>Cable Joint Bays</b></p> <p>Cable Joint Bays (CJBs) are typically required every 500 - 1,000 m to string together the onshore cable sections depending on the manufacturing specification of the cable supplier. The worst-case scenario for these works are:</p> <ul style="list-style-type: none"> <li>&gt; Four CJB;</li> <li>&gt; CJB 5 m length, 1.5 m width and 1.5 m depth; and</li> <li>&gt; Excavated materials 11.25 m<sup>2</sup>.</li> </ul> <p><b>Onshore Substation</b></p> <p>The worst-case scenario for the construction of the onshore substation are:</p> <ul style="list-style-type: none"> <li>&gt; Substation width 65 m, length 65 m, height 14 m;</li> <li>&gt; Substation footprint 4,225 m<sup>2</sup>;</li> <li>&gt; Construction Compound Footprint 6,975 m<sup>2</sup>; and</li> <li>&gt; Combined Footprint 11,200 m<sup>2</sup>.</li> </ul> <p><b>Access tracks</b></p> <ul style="list-style-type: none"> <li>&gt; Permanent access track length 600 m;</li> <li>&gt; Permanent access track width 6 m;</li> <li>&gt; Temporary access track length 600 m; and</li> <li>&gt; Temporary access track length 6 m,</li> </ul> <p><b>Summary</b></p> <ul style="list-style-type: none"> <li>&gt; Permanent loss of agricultural grassland amounting to approximately 0.78 ha; and</li> <li>&gt; Temporary damage and small-scale change agricultural grassland amounting to approximately 6.05 ha.</li> </ul> <p>For the TJB and CJB, manhole covers will be the only surface level structure visible following reinstatement.</p>
Disturbance	<ul style="list-style-type: none"> <li>&gt; Ground-based construction activity over approximately an 18-month period at the Onshore Site.</li> <li>&gt; Construction activity that could be a source of visual and noise disturbance is anticipated to extend no more than 50 m from the footprint of proposed permanent and temporary Onshore Site infrastructure.</li> </ul>

Potential Impact	Design Envelope Scenario Assessed
<b>Operational and Maintenance Phase</b>	
Disturbance	<p>Post construction, the temporary works will be removed and the ground re-instated. The only permanent structures will be the substation, associated hardstanding and permanent access tracks. The permanent footprint loss during operation will be 0.78 ha.</p> <p>The operational phase assumed to be approximately 30 years. Activities at the Onshore Site during the operation and maintenance phase are anticipated to be limited to infrequent visits (on average four visits per month) by vehicle to the substation and route inspections of the underground cable system.</p> <p>External lighting will be used to illuminate the building, but this will be intermittent and only used when people are on site. Passive infrared (PIR) sensor lighting may be provided around the external perimeter of the buildings. This will cover inside the substation and up to the perimeter fencing only.</p>
<b>Decommissioning Phase</b>	
Potential habitat loss and disturbance impacts arising during the decommissioning phase.	<p>The Onshore Development will be decommissioned following the end of the Onshore Substation's operational life.</p> <p>At present, the specific details of the decommissioning phase are unknown. However, in the absence of detailed information regarding decommissioning works, it is assumed that the potential effects are likely to be of a similar nature and duration as the construction activities, and the potential effects resulting from decommissioning are likely to be similar to those resulting from construction.</p> <p>Due to uncertainty regarding the specific details of decommissioning, and the fact that it is not known what guidance will be applicable at the time of decommissioning, a Decommissioning Plan has not been drafted. A Decommissioning Plan will be prepared prior to commencement of the decommissioning activities to be agreed with THC.</p>

### 7.3 Approach to Assessment

The potential adverse effects on the identified designated site include disturbance to habitats and habitat loss from construction activities.

When considering the potential effects of a project on greylag geese as a qualifying interest of designated site, it is important to consider, for the non-breeding assemblage; the sensitivity to disturbance; the proportion of the greylag goose population that might be affected by disturbance and how frequently disturbance might occur; the scale of disturbance; any sources of baseline disturbance from ongoing activities at the site; and the habitat available for foraging in order to assess the impacts of loss.

In the assessment detailed in the Ornithology Impact Assessment (Onshore EIAR [Volume 2] Chapter 10: Terrestrial Ornithology), an initial approach is adopted which considers the Caithness Lochs SPA and Ramsar Site where there is a potential impact pathway between the qualifying interest (i.e., greylag geese) and the Onshore Development.

The levels of greylag geese activity within the Onshore Site boundaries were determined during the ornithology surveys carried out in January to September 2021, which built upon the previous survey results undertaken for the Dounreay Tri project (Dounreay Tri, 2016). The aim of the survey effort was to provide updated information on the distribution, abundance and status (breeding, wintering passage) of wild bird species using the survey area. The survey area comprised the Onshore Site buffered to approximately 500 m in line with NatureScot guidance (SNH, 2017), an area that includes Isauld Farm, the coastline and near-shore marine areas. The buffer area also included adjacent parts of the Vulcan NRTE, though access to these parts was limited. Survey methods consisted of a mix of walkover and vantage point survey methods.



The subsequent SPA / Ramsar Site specific assessments included an evaluation of the Caithness Lochs SPA conservation objectives and the potential adverse effects of the Onshore Development upon the SPA / Ramsar Site and its qualifying interests.

Full details of the survey methodology and results can be found in the Baseline Onshore Bird Survey 2021 appended to the Onshore EIA; Technical Appendix 10.1.

## 7.4 Caithness Lochs SPA and Ramsar Site

The Caithness Lochs SPA / Ramsar Site covers an area of 1,378 hectares (ha) (13.78 km<sup>2</sup>). It consists of six lochs and a mire (Broubster Leans) in Caithness, including; Loch of Mey, Loch Calder, Loch Heilen, Loch Scarmclate, Loch Watten and Loch of Wester. The Caithness Lochs SPA / Ramsar is designated for the conservation of Greenland white-fronted goose (non-breeding), whooper swan (non-breeding) and greylag goose (non-breeding). The Caithness Lochs SPA / Ramsar Site is located 3.3 km from the Onshore Site at the nearest point.

The Caithness Lochs Ramsar site consists of the same suite of six lochs and mire. The information sheet (Ramsar Information Service, 2005) states that the site supports a wide diversity of aquatic and wetland vegetation, and in winter the site supports the wintering populations of Greenland white-fronted goose (non-breeding), whooper swan (non-breeding) and greylag goose (non-breeding).

### 7.4.1 Site Details and Qualifying Interests

The Screening Report (HWL, 2022) identified the Caithness Lochs SPA / Ramsar Site as a site where greylag geese are a qualifying feature where LSE could not be ruled out. The feature condition and broader conservation status of the qualifying interests have been summarised in Table 7.4.

Table 7.4 Qualifying Interests and Condition for the Caithness Lochs SPA / Ramsar Site

Qualifying Interests	Feature Condition	Assessment Date	Broader Conservation Status
Greylag goose, non-breeding	Favourable Maintained No negative pressures identified	15 November 2015	BoCC-5 <sup>ix</sup> amber list
Whooper swan, non-breeding	Favourable Maintained No negative pressures identified	08 March 2015	BoCC-5 amber list
Greenland white-fronted goose, non-breeding	Favourable Declining, Agricultural operations identified as a negative pressure	01 April 2016	BoCC-5 red list

### 7.4.2 Site Objectives

The key objectives of the Caithness Lochs SPA are to avoid deterioration of the habitats of the qualifying species, or significant disturbance to the qualifying species. Table 7.5 provides the conservation objective statements for Caithness Lochs SPA (<https://sitelink.nature.scot/site/8477>, visited September 2022). There are no specific conservation objectives for the Ramsar site.

<sup>ix</sup> Birds of Conservation Concern 5, (Stanbury *et al.*, 2021)

Table 7.5 Caithness Lochs SPA Conservation Objectives

Caithness Lochs SPA	
>	To avoid deterioration of the habitats of the qualifying species (Greenland white-fronted goose, greylag goose, and whooper swan) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
>	To ensure for the qualifying species that the following are maintained in the long term: <ul style="list-style-type: none"> <li>• Population of the species as a viable component of the site;</li> <li>• Distribution of the species within the site;</li> <li>• Distribution and extent of habitats supporting the species;</li> <li>• Structure, function and supporting processes of habitats supporting the species; and</li> </ul>
>	No significant disturbance of the species.

### 7.4.3 Assessment of Adverse Effects from Onshore Development Alone

#### 7.4.3.1 Disturbance and/or Displacement from Foraging or Roosting Areas

Construction activities have potential to disturb foraging greylag geese. The construction phase is expected to last approximately 18 months and therefore disturbance due to construction is considered to be a short-term and temporary effect. Construction activity is anticipated to extend no more than 50 m from the footprint of proposed permanent and temporary Onshore Development infrastructure.

Non-breeding greylag geese were recorded on three occasions in small to moderate numbers during the 2021 baseline survey (Onshore EIAR [Volume 3]: Appendix 10.1: Baseline Onshore Bird Survey 2021 Technical Report). The peak count was 130 birds in January, but typically fewer than forty birds were present. Non-breeding greylag geese were seen in the vicinity of the Onshore Site on only one date during the 2015 baseline survey, when 75 birds were present. However, no greylag geese were seen within 2 km of the Onshore Site during the surveys commissioned by SNH in 2011/12 and 2012/13 to identify the foraging areas of the qualifying interest species of the Caithness Lochs SPA recorded (Patterson et al., 2013). It is concluded that under baseline conditions the Onshore Site and its vicinity is irregularly used by small to moderate numbers of non-breeding greylag geese. In the context of the Caithness Lochs SPA citation population of 7,192 birds, these numbers are small, averaging below 1% of the population and with a peak count approaching 2%. The frequency of presence and the numbers seen during baseline surveys on the Onshore Site and its vicinity are considered to give a reasonable indication of the proportion of the greylag goose population that might be affected by construction disturbance and how frequently disturbance might occur.

An indication of the scale of potential disturbance of greylag geese can also be estimated by considering the size of area that could be potentially affected by disturbance. The potential area over which greylag geese may experience disturbance from construction activity will depend on their proximity tolerance to the activity. No information was found on proximity tolerance to human activities for greylag geese, however information was found for pink-footed goose. Given its close taxonomic relatedness and similar wintering ecology and habitat choice, the information for pink-footed goose is considered likely to give a reasonable approximation of proximity tolerance for greylag goose. Pink-footed goose (*Anser brachyrhynchus*) is reported as having a maximum flight initiation distance of 500 m when disturbed by hunting activities during the non-breeding season (Goodship and Furness, 2019). Thus, for assessment purposes it is cautiously assumed that, in a worst case, construction activities could result in disturbance of greylag geese, leading to flight initiation, at distance of up to 500 m from the source of disturbance. The amount of suitable foraging habitat within 500 m of the construction footprint is in the order of 175 ha. It is possible that greylag geese could be disturbed from anywhere within this area; however, it is unlikely that they would be disturbed from the whole area at any one time. In the context of the approximately 50,000 ha of suitable foraging habitat available to the greylag goose assemblage, the size of the worst case area of disturbance is negligible; the total Onshore Site represents approximately 0.35% of suitable foraging area.



The assessment requires that the disturbance potentially arising from the Onshore Development is examined in the context of baseline disturbance at the Onshore Site. The Onshore Site comprises intensively managed pasture and cropland on a working livestock farm, one of many broadly similar farms in the region. As such the Onshore Site is subject to moderate amounts of agricultural activity that has potential to disturb birds and result in habitat change. In particular there are daily checks of livestock (on foot and by four wheel drive vehicle) and regular tractor activity associated with cultivating and harvesting fodder crops and feeding livestock. Vehicle movements and operational activities associated with the adjacent Dounreay Site and Vulcan NRTE site also have potential to disturb greylag geese foraging in nearby fields. Baseline surveys results provided some qualitative evidence to these baseline activities. For example, they were noted not to take flight in response to tractor and vehicles movements that approached to within approximately 250 m. Given the level of baseline activity at the Onshore Site with potential to disturb greylag geese it is concluded that it is likely that a proportion of the disturbance events that may occur due to disturbance would probably occur within the baseline environment, regardless of the Onshore Development. It is also concluded that if, as a result of the baseline activities at the site, greylag geese have to some degree become habituated to human activities then their tolerance to construction activities could be greater than assumed.

There are very extensive areas of alternative foraging habitat available locally (i.e. other farmland) the great majority of which experiences very low levels of disturbance (e.g. occasional disturbance from farming activities). Therefore, any birds that are disturbed by the Onshore Development are anticipated to be displaced to alternative nearby areas of foraging habitat. For this reason, disturbance is not expected to have a material adverse effect on the fitness or survival of the birds affected; the effect is considered negligible.

In summary the assessment shows that construction activity could result in:

- > Irregular disturbance events over the short term involving relatively small numbers of greylag geese (typically <1% of SPA population, occasionally up to approximately 2%);
- > At worst, and over the short term, potential for disturbance of greylag geese over approximately 0.35% of the foraging habitat available to the SPA population; and
- > Inconsequential displacement of disturbance-affected birds to alternative nearby areas of foraging habitat.

It is therefore determined that scale of potential disturbance arising from construction activities would be negligible for the non-breeding greylag goose population. It is concluded that the disturbance due to the construction of Onshore Development would not compromise the conservation objective 'to maintain in the long-term no significant disturbance of the species'. There will therefore be **no adverse effects on site integrity**.

Given the very infrequent, low key, and highly localised nature of anticipated operation and maintenance activities, it is not plausible that these could lead to more than negligible disturbance effects on greylag geese. In comparison to the activities in the construction phase, operation and maintenance activities are considered to have a much lower potential to cause disturbance. There will therefore be **no adverse effects on site integrity**.

The potential for decommissioning activities to cause disturbance of greylag geese is considered to be broadly similar to, and no greater than, that of construction activities. There will therefore be **no adverse effects on site integrity**.

#### 7.4.3.2 Foraging Habitat Loss or Change

In Caithness, non-breeding greylag geese feed almost exclusively on improved grassland and cereal stubbles (Paterson *et al.*, 2013). The permanent loss and temporary damage to improved grassland and crop land that is anticipated to result from the Onshore Development construction phase amounts to approximately 6.05 ha. Given the final location of the Onshore Substation and Onshore Cable Circuit(s) route isn't known at this stage, for assessment purposes as a worst case it has been assumed the entire footprint would be on grassland and crop land. This habitat loss and change would occur outside the Caithness Lochs SPA / Ramsar Site and therefore would have no bearing on the extent of habit within the designations. However, it could potentially affect the conservation objective 'to maintain in the long-term the distribution and extent of habitats supporting

the species'. The test of whether this conservation objective could be compromised requires a comparison to be made between the area of long-term habitat loss (approximately 0.78 ha [7,825m<sup>2</sup>]) due to the Onshore Development and the area of suitable foraging habitat (i.e., improved grasslands and cereal stubble) used by the Caithness Lochs SPA / Ramsar Site non-breeding greylag goose qualifying interest.

Non-breeding greylag geese typically range up to 15 – 20 km from roosts sites to forage (SNH, 2016). The area of suitable foraging habitat within range of the SPA / Ramsar roost sites is not known precisely, but can be estimated with adequate accuracy for assessment purposes. Based on area aerial photo measurements (measured on Google Earth image taken on 16/07/2012) it is estimated there are approximately 50,000 ha of suitable foraging habitat available to greylag geese roosting on the lochs.

In the context of the amount of foraging habitat available to the SPA population, the long-term loss of 0.78 ha of foraging habitat is negligible. It amounts to less than 0.002% of the estimated foraging habitat available to the SPA's non-breeding greylag goose population. The short-term loss or damage of up to of 6.05 ha is also negligible for the same reason. It is concluded that the permanent habitat loss and change due the Onshore Development would not compromise the conservation objective to 'to maintain in the long-term the distribution and extent of habitats supporting the species'. There will therefore be **no adverse effects on site integrity**.

No further habitat loss or damage is anticipated during the operation and maintenance phase of the Onshore Development. There will therefore be **no adverse effects on site integrity**.

The potential for decommissioning activities to cause disturbance of greylag geese is considered to be broadly similar to, and no greater than, that of construction activities. There will therefore be **no adverse effects on site integrity**.

#### 7.4.4 Assessment of Adverse Effects In-combination

Given the extremely small spatial scales of the predicted long-term foraging habitat loss and short-term habitat change resulting from the Onshore Development in the context of the area of foraging habitat available to the SPA and Ramsar's greylag goose population, these would not materially contribute with other projects to an in-combination effect relating to the long-term extent and distribution of supporting habitats. There will therefore be **no adverse effects on site integrity in combination with any other plan or project**.

Disturbance arising from Onshore Development construction (and decommissioning) activity is anticipated to be a short-term and highly localised effect that would not materially contribute with other projects to an in-combination effect relating to maintaining in the long-term no significant disturbance. There will therefore be **no adverse effects on site integrity in combination with any other plan or project**.

### 7.5 North Caithness Cliffs SPA

#### 7.5.1 Site Details and Qualifying Interests

Following a consultation response from NatureScot on the HRA Screening Report (HWL, 2022), the breeding peregrine qualifying interest of North Caithness Cliffs SPA has been screened in to this Onshore RIAA. The feature condition and broader conservation status of this qualifying interest are summarised in Table 7.6.

Table 7.6 Screened-in Qualifying Interests and their Condition for the North Caithness Cliffs SPA

Qualifying Interests	Feature Condition	Assessment Date	Broader Conservation Status
Peregrine, breeding	Unfavourable Declining Negative pressures: to be identified	24 June 2014	BoCC-5* green list

\* Birds of Conservation Concern 5, (Stanbury *et al.*, 2021)

## 7.5.2 Site Objectives

The key objectives of the North Caithness Cliffs SPA are to avoid deterioration of the habitats of the qualifying species and to avoid significant disturbance to the qualifying species. Table 7.7 provides the conservation objective statements for North Caithness Cliffs SPA.

Table 7.7 Caithness Lochs SPA Conservation Objectives

North Caithness Cliffs SPA	
>	To avoid deterioration of the habitats of the qualifying species (these are breeding peregrine falcon, five species of breeding seabird and seabird breeding assemblage) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
>	To ensure for the qualifying species that the following are maintained in the long term: <ul style="list-style-type: none"> <li>• Population of the species as a viable component of the site;</li> <li>• Distribution of the species within the site;</li> <li>• Distribution and extent of habitats supporting the species;</li> <li>• Structure, function and supporting processes of habitats supporting the species; and</li> <li>• No significant disturbance of the species.</li> </ul>

## 7.5.3 Assessment of Adverse Effects from Onshore Development Alone

### 7.5.3.1 Disturbance

Breeding peregrine is a qualifying feature of this SPA, however this species was not recorded using the Onshore Site or its vicinity in the baseline bird surveys undertaken in 2015 (Dounreay Tri, 2016) and 2021 (Onshore EIAR, Volume 3 Appendix 10.1). Nevertheless, given the wide ranging behaviour of this species it is considered likely that peregrine occasionally hunt in the vicinity of the Onshore Site. Information obtained from the Highland Raptor Study Group (HRSG) identified that the closest known breeding site lies within the SPA more than 1 km from the Onshore Site. However this site has not been used for breeding in recent years, with no breeding recorded since regular monitoring by HRSG started in 2017.

The tolerance of peregrine to human activity that could cause disturbance is reviewed in the study by Ruddock and Whitfield (2007). This study concludes that there is high variation in tolerance between birds at different breeding sites. The study found that the least tolerant birds may show a disturbance response to activities as far as 500-750m (the study used distance bands to summarise results) from nest sites. The authors also point out that this species commonly shows good habituation (i.e. a high tolerance) at breeding sites where they are exposed to a relatively high 'background' level of human activity, for example breeding sites in city centre locations and working quarries (Ruddock and Whitfield, 2007).

Disturbance of peregrines when they are away from the vicinity of breeding sites, for example when hunting, is not considered to be an issue of concern (Ruddock and Whitfield, 2007). The species hunts over very wide areas of habitat and appears to have no particular sensitivity to human activity. Of course, like most large bird species, perched peregrine may show a disturbance response to humans or vehicles that approach too closely. For example, first-hand experience and studies (Ruddock and Whitfield, 2007) indicate that perched peregrines away from their nest site typically take flight if people approach them to within approximately 100-200m.

The construction and decommissioning activities associated with Onshore Development will be limited to the Onshore Site, all parts of which are greater than 1 km from the closest historical peregrine nest site, a greater distance than is likely to illicit a disturbance response. Therefore, even if this breeding site were to be occupied at the time, construction of the Onshore Development would not lead to any disturbance of peregrine nest sites. Given that peregrine were not recorded hunting in the vicinity of the Onshore Site during baseline

surveys and the relatively low sensitivity of peregrine to disturbance away from nest sites, it is also not plausible that the Onshore Development could lead to more than negligible and inconsequential disturbance of peregrine away from their nest sites. Any disturbance that did occur would be infrequent, short-term and highly localised. It is concluded that the disturbance due to the Onshore Development would not compromise the conservation objective 'to maintain in the long-term no significant disturbance of the species'. There will therefore be **no adverse effects on site integrity**.

#### 7.5.4 Assessment of Adverse Effects In-combination

There is no potential for the Onshore Development activities to lead to disturbance of peregrine nests sites. Any disturbance of peregrine away from nest sites would be infrequent, short-term and highly localised and therefore is considered to be negligible and inconsequential effect that would not materially contribute with other projects to an in-combination effect relating to maintaining in the long-term no significant disturbance. There will therefore be **no adverse effects on site integrity in combination with any other plan or project**.

## 7.6 Caithness and Sutherland Peatlands SPA

### 7.6.1 Site Details and Qualifying Interests

Following a consultation response from NatureScot on the HRA Screening Report (HWL, 2022), the breeding red-throated diver and breeding common scoter qualifying interests of Caithness and Sutherland Peatlands SPA are screened in for assessment in this Onshore RIAA. The feature condition and broader conservation status of these qualifying interests are summarised in Table 7.8.

Table 7.8 Screened-in Qualifying Interests and their Condition for the Caithness and Sutherland Peatlands SPA / Ramsar Site

Qualifying Interests	Feature Condition	Assessment Date	Broader Conservation Status
Red-throated diver, breeding	Favourable Maintained Negative pressures: burning and over grazing	31 July 2006	BoCC-5 <sup>xi</sup> green list
Common scoter, breeding	Unfavourable Declining Negative pressures: to be identified	03 June 2013	BoCC-5 red list

### 7.6.2 Site Objectives

The key objectives of the Caithness and Sutherland Peatlands SPA are to avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species. Table 7.9 provides the conservation objective statements for Caithness and Sutherland Peatlands SPA. There are no specific conservation objectives for the Ramsar site.

<sup>xi</sup> Birds of Conservation Concern 5, (Stanbury *et al.*, 2021)

Table 7.9 Caithness and Sutherland Peatlands SPA Conservation Objectives

Caithness and Sutherland Peatlands SPA / Ramsar Site	
>	To avoid deterioration of the habitats of the qualifying species (these 13 species of breeding peatland birds including red-throated diver and common scoter) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.
>	To ensure for the qualifying species that the following are maintained in the long term: <ul style="list-style-type: none"> <li>• Population of the species as a viable component of the site;</li> <li>• Distribution of the species within the site;</li> <li>• Distribution and extent of habitats supporting the species;</li> <li>• Structure, function and supporting processes of habitats supporting the species; and</li> <li>• No significant disturbance of the species.</li> </ul>

### 7.6.3 Assessment of Adverse Effects from Onshore Development Alone

#### 7.6.3.1 Disturbance and/or Displacement from Inshore Foraging Areas

Breeding red-throated divers commonly forage in coastal marine waters within approximately 10 km of their freshwater lochan breeding sites (SNH, 2016). During the 2021 baseline survey red-throated divers were recorded on two occasions in the summer months foraging in Sandside Bay (Onshore EIAR, Volume 3 Appendix 10.1), however they were not recorded in the 2015 baseline survey (Dounreay Tri, 2016). Sandside Bay lies within the foraging range distance (assumed to be 10 km) of red-throated divers breeding at the closest Caithness and Sutherland Peatlands SPA breeding lochans. Therefore there is potential for connectivity between the SPA and Sandside Bay for this qualifying species.

Although red-throated divers on the sea are reported to have a high sensitivity to disturbance by vessel activity (Furness *et al.*, 2013; Jarrett *et al.*, 2018) they show a relatively high tolerance to shore-based activities. For example the birds using Sandside Bay showed no response to low key human activities on the shores of Sandside Bay that were judged to be between 300 m and 500m from the birds, including people walking along the beach and vehicle movements.

Common scoters breed in small numbers on freshwater lochs in the SPA. It has been conjectured that common scoters from this SPA use inshore waters for foraging during the breeding season (Hancock *et al.*, 2019). However there is currently no direct evidence confirming that this is the case. If breeding common scoter from the SPA were to use marine habitats for feeding, they would most likely target areas that are relatively shallow (<15 m deep) and with soft substrates (they mostly feed on benthic molluscs); Sandside Bay is one of several locations along the north Sutherland and Caithness coast that have such characteristics. There is therefore a theoretical connectivity between Sandside Bay and the SPA.

Common scoters (non breeding) using marine habitats appear to show a moderate tolerance to shore-based activity. For example, wintering common scoter foraging approximately 300 to 600 m off the coast at Tentsmuir National Nature Reserve in south-east Scotland, show no obvious response to people and their dogs using the adjacent beach for recreation (D Jackson personal observation). The results of the disturbance review study by Ruddock and Whitfield (SNH, 2007) indicate that on their freshwater breeding lochs, common scoter may show a disturbance response a shore-based observer up to as far away as 300-500 m (the study reports results using distance bands). It is concluded that were common scoter to use Sandside Bay, then shore-based activities that are more than 500 m away from the birds would be very unlikely to cause disturbance.

The construction and decommissioning activities associated with Onshore Development will be limited to the Onshore Site, all parts of which are greater than 750 m from the inshore waters of Sandside Bay where small numbers (maximum count 2) of red-throated divers are known to sometimes forage and where common scoter could also potentially forage. Therefore it is not likely that Onshore Development activities would disturb either

red-throated divers or common scoter using Sandside Bay. It is concluded that the disturbance due to the Onshore Development would not compromise the conservation objective 'to maintain in the long-term no significant disturbance of the species'. It is concluded that will therefore be **no adverse effects on site integrity**.

#### 7.6.4 Assessment of Adverse Effects In-combination

There is no potential for the Onshore Development activities to lead to disturbance of red-throated divers or common scoter and therefore would not materially contribute with other projects to an in-combination effect relating to maintaining in the long-term no significant disturbance. There will therefore be **no adverse effects on site integrity in combination with any other plan or project**.

## 7.7 Summary

An assessment has been undertaken above for the relevant qualifying interest of the three SPA/ Ramsar Site that were screened in for Appropriate Assessment. It is concluded that there will be **no adverse effect on site integrity** for any site, either as a result of the Onshore Development alone or in-combination with other projects.

Table 7.10 Summary of results

Protected Site	Qualifying Feature	Potential Effect	Conclusion
Caithness Lochs SPA / Ramsar Site	Greylag goose, non-breeding	Disturbance and/or displacement from foraging areas	Magnitude of potential effect is negligible and would not compromise any SPA conservation objectives.
		Foraging habitat loss or change	No adverse effect on site integrity.
North Caithness Cliffs SPA	Peregrine, breeding	Disturbance at nest sites	Magnitude of potential effect is negligible and would not compromise any SPA conservation objectives.  No adverse effect on site integrity.
Caithness and Sutherland Peatlands SPA / Ramsar Site	Red-throated diver, breeding	Disturbance from inshore marine foraging areas	Magnitude of potential effect is negligible and would not compromise any SPA conservation objectives. No adverse effect on site integrity.  No adverse effect on site integrity.
	Common scoter, breeding	Theoretical potential for disturbance from inshore marine foraging areas,	Magnitude of potential effect is negligible and would not compromise any SPA conservation objectives. No adverse effect on site integrity.  No adverse effect on site integrity.

### ***7.7.1 Additional Mitigation and Monitoring***

There is no requirement for additional mitigation over and above the embedded measures for the Onshore Development proposed in Section 5.3.

Given the small-spatial scale of the Onshore Development and the lack of significant effects on SPA / Ramsar Site qualifying interests, it is considered that monitoring of onshore ornithology interests is not required.



## 8 SPECIAL AREAS OF CONSERVATIONS WITH TERRESTRIAL ECOLOGY INTERESTS

### 8.1 Introduction

This section provides an assessment of the potential adverse effects from the Onshore Development on SACs designated for the conservation of otter (*Lutra lutra*); an Annex II species which has been screened into the assessment, the only qualifying species screened into this assessment.

This section provides information that should be used to determine the potential effects of the Onshore Development on the conservation objectives of the Caithness and Sutherland Peatlands SAC.

#### 8.1.1 Summary of Screening

##### 8.1.1.1 SACs screened in for assessment

Screening was conducted to identify designated sites and qualifying features with potential connectivity and pathway for effect to the Onshore Development for which an LSE cannot be discounted. A 20 km study area around the Onshore Site was used to identify SACs designated for the conservation of otter which was based on the home ranges of male coastal otters (Chanin, 2013).

A search of available digital datasets within the 20 km buffer identified four statutory designations of European importance within the search area:

- > Caithness and Sutherland Peatlands SAC;
- > Broubster Leans SAC;
- > Strathy Point SAC; and
- > River Thurso SAC).

Full citations for statutory designated sites can be obtained from NatureScot's register of European sites (NatureScot, 2022). Of those sites, only the Caithness and Sutherland Peatlands SAC was screened in for assessment (see Table 8.1).

A number of potential impact pathways have been screened out of assessment in the RIAA (see Section 3).

Table 8.1 Summary of SAC designated sites with suitability for otter within 20 km of the Onshore Site

Designation	Site name	Distance	Qualifying non-avian ecological feature
SAC	Caithness and Sutherland Peatlands	3.3 km south-west	<p>Clear-water lochs with aquatic vegetation and poor to moderate nutrient levels</p> <p>Acid peat-stained lakes and ponds</p> <p>Blanket bog</p> <p>Wet heathland with cross-leaved heath (<i>Erica tetralix</i>)</p> <p>Transition mires and quaking bogs</p> <p>Depressions on peat substrates</p> <p><b>Eurasian otter (<i>Lutra lutra</i>)</b></p> <p>Marsh saxifrage (<i>Saxifraga hirculus</i>)</p>

### 8.1.1.2 In-combination assessment

For Annex II otter features of the Caithness and Peatlands SAC, it is very unlikely that there could be any in-combination impacts on otters. Although the Onshore Development is predicted to result in the loss of a small area of habitat which may be used for foraging by otters associated with Caithness and Sutherland Peatlands SAC, the habitat which will be affected is predominantly improved grassland. Improved grassland supports little prey for otters, and so is sub-optimal foraging habitat for this species. Additionally, the small loss of habitat is considered negligible compared to the total area of the SAC (documented at 143561.5 ha [NatureScot, 2022]). Furthermore, the majority of habitat affected will be reinstated after installation of the onshore cable circuits. As such, any impacts would be extremely small and if considered cumulatively with other projects in the area where otters have been identified as an important ecological feature would not result in a measurable difference in addition to those predicted to result from other projects. Therefore, no LSE is predicted for otters associated with Caithness and Sutherland Peatlands SAC as a result of in-combination impacts and such no cumulative projects are identified for HRA purposes. As per the HRA Screening Report (HWL, 2022), in combination effects have been screened out and are not discussed further here.

### 8.1.2 Impacts Screened Out

Following the assessment during screening, and in line with the position that embedded mitigation is not to be included for the purposes of determining the potential of LSE, Table 8.2 details potential impact pathways that have been screened out for further assessment within this RIAA.

Table 8.2 Impact pathways screened out of RIAA

Receptor	Pathway Screened Out
Otter	<b>Disturbance or displacement of holts</b> <ul style="list-style-type: none"> <li>&gt; The Onshore Development site offers poor foraging habitat for otter and there are no opportunities for holts. As such, it is considered that otter only occasionally commute over the Onshore Site. Consequently, it is highly unlikely that the works will result in the disturbance or displacement of holts. This impact pathway has been screened out and is not considered further in the RIAA.</li> </ul>
	<b>Direct mortality</b> <ul style="list-style-type: none"> <li>&gt; Due to the lack of opportunities for holts on site, and the fact that the habitats present within the Onshore Site are sub-optimal for foraging or commuting otter, it is considered highly unlikely that the works will result in the mortality of this Annex II species. This impact pathway has been screened out and is not considered further in the RIAA.</li> </ul>

### 8.1.3 Summary of Potential Pathways

The remaining pressures (impact pathways) for which potential LSE could not be ruled out for the European Sites screened into the RIAA include:

- > Direct habitat loss due to land-take during construction;
- > Disturbance and damage/injury to habitats or protected species during construction;
- > Indirect effects on habitats or protected species during construction; e.g., due to pollution or sedimentation;
- > Disturbance during maintenance works (expected to be infrequent and small scale);
- > Indirect effects on habitats and protected species during site operation/ maintenance as a result of spillage; and
- > Disturbances to ecological features during decommissioning (effects likely to be similar to those resulting from construction, with the exception that the habitats will be restored and the level of effect will depend on the ecological features present at the time of decommissioning).

Of the impact pathways listed above, these are only considered in relation to foraging or commuting otter. Only impacts upon foraging or commuting otter, as a result of habitat loss or change, are considered.

## 8.2 Project Design Envelope Parameters Relevant to Otters

The realistic WCS for the assessment of adverse effects on the SAC integrity is based on the design option (or combination of options) that represents the greatest potential for change. Confidence can be held that development of any alternative options within the design parameters will give rise to no effects greater or worse than those assessed in this impact assessment.

Table 8.3 presents the realistic WCS for potential impacts on otters during construction, operation and maintenance, and decommissioning phases of the Onshore Development.

In terms of otters, the realistic WCS has been derived by ensuring that the maximum parameters of components for the Onshore Development with the potential to interact with Annex II Otter are considered to enable the maximum habitat loss / change to be assessed. The onshore works will involve construction of the onshore cable corridor and cable landfall (including horizontal directional drilling), onshore cables, onshore substation, temporary construction compound, permanent access track and temporary access track, all of which would result in direct habitat loss. The worst-case parameters of each of these stages are addressed individually in Table 8.3 below.

Table 8.3 Design parameters specific to the otter assessment

Potential Impact	Design Envelope Scenario Assessed
<b>Construction Phase</b>	
Habitat loss or modification as a result of the construction of the Onshore Development	<p><b>Landfall including Horizontal Directional Drilling (HDD)</b></p> <p>HDD at a point along the landfall location will be required to bring the export cables ashore. The worst-case scenario for these works are:</p> <ul style="list-style-type: none"> <li>&gt; Two drilled holes (up to five attempts);</li> <li>&gt; HDD Bore Diameter 750 mm; and</li> <li>&gt; HDD Compound area 5,600 m<sup>2</sup>.</li> </ul> <p><b>Transition Joint Bay (TJB)</b></p> <p>At the cable landfall point, a concrete TJB may be required to house the joint between the offshore export cables and onshore cables. The TJB would be located above Mean High Water Springs (MHWS). The worst-case scenario for these works are:</p> <ul style="list-style-type: none"> <li>&gt; One TJB;</li> <li>&gt; TJB 15 m length, 5 m width and 2.5 m depth; and</li> <li>&gt; Excavated materials 187.5 m<sup>2</sup>.</li> </ul> <p><b>Onshore Cables</b></p> <ul style="list-style-type: none"> <li>&gt; Two onshore cable circuits (66kV);</li> <li>&gt; Length of onshore cable 2 km;</li> <li>&gt; Installation OCT;</li> <li>&gt; Two trenches; and</li> <li>&gt; Trench width 3 m, trench depth 2m and working corridor 20 m;</li> <li>&gt; Excavated materials 12,000 m<sup>2</sup>.</li> </ul> <p><b>Cable Joint Bays (CJB)</b></p> <p>Cable Joint Bays (CJBs) are typically required every 500 - 1,000 m to string together the onshore cable sections depending on the manufacturing</p>

Potential Impact	Design Envelope Scenario Assessed
	<p>specification of the cable supplier. The worst-case scenario for these works are:</p> <ul style="list-style-type: none"> <li>&gt; Four CJB;</li> <li>&gt; CJB 5 m length, 1.5 m width and 1.5 m depth; and</li> <li>&gt; Excavated materials 11.25 m<sup>2</sup>.</li> </ul> <p><b>Onshore Substation</b></p> <p>The worst-case scenario for the construction of the onshore substation are:</p> <ul style="list-style-type: none"> <li>&gt; Substation width 65 m, length 65 m, height 14 m;</li> <li>&gt; Substation footprint 4,225 m<sup>2</sup>;</li> <li>&gt; Construction Compound Footprint 6,975 m<sup>2</sup>; and</li> <li>&gt; Combined Footprint 11,200 m<sup>2</sup>.</li> </ul> <p><b>Access tracks</b></p> <ul style="list-style-type: none"> <li>&gt; Permanent access track length 600 m;</li> <li>&gt; Permanent access track width 6 m;</li> <li>&gt; Temporary access track length 600 m; and</li> <li>&gt; Temporary access track length 6 m,</li> </ul> <p><b>Summary</b></p> <ul style="list-style-type: none"> <li>&gt; Permanent loss of agricultural grassland amounting to approximately 0.78 ha; and</li> <li>&gt; Temporary damage and small-scale change agricultural grassland amounting to approximately 6.05 ha. Construction activity that could lead to habitat damage is anticipated to extend no more than 50 m from the footprint of proposed permanent and temporary Onshore Site infrastructure.</li> </ul> <p>For the TJB and CJB, manhole covers will be the only surface level structure visible following reinstatement.</p>
Disturbance	<ul style="list-style-type: none"> <li>&gt; Ground-based construction activity over approximately an 18-month period at the Onshore Site.</li> <li>&gt; Construction activity that could be a source of visual and noise disturbance is anticipated to extend no more than 50 m from the footprint of proposed permanent and temporary Onshore Site infrastructure.</li> </ul>
Operational and Maintenance Phase	
Disturbance	<p>Post construction, the temporary works will be removed and the ground re-instated. The only permanent structures will be the substation, associated hardstanding and permanent access tracks. The footprint loss during operation will be 0.78 ha.</p> <p>The operational phase assumed to be approximately 30 years. Activities at the Onshore Site during the operation and maintenance phase are anticipated to be limited to infrequent visits (on average four visits per month) by vehicle to the substation and route inspections of the underground cable system.</p> <p>External lighting will be used to illuminate the building, but this will be intermittent and only used when people are on site. Passive infrared (PIR)</p>

Potential Impact	Design Envelope Scenario Assessed
	sensor lighting may be provided around the external perimeter of the buildings. This will cover inside the substation and up to the perimeter fencing only.
<b>Decommissioning Phase</b>	
Potential habitat loss impacts arising during the decommissioning phase.	<p>The Onshore Development will be decommissioned following the end of the Onshore Substation's operational life.</p> <p>At present, the specific details of the decommissioning phase are unknown. However, in the absence of detailed information regarding decommissioning works, it is assumed that the implications for otter are likely to be of a similar nature and duration as the construction activities, and the potential effects resulting from decommissioning are likely to be similar to those resulting from construction.</p> <p>Due to uncertainty regarding the specific details of decommissioning, and the fact that it is not known what guidance will be applicable at the time of decommissioning, a Decommissioning Plan has not been drafted. A Decommissioning Plan will be prepared prior to commencement of the decommissioning activities to be agreed with THC.</p>

### 8.3 Approach to Assessment

When considering the potential effects of a project on otter as a qualifying interest of an SAC, it is important to consider the high mobility of the species. Such mobility results in the potential for individuals to be affected outside the boundary of the SAC for which they are a qualifying species.

In the assessment detailed in the EcIA (Terrestrial Ecology, Chapter 9), an initial approach is adopted which considers the Caithness and Sutherland Peatlands SAC where there is a potential impact pathway between the qualifying interest (i.e., otter) and the Onshore Development. The assessment takes into account records of otter within 5 km of the Onshore Site, evidence of otter activity within the Onshore Site boundaries and the suitability of the habitats present for this species.

The levels of otter activity within the Onshore Site boundaries were determined during the protected mammal surveys, undertaken as part of the extended Phase 1 habitat survey visits carried out in July 2021 and August 2022. The Onshore Site and a 250 m buffer area (based on best practice guidance for ecological impact assessment (CIEEM, 2018)). were searched for field signs of otter including spraint, holts, couches, slides, feeding signs and footprints. All signs of otter, and habitat meeting the ecological requirements of otter, were recorded as descriptive target notes. Locations were recorded using a hand-held Global Positioning System (GPS) device and photographs were taken where appropriate. A desk study was also undertaken. For otter, this encompassed the Onshore Site plus a 5 km buffer.

The subsequent SAC-specific assessments included an evaluation of the Caithness and Sutherland Peatlands SAC conservation objectives and the potential adverse effects of the Onshore Development upon the SAC and its qualifying interests.

Full details of the survey methodology and results can be found in the Terrestrial Ecology Baseline Survey Summary appended to the Onshore EIA; Technical Appendix 9.1.

### 8.4 Caithness and Sutherland Peatlands SAC

#### 8.4.1 Site Details and Qualifying Interests

The Caithness and Sutherland Peatlands SAC is an extensive site covering over 143,000 ha of land in Northern Scotland. Its general site character includes inland waterbodies, bogs, marshes, fens, water-fringed vegetation, heath, scrub and dry grassland. It has been designated for a number of Annex I habitats and Annex II species; including otter. The site contains numerous lochs, lochans and extensive areas of

headwaters of burns and rivers. There is extensive habitat suitable for otter and this is reflected in the presence of a good population, representative of the northern mainland of Scotland (NatureScot, 2020).

The condition and broader conservation status of the qualifying interests of the SAC have been summarised in Table 8.4 (NatureScot, 2020).

Table 8.4 Qualifying Interests and Condition for the Caithness and Sutherland Peatlands SAC

Qualifying Interests	Feature Condition	Assessment Date	Broader Conservation Status
Clear-water lakes of lochs with aquatic vegetation and poor to moderate nutrient levels.	Unfavourable Declining condition due to reduction in water quality and loss of some plant species from one of the lochs that has been monitored.  Negative pressures include forestry operations and impacts upon water quality.	16 Aug 2015	This type of waterbody occurs in the majority of EU Member States and is relatively abundant in the more mountainous areas of Europe.  In the UK, this habitat type is widespread and frequent in the north and west. It occurs rarely elsewhere.
Acid peat-stained lakes and ponds	Favourable Maintained  Negative Pressures include forestry operations.	4 Aug 2004	The status of Natural dystrophic lakes and ponds in the EU is unknown.  In the UK, natural dystrophic lakes and ponds are widespread in the north-west and scarce in the south.
Blanket bog	Unfavourable No change - condition due to effects of large, uncontrolled fires, too much browsing and trampling by red deer inappropriate drainage.  Other potential impacts include burning, erosion, tracks from vehicles, peat cutting, self-seeded conifers from nearby plantations and air pollution.	8 June 2017	In the EU, blanket bogs are found primarily in the UK and Ireland, but the extent of surviving habitat is now much reduced in Ireland.  Blanket bogs are found in the north and west of the UK, extending from Devon in the south to Shetland in the north.
Wet heathland with cross-leaved heath ( <i>Erica tetralix</i> )	Unfavourable condition due to effects of large, uncontrolled fires, too much browsing and trampling by red deer and inappropriate drainage.	8 June 2017	This habitat type occurs throughout the UK but is highly localised in parts of southern and central England. Wet heaths are increasingly extensive in the cool and wet north and west, particularly in the Scottish Highlands.  This habitat type is restricted to the Atlantic fringe of Europe between Norway and Normandy. A

Qualifying Interests	Feature Condition	Assessment Date	Broader Conservation Status
			high proportion of the EU resource occurs in the UK.
Transition mires and quaking bogs	Favourable but declining condition as some of the ladder fens appear to be drying out. This may, in part, be due to a natural cycle of creation and loss of ladder fen, but may also be due to inappropriate drainage causing large-scale changes to the site hydrology.	8 Jun 2017	<p>This habitat type is widespread but local in the UK. It is ecologically variable and occurs in a wide range of geomorphological contexts.</p> <p>These habitats have a wide European distribution but appear to be relatively scarce in the Mediterranean region.</p>
Depressions on peat substrates	<p>Unfavourable Declining condition due to effects of large, uncontrolled fires, too much browsing and trampling by red deer inappropriate drainage.</p> <p>Other potential impacts include burning, erosion, tracks from vehicles, peat cutting, self-seeded conifers from nearby plantations and air pollution.</p>	8 June 2017	<p>This habitat type is rare in the UK, exhibits a narrow range of ecological distribution and has a restricted geographical distribution. It is found in largest quantities on heaths in southern England and on blanket and raised bogs in western Britain, with an outlying example in East Anglia.</p> <p>This Annex I type appears to be widely distributed in the EU, especially in the Atlantic and Continental biogeographical regions.</p>
Eurasian otter	Unfavourable Declining condition with negative pressures including forestry operations and natural events.	9 Sept 2011	<p>Historically, otters occurred over most of the UK. However, persecution, habitat loss and, more recently, the impact of toxic organochlorine insecticides caused a marked reduction in the range of this species. At present, the majority of the otter population in Great Britain occurs in Scotland, with a significant portion of this number being found in the north and west of the country.</p> <p>In Europe, populations declined sharply during the 1960s and 1770s due to pollution. This decline was exacerbated by hunting and habitat loss. Currently, otter is scarce to extinct over most of continental</p>



Qualifying Interests	Feature Condition	Assessment Date	Broader Conservation Status
			western Europe, whilst it has a discontinuous distribution over eastern Europe, with strong populations in Greece, Spain, Portugal.
Marsh saxifrage ( <i>Saxifraga hirculus</i> )	Favourable Maintained	24 Aug 2007	<p>In the UK, marsh saxifrage is found only at a very few sites in the uplands of Scotland and England, and at one site in Northern Ireland. Since the 19<sup>th</sup> century, it has become extinct in several areas, mostly in Scotland.</p> <p>In Europe, marsh saxifrage is widely distributed but is declining or threatened in most countries.</p>

## 8.4.2 Site Objectives

The key objectives of the Caithness and Sutherland Peatlands SAC are to ensure that the qualifying features are in favourable condition and that the integrity of the SAC is restored. Table 8.5 provides the conservation objective statements for Caithness and Sutherland Peatlands SAC (NatureScot, 2020).

Table 8.5 Caithness and Sutherland Peatlands SAC Conservation Objectives relevant to otter

Caithness and Sutherland Peatlands SAC
<ul style="list-style-type: none"> <li>&gt; Restore the population of otter as a viable component of the site;</li> <li>&gt; Maintain the distribution of otter throughout the site; and</li> <li>&gt; Maintain the habitats supporting otter within the site and availability of food.</li> </ul>

## 8.4.3 Assessment of Adverse Effects Alone

For otter, the Onshore Development is predicted to result in the loss of a small area of habitat (6.05 ha during construction and 0.78 ha during operation and maintenance in the worst-case scenario) which might be used for foraging by otters associated with the Caithness and Sutherland Peatlands SAC. In the context the area of the whole SAC (143,561.47 ha), the size of the worst case area of disturbance is negligible; the total Onshore Site represents approximately 0.004% of the area of the whole SAC itself.

However, the habitats present on site were largely considered to be sub-optimal for this species, with limited opportunities for foraging, commuting or shelter. Furthermore, as the majority of the habitats impacted will be reinstated after installation of the onshore cable, such an effect will be transient. Therefore, considering the relatively small scale and nature of the works, **no adverse effects** on site integrity are predicted during the construction phase.

The ongoing operation and maintenance of the Onshore Site is unlikely to have any notable impact upon the habitats present on site. Whilst some temporary and localised disturbance effects may be anticipated as a

result of human activities related to the maintenance of onshore infrastructure, it is considered likely that such impact would be infrequent and small scale, and no greater than the baseline disturbance; resulting in disturbance effects of a lower magnitude than those during construction. Therefore, considering the low suitability of the Onshore Site for otter and following best practice guidelines as listed as embedded mitigation in Section 6.1, **no adverse effects** on site integrity are predicted followed during the operation and maintenance phase.

The decommissioning effects are considered likely to be of the same nature as the construction effects. Therefore, **no adverse effects** on site integrity are predicted during decommissioning.

**No adverse effect** on the integrity or conservation objectives of any designated features of Caithness and Sutherland Peatlands SAC is predicted.

#### 8.4.4 Summary

This assessment has shown that there is expected to be no adverse effects upon the integrity of Caithness and Sutherland Peatlands SAC, its qualifying features, or conservation objectives, as a result of the Onshore Development. Therefore, no change to the otter population, as a viable component of the Caithness and Sutherland Peatlands SAC, is anticipated.

A summary of the Onshore Development's assessment of the protected site with otter as a listed interest is shown in Table 8.6.

Table 8.6 Summary of results

Protected Site	Qualifying Feature	Potential Effect	Conclusion
Caithness and Sutherland Peatlands SAC	Otter	Foraging habitat loss or change	No adverse effects on site integrity or conservation objectives are anticipated.

## 9 CONCLUSION OF THE RIAA

As part of the HRA process, a Report to Inform Appropriate Assessment has been undertaken to provide information to allow the Competent Authority to ascertain whether the proposed Onshore Development will or will not adversely affect the integrity of a European Site. The conclusions of the terrestrial ecology and ornithology assessments presented within this document show that there are no adverse effects either from the Onshore Development alone, or in-combination with other developments, on the site integrity or conservation objectives of the European Sites screened into the individual assessments.

## 10 REFERENCES

- Chanin, P. 2013. The British Natural History Collection Volume 2: Otters. Whittet Books Ltd, Stansted.
- CIEEM. (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.
- Dounreay Trì (2016). Dounreay Trì Floating Wind Demonstration Project Environmental Statement Appendix 23.1: Terrestrial Ornithology Technical Appendix.
- European Commission (2000). Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Available at: [https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/EN\\_art\\_6\\_guide\\_jun\\_2019.pdf](https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/EN_art_6_guide_jun_2019.pdf)
- Furness, R. W., Wade, H. M., and Masden, E. A. (2013). Assessing vulnerability of marine bird populations to offshore wind farms. *Journal of Environmental Management* 119 (2013) 56-66.
- Goodship, N. & Furness, R.W. (2019). Seaweed hand-harvesting: literature review of disturbance distances and vulnerabilities of marine and coastal birds. Scottish Natural Heritage Research Report No. 1096
- Hancock, M.H., Robson, H.J., Smith T.D. and Douse, A. (2019). Spatial and temporal patterns of foraging activity by breeding Common Scoters (*Melanitta nigra*) in Scotland. *Ornis Fennica* 96: 124–141.
- Highland Wind Limited (2022). Pentland Floating Offshore Wind Farm – Onshore Habitats Regulations Appraisal Screening Report.
- Jarrett, D, Cook, A.S.C.P., Woodward, I., Ross, K., Horswill, C., Dadam, D. and Humphreys, E. M. (2018). Short-term behavioural responses of wintering waterbirds to marine activity. *Scottish Marine and Freshwater Science*, Vol 9, No 7.
- NatureScot (1999). Caithness Lochs SPA. Available at: <https://sitelink.nature.scot/site/8477>
- NatureScot (2021). Caithness and Sutherland Peatlands SAC. Available at: <https://sitelink.nature.scot/site/8218>
- Oxford Brookes (2001). Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC. November 2001.
- Patterson, I.J., Lambie, D., Smith, J. & Smith, R. (2013). Survey of the feeding areas, roosts and flight activity of qualifying species of the Caithness Lochs Special Protection Area, 2011/12 and 2012/13. Scottish Natural Heritage Commissioned Report No. 523b.
- Ramsar Information Service (2005). Information Sheet on Ramsar Wetlands: Caithness Lochs SPA. Available at: <https://rsis.ramsar.org/RISapp/files/RISrep/GB928RIS.pdf>
- Ruddock, M., & Whitfield, D.P. (2007). A Review of Disturbance Distances in Selected Bird Species: A report from Natural Research (Projects) Ltd to Scottish Natural Heritage
- Scottish Government (2013). Planning Circular 6/2013: development planning. Available at: <https://www.gov.scot/publications/planning-series-circular-6-2013-development-planning/>
- Scottish Government (2019). Implementation of Scottish Government policy on protecting Ramsar sites. Available at: <https://www.gov.scot/publications/implementation-of-scottish-government-policy-on-protecting-ramsar-sites/>
- Scottish Government (2020). EU Exit: The Habitats Regulations in Scotland. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2020/12/eu-exit-habitats-regulations-scotland-2/documents/eu-exit-habitats-regulations-scotland/eu-exit-habitats-regulations-scotland/govscot%3Adocument/eu-exit-habitats-regulations-scotland.pdf>
- SNH (2014). Natura sites and the Habitats Regulations: How to consider proposals affecting SACs and SPAs in Scotland. The essential quick guide.

---

SNH (2016). Assessing Connectivity with Special Protection Areas (SPAs). Guidance. Scottish Natural Heritage, Battleby, UK

Scottish Natural Heritage (SNH) (2016). Assessing Connectivity with Special Protection Areas (SPAs) Guidance. Available Online at: <https://www.nature.scot/doc/assessing-connectivity-special-protection-areas>

SNH (2019). Natura Casework Guidance - How to Consider Plans and proposed developments affecting Special Areas of Conservation and Special Protection Areas Version 9: <https://www.nature.scot/natura-casework-guidance-how-consider-plans-and-projects-affecting-special-areas-conservation-sacs>

Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114 114, 723–747

Tyldesley and Associates (2015). Habitats Regulations Appraisal of Plans: Guidance for Plan-Making Bodies in Scotland. Version 3.0. Available at: <https://www.nature.scot/sites/default/files/2019-07/Habitats%20Regulations%20Appraisal%20of%20Plans%20-%20plan-making%20bodies%20in%20Scotland%20-%20Jan%202015.pdf>